

DRIVING CHANGE

Meeting the needs of society, without costing the earth

GOOD CHEMISTRY

Finding solutions for global challenges

THE ROAD TO THE FUTURE

Which direction for the car industry?

THE CLIMATE IS CHANGING

And industry is best placed to change the world for the better

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INEOS
THE WORD FOR CHEMICALS

“Using our technology, waste could be taken from your doorstep and returned to you in the form of biofuel for your car and renewable power for your home”

Peter Williams CEO

INEOS BIO INDIAN RIVER BIOENERGY CENTRE.
Annual benefits once fully operational.

8 million gallons bioethanol – enough to run 150,000 average family cars a year*

80,000 tons CO₂ saving from biofuel compared to using gasoline – 10 kg of CO₂ saved per gallon of ethanol used

6 MW (gross) renewable power generated – enough to run the facility and export power to 1400 local homes**

Over 85% of the equipment comes from U.S. manufacturers

Over \$130 million project investment that will have created an estimated 380 direct and indirect jobs (including 275 construction jobs) and 60 full time jobs once the BioEnergy Centre becomes operational.

*assuming use of E10 (10% bioethanol mix in gasoline by volume), 12,000 miles/year, 22.5 miles per gallon (US EPA 2010 light-duty vehicle fleetwide average fuel economy). **data courtesy of US Energy Information Administration, 2010 average annual electricity consumption for a U.S. residential utility customer was 11.5 megawatt hours, 2 megawatts equals 16,000 megawatt hours.

INTRODUCTION



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SUSTAINABILITY is a fundamental part of our business.

It is not a marketing initiative. It's not there just so that we look or sound good. For INEOS, sustainability makes good business sense.

If we seriously want our business to thrive in today's fiercely competitive world we need to produce the products that society needs, in so doing be as efficient as we can be, optimising our processes, minimising waste and energy use and operating safely, wherever we are in the world.

Our chemicals are the building blocks for our modern world. They are essential components in many of the products we use today and in the technologies that will drive us towards a more sustainable future.

This edition of INCH takes a look at how INEOS and the chemical industry are meeting the needs of a rapidly growing population in a way that does not cost the earth.

A good example is what we are working on in Florida. This will be home to INEOS Bio's ground-breaking, patented technology that is designed to turn many different kinds of waste into renewable energy and advanced biofuel.

And one man who is deeply impressed by that is environmentalist Sir Jonathon Porritt, a former adviser to the UK Government, who also worked closely with INEOS on The Natural Step, another global sustainability initiative.

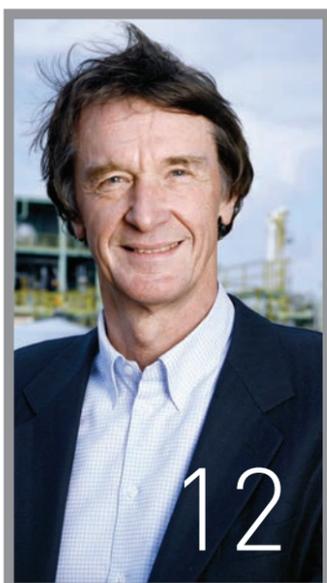
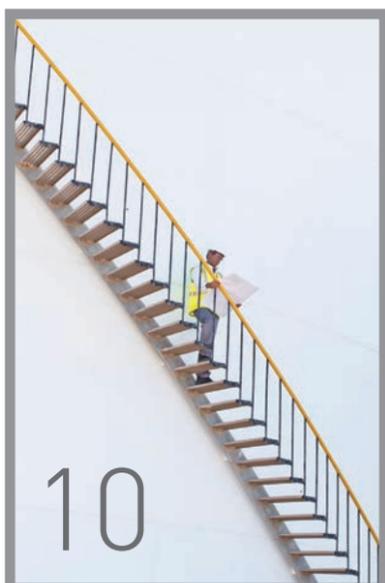
He is quoted in this edition and recognises that the real leadership to create a sustainable world is now coming from privately-owned companies, like INEOS, not politicians.

INEOS does not give sustainability a label or a stand-alone department. It is simply an integral part of our business.

Our approach to doing business drives efficiency, performance and sustainability across the Group. It helps us to stay reliable and competitive. It creates new opportunities to reduce energy and waste and encourages us to work in partnerships, internally and externally.

Building positive relations with our local communities and making our company a great place to work also make good business sense; essential to ensuring the long-term success of our company.

Ultimately, sustainability is what we aim to achieve, by excelling at what we do every day and taking the greatest of care how we do it.



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GOOD CH

The world faces a constant and growing challenge. How does it meet the demands of a rapidly rising population – last count seven billion – with finite resources, in a way that does not threaten the planet? One sector that has an answer and is doing more than the public realises to meet that challenge is the global chemical industry

AROUND the world, the chemical industry is working hard to find solutions to many of the issues that a rising population presents society.

That work – since the first historic Earth Summit in Rio de Janeiro in 1992 – has helped to ensure that farmers adopt sustainable agricultural methods and that more and more people can access cleaner, safer drinking water. It has further led to medical breakthroughs, transformed the way energy is used and is helping to reduce greenhouse gases.

And the work goes on.

Last year, the chemical industry, which directly employs more than seven million people worldwide, took stock of what it had achieved over the past 20 years since that first United Nations Conference on Environment and Development, and looked forward at how it could collectively begin to address the challenges that have emerged since.

During the Rio + 20 conference, which was attended by representatives from 196 nations, Steve Elliott, chief executive of the UK's Chemical Industries Association, said that the chemical industry had been at the forefront of the emerging green economy.

“Without chemical businesses, green technology and the green economy simply cannot happen,” he said.

Mr Elliott said he hoped Rio +20 would show the world how the industry and its stakeholders had worked together to enable people, the planet and companies to thrive.

Some of that progress has been highlighted in a report published by the International Council of Chemical Associations, the worldwide voice of the chemical industry.

ICCA president Andrew Liveris said during a panel discussion that progress had been the result of innovative ideas, technologies and processes, all made possible only through chemistry.

“Around the world, the chemical industry is enabling the very solutions we need to meet the global challenges,” he said.

In its report, the ICCA said building a green economy would depend on innovative solutions from all sectors – a view shared by UN Secretary General Ban Ki-moon.

“In these times of austerity and economic uncertainty, public sector efforts alone will not be sufficient,” he said.

“We need everyone at the table – investors, CEOs, governments, civil society groups, technical experts and practitioners – working in a common cause.”

Carlos Fadigas, chief executive of Brazilian chemical company Braskem, also took part in the ICCA panel discussion at the summit.

He said that the efficient use of resources was crucial.

“We must focus on sustainable consumption as well as sustainable production, with a commitment to producing goods and services efficiently and consuming them differently,” he said.

“To achieve that, it is crucial that each company puts sustainability as a core driver of its business strategy. More and more chemical companies are doing that.”

The ICCA said it hoped Rio +20 would spur governments into creating the right environment that would allow chemical companies to act swiftly to find even more innovative solutions to the world's changing needs.



EMISTRY



“Innovative, efficient solutions are required to achieve sustainable development,” it said.
“And contributions of the global chemical industry will play an essential role in the transition to a green economy envisioned by Rio +20.”

The ICCA also continues to encourage developing economies to responsibly use and handle 2,000 plus chemicals currently on the market, through its training workshops, which have so far been conducted – in such places as the Middle East, Africa and Asia – by leading chemical companies that are keen to share best practices.

“Promoting safe management and use of essential products of chemistry is a shared responsibility of manufacturers, government and all those who sell or use chemical products,” it said.

Rio+20 followed the publication of The European Chemical Industry Council’s first-ever sustainability report designed to raise public awareness of the benefits that the industry brings to society.

“This is a significant challenge,” said Tom Crotty who is also a member of the Cefic Board and Executive Committee.

“Our world is changing. Global population is rising. There is pressure on resources rising energy prices and climate change have created a need for new lower carbon energy sources.

All of this is driving the transition to a resource and energy efficient economy and the chemical industry has a central role to play in enabling this shift.”

Jim Ratcliffe, chairman, INEOS

Cefic is the European Chemical Industry Council. This Brussels-based organisation said its own surveys and external research had shown that public opinion of the chemical industry differed from one country to the next.

The report, which highlighted examples of innovative products and initiatives, and groundbreaking advances, aimed to improve the public’s generally negative perception of the chemical industry.

“The chemical industry is, perhaps, better placed than any other sector to tackle the challenges of sustainability,” he said.

“After all there’s virtually no product, no service or human activity that does not in some way rely on the contribution of chemistry.”

In its report, Cefic stressed the importance of open communication.

“Partnerships and collaboration within industry are essential,” said Mr Giorgi Squinzi President of Cefic. ***“But so too are partnerships with authorities, those in the supply chain, and academic and research institutions.”***

INEOS CAPITAL



Sustainability runs through the very heart of the way INEOS operates around the world. But how does the company approach this much talked about subject? To find out, Tom Crotty met Jim Dawson, a non-executive director of INEOS, the chairman of INEOS Technologies, Oxide and Bio and someone with vast experience of the petrochemicals industry.



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INEOS CAPITAL
INTERVIEW

Tom: Many companies have invested in sustainability departments but INEOS hasn't. Doesn't INEOS view sustainability as important enough to warrant its own department?

Jim: Quite the contrary. Sustainability is important to INEOS. It is a feature of all of our activities. We are not the sort of company that has a big central office that says 'Sustainability'. We expect every business and everybody in it to follow that approach as part of its day-to-day business.

I can remember when – because I am old – some 40 years ago the price of oil was \$2 (about \$10 in today's terms) and energy was cheap. Today, and for the past couple of years, it has been about \$110 globally and therefore there is a big pressure to improve energy consumption and also to produce products that save energy, so a good example of this is where we improve the operation and efficiency of our plants. We invest in better heat exchangers. We improve our reliability and reduce flaring. We improve our furnaces to be more efficient. As a result our energy consumption drops quite a bit. And the products we produce also provide significant benefit to society. Products such as expanded polystyrene for example. We have a special version called EPS Silver that is used to insulate buildings. It is a special form of EPS that can improve energy efficiency by 20% compared with the standard product. That's just one example of producing products that are good for sustainable development. On average, across chemical products, for every kilogram of carbon emitted in their production, two kilograms of carbon are saved in their use.

Tom: INEOS often talks about the importance of being a good neighbour. Why is that so important to the sustainability of the business?

Jim: It is important in many ways. We have to maintain trust and have a good relationship with our neighbouring communities. One reason, of course, is that we employ quite a lot of people, at our sites, who live in the neighbouring communities. It is very important to be transparent about what is going on our sites. A good example is on safety and environment. Both are very important to us. If we get that right, our communities know we are doing the right thing. We take Safety Health and Environmental performance very seriously at the highest level. We have 15 businesses and we have board meetings every month or two. At the start of every meeting we have a session on personal safety, on process safety and environmental impact. And I am pleased to say that last year our personal safety records was one of the best ever in INEOS history and the environmental impact record was one of the best in INEOS history, so I think we are doing good things for the community and ourselves by working on that. We also have community meetings at many sites so that people are totally aware what's going on in their neighbouring plant.

Tom: Another important aspect of sustainability is attracting and retaining the right people. How is INEOS investing in training and developing the best workforce?

Jim: Ours is a technically demanding business and there is plenty of competition so we need to make sure we attract and retain the right people, and that is at all levels in the organisation. It may be apprenticeships where we are trying to improve operations on our plants and provide opportunities for further progression. Or it may be graduate programmes where we are trying to get other training for those people so that they can diversify their career, get opportunities in different businesses and progress through the company. Because of that, we do a lot of work with various institutions, with schools, with technical colleges and universities to try to identify and attract those best people, that will one day be the leaders of our businesses.

Tom: Jim, we have talked a lot about the culture of the business. And the culture within INEOS seems to encourage the development of an entrepreneurial spirit. Why is that?

Jim: INEOS has its own style. It is focused. It focuses on profit. It focuses on safety and it wants an entrepreneurial, "can-do" style. And we need that because the chemical industry is complex and competitive. Chemicals are used in transport, in medicine, in communications, in buildings, in a whole raft of important markets and we need an entrepreneurial spirit to make the best of those. And there are some good examples. Liquid food packaging is important to all of us. We can make the central barriers 35% thinner by using a different catalyst in the polyethylene that forms them. We also do simple things like using a different form of high density polyethylene to reduce the weight of bottle tops. It is a trivial thing but when you think of the billions of bottles that are produced and the contents consumed, then small amounts of change like that make a big difference. Another example of entrepreneurial thinking is in our bio-fuels. We have developed a process to convert organic waste into bio-ethanol, and that organic waste can be municipal solid waste. It is then gasified into syngas, which is carbon monoxide and hydrogen. That then reacts with micro-organisms and they convert it into ethanol. We have constructed an eight million gallon, commercial scale plant in Florida. It is the first plant in the world. It is new technology so we have been going through a quite time consuming mechanism of starting the plant up. Dealing with solids at the front end or liquids in the middle has taken time to optimise. As of today we are producing bio-ethanol on a commercial scale for the nation's fuel supply. And that's certainly an example of sustainable development. (INEOS announced commercial scale production from this plant on July 31st 2013)

Tom: Why is it so important that companies like ours create and develop products that make a difference?

Jim: Quite simply, it is the nature of the chemicals business. It's important that we produce new products for what the world requires. And sometimes those products may be common ones. For example, chlorine is a commodity that has been around for many, many decades and yet the chlorine we produce in the UK purifies 98% of the country's water supply. Now that is a statistic to be proud of. We have also developed a bio-chlor membrane process to remove mercury and improve the efficiency of making this chlorine by some 30%.

Another example are synthetic motor oils. Car engines are getting more and more complex and they are getting more and more efficient and therefore they need high quality motor oils to operate them. We produce synthetic oils and this goes into top-end lubricants.

But it doesn't stop there. We also use similar things in compressor boxes and in gear boxes and a good example is a special form of lubricant that we have developed for wind turbines. You can imagine if you have set up a wind turbine - it is on a tall structure and the gear box is high in the sky – you won't want to be climbing up and down that structure every week to lubricate it. That's why we have developed products that have a good sheer strength, last a long time, are good lubricants, reduce friction, and are ideal to extend the service life of the wave of wind turbines we see around the world.

We are also a producer of acrylonitrile, which is the precursor to carbon fibre. Carbon fibre is light and strong. If you use them in aircraft you can reduce fuel consumption by about 30%. Of course, you are moving a lighter structure around the sky so it is not just carbon fibre in golf clubs. In transport you can make a big difference. We do feel at INEOS that we make products that make a real difference.

“INEOS has helped to reduce the weight of bottle tops by using a different form of high density polyethylene. It is a trivial thing, but when you think of the billions of bottles, which are produced, then small amounts of change like that make a big difference” Jim Dawson



DRIVING CHANGE

INEOS THRIVES ON INNOVATION. SO NO
GUESSES FOR WHICH COMPANY IS BEHIND
A PROJECT THAT HAS THE POTENTIAL TO
CHANGE THE WAY WE THINK ABOUT
CHEMICALS, ENERGY AND WASTE.



BUILDING on more than 20 years of research, INEOS is perfecting the technology to turn household waste into renewable energy and advanced biofuel.

And unlike some biofuels, which rely on corn, sugar cane or vegetable oil, the INEOS technology won't be competing with food crops for land or resources.

"Not only does it divert waste that would otherwise have gone to landfill but it also breaks the link between food crops and bioethanol production," said Peter Williams CEO of INEOS Bio.

"Reducing waste and recycling is essential but there will always be some waste that has to be dealt with. Recover and recycle what you can as part of the existing waste infrastructure then instead of sending the rest to landfill in the future it can be sent to a biorefinery based on INEOS technology."

America alone is believed to generate about 260 million tons of household waste (garbage) every year. New landfill sites are becoming more difficult to permit and many existing sites are almost full.

"Several states are actually shipping their garbage across state lines," said Kelly Russell Regulatory Affairs analyst at INEOS Bio.

INEOS' patented technology offers a way to break the old cycle.

INEOS Bio has invested millions of dollars in building the ground-breaking Indian River County BioEnergy Centre on the site of a former grapefruit juice plant near Vero Beach in Florida.

As it stands, it will be the first commercial plant in the world using INEOS Bio's technology, which is capable of turning a huge range of waste into bioethanol.

But that's not all.

The centre is already producing electricity to run the plant – and power up to 1,400 homes in the area.

"The production of renewable energy is a significant benefit of our technology," said Peter.

When the plant becomes fully operational, it will produce eight million gallons of advanced biofuels every year for blending with gasoline.

Those eight million gallons will be enough for 150,000 average-sized family cars to travel 12,000 miles a year, assuming that the gasoline includes 10% ethanol.

US Agriculture Secretary Tom Vilsack is 'very excited' about INEOS' plant.

He told reporter Laura Ruane at USA Today that INEOS is a company to watch.

The US is in a strong position to lead the world. It desperately needs to reduce its reliance on fossil fuels and foreign oil, and INEOS is helping to find a solution.

Its bioethanol is expected to help the growth in the use of biofuels in both America and Europe, and at the same time offer a new and better solution to dealing with waste.

In America, the major oil companies must, by law, buy – and blend – a certain amount of biofuels through the Renewable Fuel Standard.

"Basically we are aiming to help governments to achieve their targets on a number of policy issues: reducing waste to landfill; increasing access to renewable fuels and energy; lowering carbon emissions; and improving energy security. All from one technology" said Peter.

America has been blending ethanol into gasoline since the late 1970s but nearly all ethanol is currently derived from corn.

That means, when the weather misbehaves – as it did last summer when the Midwest was hit by a severe drought – availability of traditional bioethanol fell and costs rose. INEOS bioethanol will not depend on the weather.

This, though, is really just the start of INEOS' biofuels' worldwide journey.

It wants to rapidly roll out its highly innovative technology around the world to help communities deal with their own waste.

"This technology changes the way that people will think about chemicals, energy and waste," said Peter. **"Our expertise in licensing technology means that we will be able to make this available around the world wherever there is a waste issue to be tackled. And at the same time we are helping meet climate change targets,"**

Altogether, there is potential for hundreds of biorefineries.

"INEOS cannot possibly build enough of these alone," he said. **"But we are interested in working with local municipalities and partnering with governments to meet their needs."**

A country that had a waste problem should be excited by what's happening in Florida. And it seems many are.

The Florida plant will initially be creating fuel – and power – from yard and garden waste only.

The BioEnergy Centre is also a research and development facility and will be a reference point for other countries that opt to license INEOS' bioethanol technology.

"The plant, which is in its final stages of the process of moving from commissioning to operation, has already provided vital learning for our plans of broader commercialisation," he said.

"It has allowed us to test and validate results from laboratory and pilot plant at a much larger scale and has added considerably to our knowledge and understanding."

"And going forward it will provide us with a tool to extend our technology."

He said several important innovations had been made over the years at the plant due to its size and facilities.

"Those discoveries simply would not have been possible using only laboratory scale equipment and pilot plant," he said.

HOW IT WORKS

It will take about seven minutes to convert a ton of waste into fuel that can be blended with petrol.

Vegetative and agricultural waste is mixed with oxygen to produce hot, synthesis gas.

The gas, which consists of hydrogen and carbon monoxide, is then cooled, cleaned, and fed to naturally occurring bacteria.

The bacteria convert the gas into cellulosic ethanol which is then purified to prepare for use as fuel.

The excess gas, which is not converted into ethanol, ends up in a vent gas boiler where it produces steam. Heat from the gasification process also turns into steam.

Both are then used to produce electricity to run the plant and up to 1,400 homes and businesses in the local area.

"We are hoping to produce about 24,000 gallons (90,000 litres) of fuel a day because our process is unique in that it is a continuous process rather than a batch," said plant manager Dave King.

"Conventional ethanol from corn starch is a batch type process that takes days to ferment into ethanol."

About 60 people will work full-time at the Vero Beach plant. Most of them live locally.

"The jobs brought an annual boost to the local payroll of more than \$4 million per year in an area that was experiencing 15% unemployment when the project started," said Dave.

Looking to the future, Dave hopes more and more car manufacturers will build cars that can take more than 10% ethanol.

"There are vehicles that exist that are called 'flex fuel vehicles' that in the US can run on any ethanol blend up to 85%," he said.

He said in the US all conventional vehicles could currently run on up to 10% ethanol – and that had been the case for many years.

By contrast, in Brazil, all vehicles can run on up to 100% ethanol and are flexible-fuelled vehicles.

"The Brazilian government can at their discretion adjust the ethanol-gasoline mix based on supply and demand," said Dave.

"But Brazilian ethanol is made from sugarcane and their market is dependent on the sugarcane crops and the price of sugar."

A SAFETY FIRST FOR INEOS

AFTER YEARS OF GOING IT ALONE, INEOS JOINS RANKS OF SHELL, DOW CHEMICAL AND EXXON

Safety is INEOS' top priority. The company knows that its businesses won't last long if it takes the safety of their employees and those living close to its manufacturing plants for granted. For years INEOS as a group has kept very tight control on its performance, using a system it inherited from ICI. Today it is doing things differently. It wants the world to be able to judge its performance against the very best

THE WORLD will soon be able to fairly judge INEOS' safety performance against other petrochemical companies.

Multi-national chemical giants Shell, Dow Chemical, BP, and Exxon have, for years, reported their workplace injuries and illnesses according to the rules of the Occupational Health and Safety Administration (OSHA), a federal agency of the United States Department of Labour that was founded during Richard Nixon's US presidency in 1970.

For years INEOS – a company that has grown from acquisition – has used a system for recording 'classified reportable injuries' and illnesses that it inherited from ICI.

Now, though, it has decided as a Group to report under OSHA's Umbrella, in line with other companies.

"Although the OSHA record keeping is an American-based system, it is recognised globally," said Stephen Yee, Business Safety Health and Environment Manager based at INEOS ChlorVinyls.

"This will make it easier for us to compare our safety performance against the likes of Exxon," he said. **"We will now be able to compare like for like."**

INEOS' businesses in the US already fall under OSHA regulations and INEOS Olefins & Polymers USA's two largest facilities have already earned OSHA Star and Merit ratings under the Voluntary Protection Program (VPP).

Companies that qualify to join this programme must operate an effective health and safety systems that meets rigorous performance-based criteria. In short, they are deemed to go above and beyond what OSHA expects of them.

The INEOS system has worked extremely well and has enabled the company to significantly improve the safety performance of its businesses. As the company has grown over the years INEOS saw no need to change it.

The decision to now switch to OSHA record-keeping guidelines is a big and bold step.

"OSHA is very different" said Stephen.

Whereas INEOS would not log an incident as a 'classified reportable injury' if a member of staff were prescribed paracetamol by a company doctor, OSHA would expect it to be recorded under its recording guidelines.

"Safety remains our highest priority and by making this change we will continue to monitor and improve our safety performance but the company will be recording events in a slightly different way" said Stephen.

To make the transition easier – and so that staff know that INEOS' safety performance has not deteriorated overnight – Stephen said he had compiled a report to show how INEOS would have fared under OSHA record-keeping guidelines since 2002.

"We wanted to give staff an indication of what the figures would have looked like, across the company" he said.

Since October, INEOS has been running both systems to ensure continuous improvement.

"By doing that our employees can continue to see what our performance would have been like under our old system," said Stephen.

Making this change does not alter the company's legal compliance and INEOS will continue to meet its regulatory requirements.

"In every country we have local, legal requirements," he said. **"That won't change."**

For the past four years INEOS' safety record has improved year on year, and 2012 would have been its best year to date, save for a process safety incident at Lavéra in France last December, during which five firefighters were exposed to higher than normal noise levels.

"Because they were off work for more than three days it became a classified reportable injury," said Stephen.



Safety is – and has always been – INEOS’ top priority, and INEOS prides itself on being open and honest about what it does, how it does it and the impact it has on its staff and those that live and work close to its 51 manufacturing sites.

“We have always tracked and reported more than we were required to do by law,” said Stephen, ***“and that engrained approach will not change under the OSHA system.”***

Although some in the company may be unaware of OSHA, plenty others will know about the way it operates.

“OSHA won’t be totally new to many people because over the years INEOS has acquired businesses from companies where this system would have been operated before,” said Stephen.

All staff that are required to make the determination of an OSHA injury were trained in September last year and Stephen is on hand (along with teams from its US businesses) if there are any cases of doubt.

“For us, this does not change our view of the importance of safety across every aspect of our business. It is now just a different way to do things, but it is important that we make the transition smoothly and spend our time focused on keeping safe,” said Stephen.

JIM'S A LEADER IN HIS FIELD

INEOS chairman joins the elite

INEOS chairman Jim Ratcliffe has won an award for his outstanding contribution to the world in which we live.

He was presented with the Petrochemical Heritage Award at the 2013 International Petrochemical Conference in San Antonio, Texas.

Previous winners of this lifetime achievement award – long viewed as one of the most prestigious by the industry – have included some of its most prominent pioneers from all corners of the globe.

Tom Tritton, president and CEO of The Chemical Heritage Foundation, said Jim had been this year's overwhelming winner due to INEOS' rapid growth and incredible success over the past 15 years.

"Science-based industries need people like Jim," he told INCH magazine after the ceremony. **"He combines an understanding of basic science with an acute level of insight into how to translate science to practical application."**

"He also knows how to take well-timed risks that will turn ideas into reality."

It is the first time that a Briton has ever won the award in its 17-year history – a fact that did not go unnoticed by Jim.

"I was a bit concerned that your standards were slipping," he said with a smile.

But the former chemical engineer, who graduated from Birmingham University in 1974, said INEOS' success was not the work of just one man.

"I am here because of what INEOS has achieved but it has not just been myself who has done that," he said.

"We are quite a tightly-knit group of people in INEOS so it has very much been a team effort to get us here."

INEOS, he said, worked in a different way to most similar-sized companies.

"We are more like a federation of businesses," he said. **"We give our businesses a lot of autonomy. We give our management and chief executives a lot of autonomy and independence."**

"That's why people in INEOS behave, I hope, more like owners than employees. And it hopefully generates that spirit of entrepreneurship, being nimble and making quick decisions."

He said INEOS was very focused on fixed costs, operating reliable machinery, profit and safety.

"Everybody in our industry talks about safety but we have about 10 or 15 board meetings a month and the first item on every board agenda is safety," he said.

During his acceptance speech and subsequent Q&A, Jim also touched on INEOS' proud history, the 2008-2009 recession and how INEOS managed its way out of that crisis and the shale gas boom which has transformed America's manufacturing industry.

He also spoke about why INEOS disliked bureaucracy – 'it suffocates businesses' – and why, he believed, the UK, once home to INEOS' headquarters, was still in recession.

"I am a firm believer that any economy must have a strong manufacturing base," he said.

"The main reason that the UK has not come out of this recession is because it has no, or very little, manufacturing."

He said it had been quite depressing to witness the virtual collapse of manufacturing in the UK where 15 years ago it had been on a par with Germany – at about 25%.

Today only about 10% of the UK's economy is manufacturing while Germany's is still at 25%.

That happened, he said, because the British Government, at that time, had been more interested in financial services than manufacturing.

"They thought financial services was the future," he said.

Jim told guests that for manufacturing to be successful in any country, it needed to have unique selling points (USPs).

"If you look at the UK today, there are not many USPs," he said. **"There are not many reasons why someone what want to manufacture in the UK, other than perhaps the English language."**

"Taxes are relatively high, the unions are difficult, pensions are expensive, there are logistics and energy costs are extremely expensive."

He said America – on the other hand – had 'lots and lots of USPs'.

"You have skilled labour, the unions are sensible, pensions are sensible, and you have this enormously strong new one, which is cheap energy and cheap feedstock," he said.

During the question and answer session, Jim was asked about shale gas – the cheap feedstock that has revived America's manufacturing industry – and whether the US government should limit shale gas exports to protect the American economy.

"I can understand it in certain areas perhaps it being restricted," he told them. **"But across the board I think that would be regarded by the world as creating a difficult precedent because America imports a lot of oil."**

As the 17th recipient of the Petrochemical Heritage Award, Jim joins an elite group, including the former president of Cain Chemical and the founder of Texas Petrochemicals Company.

"Jim's career shows how an optimizer steadily grows," said Tom Tritton. **"He has taken INEOS through two major industry downturns to success after success."**

"He is also clearly a man who is in for the long haul. He has held the chairmanship at INEOS since 1998 and this year he finished, Paris, London and Geneva Marathons in under four hours."

"To me, running a marathon is a wholly admirable accomplishment. It demonstrates dedication, persistence in the face of adversity, and a willingness to take on hard goals."

The Chemical Heritage Foundation and the Founders Club established the Petrochemical Heritage Award in 1997 to recognise inspiring individuals who had made an outstanding contribution to the petrochemical industry and promoted public understanding of the modern sciences, industries, and economies.



SCAN HERE
TO VIEW VIDEO:
FOUNDERS

WHAT'S IN A NAME?

Ever wondered where the INEOS name comes from?

It was a question asked of Jim Ratcliffe after he accepted his award in Texas.

Two sons, two dictionaries and an acquisition deadline led to the company's unique name when it was first established 15 years ago.

On the Friday before Jim was to close the acquisition of the company his lawyers needed a name. By Monday.

On Saturday morning, Ratcliffe bought two dictionaries, one Greek, one Latin and sat down with his two sons, then aged 10 and 12. The three then set to work on a name. And at a cost of \$20, they came up with one word that holds a lot of meaning.

The new company's business was previously INspec Ethylene Oxide and Specialties, so the letters fell into place.

From the dictionaries the three found 'INEO' which is Latin for a new beginning. 'EOS' is the Greek goddess of the dawn and 'NEOS' is new, novel and innovative. So the name was chosen – 'INEOS' - representing the dawn of something new and innovative.

The company has been living up to its name ever since.

THE ROAD TO THE FUTURE

BUT WHICH DIRECTION WILL THE CAR INDUSTRY TAKE US?

FUEL TANKS

Plastic fuel tanks are replacing steel because they are lighter (lighter cars improve fuel economy), they can be recycled and don't corrode.

INEOS Olefins & Polymers manufactures the high density polymers for plastic fuel tanks.

TYRES

There are currently more than 160 tyre manufacturers in the world who spend over £1,000 million every year in research and development to make cars more efficient and improve stopping distances.

INEOS Olefins & Polymers produces the materials used to make for tyres. These help to improve performance and reduce wear and tear. INEOS Phenol produces phenolic resins that are used to make tyre tackifiers and its alpha methyl styrene helps to produce better, fuel efficient tyres.

The future belongs to those who believe in the beauty of their dreams -
Eleanor Roosevelt

SOME say that behind every successful man is a great woman.

German car engineer Karl Benz, if he were alive today, might well agree with that.

For it was his wife Bertha's publicity stunt in 1888 that focused the world's attention on his patented Motorwagen and earned the company its first sales.

On August 5, without telling him, she borrowed his car and set off on an historic journey from Mannheim in Germany with their two oldest children. It was the first time anyone had attempted to drive a car over such a long distance.

People thought cars were dangerous and unreliable. And no one wanted one.

Bertha decided to prove otherwise. She wanted no one to be in any doubt. The car was the future.

She set off before dawn and, shortly after dusk, arrived at her mother's home in Pforzheim from where she sent Karl a telegram, informing him of the good news. The following day, she confounded the critics even more by driving home whereupon she presented her husband with

a list of suggestions for all the mechanical things that had gone wrong during her trip.

That 106km journey 124 years ago triggered a love affair with the car that continues to this day.

Back then, it might have been convincing a sceptical public that it was a viable method of travel. Today it's finding a way of keeping the growing millions of cars on the roads whilst reducing their impact on people and the planet.

And it's a full-time job.

For technology is moving so fast that it's hard to predict which direction the industry will eventually go.

Will cars be run on hydrogen, biofuels, fuel cells, solar power, electricity, liquid nitrogen or natural gas? Will they be built from plastic, carbon fibre or aluminium?

There is not going to be a single solution but the direction is the same. Cars of the future need materials and technologies that will make them lighter and safer, reducing fuel consumption and dramatically cut down on exhaust emissions.

Conventional cars currently operate at about 15% efficiency so the potential for improvement with advanced technologies is enormous.

Scratch the surface and you will find that INEOS is already at the heart of so many of the advances that are being made by manufacturers to make cars stronger, safer, lighter, sexier and more efficient while also satisfying those concerned about the environment.

Plastics is a big one that is pulling its weight. So too is carbon fibre. But there are a host of other raw materials made by INEOS that are going into tyres, seat belts, brake fluid, anti-freeze, air filters and synthetic oils.

INEOS' Olefins & Polymers makes the high density polyethylene and polypropylene, which form the backbone of the entire plastics manufacturing industry.

Car manufacturers especially like plastic because it can be moulded into virtually any shape but there's more to plastic than just versatility.

It's also incredibly strong while being much lighter than steel, which as a result enables lighter, more fuel-efficient cars that do not

compromise on safety.

Today most fuel tanks in Europe and America and about 40% in Asia are believed to be made of plastic instead of steel because they are lighter, can be recycled and don't corrode.

And some of the world's leading producers are using INEOS' custom-engineered polymers to make them.

The use of carbon fibre is another exciting area and INEOS' Nitriles business, which is the world's largest producer of key carbon fibre ingredient acrylonitrile, is at the heart of that too.

Carbon fibre is 50% lighter than steel yet about five times stronger. The challenge is to find a way of making it more affordable so it can be mass produced.

INEOS says, if that happens, the potential environmental benefit, given the number of cars on the roads around the world today, is enormous.

Look closely at the electrics in most cars and you will find that all the wiring is coated in PVC largely because it is flame resistant – a factor which will become ever

INTERIORS

Plastics are being used inside cars to improve aesthetics and safety.

INEOS Olefins & Polymers manufactures the high density polyethylene and polypropylene that form the backbone of the entire plastics manufacturing industry.

Phenol and Acetone from INEOS are both needed to make polycarbonate that is also being used to reshape car interiors and exteriors.

INEOS Phenol's phenol and acetone are both needed to make polycarbonate.

FUEL

The world is looking for an alternative to traditional fossil fuels.

INEOS Bio's technology produces advanced biofuels (from waste not crops) to be blended with petrol. The technology also produces renewable power that could be used to charge batteries.

SYNTHETIC OILS

Demand for better fuel economy and better performing engines has led to an increase in the interest in low viscosity engine oils.

INEOS Oligomers provides the manufacturers of synthetic oils and additive suppliers with the high performance base oils that help to improve a car's overall efficiency.

ELECTRICS

PVC is used to coat the wiring of electrical components in cars because it is flame resistant and, unlike rubber, doesn't perish.

INEOS ChlorVinyls is Europe's largest PVC manufacturer.

BODY PARTS

Carbon fibre is 50% lighter than steel but about five times stronger. More of this product is being used in cars to reduce weight without compromising safety.

INEOS Nitriles is the world's largest producer of acrylonitrile which is the essential ingredient in carbon fibre. Without it, carbon fibre would not exist.

more important as the number of electrical components in cars increases.

"PVC cabling doesn't perish unlike rubber," said Dr Jason Leadbitter, Sustainability & Compliance Manager at Ineos ChlorVinyls, Europe's largest PVC manufacturer.

His colleagues at INEOS Oligomers, meanwhile, are working closely with the manufacturers of synthetic oils and additive suppliers to deliver what their customers want. Advanced synthetic oils are helping to reduce wear and tear on engine components, whilst helping to improve the efficiency of modern engines for longer.

"Today demand for better fuel economy has increased both end-user and car manufacturers' interest in low viscosity engine lubricants," said Michel Sánchez, PAO market development manager at INEOS Oligomers. **"And that trend will continue with the introduction of new, tailor-made viscosity grades."**

He said INEOS' Group IV base oils – known as PAOs – performed above and beyond in maintaining engine durability, performance and reliability.

At INEOS Olefins & Polymers, the raw materials for butadiene are also produced to create synthetic rubber for tyres. The beauty about butadiene is that it performs equally well whatever the weather and can withstand a lot of wear and tear compared with other rubbers.

There are currently more than 160 tyre manufacturers in the world who spend over £1,000 million every year in research and development to make cars more efficient, enhance handling and improve stopping distances.

Treading that road too is INEOS Phenol.

Its phenol goes into resins to make tyre tackifiers and nylon intermediates to make tyre cord and other engineered thermoplastics.

But INEOS Phenol's involvement doesn't end there.

Phenol and acetone are both needed to make polycarbonate, a magical, pliable material that is used extensively to make sun roofs, side windows, tail lights, headlamps and other car parts.

The good thing about polycarbonate is that

it can be moulded into a single piece, it is light and incredibly strong, which means better protection in the event of an accident.

INEOS Phenol also makes acetone which is used in Perspex, in acrylics for the paints, along with resins for brake pads and air filters.

Perhaps the biggest question of all, though, is how will cars of the future be powered?

Every car company without exception is considering the alternatives to fossil fuels and how this shapes their product.

It is an area that INEOS is also involved. It has built a plant in Florida that is designed to produce eight million gallons of advanced biofuels from waste every year for the cars of today and tomorrow.

Meanwhile, their colleagues at INEOS ChlorVinyls have helped to create a 'hydrogen highway' across Norway by providing a clean form of hydrogen. The hydrogen, which is essential for fuel cells, is a by-product of INEOS' chlor-alkali process at its Rafnes site.

"It provides fuel from one of several hydrogen fuelling stations that

are now forming a corridor from Stavanger to Oslo," said Jason.

No-one should ever doubt the importance of the chemical industry to the car industry.

The International Council of Chemical Associations said recently that chemical products for vehicles were now saving 230 million tons of greenhouse gas emissions every year.

In a report to the Rio +20 summit, it also highlighted how metallocene catalyst technology, licensed by INEOS Technologies, had been a major breakthrough in the manufacturing of plastics.

"Metallocene polymers also enable modified plastics to be used more widely in automobile applications, replacing steel," the ICCA said.

Whatever happens, the car manufacturing industry will continue to look to companies like INEOS for answers.

Thankfully INEOS has plenty.

THE IMPORTANCE OF FORWARD-THINKING

And it has never been more important to the chemical industry

Companies wanting to grow sustainable businesses must have a rich source of talent to tap into. But when you are faced with ageing workforces and a shortage of skills, it becomes critical. Like all Science, Engineering and Technology companies INEOS knows that only too well. It's one of the reasons it works so hard to ensure that that INEOS is a rewarding place to work so that they can attract – and more importantly, develop and retain – talented employees

FORWARD-THINKING companies do just that. They think ahead. They think about the future. They plan.

And an essential part of that plan means working out exactly who are the future stars of your business.

And that has never been more important for the chemical industry.

An ageing workforce combined with a skills shortage is now having a profound effect on all industries, says The European Chemical Industry Council (Cefic).

For the chemical industry, which needs a continuous stream of skilled, highly trained, highly disciplined and motivated employees to survive in highly competitive world markets, it's a particular worry because of the decline in the number of students who view science as a career.

Part of the problem is to do with the image of science in schools and the public's generally negative perception of industry.

Earlier this year Cefic published its first-ever report on how the chemical industry in Europe should work towards sustainability.

It said the chemical industry had to do more to change its public image – and believed it could, if the industry were more open, engaged more with students, governments and stakeholders, and publicly demonstrated how its products made a difference to society.

"Our aim is to make chemistry and our business an even more attractive employment option," said Cefic.

As a company, INEOS has arguably started to do that.

It knows it needs to raise its public profile globally so that is able to attract the next generation of researchers, engineers, managers and line workers.

For despite INEOS' position in the world you would not be alone if you said: **'I've never heard of INEOS.'**

To address the balance, INEOS has been busy building solid bridges with schools, colleges, universities, and local communities.

Its aim is always the same: to inspire and excite the brightest young sparks to want to work for them – and reassure communities that it cares about their wellbeing too.

"Building positive relations with our local communities and making our company a great place to work make good business sense," said Anne-Gret Iturriaga Abarzua, Communications Manager at INEOS' Köln site.

"And both are essential to ensuring the long-term success of our company."

The approach is working.

In America and Germany, where INEOS works closely with schools, universities and organisations, it has effectively been able to shape its own destiny by recruiting exactly the type of people it needs.

"In short we have been able to establish a talent pipeline," Sam Scheiner, HR director at Olefins & Polymer USA, told INCH magazine.

Much of the good work, though, that INEOS does goes on – quietly – behind the scenes.

Dr Anne-Gret Iturriaga Abarzua recently addressed a global science conference in Helsinki, Finland, which was organised by the Global Network of Science Academies to highlight how schools and industry needed to prepare tomorrow's workforce.

INEOS – along with the other chemical industries in Stenungsund, Sweden – is also heavily involved with Molekylverkstan, a world class science centre that last year alone welcomed 50,000 visitors.

There, young children are encouraged to experiment with exhibits of molecules to help them understand how the world really works.

"Molekylverkstan is a platform for the chemical industries," said Carita Johansson, Communications Officer at INEOS ChlorVinyls in Stenungsund.

"And our ultimate aim is to raise awareness and interest in science."

In addition, INEOS works with the local specialist Technical College to help shape the students' courses so that they are relevant to life in industry.

"The co-operation between the chemical industries and the schools is important because it means we are more likely to interest talented children that will one day be future employees with the skills we need," she said.

Elsewhere, though, INEOS' biggest hurdle is the fact that many outside the company remain unaware of INEOS even though it employs 15,000 people and operates 51 manufacturing sites in 11 countries.

"Considering the size of INEOS, we have never really sold the INEOS story as well as we should," said Jill Dolan, INEOS Group HR Director.

To help tell that story, this year, INEOS attended some top university careers fairs in the US and Europe for the first time.

But tempting the very best to join an organisation is not enough, says Nathalie Crutzen, Accenture chairman in Sustainable Strategy, HEC-Management School of the University of Liege.

She said companies also needed to do more to improve the lot of the employee – and those living in and working close to chemical sites.

"If we want to reach the objectives of the macroeconomic goal of sustainable development, firms also need to improve the social aspects, such as the wellbeing of workers and the wealth of the population around the firm," she said.

It's an area in which INEOS again addresses as part of its day to day operation.

"We work hard to ensure that INEOS is a rewarding place for our staff to work because we know that a highly skilled workforce is vital for the long-term sustainability of our company," said Jill.

"We also want and need to maintain the trust of communities living and working close to our sites and are committed to supporting them because it underpins our licence to operate."

INKING

By failing to prepare, you prepare to fail
Benjamin Franklin





AS EUROPE DITHERS, INEOS SIGNS DEAL WITH AMERICA TO GIVE IT EDGE OVER RIVALS

No-one really knows the impact shale gas could have in Europe but the Continent is sitting on significant reserves. These can be tapped by a process known as 'fracking'. INEOS says it is an opportunity the EU cannot afford to turn down if it seriously wants to compete with America where access to shale gas has slashed its energy prices, and fuelled its industrial revival with jobs and production processes, once outsourced to China, now coming back to the US as a result

AS Europe hesitates, America is already reaping the rewards of shale gas in terms of energy costs and security as well as competitive raw materials that underpin most of its manufacturing sector. And those rewards keep on coming.

Chemical companies from around the world are now flocking to the Houston area to build new gas crackers, restart old ones or expand existing plants so they can take advantage of the vast amounts of domestic natural gas that contains the vital raw materials used by the petrochemical industry to make plastics and solvents.

The American Chemical Council said it was one of the most exciting domestic energy developments of the past 50 years and was fuelling America's industrial revival.

After years of losing out to developing economies in Asia, a growing number of American companies are now moving their manufacturing back to the United States. The tide may be turning. PricewaterhouseCoopers is calling it The Homecoming.

Across the Atlantic, though, in Europe, it's a different story.

They too have the breakthrough technology to unlock the natural gas trapped in shale rock, but so far it remains untapped. And no one knows for how long.

France, having invested heavily in nuclear power, is facing opposition to shale gas exploration from the nuclear industry, and Germany, which has put its money into huge wind farms, faces the wrath of the renewable energy lobby. So the debate continues.

INEOS has decided it cannot wait, and has struck a deal with the US to bring US raw materials to its European plants to maintain a competitive global Olefins & Polymers business.

From 2015 INEOS Olefins & Polymers in Norway will begin taking 'shipments of US-derived ethane – an essential ingredient necessary to produce ethylene.

"We are a global business supplying world markets so competitively-priced raw materials are essential if we are to maintain our business and jobs here in the future," said Magnar Bakke, site manager INEOS Olefins & Polymers Norway.

INEOS believes that having the capability to import up to 800,000 tons of ethane feedstock from the US every year complements our portfolio of feedstock agreements for its European gas crackers and will strengthen its competitive position as an ethylene producer in Europe for the foreseeable future.

Negotiating the American contract has taken two years – from when the idea was first suggested to the signing of the contracts. INEOS will not benefit financially from it until 2015. But when the benefits come, they will be substantial.

"We could start taking the ethane now but the systems and infrastructure are not yet set up to ship it out," said David Thompson, Procurement Director INEOS O&P Europe. **"They need to build an export terminal, for instance".**

Not long ago, America depended on imports of liquefied natural gas.

Now it is on the verge of becoming a major gas exporter.

What has made it economically viable is horizontal drilling and major advances in hydraulic fracturing of shale rock.

Upstream oil and gas companies have discovered how to squeeze oil and gas out of rock once thought too difficult and expensive to tap. In a nutshell, they have found a way of cracking open long, thin seams of shale and other rock by pumping water, sand and chemicals into the ground at high pressure to force the gas from the rock.

"It's the technology which is the key technical breakthrough," said David.

The problem for the US, though, now is that they have so much gas they don't know what to do with it and, as a result, gas prices in the US have been tumbling, pulling down ethane feedstock prices too.

One way of stabilising prices is to find new customers. And INEOS is one of them.

"Right now the gas is used locally in America but a deal with us is a new way for the US to sell the ethane, which has been found in abundance in the typically 'wet shale gas'," said David.

There are some in the US that want to keep US gas in the US. Dow Chemical, for one, fears that unchecked exports will increase domestic prices again and also threaten investment in the US manufacturing sector.

"That debate is still ongoing," said David.

Shortly before Christmas, INEOS finalised its 15-year contracts with the three companies that will be responsible for the drilling, distributing, liquefying and shipping of ethane from America to INEOS' Rafnes site in Norway.

Ethane will be piped from the Marcellus shale reserves in the Appalachian Mountains to Marcus Hook, Pennsylvania. From there it will be shipped to Europe.

The gas will then be stored on site in a new ethane tank, which will be built alongside INEOS' existing stores of local ethane and LPG.

The price of each will determine which feedstock INEOS uses – ethane or LPG – to produce ethylene, a chemical that is used in thousands of products we use every day. In short, it gives INEOS great flexibility.

David said the supply deal with Range Resources Appalachia LLC also strengthened INEOS' competitive position as an ethylene producer in Europe for the 'foreseeable future'.

And with EU decarbonisation policies likely to drive up energy prices in Europe, that has never been more important.

In a report to the House of Lords EU sub-committee, INEOS has warned that rising energy costs threaten to undermine the ability of manufacturers in the EU to compete on the world stage.

Particularly at risk, it said, were chemical industries that relied heavily on fossil fuels to run its plants.

"We are acutely vulnerable to fluctuations in energy prices," said Tom Crotty, INEOS Group Director.

"We sell our products in fiercely competitive international markets and cannot pass on costs to our customers."

"But we cannot afford to operate in jurisdictions with uncompetitive energy prices."

INEOS said if Europe were serious about decarbonisation, it had to shield energy-hungry industries from steep price rises while it moved towards creating affordable low-carbon energy sources.

"If it doesn't, production will be forced out of Europe to more competitive locations which will mean the loss of jobs, investment and tax revenue," he said.

Decarbonisation should not mean deindustrialisation, said Tom.

"The aim must be to connect industry to green energy supplies, not push industry away," he added.

He said energy-intensive industries were not 'sunset industries' standing in the way of environmental improvements.

"They are actually a vital source of raw materials and innovations required to make the green economy a reality," he said.

It is estimated that for every ton of CO₂ used in the chemicals industry, more than two tonnes are saved by its products, which include catalysts, insulation, components for wind turbines, and solar cells.

INEOS said Germany and France had both implemented policies that gave industry the confidence to invest and thrive.

Germany, it said, provided significant energy tax rebates while France facilitated long-term energy contracts.

"The UK currently risks being left behind," said Andrew Mackenzie at INEOS ChlorVinyls. **"UK electricity prices are high compared to other European countries, and our gas prices are much higher than countries outside Europe."**

"This international competitiveness gap is set to widen dramatically over the next decade due to government policies increasing energy prices."

He said shale gas, which is widely regarded as the most important bridge to future renewable energy because of its low carbon footprint, was a valuable new resource that would improve the UK's energy security and mean more competitive prices in the UK.

Test drilling for shale gas in the UK, which is believed to have an estimated 200 trillion cubic feet of onshore reserves in the North West alone, has now resumed in Lancashire after an initial scare in May 2011.

And that's good news for INEOS.

"Our success in the UK depends on access to competitive energy and feedstock supplies," he said.

"Having access to more competitively priced feedstock and energy would transform the fortunes of the UK petrochemicals industry and help it to compete in a global market."

In America, gas – thanks to the shale gas bonanza – is now five times cheaper than the UK.

"Similar gas prices in the UK would reduce the cost of chlorine production by £50 million a year at our Runcorn site, which currently uses as much electricity as the city of Liverpool," said Andrew.

Test drilling for shale gas in the UK was stopped by the Coalition Government after Cuadrilla Resources Ltd caused a minor tremor near Blackpool.

A subsequent investigation by three eminent geologists reassured the government that fracking was safe.

"It was just blown out of proportion by the media," said Tom. **"The 'earthquake' was lower than the tremors we get every day from shifts in old mine workings."**

"The geologists' report said there was not a problem but the company needed take necessary steps to ensure it didn't happen again."

INEOS is keen to do business with Cuadrilla.

"They are planning to use it as fuel but how easily you can use it as fuel will depend upon what's in it," said Tom.

Before natural gas can be sold commercially, the certain components of the mixture, called fractions, must be extracted. Those include hydrocarbons such as ethane, butane and propane, which are highly valued as raw materials by the chemical industry.

"Cuadrilla don't know the composition of the gas yet because they have not got it out of the ground, but if they need to take out those gases, that's where we can step in and help," said Tom.

"We can take off those gases, if you like, and make chemicals with them to make valuable products that can be used and re-used," he said.

"As far as we are concerned, nothing should be wasted."

Waste is one of INEOS' biggest bugbears.

"Ethane is the most valuable chemical feedstock in the world because you can make things out of it but most of it gets burned because it doesn't get extracted out of the gas stream," he said.

INEOS CURRENTLY OWNS TWO OF THE FOUR GAS CRACKERS IN EUROPE. ONE IS IN NORWAY; THE OTHER IS IN GRANGEMOUTH IN SCOTLAND.

About 30 years ago the Grangemouth cracker was built to run on pure ethane which was coming from the North Sea oil rigs.

Over the past 15 years, though, the quantity of ethane, which is a lighter gas, has gone down and has been replaced by heavier gases, which contain a lot more carbon.

"The carbon clogs up the ethane cracker so you have to shut the whole thing down to get in and clean it which means it is very inefficient," said Tom Crotty.

INEOS recently spent millions on its cracker in Grangemouth so that it could cope with the wetter, heavier feedstock.

As things stand, Grangemouth cannot take advantage of the ethane, which has been distilled from the cheap shale gas in America, without investing heavily in the site.

Studies are being carried out to explore options at the site.

"We would have to build a new jetty, reception facilities and storage tanks," said Tom.

"In Norway we already have much of that. And we will be investing in building more facilities so we can take more of it in the future."

An independent

Don't bury heads in sand over shale gas, urges expert

Professor Peter Styles was one of three experts commissioned by the UK Government in 2011 to write an independent report after fracking caused two tremors in the North of England. Here he explains why Britain's long-term future depends on the vast reserves of shale gas buried deep beneath the ground

BRITAIN'S salvation could come from shale gas that has been buried in rocks for 300 million years.

Professor Peter Styles believes that the UK's vast reserves must be tapped if Britain is to secure its long-term energy needs.

"This is really important," he said. **"I don't think people realise how extremely vulnerable we are in the UK."**

"At the moment 70% 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."

But he said on a normal day, Britain only had the capacity to store 12 days worth of gas.

"France has 120 days and Germany has 150," he said. **"But we have 12."**

And the situation is set to worsen.

By 2015 Britain will have closed six coal-fired power stations due to European regulations.

"That will take out about eight to nine Gigawatts of generated electricity out of the system," he said. **"We are talking about one day a week of power lost. We are effectively saying that we will need to do without the amount of electricity and power we would use in one day. How we are going to replace that? Not with wind turbines, I'm afraid, because people are reluctant to have them in their back-yards either."**

Professor Styles said the British public needed to understand the consequences of their actions if they rejected shale gas exploration in the UK, the development of wind farms or refused to allow companies to build facilities to store gas in the UK, a situation that happened in Byley, Cheshire, England, in 2001.

"Their attitude is often: 'I don't know anything about it at all but I know that I don't want it,'" he said.

"That's fine. If people say they don't want it, I can live with that. But if we make that decision, we have to live with the consequences and that might mean living with less power."

On January 30, the British nuclear power industry suffered a setback when plans to look for a site for a £12billion underground nuclear waste store in Cumbria were rejected by Cumbria County Council.

"I am not sure that Cumbria County Council realise that they have effectively voted that they will have to live with surface storage of the bulk of the UK's Radwaste at Sellafield, including more than 100 tons of Plutonium, for probably an extra 10 years (or even more) now," he said.

"That decision will not help nuclear power. It will stop new nuclear build in the UK because you have to do something with the waste. Yet it is with gas in the medium the only one that can provide us with long-term, clean, in term of CO2, baseload energy"

"It sometimes surprises people when I tell them that Radioactive Ores are found in rocks anyway, that's where they originate, and that despite their natural radioactivity, it is not trivial to detect them so returning them to the ground for deep geological storage is not as unexpected as they might suppose."

"At the moment all that waste is sitting on the surface at Sellafield, in storage conditions that were designed 50 years ago."

The other storm that is brewing – and taking up protesters' energy – is the search for shale gas and the controversial technique, known as fracking, which involves pumping water, sand and chemicals into rock at high pressure to extract the gas.

"Shale is so tightly packed that that's why the gas is still there after 300 million years," he said.

"But in the Bowland Basin in Lancashire, we have half a mile of this shale. That is four times the thickness of what they have in the US, where it has become almost the complete source of gas for them."

Protesters believe fracking poses 'huge risks to the environment'.

But Professor Styles, who was one of three experts commissioned by the British Government in 2011 to write an independent review after the technique was blamed for causing two tremors in Blackpool, says it is safe, if carefully controlled.

"In Stoke-on-Trent in the UK we regularly get bigger earthquakes caused by old mine workings flooding," he said.

"That is not to say that felt earthquakes are not a disturbance but properly monitored fracking need not generate felt earthquakes at all."

He said protesters' fears about water pollution were also unfounded.

"We have the best regulated industry," he said. **"If INEOS ChlorVinyls in Runcorn tip a single can of coke down their waste, they exceed their discharge rate."**

"That is how regulated we are in the UK."

He said one of the chemicals, which would be mixed with the sand and water, was a detergent similar to washing up liquid.

"Someone washing their car doesn't think twice about pouring that down the drain," he said. **"And paint brush cleaner is awful stuff but again people will be tipping that into their drains,"** he said. **"Do they think their drains don't leak?"**

Companies drilling for shale gas have been told that fracking must not be carried out within 2,000ft of a watercourse.

"The fracking is actually taking place at 3km down," said Professor Styles. **"Which is most likely to cause contamination?"**

He added: **"If people want to object, it should not be on spurious, scientific grounds."**

ent view

Britain is believed to be sitting on vast reserves of shale gas. How much of it will be accessible is still open to debate.

"The UK is more densely populated than America so that doesn't help," he said.

"I can tell you whether it is technically feasible and the developers, to get it out, will have to decide if it is economically possible. And if it's not, they won't do it."

"But the hardest issue with almost all of these major issues, such as Radwaste, Carbon Sequestration and most recently shale gas, is persuading people to let you and that can be government, local authorities and local pressure groups."

And therein lies the problem.

"In the olden days, you got your heat and power from your surroundings," said Professor Styles. **"You went out and cut peat or chopped down trees."**

"The invention of the National Grid was a wonderful thing but it distanced everybody from the source of production. It distanced people from the realities of what actually went on."

"Everyone wants energy but they don't want to live next to it, apart from a roaring log fire."

Professor Styles said he was disappointed with those who were quite happy to accept gas from countries which were unregulated.

"Leaking pipelines bringing the gas from Siberia have a higher carbon footprint than burning it in the UK," he said. **"If people are making a point that shale gas will leak more than conventional gas, they need to be aware of that. We might as well take that same volume of CO₂ and pump it straight into the air."**

"We want our gas but they have our problems. Global change doesn't know about boundaries. It won't stop the climate warming here."

"Not only that, but it's not ethical to believe that it is okay for others to bear the brunt of environmental problems which are due to our energy demands."

He said shale gas was better for the environment than coal in terms of the amount of harmful greenhouse gases it produces.

"It is half as bad as coal," he said.

Scores of companies have already been granted Petroleum Exploration and Development Licences by the British Government to search, drill for and get petroleum and conventional, and what is mistakenly known as unconventional, gas such as coal-bed methane and shale gas.

"These companies are contractually obliged to drill some exploration wells as part of those licences," he said.



Running on empty

During the height of the 2009 dispute between the Ukraine and Russia over natural gas prices, Britain had just two days supply of gas left in its tanks.

THE CLIMATE IS CHANGING

And privately-owned companies, like INEOS, are best placed to change the world for the better, says Jonathon Porritt



On the face of it, you would not expect one of the world's leading environmentalists and the world's third largest chemical company to share much common ground. But the climate has changed, as the former adviser to the UK Government Jonathon Porritt has discovered

ENVIRONMENTALIST Jonathon Porritt believes privately-owned companies, like INEOS, are now best placed to change the world for the better.

He said they had the will, the desire, the know-how and a convincing business case to help combat climate change and other pressing sustainability issues.

"The real leadership to create a sustainable world is coming from the private companies," he said. **"It is not coming from governments. At the moment governments are paralysed by their own mediocrity."**

But he said governments could help by de-risking the flow of investments so that the capital markets could clearly understand what a sustainable world would really look like. That meant consistent policy-making, and using incentives to help frame capital markets for the long term.

"Governments don't just have a mandate to make things happen," he said. **"They are also there to stop bad things happening."**

"INEOS has shown a readiness to deploy its intellectual innovations. A pipeline of solutions to the sustainability dilemmas that we face today. INEOS is one of those companies in a position to respond to these opportunities."

Jonathon spoke to INCH magazine after drafting a report for the British Government on the future of industrial bio-technology.

In it, he highlights INEOS' ground-breaking achievements in Vero Beach, Florida, home to the first commercial scale plant of its kind in the world that is capable of turning a range of waste into advanced biofuel and renewable power.

His report – published on January 22 – is aimed primarily at industry to encourage it to think differently, rather than government ministers.

But that said, Jonathon agrees Government must still play a part.

"I am not recommending more regulations, but they can make a big difference," he said, **"especially on major issues like climate change."**

Jonathon said that INEOS, like all big chemical companies, was still 'addicted to oil', but that it had a good track record in many areas.

He was referring to INEOS's involvement in The Natural Step, a global sustainability initiative, originally launched in Sweden, to provide a rigorous scientific framework for the changes that need to be made in our economy.

INEOS and Norsk Hydro were approached as two of the world's largest producers of PVC.

"That involvement was critical," said Jonathon.

At the recent European plastics summit in Germany, Jonathon praised INEOS – and the plastics industry as a whole – for what they were now doing to help create a more sustainable future.

"Those endeavours give a lie to the image many people still have in the European Union of plastics as an on-going environmental horror story of

unparalleled proportions," he said during his speech to the PolyTalk summit in Wiesbaden.

He said the extraordinary wealth of new ideas coming from all the industries that relied on plastics – cars, electronics, health, farming, packaging, energy, lighting and construction – also gave him hope of a better, brighter future.

His comments were warmly welcomed by Dr Jason Leadbitter, Sustainability and Compliance Manager for INEOS ChlorVinyls.

"PVC is often singled out among the other plastics, and not always for the best of reasons so it was extremely encouraging and heartening to receive such praise," he said after the summit.

During his talk, Jonathon explained that the difficulty facing the plastics industry would be convincing those outside the industry. There was a serious credibility problem because of the way the industry had often behaved in the past.

But he said he also understood the frustration at environmentalists who were completely preoccupied with the past, rather than the future.

However, he said the plastics industry needed NGOs (non-governmental organisations) because they had earned the trust of society, which allowed them to act as intermediaries in complex, controversial debates.

"Deep down, if we don't work more effectively together, the prospects for the industry are much less good than they might be," he told the summit.

But Jonathon was not without criticism of the role of the NGO. He said he often felt deeply frustrated at the way NGOs sometimes abused that trust, especially in the UK where he blamed some NGOs for whipping up people's NIMBY ('Not in my back yard') tendencies, particularly regarding new waste management technologies.

"If they deployed a fraction of this energy to direct people's attention towards a much more integrated, sophisticated approach to managing waste in our society, we'd be in a very different place," he said.

As chairman of The Natural Step in the UK, he said he had experienced some of these difficulties when working with INEOS and Norsk Hydro on an initiative to define exactly what a 'truly sustainable PVC industry' would really look like.

"Some NGOs thought it was inappropriate to be even having this discussion," he told the PolyTalk summit. **"They felt it was impossible to articulate a genuinely sustainable vision for the future of PVC. They saw it as a 'contradiction in terms', and eventually walked out of the dialogue."**

Yet that Natural Step initiative led eventually to the development of Vinyl 2010, a voluntary 10-year commitment to look at what the plastics industry could do about PVC not just in the UK, but across Europe.

"The good thing about Vinyl 2010 was that it was indeed voluntary, but that it also had teeth," said Jonathon.

"A huge number of initiatives don't have any teeth so it's easy for companies to sign up to them because there are no consequences while they just sit around and do nothing."

Since then, the plastics industry has gone even further and signed up to VinylPlus, which has set even more ambitious targets for sustainable development.

During his interview with INCH, Jonathon said that the legacy of ill-feeling and antagonism between business and NGOs was partly an historical problem.

“In the past, industry and NGOs always seemed to be at loggerheads, with one confrontation after another,” he said. ***“Today most NGOs are happy to work with businesses if they feel the business understands what they are trying to achieve.”***

He told INCH magazine that even as recently as 10 years ago, companies had struggled to understand the concept of sustainability.

In the 1990s, ‘greenwashing’ was also prevalent with many top-end companies making spurious claims to please their customers by appearing environmentally-friendly.

“There were some companies who flirted outrageously with sustainability but it was never consummated,” he said. ***“This was a serious matter because it led to intense scepticism, and people then thought they were being conned on green issues.”***

That had now changed, he said, and there were three good reasons why companies were now becoming more sustainable, and realising it made good financial business sense to ensure their companies had the resources to compete more sustainably in the global markets.

He said the three key drivers for more sustainable wealth creation were government regulation, consumer expectation and industry innovation.

He went on to say how impressed he was at how many businesses were now waking up to the difficult challenges ahead, and facing up to their responsibilities.

“Politicians are there to win short-term votes, but businesses are in it for the long-term,” he said.

However, he did express some regret that, although consumers talked a lot about sustainability, they did not always shop with their consciences.

“That can be very frustrating,” he said. ***“But more sustainable companies can still hope that their consumers will eventually reward them in the right way.”***

“However, sustainable products should not be more expensive because that just won’t work.”



IS CLIMATE CHANGE A DISASTER WAITING TO HAPPEN OR A TECHNOLOGICAL CHALLENGE THAT CAN BE OVERCOME?



Scientists are warning that record-breaking ice melt in the Arctic is part of a worrying trend – and the clearest sign yet that society needs to act to tackle climate change. But is climate change a catastrophe waiting to happen or a technological challenge to be overcome? What are some of the world’s leading lights saying?

Climate change is everyone’s business. For the case of global warming, we should take action, but most of the action that people are suggesting will not address the problem, and so we have to get the energy policy right. It has to be based in science and engineering and technology. There are two things that are really important. One is there’s an enormous amount that can be done with energy efficiency and conservation: better automobiles, better insulation in homes. The second thing that we need to do, and this is equally important, is to recognize that natural gas emits one-third the carbon dioxide of coal.

Richard Muller, senior scientist at US Lawrence Berkeley National Laboratory

While climate change poses significant global challenges, it also provides strong incentives for research and development and creative problem-solving to help cities and communities anticipate and adapt to its impact. Countries that are more successful in these endeavours will be better positioned to address their own national challenges, provide green technologies and solutions to other countries, and thrive in a changing world. Singapore is actively investing in this area and positioning itself as a test-bed for new technologies and business models that can provide green solutions to the world.

The National Climate Change Secretariat, Singapore

It’s a catastrophe happening. We’ve already broken one of the largest physical features on the planet (the Arctic, which has melted with horrifying speed) and badly damaged another (the oceans, which are 30% more acidic than 40 years ago). The technological challenges of dealing with it (converting quickly to renewables) are small compared to the political problem of dealing with the fossil fuel industry, which so far has blocked change at every turn.

Bill McKibben, American environmental activist

Some changes to our climate are inevitable given the historic build-up of emissions in the atmosphere, but fortunately, many technological solutions exist for reducing greenhouse gas emissions. While these technologies come with a price, it is far outweighed by the cost of inaction. Financing these technologies, however, remains a challenge. New sources of finance, such as the carbon markets, are required to mobilise the necessary investment and financial flows to address climate change.

The Carbon Neutral Company, London

Based on the evidence currently available, it is premature to consider geo-engineering as a viable option for addressing climate change. The priority is, and must be, to tackle the root cause by reducing emissions of greenhouse gases from human activities and adapting to those impacts that are unavoidable. Mitigation of climate change, by reducing emissions and protecting natural carbon sinks, remains the surest way of increasing our chances of avoiding dangerous climate change in the future. Some, including scientists, have suggested that in the future geo-engineering may have a role to play in supplementing our efforts to mitigate climate change. However, for most techniques, current understanding of the costs, feasibility, environmental and societal impacts is limited.

The Department of Energy & Climate Change (British Government)

Alarmist messages concerning climatic change are generally counter-productive and raise more skepticism than a desire to act. However, the impacts of a changing climate will have significant repercussions on environmental (water availability, ecosystems) and socio-economic (agriculture, health, energy) sectors, with sharply contrasting regional differences and implications for the poorer segments of our societies. Technological and economic measures are thus required to implement adaptation strategies that will alleviate the more negative impacts of a warming climate to which we are currently committed.

Professor Martin Beniston, Director, Institute for Environmental Sciences, University of Geneva, Switzerland

We do not know what negative and positive effects climate change will have around the world in the next 100 years. Many climate scientists have exaggerated the potential risks due to global warming. While magnifying the possible hazards as a result of warmer temperatures, many ignore the possible economic and health benefits of moderate warming. There is no reason to believe that developed societies won’t be able to cope with any climate changes nature may throw at us. While past societies were extremely vulnerable to climatic stress factors, high-technology cultures are much more sheltered from likely temperature changes as a result of technological adaptation and societal mitigation.

Dr Benny Peiser, Director, The Global Warming Policy Foundation, London

Short political cycles discourage long-term thinking, particularly where upfront costs may be high. But tackling climate change can help accelerate economic and energy transformations, drive revolutions in technology, and spur creation of new production models. It can drive the creation of new goods, services, jobs, and exports. This, though, requires engaged citizens and bold, far-sighted leaders.

Helen Clark, chairman of the United Nations Development Group





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TRICOYA

TRICOYA HARVESTS INEOS' EXPERTISE

The trade in tropical hardwoods, such as mahogany and teak, has long been seen as a major reason for the destruction of the rainforests. Some of that demand could soon change thanks to INEOS' teaming up with a small, innovative Anglo-Dutch company

INEOS has formed a partnership with an Anglo-Dutch company whose innovative technology could help to prevent the need to use hardwood taken from the world's rainforests.

It has signed a deal with Accsys Technologies Plc, a small AIM-listed quoted company, which has developed a ground-breaking technique to turn soft wood, harvested from fast-growing, sustainable forests, into a resilient long-lasting wood, with properties at least as good as those of tropical hardwoods.

"I think the world as a whole recognises that these forests cannot be chopped down anymore, and our unique technology will contribute to reversing the need for tropical wood from rainforests," said Paul Clegg, chief executive officer of Accsys.

"We want to have licensed operators using our technology all over the world. It may take a while. It may be a lofty ambition but we think it is very possible."

INEOS' role in the new company, Tricoya Technologies Ltd, will be to use its vast experience, excellent global connections and expertise in licensing technologies to sell the Tricoya acetylation technology to the world.

"Without INEOS, we would have got there in the end but it would have taken longer, said Paul.

"A lot of people have great ideas but what counts is the successful implementation of an idea."

"INEOS' involvement will make the difference and increases the likelihood of its successful execution."

"It will accelerate the roll-out of Tricoya, and INEOS also has contacts in markets, such as China, India and Russia, which we don't."

Negotiations between the two companies to exploit a market, worth about €60 billion a year, began about 18 months ago.

INEOS was excited by what Tricoya could offer the world and how its patented technology could revolutionise the wood-panel market. Accsys needed a partner with a global reputation for excellence.

"It can be a very long process to convince markets that you have the better product and have the breakthrough technology," said Pierre Lasson, general manager at Tricoya.

"INEOS will be able to speed up that process by bringing its expertise to support this innovative technology."

What INEOS offers is effectively **'third party validation'**, which money cannot buy.

"People are more inclined to believe those who have bought a product or use it, rather than a company itself," said Paul.

Together the two companies will combine their strengths to develop the manufacture and sale of Tricoya's engineered wood products.

What is special about the Tricoya technology is that it opens up new horizons for products, such as MDF, which itself revolutionised the industry in the eighties.

For although MDF was hailed as the ultimate in versatility and reliability when it was first commercialised in 1980, its weakness was that it absorbs water like a sponge, rendering it useless outdoors or in wet, 'hostile' environments.

"If you put it in a bucket of water, it turns to mush," said Paul.

Tricoya retains all the positive things about MDF but it does not retain water, which means it does not warp, swell or rot. Instead the process improves the wood's durability and stability, turning it from a soft wood panel into a wood panel with class 1 durability properties and with a 50-year guarantee for external use above ground.

"What is especially unique about Tricoya is its resistance to water which means it can go where no other soft wood has ever gone before, into new markets where traditionally other products – such as PVC and aluminium – have been favoured," said Paul.

That is likely to please, and benefit, the construction industry – often rewarded for using sustainable materials – and wood panel manufacturers whose margins are low because their products are so cheap.

"We can help them to create higher value products, which will give them a better return," said Paul.

The other beauty about Tricoya is that it consumes carbon dioxide. When the tree is harvested, the carbon is captured and because it doesn't rot, it holds the carbon.

"Lots of people have great ideas but what counts is the successful implementation of an idea. INEOS' involvement will make the difference"

Paul Clegg, chief executive office of Accsys Technologies Plc

"Even when our product does reach the end of its shelf life, it can be burned for energy," said Paul.

The release of carbon dioxide into the atmosphere is currently giving Canada a thumping headache.

Huge swathes of its forests have been hit by an outbreak of mountain pine beetle, which are killing millions of trees. Researchers believe that by 2020, the pine beetle outbreak will have led to the release of 270 megatonnes of carbon dioxide.

On March 5th Tricoya was named Product of the Year by Sustain Magazine.

"Obviously the award does bring kudos," said Paul. **"But kudos doesn't put food on the table."**

"What it does do, though, is validate our process and products because it says that someone else agrees with what we are saying."

It is the Joint Venture with INEOS, though, that has given Accsys the biggest cheer.

"Tricoya is our baby but what appealed to us about INEOS was that it has all the attributes of a larger company, but unusually it is a privately-owned company," said Paul.

"It is fast acting and has a real interest in fostering sustainable ideas. And that is an unusual mix."

Paul said trust and confidence had also played a significant – and important – part in Accsys' decision to 'share the spoils' with INEOS.

Peter Williams, chief executive officer of INEOS Technologies, said he was looking forward to the joint venture accelerating the commercialisation of the new process around the world.

"Tricoya offers the building industry valuable new options for the application of high performance, cost-competitive and more sustainable wood-based materials," he said.

"Our skills complement those of our partner, and together we will realise important synergies for the new company."



INEOS adds up benefits of smart refinancing deal

INEOS has once again shown its ability to move quickly to make the most of an opportunity. Its latest decision to take advantage of favourable loan markets has just saved the company \$140 million a year in interest payments.

Finance director John Reece said the perfectly-timed deal would now mean significantly lower annual interest costs, which helps retain more money in the company to develop the business.

In a note to all staff, chairman Jim Ratcliffe described the latest refinancing deal as a 'very successful outcome'.

"The financial markets have become increasingly favourable during the course of this year," he said.

INEOS is now paying 4% interest on its \$3 billion term loan instead of 6.5%.
"That is the largest interest rate fall of any loan refinancing by a company this year," said Jim.

In addition INEOS raised \$2.4 billion of new debt, in a mixture of loans and bonds, and paid down \$2.4 billion of older more expensive debt.

Credit analysts believe that INEOS is taking advantage of the loan markets to keep costs as low as possible so that it can weather the storm of any potential downturn.

Whatever happens, it was another shrewd move by INEOS, which last year made history in the financial world when it achieved the largest-ever covenant-lite loan for a European company and the largest globally since the credit crunch began in 2008.

That move in April 2012 was described as a 'staggering achievement' by financial analysts.

"You really have to take advantage of the credit markets when they are there because they are very cyclical," John told INCH magazine last year.

Malcolm Stewart, a partner at Ondra Partners, a long-standing adviser to INEOS, said the timing had been perfect.

"They nailed it," he said.

Standard & Poor's raised its rating on the company to B+ from B, noting a "resilient" 2012 performance in North America that "largely offset" difficult European results.

INEOS Marathon raises €100,000

INEOS raised €100,000 for a UK children's charity in April through sheer mental and physical determination.

The 43 runners representing INEOS were among the 34,631 who lined up at the start of the London Marathon, now viewed as one of the most iconic sporting events in the world.

But more impressive still is that everyone from INEOS crossed the finish line – and, in the process, managed to raise 100,000 Euros for the National Society for the Prevention of Cruelty to Children (NSPCC) and get a mention for the company on national television.



Chris Woods, from O&P Europe, completed the course in three hours, 14 minutes and 41 seconds.

For many at INEOS, it had been their first marathon.

For others, though, including Chris, the 26.2-mile race had been just a warm-up exercise.

Five weeks later, Chris, Jim Ratcliffe, Leen Heemsker, Oliver Hayward-Young and Alessia Maresca then went on to complete the ultimate human endurance race, the 56-mile Comrades Marathon in Durban, South Africa.



INEOS to join forces with Solvay to create a world-class PVC producer

INEOS signed a Letter of Intent (LOI) to combine its European chlorovinyls activities in a proposed 50-50 joint venture on May 7th. The combination of the two businesses would form a polyvinyl chloride (PVC) producer ranking among the top three worldwide. It would build on the strengths of both our companies' industrial assets, the skills to enhance competitiveness.

"This agreement will result in the creation of a truly competitive and sustainable business that will provide significant benefit to customers such as reliable access to PVC," said Jim Ratcliffe, **"The newly combined business, which will be of world scale, will be able to better respond to rapidly changing European markets and to match increasing competition from global producers."**

The agreement provides the mechanism under which INEOS would acquire Solvay's 50% interest in the joint venture between four and six years from its formation, after which INEOS would be the sole owner of the business.



INEOS Nitriles and Tianjin Bohai Chemical Industry Group Corporation to form Joint Venture

On 22nd May, INEOS Nitriles and Tianjin Bohai Chemical Industry Group Corporation signed a non binding Heads of Terms. The agreement set out their intention to form a 50/50 Joint Venture, to build and operate a 260,000 tonne Acrylonitrile plant located in Tianjin, China. It is expected that the plant, which will be designed using the latest INEOS process and catalyst technology, will be completed by the end of 2016.

Rob Nevin, CEO of INEOS Nitriles said, **"This is an important investment for the Nitriles business in Asia to support our customers' growing needs across the region. We are very pleased to be building this new facility with Tianjin Bohai Chemical through the formation of the Joint Venture. Our partnership is set to bring considerable value to both companies and their customers. Bringing together our proprietary Acrylonitrile technology, with Tianjin Bohai Chemical's expertise and advantaged feedstocks, presents a formidable combination."**

This is the second Joint Venture project INEOS has announced in China this year. In March INEOS Phenol initialled a joint venture agreement with Sinopec YPC. Both Joint Ventures bring together our world leading technology with a strong Chinese partner. They will add up to a total investment across all partners of more than \$1 billion.



INEOS Barex AG is to buy the Polyacrylonitriles Business from Mitsui Chemicals Inc

INEOS Barex AG has signed a binding agreement to acquire the Polyacrylonitriles (PAN) Business from Mitsui Chemicals Inc. The agreement brings together complementary capabilities of both businesses and secures the long term supply of PAN resin and Zexlon™ film to customers across Asia.

CEO David Schmidt says: **"The transfer of this business into INEOS Barex AG provides a very close strategic fit. The agreement is good news for all parties involved. Most importantly it will provide significant benefit to customers through ongoing, reliable access to Barex®, PAN resin and Zexlon™ film"**.

INEOS Barex AG continues to invest in its Barex® business to enhance product quality and expand available capacity to meet the growing needs of new markets in pharmaceutical, medical, cosmetic, and personal care packaging.

Barex® is a specialised acrylonitrile-methyl acrylate copolymer that has both US Pharmacopoeia and FDA clearances for medical and pharmaceutical packaging. The chemistry behind Barex® makes it readily convertible into film, sheet and bottles on standard equipment using extrusion, injection and calendaring techniques.



INEOS strikes gold at Seal Sands

APPRENTICES sometimes left floundering in unfamiliar roles are now being turned into world-class performers.

And they have INEOS to thank for that.

INEOS Nitriles discovered the haphazard approach to training when they acquired the Seal Sands site on Teeside in the UK in 2008.

They found that the training of new starters and apprentices was ad-hoc and disjointed and that limited refresher training was available for existing production technicians. All the training was also carried out by members of staff in addition to their main jobs.

INEOS knew that to get the best out of the site, it first needed to get the best out of the staff and that meant creating a dedicated team of trainers whose sole job would be to improve the skills of its chemical workforce.

The company brought together four experienced process co-ordinators with in-depth knowledge of their individual plant areas.

Initially they focused on assessing, retraining and re-certifying all the existing production technicians to ensure everyone had a basic understanding and ability.

It was time-consuming but it provided the four trainers with a clear idea of future training needs.

From the HR database, they also discovered that 70% of the existing production technicians were due to reach state retirement age within the next 10 years.

Since that initial assessment they have introduced a new refresher programme – which is delivered on and off shift – to maintain skill levels, transfer INEOS knowledge from other INEOS Nitriles' sites and integrate any changes to the plant or processes.

They have also developed 32 basic initial training sessions which all new starters attend before they move on to their specific plant training. To ensure that the training is up-to-date and relevant, a quality control system has been set up with the support of site specialists.

INEOS was so proud of the group's achievement – and plans – that the Middlesbrough site commissioned The National Skills Academy Process Industries to audit its training process.

The result? INEOS Nitriles' training programme at the site has now been awarded the Cogent Gold Standard, which sets the skills benchmark for world class performance.

"We are obviously delighted that our commitment and hard work has been recognised," said Dave Hart, training and development manager at Seal Sands.

"The fact that we can now use the Gold Standard logo on our correspondence and the INEOS logo is on the Cogent/NSAPI Roll of Honour is a reflection of the great commitment to on-site training which INEOS have shown since taking over the Seal Sands site."

But the hard work doesn't end here.

Dave said they were now keen to move on to the next stage.

"We plan to have our internal site training verified as a recognised qualification by an external awarding body," he said.

Going the extra mile to attract very best graduates

Companies know they need to go the extra mile in today's fiercely competitive world if they want to attract the very best students.

At the INEOS sites in Belgium, they physically go the extra mile. Every year a few company engineers and HR staff from INEOS and a select group of other companies board a special train that stops at all the main university cities in the north of Belgium.

At each stop, engineering students, who are in their final year, are encouraged to board the train to meet and chat to potential employers about opportunities.



The job train – as it is known – is laid on by ie-net, a network of alumni from all the major engineering faculties in Belgium.

Lunch is laid on for all the company representatives and students so that there is plenty of time for networking.

The train has now been running for three years.

And for INEOS, it has been worth catching, particularly to enhance students' awareness of INEOS as a key employer in the Belgian chemical job market.

"Over the past two years more than 300 engineering graduates have been introduced to INEOS this way, and that has led to good candidates joining INEOS," said personnel and communications officer Katrien Poppe.



INEOS JV set to build the largest Phenol plant in China

INEOS has embarked upon a joint venture with a leading Chinese petrochemical company to design, build and operate the largest-ever phenol production plant in China.

Once built, it will be capable of producing at least 400,000 tons of phenol every year to serve the rapidly growing Chinese market for this valuable raw material.

The deal with Sinopec Yangzi Petrochemical Company was struck earlier this year.

Harry Deans, CEO of partners INEOS Phenol, said it was the largest capital investment ever made by INEOS in China.

"This mutually beneficial partnership is an important development for INEOS Phenol and INEOS in China," he said.

"Combining a strong, local partner like Sinopec YPC with our phenol technology and access to the market will bring considerable value to our business and to our customers."

The plant, which is expected to become fully operational by the end of 2015, will also be able to produce 250,000 tons of acetone – another valuable raw material used in everyday products – and 550,000 tons of cumene every year.

Dr Ma Qiulin, CEO of Sinopec YPC, described the joint venture as an important partnership.

"Our established presence, competitive edge and cumene technology, combined with INEOS' leading

phenol technology, puts us in a strong position to meet growing demand for downstream petrochemical products in the region," he said.

INEOS is already the world's largest manufacturer of phenol and acetone with sites in Germany, Belgium and America.

This will make it the only manufacturer in the world to have phenol and acetone production sites in Europe, America and Asia.

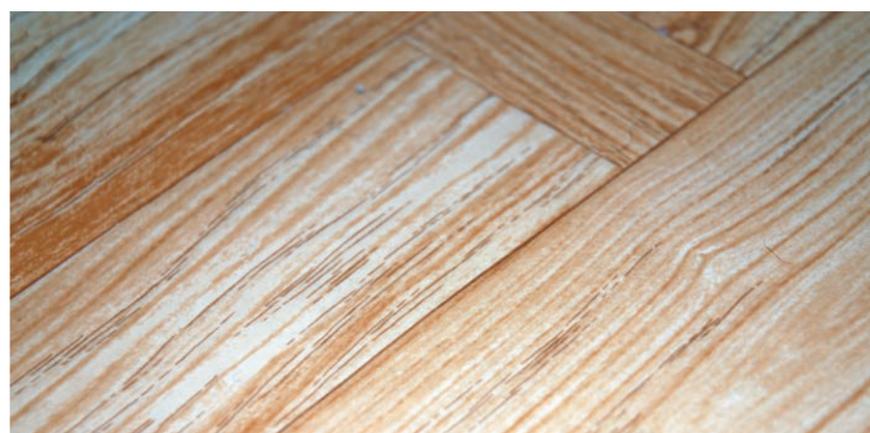
The path was cleared for the project to proceed in November last year when the Chinese Ministry of Environmental Protection approved INEOS and Sinopec's Environmental Impact Assessment.

That approval, which followed a detailed analysis, was viewed as a major step forward towards the formation of the joint venture.

The plant will be built on the Nanjing Chemical Industrial Park in Jiangsu Province – at the heart of China's largest market for phenol and acetone.

With China now the world's fastest growing market for phenol and acetone, it is expected that the new plant in Nanjing will free capacity at INEOS' European and American plants so that they too can meet growth in those regions.

Sinopec, which is China's leading producer of phenol and acetone, currently has three production sites in Shanghai, Beijing, and Tianjin.



Tarkett builds solid foundation for PVC flooring as Reflex flexes its renewable muscles

THE future of PVC flooring in Sweden has never been better – thanks to INEOS' biggest customer in Scandinavia.

Tarkett is now selling PVC flooring that is free from phthalates, a type of plasticiser that has long been at the centre of controversy.

Not only that, but the company's PVC flooring has become the first to receive the blessing of a well-respected trade association in Sweden.

The Swedish Byggarubedömningen lists Tarkett's iQ Granit on its database as a product that it recommends.

The BVB, as it is known, evaluates all building materials to allow the construction industry to make environmentally-sound choices. So far its experts have evaluated more than 7,000 products but new ones are being added continuously.

Approval for Tarkett's PVC flooring is also good news for INEOS which currently supplies the company with its PVC every year.

Meanwhile, Swedish company Reflex Film AB, another of INEOS' customers, has developed a range of products using a new plasticiser that is based on renewable resources.

Managing director Magnus Jörsmo said the investment was part of the privately-owned company's quest to become Europe's leading producer of niche speciality PVC films.

INEOS supplies Reflex with polymers produced at INEOS ChlorVinyls in Stenungsund.

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