National Manufacturing Debate 2013

May 21, 2013

Cranfield UNIVERSITY

Does the UK need a national manufacturing strategy?

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THE Manufacturer

This report was produced by Cranfield University in partnership with *The Manufacturer*

Contents

3 – What is the National Manufacturing Debate?

4 – Keynote presentations

11 – The Debate

12 – Does the UK need a national manufacturing strategy?

14 – Public procurement

15 – Reshoring and Catapults centres

16 – Inspiring young people to work in the sector

17 – Education and school engagement

18 – Flexible working: now the norm?

19 – The Germany comparison; Advanced engineering or basics; Govt scheme failure

20 – Delegate comments

23 – Conclusion

24 – Call to action

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What is the National Manufacturing Debate?

An annual debate launched in 2010 hosted by Cranfield University to provide an independent national forum for supporters of UK-based manufacturing. Stakeholders who attend the debate include manufacturing companies, engineers and scientists, academics, national and local government, finance providers, trade bodies, membership organisations and education providers.

Previous National Manufacturing Debates (NMD) have focused on:

2010: Manufacturing for recovery

2011: Investment, incentives and innovation

2012: Enhancing the supply chain for growth

With a big government push to rebalance the economy, low growth and high unemployment, manufacturing has been back in the spotlight. This year the subject debated, with over 250 delegates present, was:

Does the UK need a manufacturing strategy?

This headline topic naturally pulled facts and opinions from the three previous NMDs and elicited strong responses from the expert panel and audience.

The debate is documented in this report and circulated to The Manufacturer's readership, as well as Debate delegates, Cranfield University students and alumni – in total 10,000 copies are distributed.

New for 2013: This year, Cranfield University, the IET, the ERA Foundation, the Technology Strategy Board and EEF will pool the responses made at the NMD and after the event, and publish these comments online at www.national-manufacturing-debate.org.uk and www.themanufacturer.com/NMD2013. This dialogue can be added to over time and used to help structure the programme of NMD 2014.

Cranfield University is proud to host the annual National Manufacturing Debate. Cranfield Manufacturing research and education has a strong track record and the NMD has built on that tradition. NMD provides a neutral platform to discuss difficult and challenging national manufacturing issues with bold and open perspectives. The facts and opinions from the NMD will support the decision makers to bring manufacturing back to the UK and encourage more British people to get involved in manufacturing again! This year we have also launched the National Apprentice Competition in order to promote the next generation of apprentices for the British industry.

The Keynotes

Lord Alec Broers, past president of the Royal Academy of Engineering

Lord Broers set the stage for the 2013 Debate, saying:

The Government is working on a series of industrial strategies – led by an overarching strategy launched last September.

There is insufficient spending on research and development in the UK. Economists and politicians had previously promoted a "post-industrial dreamland" that focused on services. This led to a deficit in goods in 2008 of £60 billion. The deficit is now £100 billion, despite selling off assets.

Quite simply, we must make and sell more products. We need new, better and lower cost products to stimulate demand, and we need innovation to achieve this. The preoccupation with short-termism must change for this to happen; stating that we cannot create a strong manufacturing base without more R&D investment.

Professor Rajkumar Roy, Head of Manufacturing and Materials, Cranfield University

Professor Roy took a patriotic stance. He said:

The UK needs a national manufacturing strategy, and it also needs more local manufacturing. This must have a structured approach.

Is it is possible for manufacturing to achieve 20% of GDP by 2020? We can double the contribution of manufacturing in the next few years.

More British people need to become involved in manufacturing for this to happen, and this will bring pride back into manufacturing. FTSE-100 companies need to invest in their supply chain and in the country and reshoring must take place.

The Right Honourable Michael Fallon MP, Business Minister

Michael Fallon said that:

UK manufacturing still contributes almost three quarters of business R&D. But manufacturing no longer provides the employment it used to.

Although the rise of emerging economies is threatening UK competitive advantage, it also offers export opportunities.

An industrial strategy is needed in Britain to facilitate growth and government is committed to a long term partnership with industry.

Delivery of a strategy needs industry leadership. For the first time since 1976, we are now exporting more cars and engines than importing. In aerospace, government investment is £1 billion with a further £1 billion coming from industry. Other strategies are being published.

Overcapacity and over regulation in the car industry

Stephen Odell is Executive VP and President of Europe, Middle East and Africa, Ford Motor Company. His presentation centred on two subjects: regulation and the cost to big auto companies from excessive regulation, and the importance of free trade.

In his keynote Mr Odell issued a "wide-ranging call to [European] politicians, business leaders, academics and regulators to create market conditions that enable manufacturers to flourish."

Mr Odell said:

That without help from policy makers, the European car industry would continue to struggle, on the back of total European car sales being down 22% in the past five years. Current EU regulations "make an average car approximately twice as expensive as it otherwise would be."

The European motor industry employs 12 million people but is faced with serious structural overcapacity. In 2007, 18 million vehicles were sold in European markets. In 2012, 14 million were sold, but with the same manufacturing capacity. This is down by 22% and is the lowest for two decades.

In 2013, sales may possibly be 13 million. The European motor industry has been slow about addressing over capacity.

EU regulations add about Eu6000 to the cost of an average car. He suggested that this regulation should not be implemented without rigorous scientific analysis.

In free trade, agreements must be fair and properly implemented. He stopped short of directly attacking any single piece of legislation, nor mentioned exactly the factors to blame for ramping up prices, but did criticise European free trade agreements with South Korea, said that Europe should follow the US's example in order to help boost the car market:

"We expect Europe's volume carmakers, preferably encouraged and aided by Brussels, to follow the hugely successful American example and do what everybody knows needs to be done: to restructure, to cut excess manufacturing capacity, to reinvigorate their product ranges. And to develop industry-leading technology for the world," Odell told the Debate audience.

Skills need to be addressed urgently. Finding the right people in Britain is becoming harder and there is a skills deficit. "The UK needs to product around 50,000 engineering graduates per year, but is currently producing 23,000," he said, quoting figures from EngineeringUK.

> *"Current EU regulations make an average car approximately twice as expensive as it otherwise would be"*

Reasons to be cheerful

Odell reemphasised Ford's commitment to launch more than 15 vehicles in Europe in the next five years, most powered by British-made engines; and said that he was "confident that European and UK manufacturing could survive under the right business conditions."

He also vowed that Ford of Europe's restructuring efforts – regardless of any political intervention – would deliver "sustainable profit margins of 6-8% in the medium term".

Crossing the Valley of Death: The High Value Manufacturing Catapult

Dick Elsy is CEO of the HVM Catapult, a business support agency part funded by the Technology Strategy Board, whose purpose is to assist companies achieve key Technology Readiness Levels between invention, design, manufacture and market place.

Mr Elsy described how the High Value Catapult exists to help companies cross the "valley of death" – the period between development and industrialisation of a new product. The HVM Catapult, the name given to seven innovation centres that are tied to universities, provides support to industry during industrial scale-up when there is some financial and technical risk aversion.

Catapult centres are accessible for small and large companies through membership fees and, in certain cases, some gratis consultancy for qualified projects.

The Catapult is funded through a three thirds model: government funding comes via the Technology Strategy Board and the remaining two thirds come from research and development grants won by the Catapult working with business and from contract research funded fully by business.

Although the Government supports through the Catapult initiative, Elsy suggested that the UK has lost its self-confidence. The Catapults provide access to a world class research base across several sectors and are helping rebalance the economy.

The HVM Catapult, in just over a year, has helped several companies bridge the Technology Readiness Levels they needed to enable commercialisation. Thus far, there is more evidence that the model helps large companies such as Rolls-Royce and GKN. Elsy accepts that the location of the Centres is an issue for SMEs (small and medium sized firms) who cannot afford to lose an employee on full-time secondment to a centre far away.

> *Don't starve the funding and move on to something else after two or three years*

A set of satellite Catapult research centres are therefore being considered.

Elsy said the Catapult model can only be fulfilled if the Government and stakeholders stay the course.

"We've just started this journey, it is starting to come good, for Heaven's sake let's stick with it," said Elsy. "It is a cross-party thing, it's blindingly obvious that it must be. Don't starve the funding and move on to something else after two or three years. Stick with it."

Just give me a level playing field

- Governments to create global level playing field with currencies
- Product design is key to deskill manufacturing to provide jobs for all abilities
- Ban innovation for a year – focus on the basics

John Elliott MBE is founder and chairman of Ebac, a manufacturer of dehumidifiers and soon to make washing machines, in County Durham.

John Elliott posed a different solution to manufacturing strategy – how to close the trade gap.

The UK imports four million washing machines per year, and that not one is made in the UK. Ebac will make washing machines from mid-2014, which will contribute to reducing the trade gap. Global imbalance has caused the problem. Elliott says "We are living beyond our means," advocating that we either spend less or make more, suggesting that this is where manufacturing can contribute.

Design is the key to manufacturing, Elliott said. "A good designer must understand what the customer values and does not value. The designer must understand what can be made. A good designer can design a product that does not need skill to make."

His approach is that good product design can de-skill manufacturing to make it easy to make the product right every time at the right price, allowing the UK to compete with Asia on price. "Having cheap goods from China means we are paying for the goods twice – in that the person who could manufacture the goods at home is on benefits," he said.

Innovation - the cherry on the cake

Elliott believes innovation is the cherry but that the UK does not have the cake. "I would ban innovation for a year and put those resources into better manufacturing the basic things. We know how to do it but we need to level the playing field in order to do it."

He said governments must work to allow the currencies to balance in order to allow the UK to sell goods abroad on parity. "Inflation is like having a cough when you have pneumonia, in that when you have pneumonia don't take cough medicine to cure it," he said. He suggests we sort the trade problem out first and stop printing money.

"Printing money suits the speculators – I would shoot them!" he finished.

> *"A good designer must understand the customer, what the customer values and does not value"*

Recent poor record but plenty of opportunities for UK to shine

Peter Marsh, author and ex-manufacturing editor of the *Financial Times*, described manufacturing as adding materials energy and ideas and suggested that manufacturing is bringing order to chaos.

He said:

Manufacturing is reviving globally, but although UK manufacturing is still significant, its recent record is poor. Britain is now almost back to the same situation as it was in around 1800, with Britain having performed poorly compared to other countries.

Britain's changing world role 2011 - Specialist player	
Population (% of world)	0.8%
Manufacturing output (% of world)	2.1%
Manufacturing position (out of 197)	11

China is at the centre of world production and has seen significant growth, but this will slow down.

The US is supporting manufacturing, and borrowing to get out of an economic problem. This solution has precedent as it was the basis for Roosevelt's New Deal after World War II.

Public borrowing is not wrong to get out of the current problem. Mr Marsh graded the UK government 6/10 in resolving the problem, saying that they have done a reasonable job so far.

On the 20% GDP target, Marsh said that to achieve a 14% share of GDP, manufacturing would have to grow at 5½% per year while the rest of the economy grows at 2% and there is no recent precedent for this. He suggested that a 20% target of GDP is just nonsense.

"It is fine to support manufacturing, but there is no sense in setting unrealistic targets, which fail to recognise reality."

The strengths of UK manufacturing are, and will be, in technology, automation, personalised manufacturing, servitisation and global niches, Marsh says. The medium term outlook is good. It is necessary to make manufacturing more attractive to young people, suggesting that perhaps we need more promotion of manufacturing.

He remains optimistic about the future of UK manufacturing.

Peter Marsh is the author of The New Industrial Revolution: Consumers, Globalization and the End of Mass Production, which considers the relationships between old and new economies and the global future of manufacturing.

Procurement strategy in the public interest

- Better public procurement essential to grow UK manufacturing
- UK government tends to adopt 'lowest price' procurement, fails to consider economic and social benefits to local companies.
- Germany and France seem to operate within the law yet still procure with local interests at heart.

Martin McKervey leads Nabarro's manufacturing group. His presentation focused on non-strategic interpretation of EU public procurement rules.

He said:

UK procurement practices have had a detrimental effect on manufacturing in the UK. The UK is being challenged to maintain competitive advantage by emerging nations and procurement can play an important role.

Procurement is a mechanism to support SME growth and is a key driver for growing the economy.

The British government's approach to procurement rules is less supportive of its national economy than other European countries. The £1.4 billion Thameslink train contract awarded to Siemens and the £452 million naval ship building contract awarded to Daewoo are examples where the Government argued that this was best value for money.

The Government claimed it was bound by EU rules, and ministers say that any deviation from these rules is illegal. But the Government is complying with rules in a way that other EU member countries are not, Mr McKervey said.

EU rules state economic benefit which includes environmental and social impact but that the UK government prefers a "supermarket approach" of focusing only on lowest price. He contrasted this with Germany and France, where both require contractual requirements for local SME businesses to such tenders.

"Germany has no specific manufacturing policy," McKervey said, "but all its policies are geared towards supporting German business, and focused on SMEs which make up 80% of its industrial base."

Where Germany and France provide subsidy support for industry, the UK government is reluctant to provide such support. The UK relies on procedures for procurement that restrict innovation, and called for a move to a model that focuses on collaboration, negotiation and consultation.

The UK has developed a reputation for legal challenges on procurement processes, where the only winners are the lawyers.

There are three ways to improve procurement: (1) a clear UK strategy, (2) effective procurement practices, and (3) understand what is required to drive efficiency.

A Minister for Manufacturing would be a useful step, McKervey concluded.

21st Century design capability married to a 20th Century manufacturing base

Brian Holliday is Divisional Director, Industry Automation, Siemens plc. He gave the perspective of a company that employs 13,000 people directly in the UK, 8,000 in engineering, with 28 major sites, which makes goods here and sells products to manufacturers in Britain.

He said:

Siemens welcomes dialogue with the Government about what can be manufactured locally.

Like John Elliott, manufacturing of low value goods is also important. The focus on high value manufacturing is not appropriate with the projected population growth.

Design is a key aspect for manufacturing – compare the success of Land Rover Freelander and Evoque as an example of good design leading to sales growth. The UK is good at design, but while it has a 21st Century design capability, this is married to a 20th Century manufacturing base. Manufacturing needs to catch up.

Automation is an opportunity for manufacturing, noting that although the technology is available to improve this manufacturing capability, there is little appetite to adopt it, compared with Germany. German industry spends 10 times what the UK does on automation.

The success of the economy is dependent on sustained investment in infrastructure, people and innovation; applied at national, sector and factory level. There needs to be a 25-year approach to a national manufacturing strategy.

He raises the issue of skills, noting that there is a demographic challenge in providing skills for the future of manufacturing; and with the many support organisations involved in this, asks if the current approach simple enough. Holliday concludes by noting that the Government is doing a lot to support manufacturing, but that the challenge is decades old, and the solution will not be a quick fix. On the topical issue of a target, he would support a target for manufacturing as % of GDP, but considers 20% as too aspirational.

> *"There needs to be a 25-year approach to a national manufacturing strategy"*

The Debate

TeenTech

Radio and television presenter Maggie Philbin, whose credits include Tomorrow's World, is also president of TeenTech, an organisation that connects 14-19 year olds with science and engineering projects.

Working in education she told the audience "I feel you should be doing far more in this space. But there is a sense we're all talking more about it."

TeenTech has grown into a national scheme with its own awards. It gives youngsters new ideas about careers in a very immersive way.

For example, pharma company Leylam Healthcare set up a mini-production line for a drink, so young people understood what it actually meant to manufacture something. All of the processes for design and manufacture were replicated in the exercise. After the exercise students had 25 mins to sell as many bottles of TeenTech Tonic as they could. The activity got the best feedback at the event.

"The power that you have as companies and people as role models to affect how young people think about your industries is immense" said Ms Philbin. "Whether you are engineers, scientists or technicians you need to reverse [these young people's] impressions and make them think you are someone they'd want to go to the pub with."

The National Manufacturing Debate 2013 asked:

- Do we need a national strategy for UK manufacturing?
- Can we achieve 20% of UK GDAP from manufacturing by 2020?

The panellists for the 2013 debate were:

Mark Claydon-Smith, Head of Manufacturing at the Engineering and Physical Sciences Research Council, a public body that supports the development of basic and applied science in the UK.

The areas with the greatest opportunity and perhaps biggest challenges are in disruptive and transformative technologies. Companies like Samsung are delivering very innovative products. There we [the UK] haven't seen the real answer yet.

Mike Rigby, Head of Manufacturing Transport and Logistics at Barclays

Companies that service the sector all have a manufacturing team and a strategy. Why wouldn't the sector as a whole have a strategy? It's common sense.

Professor John Nicholls, Head of the Surface Engineering and Nanotechnology Institute, Cranfield University

Using new processes, can we advance down the fifth step of the manufacturing revolution, building intelligent materials into the manufacturing system so it can reveal when a component comes to the end of its life and what we need to do to increase its life.

Martin McKervey, Partner and Head of Manufacturing and Infrastructure, Nabarro

My interest in the manufacturing sector is driven my passion for helping our young people. I honestly think that we keep talking about it, but unless we instil something substantial with them in this and the next generation, we risk losing much of out manufacturing.

Peter Marsh, former manufacturing editor of the Financial Times and author

It is not my role to go around banging a drum for manufacturing. I have a dispassionate view about targets for manufacturing in UK. It is important to support it but I find it interesting on merit, rather than needing to advocate a strategy.

Dick Elsy, Chief Executive Officer, High Value Manufacturing Catapult

I've spent 30-years experience at large and small companies wrestling with the challenge of bringing new technology to market. It is a very big challenge. I wanted to bring some of this experience back to a national level with the HVM Catapult.

Brian Holliday, Divisional Director, Siemens Industry UK

Having worked in the last two years applying these Siemens technologies to industry, I feel there is a sense of underachievement. We can do much more and there's a translation piece needed to explain e.g. BARA*'s findings that the benefits of automation technology are not well understood.
(*the British Automation and Robotics Association).

John Elliott, Chairman, Ebac

It's very easy to get the country back to a stronger economy through manufacturing. We underperform. We must level the playing field. It's simple to do this with manufacturing, with or without automation.

Do we need a manufacturing strategy?

Srikanth Meka, Rolls-Royce: "The consensus seems yes we do and I agree. Where will it come from, top down from policy deployment or bottom up from the supply chain? One or two people have said it's not for the Government to tell manufacturing companies what they should be doing, but for manufacturing companies to ask them what they want.

"95% of companies are SMEs and SMEs aren't geared up to know this. We cannot expect them to know what they want at the national level."

Maggie Philbin: That's true, as a small company you don't always know what you do want.

Claydon-Smith: "The strategy, sectors and priorities that the Government has identified are the low hanging fruit. The medium to long term is more interesting – where things will needs to develop.

[John Elliott has talked about levelling trade terms] I don't feel instinctively that a strategy for domestic trade is right. During World War II we almost starved, we're not of the scale to be self-sufficient. A feature that must be part of a national industrial strategy is to take account of globalisation.

Fuel and energy prices will change the dynamic of global trade, and we need to work within that framework."

Marsh: "Mr Cable and Mr Cameron will say they do have a strategy for manufacturing. It may not be what you want, but they've done various things to support manufacturing.

This [call for a strategy] is a little like being transported back 60-years to the politburo of Stalin's time when they said we must have a five-year plan, spent months doing it, they think the job's done and then the country crumbles. It seems to be a more useful debate to identify the strengths and weaknesses of the British manufacturing economy and build on that. To their credit the government have focused on some of these.

"A feature that must be part of a national industrial strategy is to take account of globalisation."

Mark Claydon-Smith

Rigby: "BIS [the Dept for Business, Innovation & Skills] could take the lead but it should be a 25-year programme. Does the [UK] consumer vale the Made in Great Britain aspect to local manufacture?

McKervey: "I would share Peter's point about the incessant desire we have to drive strategies. It's what people write books about."

Public procurement

Nabarro's McKervey made an oft-lamented observation that UK government is too literal on its interpretation of EU procurement rules and is obsessed with best - i.e. lowest - price tenders, shutting the door on bids that could benefit the local British economy.

Stephen Gray, UK Trade and Investment: "Well targeted public procurement is welcome. My concern is that even when we have changed the way we interpret regulations in the UK, we have to change the mindset of public sector procurers (PSPs) at the operations level.

"Is there a programme, in anticipation of secondment, so that PSPs can sit on the other side so they can see what really is advantageous (to SMEs) in the procurement process?

Philbin: It is frustrating that you may feel you have a good product for the NHS, for example, but the chance of getting it in there makes you lose the desire to try.

Bill Williams, Centre for Excellence in Manufacturing and Engineering: "If this debate was an AGM and the panel was the Board of Directors who had said we're going to double the size of the business over the next seven years, and there is no compelling vision or strategy for getting there, it would not be taken seriously. A more compelling vision and strategy is needed.

"Brian Holliday said several times that Siemens applies a 25-year strategy for growth to plan their inward invest and infrastructure strategy.

"One example of where this is missing in UK is the rail industry which has a massive skills shortage.

One reason it's so bad is that Network Rail never have more than a five-year contract, so they never give more than a five-year contract, so the entire supply chain never invests in apprenticeships more than five-years out."

> *"Network Rail never has more than a five-year contract, so their entire supply chain never invests in apprenticeships more than five-years out."*
>
> *Bill Williams, CEME*

"Britain has everything it needs to [grow manufacturing], it's all there for the taking. What's absent is a 25-year vision. It doesn't need to be defined to the nth degree, it needs someone living and breathing it on government.

Without this, it dilutes local and regional government initiatives, because people think it's coming and going. Some of the things done locally with these initiatives are very good but it gets lost in the overall piece."

Philbin: One area where a strategy works, where Germany doesn't take a lead, is that parents and teachers will think it would be a good idea for kids to be an engineer rather than e.g. a lawyer. Without one they don't have this vision.

Reshoring, and Catapult centres

Helping innovation to market, or low value manufacture on a level playing field?

Audience member, to be identified: "The UK not is lagging behind much in innovation and R&D, we are lagging behind in the actual manufacturing. Flat screen TV was invented here but is made somewhere else. The question we need to ask is can we bring back manufacturing of the goods that were developed here? Can Dyson return from Malaysia? Let's make it here."

Elsy: "Embedding the technology through to commercialisation is exactly what the HVM Cat is all about. "LCD screens, yes. Another classic example is lithium ion battery technology, invented in Oxford. There are probably 200 in this room, and none made here.

"There is a very interesting new battery chemistry being developed at St Andrews University, we're developing a factory scale up at WMG to develop this from a small to full size battery pack. The idea is that all the knowledge will reside in the UK to keep the manufacturing in the UK.

Elliott: "I would ban innovation for a year, get all those good people to work on the basic things we need. The only way is to level the [trade] playing field. We must be able to trade with emerging countries evenly, that's about looking at currencies and getting parity. You can't do it without [that intervention] because it's cheaper to make in Malaysia."

It's different with Ebac. With washing machines we're competing with European suppliers not with Asia. People say we have to bring textile manufacturing back to the UK – I agree.

"We've got to get the World Bank to intervene so that countries have got balanced budgets. That needs to be done by governments changing currencies."

"The whole point of the Catapult is to scale up these technologies and find them a reason to stay in the UK."

Dick Elsy, HVM Catapult

Holliday: "BIS takes the lead and has already done several good things already. There are several point solutions such as the Patent Box, giving credit in tax terms to companies that actually make things they've invented.

"The enhanced capital allowances are already in place to help invest in plant and equipment.

"What we're missing is the stretch to make that a long term picture that crosses parliament. As a multinational, whether we make things or not in a country depends on things like seeing long term government support. That enables us to see ROI from a long term investment and indeed the availability of skills."

These things need to be addressed, but need stepping up to make it a 25-year programme, about the length of time you might need for a big infrastructure investment."

Inspiring young people

The panel agreed unanimously that part of a national strategy to realise manufacturing growth must be a push to inspire children to work in engineering and manufacturing jobs. Such action is needed regardless of the existence of a true strategy, it was agreed.

McKervey: "Strategy or not, we need more collaboration between government, the private sector and education. You need look no further than Germany. I know of three SME companies in Germany where an employee spends one day a month in local primary schools, speaking to 6-8 year olds.

"We must be more realistic about what we can expect from our government here. The news at moment has nothing to do with manufacturing and will not tomorrow. The next generation are literally the future of this.

Nicholls: "We need two levels of training to both to have the ideas and the knowledge to take these ideas into industry.

We should inspire at school both those to want to go to university who want to become engineers and scientists, and those people who like to use their hands to make things. We have to take both of those education trains along at the same time."

Kenneth James, Young Engineers: "We have an enormous problem. We [the UK] need 500,000 more engineers in the next 10 years. You think that engineering has a perception problem, but addressing the manufacturing perception problem is much bigger.

Marsh: "I'm involved in an imaginative programme, run by Multi Story in Birmingham, called Open for Business. They got £350k from the Arts Council to set up a travelling exhibition to display British industry through the lenses of some of the world's best photographers.

"A teenager at TeenTech invented a machine that worked in a global tube system, operating a vehicle in a vacuum. He had a Skype call with engineers at Airbus in Germany about it"

Maggie Philbin

Because people visit art galleries and museums it will work. It's now expanding into Europe.

If they can get £350k out of Arts Council there will be many other useful activities."

Philbin: "At TeenTech a teenager invented a machine that that operated a vehicle in a vacuum. He had a Skype call with engineers at Airbus in Germany about it. When all drawings of vehicle were submitted to TeenTech – it looked a bit like an Airbus but with the wings cut off. But the important thing is that lab in Cumbria had made contact with Airbus and they'd taken his ideas seriously.

Education & school engagement

Lord Broers said in his opening address there is a shortfall in engineering and science graduates. According to the Royal Academy of Engineering, the UK needs about 50,000 graduate engineers a year and it produces 23,000.

Claydon-Smith: "One of the most important decisions you make in life is which options you take at school. You only do it once, this can open or close whole opportunities. That has an economic consequence as well.

A good example is the nuclear industry. There was no long term vision so there was no investment in the human capital. At EPSRC we took an initiative called Canoe, to try to address the labour market deficiencies revealed in the RAEng report.

Now we are moving into the marketisation of this labour market with high university tuition fees.

Nicholls: "Young people coming through today at 13, 14 and 15 – in this seven year timeline they won't have even graduated by the time we get to 2020. We must be more long term with targets."

Marsh: "So what is the solution?"
"You could forcibly put school children through engineering courses, like communist Russia – the Great Leap Forward idea – but you're not going to do that. You could make an incentive, you could make the case that if people enrolled on engineering courses the universities and students get paid more by the government. But government doesn't have any money and all other courses would ask for the same.

So you need to make eng courses more attractive. I would:

1. Get more people who run companies to visit schools in a more ambassadorial role – some are already. Get more women to do this too – there are no women on this panel.

> *"We have a UTC at the bottom end, got Jaguar Land Rover and Rolls-Royce at the top end - it works"*
>
> *Will Searle, Axillium*

2. Perhaps tweak the finances of the univsersities, because it's expensive to finance these courses compared with a social science or English degree.

The University Technical Colleges

Will Searle, Axillium: "I've been to this event three times, I hear skills and universities again and again. How many here have heard of the UTCs? (good showing).

My organisation develops composite capabilities, and we've received £23m from government. We have a UTC at the bottom end, got Jaguar Land Rover and Rolls-Royce at the top end – it works. So much of this is about getting SMEs involved in what the primes want – so go and have coffee with Rolls-Royce and some students.

"For me, its about everybody in this room getting involved with Technical Colleges. Next year I would like to see Michael Gove and the guy running the UTCs [Lord Baker] here.

Philbin (to the audience): "People have no idea what goes on inside the four walls of your companies." "Could we get the government giving tax breaks to the companies who do engagement activities like this?"

Flexible working - common sense?

Despite the 'labour is cheap' threat from developing countries there was general consensus that the UK uses flexible working in manufacturing to good effect, and the UK workforce is now very willing to flex their hours to win business.

Peter Alderslade, manufacturing consultant: "I did a job in Morocco where a US business invested £170m, mainly textile manufacture.

Employees work a 6-day week, labour is much more flexible, the managers can say "I don't want you to come in tomorrow" with impunity. We [the UK] have lost that, we are generally more interested in the standard of life. There are lots of practical things like flexible labour that would support a strategy.

"I also introduced annualised hours to the DVLA. You work the same total no. of hours in the year but would work 22% less the shift. That's 22% more days off, 22% fewer travel costs, 22% less CO2 and so on."

Stevenson: "We moved to 40-hours in a four day week a few years ago, because it made no sense working half a day Friday then coming back on Saturday morning.

Holliday: "To allow this perception that the UK is inflexible is a disservice to manufacturing. In 2008 in the downturn demand for variable speed drives that drive electrical motors dropped through the floor.

"We had to flex from 600 to 300 staff at Congleton and we got incredible support from workforce.

At the same time in Germany everyone went on a four-day week, the German government funded a 5th day rather than make people redundant. It's called *kurtzarbeit*."

"It's not clever its just common sense. You have to keep on repeating again and again, the customer comes first"

John Elliott, Ebac

Elliott: When we put annualised hours in several years ago we didn't know it was called that, we thought it was called common sense. We had a system where anyone working the same hours would get the same pay but there is no overtime premium. You can apply for O/T but we plan it – this gets rid of all conflicts. You can never beat an employee, has to be mutual benefit."

Thomas Pye, BMW: "We have flex up, flex down at BMW with tens of thousands of employees. The UK system does work."

The Germany hang up; Advanced or basic goods?; Failure of government schemes

John Stevenson, Hitec Sheet Metal: "We must stop holding Germany up as the great leader of manufacturing – they are not. But they are very good at talking up how good they are and very good at producing paperwork for something.

I had two German customers, I got one job from a German subcontractor because they couldn't make sheet metal at all, and another German company that took over a British company and completely destroyed what that company was doing.

Many German companies have become complacent – like we did 50-60 yrs ago.

Thomas Pye, BMW: "At BMW Mini we see both British and German sides of it.

"They are all British employees but owned by a German company. The German and British way of doing things is not that different. In many ways, what we do at MINI and Rolls-Royce [Motor Cars] is better than what they do at BMW in Germany. It's a matter of making something that the customer wants and getting the skills in the UK to make it."

Rowena Vestey, The Design Council: "We run a design leadership programme. What is often better in Germany is the relationship between the German government and those companies and the support they receive locally, which is back to the strategy. We see this from SME perspective."

The obsession with advanced engineering

Stevenson: "If textiles came back to the UK it would make a huge difference. If we grew this advanced engineering sector we are only going to create another 100,000 jobs at best. We need one or two million jobs.

"People today have got so used to buying three Bangladesh-made t-shirts for £5 rather than one British made that will last. These excess T-shirts go to landfill.

> *"The German and British way of doing things is not that different. In many ways what we do at MINI and Rolls-Royce (Motor Cars) is better than what they do at BMW in Germany"*
>
> *Thomas Pye, BMW*

Forget the strategy, it's the people that cause the problem."

Why some government support schemes fail - dti smart

Prof Neale Thomas: lifelong academic who "accidentally won" four SMART awards in the 1970s. "Smart was run by the DTI. I got £25k in Year 1, £75K in Year 2 with contributions from a company to develop two technologies, a wind-powered water treatment and a spray nozzle for general applications. I was a sole trader academic, so I tried to form alliances. We persevered, we prototyped and pre-produced with several utility companies and a couple with large agrichemical firms through DEFRA.

We didn't make it into market, but the product came back to bite me a decade later – I saw it at NEC trade shows, it had been "*durchtechniked*". It cost me £250k all told. The problem was not being able to forge the alliance and / or not being able to secure the capital and I was not alone, most SMART winners fail for that reason.

"SMART the concept succeeded because the winners generated enough tax to pay for the whole scheme."

The Debate extended

Average weekly wages by sector, March 2013:

Manufacturing £524

Construction £515

Services £428

Source: ONS

Live and ex-post facto delegate comments

Steve Brambley, Deputy Director, Gambica

"I support a target as the measure of success in achieving a goal. However, if the target is proportional (e.g. manufacturing should be 20% of GDP) then it doesn't necessarily help to measure success. We have a scenario where manufacturing is 10% of GDP and the target is 20% of GDP, and there are two outcomes to this.

"Scenario 1 - success appearing as failure. Manufacturing output increases by 30%, but so does services – the total economy has grown by 30%, manufacturing has grown by 30%, but the proportion of the total economy from manufacturing remains unchanged at 10% – therefore a failure to meet target despite being a positive economic outcome

"Scenario 2 - failure appearing as success. Manufacturing output does not change, but services reduce by 50% – the economy has shrunk by 39% and manufacturing hasn't grown, but now manufacturing is 18% of GDP – almost on target despite being an economic catastrophe.

"A target should be absolute, rather than proportional. For example – manufacturing contribution to GDP should increase from £X trillion to £Y trillion by 2020 – success can be measured by actions within manufacturing, without relying on the results of other parts of the economy."

Richard McKee, Supplier Development Leader, Rolls-Royce

"Many times the debate mentioned the need for engineers and how they can be attracted to careers in manufacturing. I have worked globally in aerospace supplier development and where I see the core weakness in UK aerospace manufacturing is not in the actual engineering, or lack of, but in low managerial skills with limited foresight leading to the lack of strong business strategy and leadership within the SMEs.

"I believe the bigger challenge is attracting strong business candidates into the manufacturing world. If, as part of a national manufacturing strategy, the manufacturing leaders and government can help SMEs to create strong business and operational strategies there is a larger opportunity to close the cost gap to BRIC nations."

Neil Lloyd, Head of Sales Development, Lombard Business & Commercial

"Two themes in particular resonated with me. The first was how the EU procurement policy is interpreted by the UK government vs that of Germany's. The UK seems focused on achieving the lowest price, while Germany focuses on the local economic and social benefits a German supplier would generate.

"The second was the introduction of engineering to young children so they can understand the vast array of opportunities available. Maggie Philbin gave a passionate presentation on the work she does as CEO of TeenTech, which runs engaging one-day events that introduce teenagers to the wide range of career possibilities in science, engineering and technology."

Professor Rajkumar Roy, Head of Manufacturing and Materials Department, Cranfield

"UK manufacturing has a window of opportunity to grow, contribute more to the economy and jobs.

For example, fundamental research and technology development done by EPSRC Centres for Innovative Manufacturing is now supported by Catapult Centres to exploit the technologies. The Government funded AMSCI project is supporting development of UK supply chain to bring more manufacturing activities within the country.

"There are high hopes the Business Bank will address the issue of access to finance. The UK is recognised as having the least economy-wide product market regulation in 2008 within the

> *"Let's try not to use the context of high value engineering as a mask for low levels of labour productivity or weak operational strategy.*
>
> *Richard McKee, Rolls-Royce*

OECD countries. We need to build on these strengths and have a strategic approach at the national level to support local manufacturing and boost product innovation.

"We need to involve social enterprises such as co-operatives and charitable organisations to support small companies, encourage British people to take pride in manufacturing and encourage more people to join the profession. We also need to promote significant job creation from manufacturing.

"The USA shows that advanced manufacturing is not creating enough jobs. By focusing on local manufacturing, more product and technology innovation through the industry, catapult centres and universities, using public procurement to create new manufacturing opportunities within the UK, we shall be able to create more jobs from manufacturing."

> *"At a young age, most feel a degree in STEM will be far too challenging as opposed to ones in the arts, business studies and economics and take the safe way out*
>
> *Srikanth Meka, Rolls-Royce*

Srikanth Meka, Supplier Development Leader, Rolls-Royce

"Having worked with school kids and prospective undergraduate students [in the UK] over the last couple of years, I am left with a disheartening belief that we have not been able to convince very many of them to seriously consider studies and careers in STEM.

"At a young age, most feel a degree in STEM will be far too challenging as opposed to ones in the arts, business studies and economics and take the easy and safe way out. A service sector dominated economy with reasonable prospects of jobs leads them to believe in taking the safer way. Compounding the problem is the fact that the brightest of the crop who do take up STEM degrees are lured away with the promise of the big bucks by the financial institutions of the City.

"We need to seriously consider the implications this trend can have on the availability of people and skills within our sectors, and take measures to address this before it is too late and we are left in the wake of a human resource revolution that will leave us short-handed."

Conclusion

Does the UK need a national manufacturing strategy?

The consensus was split. Most of the panellists and audience believed that a strategy in some form was important for manufacturing to grow and create jobs. A rigidly defined, prescriptive strategy would be inappropriate to implement because of the wide range of needs of "manufacturing", by definition a hugely diverse group of activities and not a homogenous lump. The UK government already has an Industrial Strategy, launched in September 2012, based on five pillars covering skills, sectors, technologies, a business bank and government procurement.

Some warmed to the view espoused by John Elliott that a strategy should focus on the basics – such as seeking parity in currency values – to engineer fairer trade, to encourage the profitable manufacture of commodity goods. But many would stop short of a "ban on innovation for a year". Peter Marsh warned of the risk of "analysis paralysis", spending too much time with too many stakeholders agonising over the composition of a strategy, meanwhile missing many good opportunities to support companies that are doing things right in the present.

The Government is often the whipping boy for these debates but, as pointed out by several people including Brian Holliday, it has done a lot in recent years to help create the environment manufacturing business needs to develop; increasing capital allowances, relaxing labour laws and providing a string of funding competitions through the Technology Strategy Board and other vehicles like AMSCI.

In sum, the panel provide their one-line wish lists for what's needed to boost UK manufacturing.

Elsy: We need absolute consistency, the strategies are not connected up enough yet. Stick with it – we're just beginning to do the right thing.

Rigby: Manufacturers want confidence in the whole system.

Holliday: I'm with Dick, consistency.

Elliott: Give us a level playing field and businesses will be able to take care of themselves.

Nicholls: We want to make sure it all joins up. Don't forget the education part with schools, school leavers and universities, linked to centres of innovating manufacturing enabling centres like the Catapult.

McKervey: A public procurement system that protect our national interest.

Claydon-Smith: Level of ambition. India is looking to grow 100 million manufacturing jobs. When the UK was at the heart of global manufacturing the population was about 38m, and only a third employed in manufacturing. Our own ambitions are pretty modest if we look at other parts of the world.

The National Manufacturing Debate will be held at Cranfield University in 2014 from May 20-21.

National Manufacturing Debate 2013

Cranfield UNIVERSITY

CALL TO ACTION

The National Manufacturing Debate 2013 provided at least six, main action points for government and industry on which to base a manufacturing strategy. They are:

1. Integrate schools and universities into industry more effectively
2. Consider all forms of manufacturing – commodity as well as advanced engineered goods – in a national strategy
3. Engineer, where possible, a level playing field for free trade, giving the UK a chance to compete on price
4. Consistency: choose fewer, better conceived support projects – like the Catapult centres – and stick with them
5. Review the public procurement system. Train civil servants to assess local economic impact from domestic bids
6. Aim high – be more ambitious in support and targets

www.national-manufacturing-debate.org.uk

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Published in partnership with: *The Manufacturer*
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