AMBITIOUS INNOVATION, UNCERTAIN OUTCOMES?

INNOVATION MONITOR 2015/16

Manufacturers’ views on how changing economic conditions affect the opportunities and challenges associated with innovation.
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Foreword

Innovation is central to the success of the UK’s manufacturing sector. It enables companies to reduce the costs of production, boost sales and enhance margins. It is central to the health of the UK economy, as a key driver of productivity growth.

The EEF/Vodafone Innovation Monitor 2015/16 looks at the trends affecting innovation in manufacturing and how these have shifted in recent years. Last year’s survey showed that, as growth picked up in the economy, and companies became busier, they narrowed the focus of their innovation activity. This narrowing has continued again this year, though the underlying trends are different, as manufacturers once again adapt their strategies to reflect the economic challenges and opportunities they face.

In the last twelve months, a key trend affecting the UK manufacturing sector has been the weakness in demand from the oil and gas sector, which has particularly hit investment goods manufacturers. Manufacturers in these sectors have responded by upping their product innovation to enable them to move into new markets and capture growth opportunities where they exist.

While this year’s report shows that manufacturing remains a highly innovative sector, it also highlights the many challenges manufacturers have to overcome to achieve successful outcomes. These vary from overarching issues, such as the need for access to the right resources, through to particular issues with achieving certain outcomes, such as the need to identify and develop relationships with new customers before sales can be made.

With innovation central to achieving productivity growth, helping companies to overcome these challenges must be a priority for government.

Here are our top takeaways from this year’s report:

- **Manufacturers are using innovation to deliver productivity improvements and export growth** with innovation strategies varying according to the shape, size, and sector of companies and the challenges they are facing. Large companies remain the broadest innovators while sectors facing economic challenges, such as those in oil and gas supply chains, are innovating to diversify their way out of the investment downturn.

- **Manufacturers are highly ambitious about innovation** and are investing heavily in it using specialist resources, but they also have to pull in employees, equipment and finance from elsewhere in the business. Despite all of this, manufacturers are not always achieving the results they need. Innovation is challenging and a lack of resources reduces chances of success.

- **Concerns about falling behind competitors have risen** for the second year running. However, manufacturers find that government support schemes can make innovation easier, improving companies’ access to equipment, expertise and finance.
Innovation Monitor 2015/16

Innovation Monitor is an annual survey looking at why manufacturers innovate, how manufacturers innovate, and the difference that innovation makes to their businesses. This year’s survey focuses on the outcomes from innovation, and which factors make the difference between success and failure.

Key trends

Manufacturing is highly innovative

94% of manufacturers engage in innovation. All larger and medium sized companies are engaged in innovation, but even amongst small companies, 90% engaged in innovation in the last three years.

Innovation is becoming narrower

In 2013 43% of companies engaged in three or more types of innovation...

... this dropped to 38% in 2014...

... and to 34% in 2015

Product innovation has increased

59% in 2014
64% in 2015

Despite the drop in the range of innovative activities manufacturers are involved in, the number who engaged in product innovation increased from 59% in 2014 to 64% in 2015.

Customer is key

Satisfying existing customers remains the top reason for innovating, with 69% of companies citing this as a driver. The next two most important reasons are enhancing margins and seeking new export markets.

Source: EEF Innovation Monitor Survey

What do we mean by innovation?

Innovation can be difficult to define. For the purpose of this report we are talking about research and development activities which have a commercial purpose. This is different from the kind of fundamental research primarily undertaken by universities, which is often curiosity-driven without commercial purpose.

Innovation could include the development of – or significant improvement to – products, processes, services, marketing/distribution or organisational structures.
Question 1: Which companies are the most innovative?

Manufacturing is a highly innovative sector; 94% of manufacturers engage in innovation. But they do not all innovate in the same way. There are a breadth of innovation strategies, highlighting the dynamism of the UK manufacturing sector as companies respond flexibly to changing economic conditions and shifts in their customers’ demands.

Table 1

<table>
<thead>
<tr>
<th>The most different types of innovation</th>
<th>Large manufacturers</th>
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<tbody>
<tr>
<td>The most product innovation</td>
<td>Manufacturers looking to diversify markets</td>
</tr>
<tr>
<td>The most process and service innovation</td>
<td>Manufacturers looking to enhance profit margins</td>
</tr>
</tbody>
</table>

Source: EEF Innovation Monitor Survey

This year’s Innovation Monitor confirms that manufacturers of all shapes and sizes are innovators, but, as this section will show, there are some differences in the approach to innovation taken by companies depending on their size, and what they are trying to achieve. Large companies remain the broadest innovators while smaller companies can be more nimble and flexible in their approach to innovation. In addition, this year’s survey shows an uptick in product innovation that has been driven by manufacturers looking to diversify into new markets.

1. Large companies: most likely to be innovating broadly

Large companies are most likely to be innovating broadly, with 56% engaging in three or more types of innovation, for example: product, process and service innovation. This compares with the smallest companies where only 31% said this was the case. This is a long-standing trend as large companies will generally have access to more resources than smaller companies, which gives them the bandwidth to innovate broadly. They also face more demands from a larger range of customers and will often have a larger product range.

Broad innovation can increase the returns to innovative activity, for example developing new marketing activities alongside new products could increase sales and demand for those products. Indeed, our Innovation Monitor 2014 survey showed that there were a range of benefits to innovating broadly. For example, companies which engage in a higher number of innovations were more likely to describe their company as having a culture of innovation, and were more successful at developing viable commercial ideas.

Chart 1

Large companies more likely to be broader innovators

Number of innovations engaged in by company size

Source: EEF Innovation Monitor Survey

2. Diversifiers: most likely to be developing new products

Product innovation has long been the type of innovation that manufacturers were most likely to engage in. However, this year we saw an increase in the number of companies who said that they had developed new products at a time when most other types of innovation saw a fall in activity.

This year, the sectors that are most likely to be engaging in product innovation are those most closely embedded in oil and gas supply chains. Following the fall in the oil price in the latter half of 2014, demand for investment goods from the oil and gas sector fell...
markedly. This hit the companies who supplied these goods: particularly those in the electrical equipment, mechanical equipment and metals sectors.

However, manufacturers in these sectors have not stood still; instead, they have been actively investing in product innovation, to help them take advantage of growth opportunities outside of oil and gas, both in new domestic markets and in new export markets. As with 2014, manufacturers in the electrical sector remain the most likely to engage in product innovation, but amongst manufacturers in the metals and machinery sectors, the proportion of companies engaging in product innovation has increased. This is helping companies to take advantage of growth opportunities in other sectors and markets. For example, one metal products manufacturer we spoke to said that his company had developed new products to go into cash machines, where demand is more buoyant.

3. Margins seekers: focus on process and service

For companies outside of the oil and gas supply chain, demand has not been such an issue, and the increase in product innovation is not evident. However, the drop in the oil price has had other impacts.

For example, the low oil price has reduced input prices for a number of sectors, notably chemicals, and rubber and plastics. The impact of this has been that manufacturers in these sectors have had to reduce their prices, under pressure from their customers. These price reductions are evident in our recent Manufacturing Outlook surveys. With limited pricing power, companies in these sectors have also seen margins come under increased pressure, something that has been exacerbated by the strength of sterling.

Companies are responding to this pressure on margins by refocusing their innovation activity: at the same time as reducing levels of product innovation, plastics and chemicals manufacturers have maintained a high level of process innovation, and increased the level of service innovation they are engaged in. The proportion of companies in these sectors engaged in service innovation increased from 17% in 2014 to 40% in 2015, at a time when the levels of service innovation in all other sectors fell.

In section two we explore in more detail how these different types of innovation can help companies achieve their goals.

SMEs: less breadth, more flexibility

SMEs do not innovate as broadly as larger companies, but their smaller size means that they can be more nimble and more flexible. As we have seen in previous Innovation Monitor surveys, while speed to market can be a challenge for all companies, smaller companies are far less likely to say this is the case. This is because internal processes are often simpler, and key people within the business – decision makers, sales people, designers and engineers, for example – are likely to be working close together.

Not only can simpler company structures make innovation faster, they can also enable SMEs to be more flexible and responsive to their customers’ needs. Our survey shows that SMEs are more likely to be using innovation to develop custom designed goods and services than larger companies, and they are also more likely than larger companies to be doing this successfully.

“Innovation and technical agility allows our SME to compete with the largest global concerns.” – Survey respondent, Innovation Monitor 2015/16

One Managing Director of an SME with 65 employees told us why this was the case for his company. He said that a customer requested a change to their product with a short turn around, and because of his close knowledge of the products and close work with the engineering team, he knew this was something the company was able to deliver and was able to get back to the customer within short timescales. This won the SME the business and long-term orders from this customer.
Question 2: How important is innovation to manufacturers?

The last section has shown that manufacturers are innovating, and that they are adjusting their innovation strategies to reflect changing economic conditions. This section will look at how innovation makes a difference, both to companies and to the economy.

Innovation is important to the economy as a whole because it is absolutely central to increasing the UK’s productivity. NESTA analysis suggests that innovation was responsible for 63% of the UK’s improvements in labour productivity between 2000 and 2008. Investment in innovation leads to the development of new products, processes and services and supports the exploitation of new technologies all of which can raise productivity.

Innovation is also a key driver of productivity at the firm level. Innovation can reduce the number of resources required to produce one unit of output by increasing the efficiency of production through the development of new processes and organisational structures. At the same time, innovation can boost the value of companies’ output through the introduction of new and improved products and services. Innovation also boosts manufacturers’ ability to export successfully, and a higher degree of export intensity exposes firms to competition, pushing them to be more productive.

How innovation boosts productivity

- **Boosts value of output**: New products, services and marketing strategies can increase the value of one unit of output.
- **Reduces costs of output**: New processes and organisational structures can reduce resources needed for one unit of output.
- **Increases exposure to competition**: Innovation boosts companies’ ability to export successfully, exposing them to more competition and pushing them to be more productive.

This section shows that innovation helps manufacturers to raise productivity – reducing costs, while boosting sales and profitability – but that different types of innovation will be used to achieve different outcomes.

1. **Innovation reduces costs and boosts productivity**

   “Innovation enables the business to compete with overseas businesses in manufacturing on a similar cost level” – Survey respondent, Innovation Monitor 2015/16

- Half of manufacturers said that improving productivity was a top-three long-term business objective.
- Of these, 45% expected innovation to have a significant impact on their productivity. A further 45% of manufacturers said that it would have some impact on productivity.
- Improving productivity requires multiple investments: innovation must go hand-in-hand with investment in capital equipment and skills.

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Table 2

Which forms of innovation do companies use to meet their innovation goals?

<table>
<thead>
<tr>
<th>Goal</th>
<th>% of companies citing goal</th>
<th>Top two types of innovation to meet goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Satisfying existing clients</td>
<td>69</td>
<td>Service and organisational innovation</td>
</tr>
<tr>
<td>Enhancing profit margins</td>
<td>55</td>
<td>Process and service innovation</td>
</tr>
<tr>
<td>Seeking new export markets</td>
<td>52</td>
<td>Product and service innovation</td>
</tr>
<tr>
<td>Developing existing domestic markets</td>
<td>48</td>
<td>Product and marketing innovation</td>
</tr>
<tr>
<td>Developing existing export markets</td>
<td>47</td>
<td>Product and marketing innovation</td>
</tr>
</tbody>
</table>

Source: EEF Innovation Monitor Survey

The manufacturing sector can help address the UK’s productivity puzzle. Growing productivity through reducing the costs of production is part of day-to-day life for UK manufacturers. As well as using lean production methods, the key type of innovation for reducing costs and increasing operational efficiency is process innovation. Process innovation can help in a number of ways, for example: new processes could be developed that use less energy; reduce the time it takes between design, prototyping and manufacture; or increase production capacity.

One SME manufacturer we spoke to said that process innovation had proved a useful alternative to buying new equipment. By enabling his staff to experiment with different ways to use their existing equipment, they were able to reduce the time taken for one part of their production process from 15 seconds to 10 seconds. This effectively increased their capacity. It also reduced the amount of electricity required as part of the production process, further reducing their costs.

Innovation: not in isolation

Boosting productivity is an important business ambition for many manufacturers, and 45% of manufacturers looking to boost productivity think that innovation will make a significant difference to their ability to do this.

However, innovation alone cannot be expected to achieve productivity improvements. Our survey shows that 47% of manufacturers expect investment in capital equipment to play a significant role in improving their productivity, while 56% say the same of training and skills. This chimes with our latest Investment Monitor survey which showed that companies invest in each of these three areas in order to achieve productivity gains.

Indeed, successfully delivering productivity improvements from innovation can often require multiple and complementary investments. For example, one large manufacturer we spoke to described how they had developed a new product that would be a market leader, but they were not able produce it economically. In order to get round this they purchased new equipment, hired new employees and worked with a university to develop new production processes. They then retrained existing employees on the new processes, and were able to reduce production times and costs drastically.
2. Innovation boost sales

“Innovation gives us the stepping stones to future sales” – Survey respondent, Innovation Monitor 2015/16

- 32% of manufacturers said that growing exports was a long-term business objective.
- Of these, 54% of companies thought innovation would have a significant impact on their exports, and 39% thought innovation would have some impact.

Innovation boosts export demand

Growing exports can help boost productivity by creating a larger market for UK goods, and exposing UK manufacturers to greater competition. The importance of export growth is recognised in the government’s stretching target to achieve £1 trillion of exports by 2020. Manufacturing has a central role to play in this, as the sector accounts for nearly half of all exports. As well as supporting overall economic growth, at a firm level, exporting helps businesses to grow: by growing the size of their potential market, firms increase their opportunities for profit.

The UK’s export growth has, however, performed poorly in recent years. Total goods exports dropped nearly 6% between 2011 q1 and 2015 q1. But this masks divergent underlying trends; persistent economic weakness in Europe meant that goods exports to Europe fell by 17% over this period. To counter this, manufacturers upped their focus on markets outside the EU – including many emerging markets – and the value of goods exports going to non-EU countries grew by 7%.

This is the result of manufacturers’ proactive efforts to expand their sales into new markets. In this year’s survey, 52% of manufacturers said that seeking new export markets was a driver of their innovation activity, making this the third most likely reason for manufacturers to be innovating. It is also positive news for the health of the UK economy, as a greater diversity of export markets can make countries more resilient to economic shocks by reducing the volatility of export earnings.

The key types of innovation manufacturers use to help them boost sales overseas are product innovation and service innovation. Both can prove valuable differentiators from competitors.

Higher specification products win export orders

One manufacturer we spoke to develops and makes measuring equipment. The company exports 96% of its products, and innovation has enabled them both to develop a market lead, and maintain this position.

The company has engaged in research with a university, which led to the development of a number of patents and eventually to the launch of a new product in 2014. This product used new software and new mechanical design to deliver a 50% improvement in performance. As the company worked at the same time to design new manufacturing processes they were able to deliver this large improvement in performance for a limited increase in cost.

In order to drive sales abroad, they did a lot of comparative testing to prove the high performance of their products and trained sales people on competitors’ products as well as their own, so they could see the difference first hand. The company also used support from UKTI who helped them find the right contacts to develop their distributor network.

Innovation can boost demand in existing markets

“Innovation gives us the ability to provide our customers with the best available product now and in the future”

“Innovation makes our company important to its customers’ future plans.” – Survey respondents, Innovation Monitor 2015/16

Manufacturers do not just use innovation to create demand in new export markets; they can also use innovation to boost demand in existing markets and with existing customers. Our Innovation Monitor surveys have shown that manufacturers adjust the focus of their innovation activity in response to changing market conditions. Since last year’s survey,
weaker global growth conditions have contrasted with a stronger picture in the UK – with the exception of the oil and gas sector – and this has led some manufacturers to look to grow their presence in domestic markets this year.

For example, the number of companies that said they were developing new domestic markets increased from 27% in 2014 to 38% in 2015. Manufacturers see product innovation and marketing innovation as the key tools for driving new sales in existing markets.

As well as finding new customers in existing markets, sustaining and growing demand from existing customers remains a priority. In this year’s survey, 69% of companies cited satisfying their existing clients as a driver of innovation in the past three years – once again the top driver of innovative activity.

Our conversations with manufacturers reveal just how integral innovation is to satisfying customers. Many customers expect their suppliers to be constantly innovating, a point one metal goods manufacturer highlighted, saying that his company conducted ongoing research programmes with universities, partly because his customers valued this as a sign that they were constantly working to develop new higher-specification products. It also had the advantage of ensuring the company’s engineers were aware of new research in their area.

In a number of cases, manufacturers conduct collaborative research and design work with their customers to develop new products that meet their needs. Not only does this provide the customer with a better product, but it also helps to embed the manufacturers into their supply chains, as the only suppliers with the intellectual property and know how to produce the goods their customers need.

3. Innovation enhances margins

“Innovation is essential if we are to grow and increase our profitability” – Survey respondent, Innovation Monitor 2015/16

- 51% of manufacturers said that enhancing margins was a key driver of their innovation activity.
- 62% of manufacturers expect innovation to play a significant role in boosting their profitability.

Working to increase margins is an ongoing activity for manufacturers: it has to be. Factors such as exchange rate fluctuations; customer demand for lower prices; and increased competition from overseas can all put pressure on margins. Our Manufacturing Outlook surveys show that profit margins are always under pressure. During the recession and subsequent recovery manufacturers faced particularly tight pressure, with limited scope to raise prices.

Now, as we move into more mature recovery phase, manufacturers are looking to restore margins, and innovation will be a key tool. This year’s Innovation Monitor shows that 62% of companies looking to boost profitability expect innovation to play a significant role in helping them achieve this. The two key ways manufacturers look to increase their own margins are through process innovation – which as we have seen can be used to reduce the cost of production – and service innovation.

Service innovation enables manufacturers to increase margins by adding value to their products and providing a market differentiator. For example, services can help customers use products more effectively, or prolong the useful life of a product, thereby increasing their value to customers. This can enable manufacturers to sell at a higher price.

One manufacturer we spoke to said that his business was under high levels of price pressure from customers, as low levels of demand in Europe had made competitors more aggressive, and the strength of sterling had made European competitors’ products relatively cheaper.

He saw service innovation as a way to differentiate his company from competitors – thus mitigating price pressures in existing markets – but also a way to help them move into new markets. He particularly mentioned the Middle East, saying that relationship-based business was especially important in that region and he therefore thought that developing new services, which helped his customers to use his products better, would help ensure long-term relationships.
Question 3: Can manufacturers have it all?

While the last two sections have shown that manufacturers are highly innovative, and that innovation can help manufacturers meet their business objectives, especially improving productivity, innovation is not always successful. The next two sections look at the factors behind this.

The overarching factor that impacts on the success of innovation is the availability of resources. Therefore, this section looks at the role resources play in manufacturers’ ability to innovate, while the next section will explore in more depth the factors that make some outcomes harder to achieve than others.

With regards to resources, two key themes emerge. Firstly, innovation is highly resource intensive and manufacturers do not always have the resources they need to innovate successfully. Secondly, manufacturers will divert resources from elsewhere in the business towards innovation, but this can reduce their ability to invest in other areas, such as on capital equipment and skills, further increasing the pressure on resources.

1. Successful innovation requires a lot of resources

Innovation is a resource-intensive activity. The majority of manufacturers use six or more resources in order to innovate. Top of the list is internal finance, followed by production equipment, and raw materials.
Top resources manufacturers use for innovation

- 86% of manufacturers use internal finance
- 79% of manufacturers use equipment that is usually used for production purposes
- 79% of manufacturers use raw materials/components
- 78% of manufacturers use their own factory floor space
- 73% of manufacturers use employees employed for reasons other than research and development

While nearly half of manufacturers say they have sufficient resources to innovate successfully, a significant minority do not. Two fifths (39%) of manufacturers said that there were resources they would have liked to use, but were unable to do so. In particular, manufacturers suffer from a lack of access to specialist skills and equipment. These issues were experienced by companies of all sizes, showing even larger companies can struggle with the resource intensive nature of innovation.

Key resources manufacturers would have liked to use, but were unable to

- Employees employed either solely or largely for the purpose of R&D
- External expertise
- Equipment purchased solely for the purpose of innovation
- External finance
- External factory floor space

Not having access to skills, equipment and finance matters. A lack of resources makes a noticeable difference to manufacturers’ ability to innovate successfully. Indeed, OECD research found that a lack of available external finance could have a major impact on companies’ ability to innovate, especially when internal cash flow is tight.²

Our survey shows the impact that a lack of any resource – not just finance – has on innovation outcomes. In almost all cases, manufacturers report lower success rates when there were resources that they were unable to use. In areas where manufacturers already report high success rates, it is not so much of a problem, but a lack of resources can particularly reduce success rates where manufacturers have already cited a challenge.

Chart 2

A lack of resources exacerbates challenges associated with innovation

% of companies saying they achieved desired outcomes from innovation

<table>
<thead>
<tr>
<th>Services</th>
<th>All Companies</th>
<th>Companies who would have liked to use a resource but were unable to do so</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complying with environmental standards &amp; regulations</td>
<td>75%</td>
<td>65%</td>
</tr>
<tr>
<td>Improving energy efficiency</td>
<td>80%</td>
<td>70%</td>
</tr>
<tr>
<td>Satisfying existing clients</td>
<td>75%</td>
<td>65%</td>
</tr>
<tr>
<td>Seeking new export markets</td>
<td>68%</td>
<td>50%</td>
</tr>
<tr>
<td>Developing existing domestic markets</td>
<td>75%</td>
<td>65%</td>
</tr>
<tr>
<td>Developing low-carbon technologies</td>
<td>62%</td>
<td>38%</td>
</tr>
</tbody>
</table>

Source: EEF Innovation Monitor Survey

For example, manufacturers’ ability to satisfy existing customers is little-impacted by a lack of resource – 76% of all manufacturers said that their innovation helped them to deliver for existing clients, and this drops marginally to 73% for companies who said they did not have access to resources they wanted – in part this will be because manufacturers often have collaborative relationships with their customers which can help them access resources.

In contrast, when it comes to seeking new markets and new customers there is a bigger discrepancy between success rates. Amongst all manufacturers looking to move into new export markets there was a 68% success rate, however, for those who cited that there were resources they would have liked to use, but were unable to do so, the success rate dropped to 45%. Similarly, when it comes to developing low carbon technologies, success rates dropped from 62% to 38% amongst companies with insufficient resource.

² OECD (2012) Science, Technology and Industry Outlook
A lack of resources limits success

One manufacturer told us that their product was being sought out by customers around the world. However, due to the highly specialised nature of their products, they were struggling to recruit the skilled people necessary to meet demand. The manufacturer described the situation as one of “far too much opportunity and not enough resource”. To overcome this, they were working with universities – sponsoring undergraduates and graduates and offering them internships – but this is a long-term solution and does not provide the skills the business needs now.

Similarly, an SME manufacturer we spoke to explained how a lack of both skills and equipment meant his company had to make tough decisions about which innovative projects they prioritised.

There is currently an opportunity for the company to move into a new supply chain as they have already developed higher-performance products than their competitor. However, his company does not have experience of supplying into that sector while the competitor is an existing supplier. Therefore, in order to move into this supply chain, the company would need to invest heavily in verification of its products, something that would require additional engineering, quality and testing resources to achieve. However, due to high levels of demand from existing customers for continuous innovation, this is something they do not have the capacity to do currently. They have therefore had to hold off on making these investments for now, delaying their entrance into a new and potentially lucrative market.

2. Innovation can put pressure on other areas of the business

Manufacturers are not always able to use specialist equipment and hire specialist employees in order to innovate; instead they divert other business resources towards it, including existing production equipment and employees. This is common practice: 79% of manufacturers use equipment that is usually used for production purposes as part of their innovative projects, while in 73% of companies, employees employed for reasons other than research and development are engaged in innovation as well.

Using existing equipment has advantages for manufacturers, it enables them to innovate flexibly, and manufacturers can also use older equipment to test their ideas on, or to develop prototypes, thus prolonging its useful life. Using non-specialist employees also has advantages, for example manufacturers say that engaging the whole workforce in innovation can help make employees feel more bought-into the company, helping with job satisfaction and retention.

However, there are key disadvantages to doing this as well. Pulling in resources from other parts of the business limits the amount of innovation manufacturers are able to do. As we saw in last year’s Innovation Monitor, the faster growth in output meant that manufacturers were more resource constrained, and had to innovate more narrowly. These trends have continued this year.

Using existing business resources for innovation can also limit manufacturers’ capacity to grow in other areas as well. For example, 86% of manufacturers use internal finance to fund their innovation but innovation is not the only area of the business that requires funding. For example, manufacturers will also use internal finance to fund their skills and training activities. Given that insufficient expertise is also an issue for manufacturers looking to innovate, these pressures on internal finance can present challenging trade-offs and ultimately limit the level and effectiveness of innovation.
Question 4: Are resources the only issue?

Resources are an overarching issue affecting innovative companies, but other factors can limit the success of innovation as well. Manufacturers use innovation to achieve many different things, and some outcomes are easier to realise than others.

This section shows that successfully selling new innovations to new customers is more challenging than selling to existing customers; open-ended research projects can be harder to make a return from; and service innovation presents particular challenges to manufacturers who are more used to developing new products and processes.

1. New markets more of a challenge

Chart 3

New markets more of a challenge

<table>
<thead>
<tr>
<th>% of companies saying they achieved desired outcomes from innovation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Satisfying existing clients</td>
</tr>
<tr>
<td>Seeking new domestic markets</td>
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<tr>
<td>Seeking new export markets</td>
</tr>
<tr>
<td>%</td>
</tr>
<tr>
<td>55</td>
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<tr>
<td>65</td>
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<tr>
<td>75</td>
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<tr>
<td>85</td>
</tr>
</tbody>
</table>

Source: EEF Innovation Monitor Survey

Achieving a successful outcome from innovation does not end at developing a new product. Manufacturers also have to make a sale.

Sales to existing customers can be easier to achieve as manufacturers have on-going relationships in place which can enable them to work in partnership with their customers to develop new products for them, with the assurance of demand at the end of the process. This makes innovating for existing customers less risky, though manufacturers do tell us that it can limit amount of more outward-looking innovation they are able to do.

Selling to new customers, in contrast, can open up potential new sources of demand for manufacturers, while selling into a range of markets can make total demand more resilient to economic shocks in one particular market. This makes innovating for new customers worthwhile, but, there are challenges associated with this too.

Even selling to new customers within an existing sector can be difficult. Customers will often have specific requirements that their suppliers need to meet before they purchase products and the validation processes can be expensive and time consuming. One manufacturer we spoke to had approached a customer in 2011, reached an agreement in 2012, but then had to spend two years working on the customer’s quality checks and requirements before an eventual order was placed in 2014. While the outcome was positive, and the manufacturer now has more orders from that customer, it was a challenging and costly process.

Another manufacturer highlighted the significant time investment associated with selling to new customers, telling us that it would usually take at least three visits to a new potential customer in order to win work. The first from senior management and salespeople followed by later visits with engineers, designers and other technical experts. While his company has the resources to do this, he highlighted the intensive nature of the process, and added that projects would have to be large enough to justify this kind of activity. He noted that the resource-intensity of the process was likely to make selling to new markets particularly challenging for smaller companies.
2. Clear, defined outcomes: less risk, but less return

Chart 4
Clear, defined outcomes: less risk, but less return

<table>
<thead>
<tr>
<th>% of companies saying they achieved desired outcomes from innovation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complying with environmental standards &amp; regulations</td>
</tr>
<tr>
<td>Improving energy efficiency</td>
</tr>
<tr>
<td>Developing low-carbon technologies</td>
</tr>
<tr>
<td>% 55 65 75 85</td>
</tr>
</tbody>
</table>

Source: EEF Innovation Monitor Survey

This year’s Innovation Monitor shows a divide between success rates on projects with clear, defined outcomes such as complying with regulations, or becoming more energy efficient, compared with more open-ended projects such as moving into new markets or developing new technologies. Indeed, if a company is obligated to change the inputs it uses – as with the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) obligations – or reduce its emissions – driven by schemes such as the Emissions Trading System (ETS) – they have no choice but to make the innovation work, whatever resources it requires.

One manufacturer we spoke with highlighted another reason for differing success rates between open-ended and more clearly defined projects. His company particularly looks to engage in challenging open-ended projects because this helps them to embed themselves with customers for the longer term and can secure good profit margins. He said it can be relatively easy to develop a product to a specification – you already know what the problem you are trying to solve is – but it is also easy for competitors to do this too. What his company looks to do is to work with the customer at an earlier stage, to develop the specification as well.

The manufacturer told us that working with a customer from an earlier stage can prove challenging, however. Even to get things started, the right contact in a company must be found. This is usually a technical contact and not a buyer. Then the two companies must work together to understand exactly what problem needs to be fixed – this will involve combining scientific research and design expertise – before finally developing a product. The manufacturer described it as such: “when you know the problem you’re just joining the dots, but if you don’t know the problem you have to create the dots as well”.

Why do companies plan service innovation, and not do it?

As discussed in section two, service innovation offers many opportunities for manufacturers, in particular building relationships with customers and increasing margins. However, service innovation also proves challenging for manufacturers. Our survey has shown that manufacturers consistently say that they plan to do service innovation – this year is no different – but however much interest companies express, the reality never quite matches expectations.

Chart 5
Service innovation: more in theory than in practice

% of companies who engaged in service innovation in the past three years, or planning to do so in the next three years

Source: EEF Innovation Monitor Survey
Why do companies plan service innovation, and not do it? (continued)

In *Innovation Monitor 2014*, 42% of manufacturers said that they planned to do service innovation in the next three years. This year’s survey shows that only 26% of companies did so in the past three years. In fact, our survey has consistently shown that service innovation is something more companies plan to do in the next three years, than will actually do so.

Providing services is hard. It can require substantial organisational restructuring and training or recruitment of staff for companies to be able to provide these services effectively. Indeed conversations with manufacturers show that one of the most significant investments they need to make is in boosting workforce skills to provide services to customers. In addition, a new approach to branding and marketing is often needed, requiring additional investment. All of this requires resources to achieve.

It is also unusual for a manufacturer to be engaging solely in service innovation. Service innovators are broad innovators and while broad innovation can bring many benefits, it also creates challenges for companies. Last year’s *Innovation Monitor* survey showed that the more innovations a company becomes engaged in, the more challenging it becomes to manage them. For example, when it comes to keeping costs under control, companies engaging in four or five types of innovation were six times as likely to cite this as a major barrier compared with companies engaging in one innovation.

All these challenges with service innovation raise questions about the timescales involved with manufacturing moving towards a more servitised model, and how widespread the applicability of the servitisation model is within the sector.

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Service innovation: need other structures in place first

One manufacturer we spoke to explained that service innovation would be a key part of their business strategy moving forward, though it had not been in the past three years. This is because, in the last few years, the company has been working on its growth strategy, putting new processes and organisational structures in place, employing new people and refocusing their product offering to enable them to move into new markets. These activities needed to happen before they could look at their service offering.

The business is now in a good place to develop services to help them tailor their products more precisely to the needs of new customers. However, they see their ability to hire and retain people with the right knowledge to deliver these services as a challenge that they will need to address.

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Will low-carbon innovation ever enter the mainstream?

The low-carbon economy offers a large opportunity for UK manufacturers. According to BIS, its size was approximately £26.2bn in the UK in 2013.

This year’s survey showed something of an increase in the proportion of companies saying developing low-carbon technologies had been a driver of their innovative activity, from 14% in 2014 to 19% in 2015. However, this remains one of the least cited drivers. In addition to this, manufacturers’ reported success rates for developing low carbon technologies are the lowest for any area of innovation, with only 65% of companies saying their efforts were successful.

This could be for a number of reasons. For a start, the market for low-carbon technologies is often created by regulatory interventions such as renewable energy targets or product standards. As we will highlight in our forthcoming Carbon Stick and Carbon Carrot report, although appropriate policies, targets and standards can act as considerable drivers for change and innovation, inconsistent or poorly thought through approaches can have the opposite effect. Recent examples of changes to regulations have created additional challenges for manufacturers and can discourage them from investing in low-carbon innovation.

Beyond this, it remains relatively challenging to sell products to other companies and consumers on the basis of their low-carbon attributes when this will be only one consideration in any purchase. The success of some technologies, for example marine renewables and low-carbon vehicles, will also be dependent on the availability of supporting infrastructure such as grid connections and refuelling networks.

These challenges need addressing: manufacturers are increasingly concerned about falling behind competitors

A broad range of challenges are having an impact on manufacturers’ ability to innovate successfully, and derive a return from innovation. Given the key role that innovation plays in improving productivity, this is a concern for the future competitiveness of the UK economy. This worry is something that manufacturers have highlighted. This year’s Innovation Monitor survey shows that 28% of manufacturers are concerned that they are falling behind competitors due to their level of investment in innovation, up from 26% in 2014 and 19% in 2013.

Small and medium sized companies were more likely to express concerns that they were not keeping up with their competitors, highlighting the additional resource constraints smaller companies can face. But even for large companies, one fifth said that they thought they were falling behind.
Question 5. How do companies plug the gap?

Although manufacturers have expressed concern about falling behind competitors, there are tools in place to help them. Government support plays a key role in helping manufacturers to innovate more successfully. It helps companies overcome a number of the resource gaps that they have identified.

Support can also help companies collaborate more effectively with others, it can aid relationships with customers – both existing and new – and help manufacturers to grow their network of contacts.

This section looks at which schemes manufacturers use, and how they help them achieve their goals when it comes to innovation.

**1. Government support is plugging the gaps**

This year’s *Innovation Monitor* Survey gives clear evidence that government support is plugging the resource gaps that manufacturers experience.

**Table 3**

<table>
<thead>
<tr>
<th>Resource</th>
<th>Manufacturers using support to access resource</th>
<th>Manufacturers who said support fully addressed issue</th>
<th>Manufacturers who said support partially addressed issue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specialist expertise</td>
<td>67%</td>
<td>39%</td>
<td>57%</td>
</tr>
<tr>
<td>Specialist equipment</td>
<td>29%</td>
<td>44%</td>
<td>54%</td>
</tr>
<tr>
<td>Funding</td>
<td>21%</td>
<td>38%</td>
<td>53%</td>
</tr>
</tbody>
</table>

Source: EEF Innovation Monitor Survey

**2. Innovation support helps companies access expertise**

One of manufacturers’ most-frequently used forms of innovation support is the Knowledge Transfer Partnership (KTP). KTPs place recently qualified people (at NVQ Level 4, HND, foundation degree, degree and higher degrees) into firms for one to three years to introduce a new product, service or process. This is done in partnership with a university, college, or research organisation.

Nearly a quarter (23%) of respondents to our survey had used KTPs to help them to address skills gaps in their businesses and take advantage of specialist expertise at universities. One manufacturer told us that not only had the KTP helped their company to develop a new material, but the ongoing relationship with a university professor that his company had derived as part of a KTP enabled them to have better understanding of the research the university was engaged with, and where it might have relevance to their business.

A Catapult centre is a physical innovation centre focused on a specific technology or sector, designed to promote collaboration between businesses and the research base. Companies usually pay a membership fee to access the centres and this enables them to work with the researchers and use equipment at the centres. The centres fill an important gap, enabling companies to access cutting-edge equipment that they would not otherwise have access to.

Not only did manufacturers we spoke to value the access to excellent facilities and expertise at the centres, but they also highlighted that the collaborative nature of research projects had helped them to better engage with new and existing customers.

Catapults are a relatively new initiative, which – unsurprisingly – initially had low awareness. But our survey shows that awareness of the centres has been growing strongly, increasing once again in 2015. Now, 55% of manufacturers are aware of the centres compared with 43% in 2014, and 34% in 2013. This reflects other evidence that business demand has been strong and growing, a result of the previously unmet need for this kind of support.
Indeed, the Hauser Review of the Catapult network noted the High Value Manufacturing (HVM) Catapult has experienced significant levels of industrial demand since its inception in 2011. This industrial demand has leveraged significant amounts of funding from the private sector meaning industrial investment in HVM Catapult is considerably beyond the levels originally forecast.

4. Innovation support helps companies to overcome financing gaps

As the previous sections have shown, manufacturers often use internal finance to fund their innovation, but this can reduce the amount of innovation they are able to do, or put pressure on other areas of the business. As a result, one fifth of manufacturers access government support to overcome a funding gap. In nearly two fifths of cases, manufacturers who used support in this way said that it fully addressed their issues, while half of companies said that it partially addressed their funding gap.

One SME precision goods manufacturer – and one of the 62% of EEF members who used the R&D tax credit – said that an annual investment of £2m in equipment was necessary to ensure high levels of accuracy with his products. In addition, to maintain an edge over his competitors, his company works to develop new – more effective and more accurate – ways of working with these tools, and measuring their effectiveness. He said the R&D tax credit boosted the company’s financial performance and allowed them to sustain their levels of investment which meant they could continue to do this effectively.

Indeed, as well as using innovation support to fund innovation directly, our surveys shows that manufacturers can use support to free up cashflow for other areas of the business. This year, 28% of manufacturers said that they had used innovation support to do this. This can have an important impact on manufacturers’ ability to innovate too. As we have seen, delivering productivity improvements from innovation can require concurrent investments in skills and capital equipment.

5. Innovation support helps manufacturers help themselves

Previous Innovation Monitor surveys have shown that – as well as using government support – collaboration is a valuable tool that enables manufacturers to increase the effectiveness of their innovation. Manufacturers collaborate with a range of external organisations, including customers, suppliers, universities and commercial industry experts. This can help companies innovate more quickly and effectively by sharing expertise, equipment and other facilities.

Manufacturers can form collaborative partnerships without support, but collaboration is not straightforward. In particular, manufacturers can struggle to find the right collaborative partner for innovation. There is, however, innovation support that eases this process for manufacturers and can make collaborations more effective.

<table>
<thead>
<tr>
<th>Schemes to help innovators collaborate</th>
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<tbody>
<tr>
<td>Knowledge Transfer Partnerships</td>
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<td>Catapult centres</td>
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<tr>
<td>European Funding</td>
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<tr>
<td>Collaborative R&amp;D</td>
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<tr>
<td>Knowledge Transfer Networks</td>
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<td>Innovation Vouchers</td>
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Manufacturing is a highly innovative sector and as such has a key role to play in addressing the productivity challenge

This report has shown that there is much to be positive about with regards to innovation in UK manufacturing. Most manufacturers are innovating, but they are not all doing it in the same way. Instead, manufacturers innovate to make the best use of their resources, expertise and the opportunities for their business.

Innovation is helping manufacturers to boost their productivity, be it through reducing production costs, increasing demand for goods or adding value to existing products by developing complementary services for customers. Manufacturers view innovation as central to achieving all of these goals.

Achieving successful outcomes from innovation is not easy

Successfully delivering results, however, can prove challenging in practice. Some projects – such as those designed to satisfy existing customers, and those with clearly defined shorter-term outcomes – are more likely to be successful than projects that also require finding new customers or long-term open-ended research projects. In addition a lack of resources can also hamper success.

Resources are the overarching issue which can determine the success of a project

Innovation is extremely resource intensive and a significant minority of manufacturers say that they do not have all the resources they need to innovate successfully. In particular, manufacturers have insufficient access to specialist skills and equipment. In order to overcome this, manufacturers are prioritising innovation, and diverting internal resources towards it. However, this limits both the amount of innovation and other investment that manufacturers are able to do. There is an increasing concern amongst manufacturers about falling behind competitors.

Government support helps manufacturers access the resources they need

Government support helps manufacturers to overcome these resource gaps – in particular – to access skills and expertise, but it also helps them innovate more effectively in other ways. Government support helps manufacturers to help themselves, by easing the process of collaboration with universities, other manufacturers and other potential partners. Most manufacturers say that government support does at least partly help them to overcome the barriers they face.

UK manufacturing is in the race, but it isn’t running fast enough

The UK is a good place to do innovation, and improvements to support such as the enhancements of the R&D tax credit, and the introduction of the Catapult network have been positive for innovative manufacturers, but it is not job done. Manufacturers’ concerns about falling behind competitors highlight just how important it is that the UK does more to boost innovation. The opportunity is large, we just need to grasp it.
Chart 6

Why innovation matters to manufacturers

Based on manufacturers’ responses to the question: what difference does engaging in innovation make to your company?

Source: EEF Innovation Monitor Survey
Viewpoint from Vodafone

Since the industrial revolution began in the late 18th century, Britain has been synonymous with manufacturing. Today, it remains an important sector and the UK is one of the most attractive countries in the world for direct foreign industrial investment. But in this increasingly competitive market awash with threats from new entrants and overseas competition, it’s clear that manufacturers must continually innovate to stay ahead while driving the right organisational change.

We are delighted to partner with EEF to bring you the Innovation Monitor 2015/16. This report offers valuable insights, exploring the challenges faced by manufacturers and how they are innovating to enhance product, process, service and marketing.

With our own strong British heritage, we understand the crucial role that manufacturing plays within the UK economy. It’s essential that in business we create the right environment for continuous innovation that supports this backbone of UK industry. The report establishes that almost all manufacturers are innovating in one form or another, but with a variety of business goals. It’s the prioritisation of goals and clear measurable progress against objectives that seem to be proving challenging for a number of reasons. The report also establishes that the level of innovation that can be taken on without disrupting day-to-day operations can be severely impacted by factors as simple as the organisations’ size and complexity.

At Vodafone in our conversations with a broad range of UK manufacturers, we’ve found that responsiveness, productivity, full visibility of a connected supply chain, along with knowledge security and IP protection are all key areas of focus. This is evident throughout the report with 45% of respondents saying they expect innovation to significantly boost their productivity, 51% see enhancing margin as the biggest innovation driver; while 54% expected it to streamline their supply chain with positive impact on their exports.

Those very challenges were the catalyst for collaboration between Vodafone and a global lift manufacturer. While the company had a deep understanding of their own manufacturing business and could see the obvious benefits of a ‘lift monitoring capability’ they didn’t have the in-depth technical expertise to design the solution or map that across into specific business goals. They didn’t know what was in the realm of the possible. In partnership with Vodafone a system was designed and delivered; collecting real time data from all of their lifts in operation across the globe and consolidated that data into a centralised repository. That information was subsequently used to predict impending service requirements and enable proactive field maintenance. The lift manufacturer then quantified the impact of the system in terms of reduced outages, a lower field maintenance cost base, an improved safety record and higher customer satisfaction; all of which flowed through to their order book.

If there is one lesson that we’d take from this, it’s that innovation and manufacturing are intrinsically linked; with over half of the companies surveyed already committed to running multiple innovation projects in parallel. We believe that at Vodafone we can help by bringing technical knowledge and experience aligned with the capability to map initiatives across into measureable business goals. We found this report incredibly useful to help us expand the realm of the possible in supporting the manufacturing industry – we hope you find it practical and actionable too.
EEF is dedicated to the future of manufacturing. Everything we do is designed to help manufacturing businesses evolve, innovate and compete in a fast-changing world. With our unique combination of business services, government representation and industry intelligence, no other organisation is better placed to provide the skills, knowledge and networks they need to thrive.

We work with the UK’s manufacturers, from the largest to the smallest, to help them work better, compete harder and innovate faster. Because we understand manufacturers so well, policy makers trust our advice and welcome our involvement in their deliberations. We work with them to create policies that are in the best interests of manufacturing, that encourage a high growth industry and boost its ability to make a positive contribution to the UK’s real economy.

Our policy work delivers real business value for our members, giving us a unique insight into the way changing legislation will affect their business. This insight, complemented by intelligence gathered through our ongoing member research and networking programmes, informs our broad portfolio of services; services that unlock business potential by creating highly productive workplaces in which innovation, creativity and competitiveness can thrive.

About Vodafone

Vodafone provide end-to-end telecommunications solutions for manufacturers, enabling them to transform their value chain. We are uniquely positioned in the UK as the only UK telecommunications provider with our own on-net infrastructure in mobile, fixed and data centre.

We have worked with UK businesses for over 30 years, starting out as a mobile provider and becoming one of the UK’s leading total communications partners. We provide a range of voice and data services, secure communications infrastructure, machine to machine technology, cloud and hosting services, fixed and call centre capability, unified communications and we are the first mobile phone operator to offer a truly converged service for fixed and mobile.

We work closely with businesses in the manufacturing sector and with industry champions like EEF to understand how we can help businesses like yours gain that competitive edge. Our solutions will enable you to invest smarter and achieve maximum returns while still delivering a positive experience for your employees and your customers.
We foster enterprise and evolution to keep your business competitive, dynamic and future focused

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