ENGINEERED IN BRITAIN
MANUFACTURING A SUCCESSFUL ECONOMY?

Improving the world through engineering
THE RESULTS OF THE 2014 ENGINEERED IN BRITAIN SURVEY REFLECT MUCH OF THE CONFIDENCE BEING REPORTED IN THE MEDIA IN RECENT MONTHS.

This is the fourth year of the Institution’s Engineered in Britain campaign, which aims to promote the value of engineering and manufacturing to the health and wealth of the UK’s economy.

This report builds on the results of previous surveys, and aims to ascertain the perceptions of Manufacturers and the Public towards the value, role and input of Government in the growth of this valuable economic sector.

This report has been produced in the context of the Institution’s strategic themes of energy, environment, education, manufacturing, transport and its vision of ‘Improving the world through engineering’.


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What a difference a year makes. When the Institution published its 2013 Engineered in Britain survey, many were questioning the future prospects of the UK economy and its ability to move forward and grow. The Office for Budget Responsibility had revised the 2013 economic forecast downwards by 50%, and the IMF’s half-yearly assessment was asking Government to consider reining back on its austerity plan. Today, the nation’s economic forecast looks very different. The economy is demonstrating strong growth in many sectors (2013 GDP reaching 1.8%, with forecasts for 2014 now being 2.7%), unemployment is slowly coming down (200,000 drop in 2013) and inflation remains under control. UK manufacturing has also recorded a 1.3% growth in the first quarter of 2014, with companies currently adding 10,000 new jobs each month.

However, we cannot become complacent about the current good fortunes of the UK. There are still many situations which could stall the recovery, most notably the economic uncertainty in Europe, the United States and China.

The results of the 2014 Engineered in Britain survey reflect much of the confidence being reported in the media over recent months. Both the Public and Manufacturer polls have become more positive about the future of our manufacturing capability, and the efforts undertaken by Government to ensure a sustained future for this vital sector.

For the Institution and its members, this is an encouraging position. However, our continuing long-term concern is the lack of new engineers and technicians entering the profession. Quite simply, the UK needs to double the amount of people entering the profession each year for the next decade just to keep up with projected demand from industry. If the UK lacks the engineering talent, companies will have little choice but to recruit overseas or, more worryingly, move their facilities to nations which do have an adequate supply of engineers and technicians.

Another concern for the Institution is the low-level adoption of new materials and technologies by UK manufacturing. The advancements by the UK’s academic research into new composites and nanotechnologies have not been translated in any significant way to the nation’s manufacturing sector. By contrast, countries such as China, South Korea and the United States are investing billions of dollars in exploiting these new technologies. It is our belief that Government needs to work with industry and encourage the exploitation of these new materials and technologies to ensure the UK can capture a large proportion of these future markets before it is too late.

The following Engineered in Britain survey is based on two sets of research conducted in April 2014. The first survey was conducted by MSS Research and gathered the views of 1,000 senior professional engineers working in the UK’s manufacturing sector. The second survey was conducted by ICM Research and focused on the views of 1,000 members of the general population on issues surrounding the UK’s manufacturing sector.

Finally, in 2014 the Institution has partnered with BDO LLP in producing this report. This partnership allows us to report the results with a broader perspective, allowing some economic analysis and insight from one of the country’s leading accounting firms.
This year’s ‘Engineered in Britain’ survey is extremely encouraging for the UK manufacturing sector and suggests that the Government’s drive to support manufacturing is beginning to have some effect.

The survey shows that 48% of manufacturers and 33% of the public believe the Government is committed to creating a more balanced economy by growing UK manufacturing. Sentiment, whilst still below 50%, is becoming more positive by the year – particularly amongst manufacturers. Whilst an increasing baseline is obviously positive, the fact that over 50% of manufacturers are still not convinced of the Government’s commitment to manufacturing is a concern but also an opportunity for further improvement.

Increasing exports is one of the policies central to the Government’s manufacturing policy. But only a fifth of manufacturers (21%) believe that George Osborne’s target of doubling UK exports by 2020 is realistic. The November 2013 CBI/BDO study Go Your Own Way revealed that 69% of SME exporters were unaware of UK Trade & Industry and two thirds had not heard of UK Export Finance. If these are the figures for companies which are already exporting, then there is clearly a significant lack of awareness amongst UK businesses about help available to them.

With 89% of respondents believing the UK is currently not producing enough engineers to sustain the sector, it is perhaps the lack of talent available which is the true inhibitor to the growth of UK manufacturing. Whilst businesses can do some of the leg work to help train apprentices into skilled engineers, there needs to be a concerted drive to encourage school age children to study STEM subjects through to further and higher education.

Labour costs remain one of the primary reasons for companies to choose to offshore manufacturing. In the 2014 survey, of those manufacturers that are offshoring, 73% said that this was to save on labour costs. However, many companies are now choosing to re-shore their previously offshored operations. 59% of respondents in this year’s survey were re-shoring as they believed UK skills were better than those on foreign shores, further emphasising the need to nurture future engineering talent. The reason why companies’ offshored operation in the first place was to help them succeed within a competitive business environment. The onus therefore remains on the Government to ensure that policy supports the most competitive business environment possible within our country.

The desire to innovate is clearly at the heart of the majority of manufacturers’ strategies: 54% of manufacturers believed that further reform of R&D tax benefits was the single biggest improvement the Government could make to encourage more innovation and development.

As with the promotion of exporting, simply promoting the current benefits of R&D tax credits to manufacturers may be enough: just 4% of SME businesses filed claims for R&D tax credits in 2012 according to the HMRC suggesting many manufacturers are still missing out.

The survey shows that manufacturers and the public are broadly confident about the future for UK manufacturing and that the structures and support being provided by the Government are welcomed and having a positive effect.

We would very much like to see a long term cross party strategic framework established for manufacturing – but the survey shows that the Government has taken many of the right first steps in re-balancing the economy back towards manufacturing.

BDO is delighted to partner with the Institution in producing this report which we hope will be a valuable addition to the perspective that UK Manufacturing is back and confident of its future.
41% of the manufacturers polled indicated support for current manufacturing policy, up from 26% in 2013.
The 2014 Engineered in Britain survey examines the health of UK manufacturing from three perspectives:

- **Political**: how are the actions and attitudes of Government impacting on the state of the nation’s manufacturing sector?
- **Skills**: do we have the right people with the skills needed to develop the UK’s manufacturing sector today, and in the future?
- **Globalisation and commercialisation**: where does the UK’s manufacturing sector stand against other nations?

The report compiles information from two surveys. The first is 1,000 senior engineers working in UK manufacturing (Manufacturers). The second explores the views of 1,000 members of the public (Public), and their attitudes towards the nation’s manufacturing sector. Where possible, the report reflects on historical data gathered from previous surveys.

**Political**

The overall 2014 Engineered in Britain results reflect the current positive mood in the UK towards our economic situation. Both Public and Manufacturer polls recorded a growing belief that Government was committed to a more balanced economy compared to results over the last four years. Furthermore, 41% of the Manufacturers polled indicated support for current manufacturing policy (up from 26% in 2013). Of the main political parties, Conservative manufacturing policy was the clear favourite with Manufacturers.

On individual policy areas, support for transport, environment and energy policy have all declined since the 2013 report, possibly reflecting some of the well-publicised issues that the current administration has experienced in these areas, for example the ongoing HS2 debate, flooding and electricity pricing.

On the Chancellor’s well-publicised aim to double UK exports to £1tn by 2020, 64% of Manufacturers felt the target was unrealistic.

**Skills**

Although over one third of Manufacturers polled indicated that their companies were currently recruiting engineers and technicians, an overwhelming majority (89%) did not believe the UK was producing enough engineers to sustain the country’s future economic growth. This view reflects well-publicised concerns from many organisations about a looming shortage of science, technology, engineering and maths (STEM) professionals in the UK over the coming decades.

Of continuing concern in both polls is the poor state of careers advice provided to the next generation, with only 19% of the Public and 13% of Manufacturers believing Government was doing enough to provide adequate STEM advice to students.

On recruitment of engineers and technicians, 35% of Manufacturers polled felt science and maths skills were lacking in new recruits, with 32% also noting a poor work ethic in many.

**Globalisation and Commercialisation**

Results of the 2014 report continue to indicate a greater number of companies offshoring activity (17%), compared to those choosing to reshore (11%). Justification for this trend indicates cost as the main driver to offshore, with a reduction in manufacturing unit costs (71%) and labour costs (73%) two commonly cited reasons. However, the decision to reshore was more often based on quality of production, with 72% citing quality of manufacturing and 59% indicating better skills in the workforce as the reasons to reshore.

Looking towards the future, 85% of Manufacturers polled believed the composite materials sector would see strong growth in the next decade, with biomedical industries (79%) and construction (73%) close behind.

With two national debates, on Scottish independence and the UK’s position within the European Union, currently under way, both groups were asked if they felt the uncertainty created by these referendums was having any effect on UK manufacturing. On Scotland, 44% of Manufacturers and 27% of the Public believed it was having a negative effect on the sector. Similarly, 52% of Manufacturers and 44% of the Public believed the uncertainty surrounding EU membership was having a negative impact on the sector.
61% of manufacturers were now more positive about the future of the sector compared to 28% in 2011.
Since the financial meltdown of 2008, all the main political parties have stated the need for the UK to increase its manufacturing capability and export more goods[1]. Indeed, it has become almost routine for senior politicians to visit manufacturing facilities in order to be seen as protectors and promoters of this vital sector.

Government’s visible and vocal support for manufacturing has been reflected in the results of the 2014 EIB surveys, with both the Public and Manufacturers reporting a growing belief that Government is committed to a more balanced economy (Q1). More significantly, not only did 48% of the Manufacturers agree with this statement (37% in 2013), but 41% (26% in 2013) believe current Government policies are also helping the sector (Q2).

The Conservative Party will also be satisfied to note that of all the mainstream political parties, 40% of the Manufacturers stated that their policies were best for the sector (Q6), well ahead of the 5% support for the Labour Party and 3% support for the Liberal Democrats.

Additional positive reaction to Government policy is seen in Q5a, where 61% of the Manufacturers were now more positive about the future of the manufacturing sector compared to only 28% in 2011. Although the Public poll (Q5b) was less enthusiastic about the future of manufacturing (15% more confident, with 50% believing it remains the same), there was a significant drop in people expressing ‘less confidence’ for the future of the sector (down from 45% in 2013 to 22% in 2014).

However, 76% of Manufacturers and 50% of the Public still believe that, overall, Government is more committed to the financial sector (Q3). With the public’s continuing criticism of the banking sector, the challenge for all political parties is to balance their support more equally between the financial and manufacturing sectors, both of which are essential for the UK’s future economic wellbeing.

Question 4 asked the Public and Manufacturer groups for their views on a range of Government policy areas. The results reflect strongly the current mood of the nation, with a range of positive results on a number of economic factors. Most notable was the upward swing for Government on its management of the economy, up from 19% to 34% (Public), and from 31% to 58% (Manufacturers).

However, in areas such as transport, energy and environment, three policy areas where Government has had several high-profile issues in recent months (HS2, electricity pricing and flooding being examples), all have seen a decline in support. For all three of these areas, the Institution has publicly advocated the need for long-term, cross-party planning to be agreed and implemented, instead of the current short-term political decision-making. In areas such as climate adaptation or infrastructure development, the UK economy needs future proofing and confidence that projects will happen, and not to be blocked by political concerns over the results of the next election.

Finally, in 2012 the Chancellor, Rt Hon George Osborne, announced his target to double UK exports to £1tn by 2020[2]. When polled on this target, 64% of Manufacturers felt this was unrealistic (Q7), as few incentives or initiatives had been introduced to make this target achievable.
Q1

The Government is committed to creating a more balanced economy by growing UK manufacturing?

- Manufacturers
- Public
Q2

The Government's policies are helping UK manufacturers?

- Manufacturers
- Public
Q3

The Government is more committed to the financial sector than to the manufacturing sector?

- Manufacturers
- Public
How well is the Government performing in each of the following policy areas?

- Manufacturers
- Public

Education and Skills

The Economy

Manufacturing Policy

Environmental Policy

Energy Policy

Transport Policy

Taxation

Regulation

www.imeche.org/engineeredinbritain
Q5a

Have you become more or less confident about the future of manufacturing since the Government came to power?

*Manufacturers only*

<table>
<thead>
<tr>
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<th>Same</th>
<th>Less</th>
<th>Don’t Know</th>
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<td>2011</td>
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<td>38</td>
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<td>2</td>
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</table>

*Q5b Have your views on the Government’s record in supporting manufacturing changed since the last election?*

*Manufacturers only*

<table>
<thead>
<tr>
<th>Year</th>
<th>More</th>
<th>Same</th>
<th>Less</th>
<th>Don’t Know</th>
</tr>
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<td>2013</td>
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<tr>
<td>2011</td>
<td>38</td>
<td>38</td>
<td>28</td>
<td>2</td>
</tr>
</tbody>
</table>
Q5b Have you become more or less confident about the future of manufacturing since the Government came to power?

Public only

More
- 2014: 15
- 2013: 11
- 2012: 10

Same
- 2013: 41
- 2012: 41

Less
- 2013: 22
- 2012: 43

Don’t Know
- 2013: 11
- 2012: 6

www.imeche.org/engineeredinbritain
Q6 Which political party do you feel has the best policies to support UK manufacturing?

Manufacturers only
Q7

How realistic is George Osborne's target of doubling UK exports by 2020?

Manufacturers only

- Unrealistic: 64
- Neither realistic or unrealistic: 11
- Don’t know: 4
- Realistic: 21
“89% of manufacturers did not think the UK was producing enough engineers to sustain the nation’s future economic growth.”
It is estimated that the UK needs to double the number of engineers entering the profession each year between now and 2020 to meet expected economic demand and counter the increasing number of engineers retiring from the profession[3]. To achieve this, the UK will need to increase its annual engineering graduate output every year from current levels of just 46,000 to 87,000, while the number of qualified apprentices needs to increase from 27,000 to 69,000 over the same period[3].

Although efforts to increase entrants into the Science, Technology, Engineering and Maths (STEM) professions by Government and industry have improved in recent years, especially in the provision of apprenticeship positions[4], concerns remain about the lack of co-ordinated action between all parties, at all levels, to address this problem. This concern is highlighted in Q12, where an overwhelming majority (89%) of Manufacturers did not think the UK was producing enough engineers to sustain the nation’s future economic growth.

A key area of concern for the Institution of Mechanical Engineers on why we are not increasing the future pipeline of engineers and technicians, is the lack of high-quality careers advice in schools[5]. This concern is reflected by both polls in Q8, where only 13% of Manufacturers and 19% of the Public felt Government was doing enough to provide adequate STEM advice at schools.

In most areas of the country, there are insufficient connections between schools and local industry to educate and inform students of the different job opportunities available to people who decide to study STEM subjects. Indeed, the commitment for schools to provide comprehensive careers advice has been reduced since the 2011 Education Act[6]. Without a guaranteed future pipeline of skilled engineers and technicians, the manufacturing sector will need to either import the required talent, or export their facilities to nations where engineers are in supply.

The Institution believes strongly that the drive to cut costs within the education budget is building a future skills crisis. It is important that schools and local industry collaborate to inform students of the opportunities available, and the qualifications and skills required to enter STEM professions. Some excellent examples (MBDA and JCB) of education/industry collaboration do exist. This should be replicated nationwide.

Focusing on the manufacturing sector itself, Q9 sought to establish if manufacturers were currently recruiting apprentices or engineers, with over 38% and 37% respectively responding positively. Asking the Manufacturers what incentives would encourage them to employ more apprentices or engineers (Q10), the results were fairly spread across the options provided. Only a reduction in the minimum wage (5%) garnered little support. A reduction in Corporation Tax (54%) was the most popular option.

However, the Institution was concerned to find that 35% of Manufacturers felt that the maths and science skills of new recruits were lacking, and 32% felt recruits had a poor work ethic (Q11). Although the economy is currently on a growth trajectory, unemployment of under-25s still remains above 900,000[7]. It is, therefore, disappointing that some of those polled felt that a commitment to work was lacking in new recruits.
Q8a

Do you think the Government is doing enough with careers advice to promote science, engineering and manufacturing in schools?

Manufacturers only
Q8a

Do you think the Government is doing enough with careers advice to promote science, engineering and manufacturing in schools?

Public only

2013

No

Yes

2014

34

55

19

12
Q9a  Is your company currently recruiting engineering apprentices?  
*Manufacturers only*

Q9b  Is your company currently recruiting Chartered or Incorporated engineers?  
*Manufacturers only*
Q10 Which of the following incentives from Government do you think would encourage your company to take on more apprentices or engineers?

*Manufacturers only*

- **Training levy fund**
  - 2011: 50%
  - 2012: 65%
  - 2013: 60%
  - 2014: 53%

- **Reduction in Corporation Tax**
  - 2011: 53%
  - 2012: 61%
  - 2013: 60%
  - 2014: 54%

- **National Insurance breaks**
  - 2011: 58%
  - 2012: 64%
  - 2013: 56%
  - 2014: 50%

- **£3,000 for any person who completes their apprenticeship**
  - 2011: 63%
  - 2012: 58%
  - 2013: 63%
  - 2014: 50%

- **Reduction in the minimum wage**
  - 2011: 14%
  - 2012: 12%
  - 2013: 9%
  - 2014: 5%
In your experience, do you find that apprentices, graduates and new recruits lack any of the following skills?

*Manufacturers only*

<table>
<thead>
<tr>
<th>Skill</th>
<th>2014</th>
<th>2013</th>
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<tr>
<td>Practical skills</td>
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<td>59</td>
</tr>
<tr>
<td>Leadership</td>
<td>45</td>
<td>59</td>
</tr>
<tr>
<td>Communication skills</td>
<td>43</td>
<td>49</td>
</tr>
<tr>
<td>Design skills</td>
<td>38</td>
<td>45</td>
</tr>
<tr>
<td>Good maths and science</td>
<td>35</td>
<td>39</td>
</tr>
<tr>
<td>Work ethic</td>
<td>32</td>
<td>38</td>
</tr>
</tbody>
</table>
Q12 Do you think the UK is producing enough engineers to sustain the UK’s future economic growth?

Manufacturers only
64% of manufacturers felt the chancellor’s target to double exports by 2020 was unrealistic.
Manufacturing contributes £6.7tr to the global economy with the UK one of the world’s top ten manufacturers. The sector makes up 10% of UK GVA, 54% of UK exports and directly employs 2.5 million people. Despite the sector’s decline since the 1970s, when manufacturing contributed 25% of UK GDP, we rank second globally in aerospace, our automotive industry exported a record-breaking 84% of its production in 2011, and the chemical and pharmaceutical industries add £20m per day to the nation’s balance of trade[8].

Future scoping, Manufacturers were asked which industries or sectors they believed would see the highest growth in the next ten years (Q16). Although aerospace and automotive both ranked highly, it was composite materials (85%), biomedical industries (79%) and construction (73%) which took top spots.

The results reflect previous work by the Institution on sectors where the UK economy could establish substantial global market share, if industry and Government worked better together to exploit the national expertise and opportunity. For instance, in biomedical industries (a global market of $325bn in 2011), the UK ranks second only to the United States in value and innovation. Indeed, this is the fastest growing sector in the life sciences, with sales predicted to outgrow pharmaceuticals within the next ten years.

Equally, the UK is a pioneering nation in the development of composite and nanotechnologies. However, although the UK advances materials research (graphene as an example), our application from lab to industry and commercial use is falling behind other nations. As an example, Samsung in South Korea alone has applied for as many patents for graphene as the rest of the world combined, excluding USA and China, and over eight times more than the whole UK manufacturing sector.

Offshoring vs Reshoring

Over the last two years, there has been a small but growing trend of companies choosing to reshore their manufacturing capability back to the UK. Although this is a positive step, 17% of the Manufacturers stated that their companies were still offshoring capacity, albeit down from 28% in 2013 (Q13). The main reasons stated for offshoring (Q14a) were manufacturing unit costs (71%), labour costs (73%) and to gain access to certain markets (73%). However, of the Manufacturers who stated their companies were reshoring (11% – Q13), 72% cited quality of manufacturing, 59% better skills in the UK and 47% maintaining unit costs. The results reflect research conducted by the Manufacturing Advisory Service in 2013[9], which showed that the initial cost benefits in staffing and manufacturing are often not sustained, due to the poorer levels of engineering skills overseas, and therefore quality of the finished product.

As stated in the Government section of the report (Q7), the Chancellor has set a target to double exports by 2020. When asked what single Government measure or initiative could help their companies export more (Q18), tax relief (17%), UK finance to help exporting (17%) and more relationship building with other nations (12%) were the most popular answers.

Scotland and Europe

Finally, the UK is currently undertaking two debates on its future. The first and most immediate is the Scottish independence referendum in September 2014. When asked if uncertainly surrounding the referendum was having a positive or negative effect on UK manufacturing (Q22), 44% of Manufacturers and 27% of the Public polled a negative view. Similarly, the ongoing debate on membership of the EU (Q21) polled a 52% negative impact with Manufacturers, a view shared by 44% of the Public polled.
Q13 Is your company reshoring or offshoring its manufacturing capability?

Manufacturers only
Q14a If offshoring, what is the reason for this?

Manufacturers only

<table>
<thead>
<tr>
<th>Reason</th>
<th>2014</th>
<th>2013</th>
</tr>
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<tbody>
<tr>
<td>Maintaining unit costs</td>
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<tr>
<td>Shipping costs</td>
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<td>Exchange rates</td>
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<td>Energy costs</td>
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</tr>
<tr>
<td>Labour costs</td>
<td>73</td>
<td>18</td>
</tr>
<tr>
<td>Life maintenance costs</td>
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<td>14</td>
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<tr>
<td>Quality of manufacturing</td>
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<tr>
<td>Intellectual property rights</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Access to certain markets</td>
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<td>5</td>
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<tr>
<td>Manufacturing in the region we sell</td>
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<tr>
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<td>2013 Percentage</td>
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<tr>
<td>UK skills better</td>
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</tbody>
</table>

Q14b If reshoring, what is the reason for this? *Manufacturers only*
Q15

Is overseas investment into the UK’s manufacturing sector helping or damaging British manufacturing companies?

Manufacturers only
Which of the following UK manufacturing sectors do you believe will see the highest growth in the next 10 years?

Manufacturers only

- Composite materials: 85
- Biomedical: 79
- Construction: 73
- Aerospace: 69
- Electronics: 67
- Automotive: 62
- Plastics: 42
- Food and drink: 39
- Chemical: 36
- Defence: 25
- Steel: 20
- Textile: 15
Q17

What single improvement to Government initiatives would encourage more innovation and development?

Manufacturers only

- **Simpler funding options**
- **Higher Capital Allowances**
- **Better access to High Value Manufacturing Catapult Centre**
- **None of these**
- **Don’t know**
- **R&D tax benefits**

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Q18

What single Government measure would help or encourage your company to export more?

*Manufacturers only*

- **24** UK finance for exports
- **17** Tax relief
- **12** More relationship building with other nations – UKTI
- **8** Peer-to-peer workshops so manufacturers can learn from each other
- **5** Guidance on best business practice in other countries
- **10** None of these
- **5** Don’t know
- **17** None of these

Engineered in Britain: Manufacturing a Successful Economy?
Q19 Which of the following are your company’s current overseas trading markets?

Manufacturers only

<table>
<thead>
<tr>
<th>Region</th>
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<tr>
<td>Oceania</td>
<td>24</td>
<td>56</td>
</tr>
<tr>
<td>South America</td>
<td>23</td>
<td>53</td>
</tr>
<tr>
<td>Africa</td>
<td>22</td>
<td>50</td>
</tr>
</tbody>
</table>
Which of the following do you envisage will be your company's main trading markets in 2020?

Manufacturers only

2014

56 UK
47 Europe
35 North America
32 Asia (excl India & China)
31 China
30 India
25 Oceania
25 South America
22 Africa
Q21 Do you think the uncertainty surrounding the UK’s future in the EU is having a positive or negative effect on UK manufacturing?

- Manufacturers
- Public
Q22
Do you think the uncertainty surrounding the Scottish independence vote is having a positive or negative effect on UK manufacturing?

- Manufacturers
- Public

![Pie chart showing responses to Q22 question](chart.png)
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