

INSTITUTE FOR DESIGN & ECONOMIC ACCELERATION

IDEA

BIRMINGHAM CITY UNIVERSITY



Countdown to Brexit

INTERIM REPORT PRODUCED FOR
PRODUCTIVITY & SKILLS COMMISSION
WEST MIDLANDS COMBINED AUTHORITY

SEPTEMBER 2017



Institute for
Design and
Economic
Acceleration



BIRMINGHAM CITY
University
Centre for Brexit Studies



CONTENTS

1. Introduction

- 1.1 Importance of Manufacturing to West Midlands
- 1.2 Three Sectors, Transport, Construction and Energy, and the Regional Opportunity
- 1.3 Summary of Three Sector Conclusions
- 1.4 Summary of Recommendations

2. Three Sectors Overview – Transport, Construction and Energy

- 2.1 Three Sector Findings
- 2.2 Business Culture
- 2.3 Collaboration
- 2.4 Supply Chain
- 2.5 Public Procurement
- 2.6 Skills Shortages
- 2.7 Business Support
- 2.8 Access to Finance
- 2.9 New Product Investment
- 2.10 Start-up activity
- 2.11 Current Investment Intentions
- 2.12 Key Barriers to Growth
- 2.13 Brexit Impact – Threat or Opportunity

3. Transport

- 3.1 UK and West Midlands Automotive Industry Overview
- 3.2 Summary of Sector Findings
- 3.3 Sector Recommendations
- 3.4 Company Insights
- 3.5 Customers and Services Provided
- 3.6 Skills Shortages, Industry 4.0 and Recommendations
- 3.7 Sourcing and On-shoring
- 3.8 Business Support
- 3.9 Tier 1 and Below - Recommendations
- 3.10 Competition and Start-ups
- 3.11 Access to Finance
- 3.12 New Product Investment
- 3.13 Brexit Impact – Threat or Opportunity

4. Construction

- 4.1 Value of Construction and Overview
- 4.2 Construction Sector Findings
- 4.3 Summary of Sector Recommendations
- 4.4 Skills Shortages
- 4.5 Supply Chain
- 4.6 Public Procurement
- 4.7 Import Substitution
- 4.8 Business Support
- 4.9 Start-ups
- 4.10 Innovation Opportunities
- 4.11 Sustainability and Health & Safety
- 4.11 Brexit Impact – Threat or Opportunity

5. Energy

- 5.1 Energy Sector Overview
- 5.2 Energy Sector Sample, Summary Sector Findings
- 5.3 Summary of Sector Recommendations
- 5.4 Business Start-Ups
- 5.5 Grant-led Innovation
- 5.6 On-shoring
- 5.7 Public Procurement
- 5.8 Skills Shortages
- 5.9 Energy Foresight
- 5.10 Brexit Impact – Threat or Opportunity

INTERIM REPORT FOR WMCA PRODUCTIVITY & SKILLS COMMISSION, SEPTEMBER 2017

1.Introduction

The evidence presented is submitted in response to the West Midlands Combined Authority *Productivity & Skills Commission Call for Evidence*, May 2017 (1) . It was gathered through consultations with 51 companies and organisations by means of online survey, supplemented by telephone calls and individual face-to-face meetings, as well as at workshops covering each of the three sectors – *transport, construction and energy*. All three sectors are core to the West Midlands ongoing success and increasingly vital to the development of a more successful circular economy – where ‘what goes round comes round’, delivering a greater multiplier impact through more focus on our home-grown businesses, strategically supplemented, where possible, by Foreign Direct Investment (FDI), in particular within our vital supply chains supporting medium-sized business growth.

The three sectors were also regarded as critical by the businesses involved in establishing greater self-sufficiency, attracting and retaining much needed talent and investment as we worked to become more of a ‘*Self Made Place*’. These sectors were similarly singled out in the *Science & Innovation Audit for the West Midlands*, produced for Birmingham Science City by SQW in June 2017, identifying particular market opportunities, amongst others, around Next Generation Transport, Sustainable Construction, Energy and Low Carbon (underpinned by advanced manufacturing and engineering, digital technologies, data and systems integration) (2).

Businesses stated that achieving the goals of the *Productivity & Skills Commission* required far greater understanding of the nature of our economy, built from the ground up. In particular, a sustained focus was required to identify our West Midlands-based medium-sized businesses, start-ups and scale-ups, enabling more meaningful insights into the real contribution made by the West Midlands as a production-oriented economy with an enviable track record in successfully commercialising innovations. Businesses did not accept the view, accepted the West Midlands Combined Authority, and made, as they understood it, as a ‘requirement’ of the first devolution deal by Westminster, that the West Midlands needed to become a ‘*net contributor*’. This was seen as particularly inappropriate after years of underfunding of the West Midlands economy in comparison with London, the South East and the devolved nations, with these nations notably receiving attributed funding shares through agreed methods for redistribution drawing on the *Barnett Formula*.

The West Midlands, in spite of this continuing underinvestment, had been contributing positively to the UK balance of payments through our growth in exports and manufacturing productivity – and had consistently been amongst the strongest performing manufacturing regions in the country. The West Midlands ranked second in England, marginally behind the North East in terms of exports as a percentage of total GVA at 20.6%, and significantly outperforming other English regions. Exports as a whole had revived since the 2009 collapse in global trade reflecting strong new growth rather than simply a recovery from the previous

peak in 2008, with overall exports expanding by 58%, considered ‘remarkable’ by economists in light of the mature nature of the region’s economy.

According to the WMCA innovation active businesses exceeded the English average at 56% for the West Midlands compared with 54% on average across England. Machinery and transport equipment comprised the largest component of West Midlands’ goods exports, averaging 61% of exports since 2008. Most recently, a higher percentage of West Midlands manufacturing firms responding to the recent *MHA Manufacturing and Engineering Annual report, September 2017/18*, were predicting growth for their business compared to the national average, at 79% in the West Midlands compared to 78% on average, representing a 6% increase of companies anticipating growth during year ahead compared to last year (3).

In the Super Strategic Economic Plan, *Making Our Mark*, the WMCA had first stated its target to become a ‘net contributor’:

“The West Midlands *must* become a net contributor to the UK exchequer. The scale of the challenge is clear from analysis of the income and expenditure for the area, showing all three LEPs are cost centres with a net deficit estimated at approximately £3.9bn (tax income is estimated to be £30.7bn and public expenditure £34.bn). Focussing on the metropolitan councils alone the deficit rises to £4.3bn (income is estimated to be £19.8bn and expenditure £24.1bn), with Solihull currently being the only net contributor to the area.” (Italics added) (4)

To become a ‘net contributor’ the region would, on the basis of current performance, lose around £4bn public sector spend and only through increased tax take would public sector spend remain at current levels. The impact of the assumptions lying behind becoming a ‘net contributor’ therefore had a substantial impact on the public funding scenarios anticipated as being due to the region in future and understanding these with greater clarity was essential for the region. In addition, the demise of the block grant, planned for 2020 brought uncertainties around equivalence of public sector funding.

Importance of Manufacturing for West Midlands

In 2014 the think tank, *Idea Birmingham* at Birmingham City University commissioned the *West Midlands Economic Forum*, (WMEF), to review the impact of outsourcing and servitisation and how these were affecting the comparative contribution of manufacturing to the Midlands economy (5). This looked at the dynamic and productive relationship between manufacturing production and services, suggesting the potential for enhanced value added in the context of rebalancing. It sought to propose a means of quantifying this interaction to provide an alternative approach to benchmarking the economy. This approach estimated that the wider impact of manufacturing to the Midlands might represent over 30% comparative contribution to gross value added, as opposed to 15% GVA at present. Manufacturing employment in the West Midlands, it was noted, was 50% higher than the English average, with 300k jobs in high value manufacturing and with 10% of all UK R&D conducted in the West Midlands.

WMEF recognised that further research was required to refine this data, however, they suggested the case remained that service sectors dependent on manufacturing demand were a key component of the Midlands (including the West Midlands) economy and taken together they formed a significant driver of economic growth.

This paper builds on the need to support our manufacturing businesses – especially in the three sectors of construction, transport and energy.

As the manufacturing sector was judged to be heavily integrated with other economic sectors it had a higher multiplier impact on the overall economy. In terms of comparative impact, for every pound spent within the manufacturing sector, there was £1.76 of expenditure in the wider economy being created. For construction the multiplier impact was more significant at £1.84, providing good reason to focus on local sourcing whenever possible purchasing materials made within the West Midlands. These figures compared to multiplier impacts of £1.50 for IT, £1.58 for finance and £1.56 for real estate and professional services.(6)

The workshop discussions and online survey focussed on key *external factors* impacting productivity and competitiveness to inform and provide greater insights into the strength of the ecosystem supporting those operating in the three sectors covering:

- Workforce requirements and skills shortages
- Links to local training and educational establishments
- Supply chain and on-shoring
- Public procurement and local sourcing
- Levels of start-ups and regionally based competition
- Business support schemes and grants
- Innovation and new product development activity
- Areas of internal investment
- Key barriers to growth ranked in order of importance
- Exporting activity and support
- Perceptions of Brexit as threat or opportunity

The contention made by those attending workshops and engaged with the online survey was that the region needed to focus on delivering more effective ‘*ecosystems*’ through sustained long term investment. The aim would be to provide clarity of vision and direction, enabling firms to *link* to resources, active clusters with other firms engaged in shared target markets and institutions with a clear focus on translational development. The fear was that the structures in place at present would disappear shortly – whether that was Growth Hubs or Local Enterprise Partnerships or even the Combined Authority. They were concerned by the short-termism, lack of policy stability (‘we’re far too good at reinventing things’), connectivity, infrastructure investment, patient finance and lack of coordination across local government. This was in spite of the recently published Green Paper published in January 2017, *Building our Industrial Strategy*, which, whilst speaking about establishing ‘an industrial strategy for the long term’, providing ‘a policy framework against which major public and private sector investment decisions can be made with confidence’, and whilst also inviting ‘the devolved administrations,

as well as local councils and mayors, to work together ...to develop jointly plans to help every place meet its potential', followed the earlier Industrial Strategy established by the Coalition government (2010-2015), giving little reason for confidence amongst business about government's longer term intentions (7).

They recognised an output gap but queried the value being attributed to this at £14bn as this statistic was based on GVA data, which through FISIM calculations, consistently overestimating the output of financial services by 50%, along with overestimating the input of areas with higher prices, and whilst taking into account where taxes were paid, favoured places with a higher density of head offices. They noted the *Productivity Commission Call for Evidence* statements indicating that 57% of the output gap was attributed to 'insufficient skills levels and too few in employment' and that 43% of this gap was attributed to the 'economy lacking dynamism'.

However, they felt that whatever the percentages were, the region needed to work from the basis of current and emerging business needs and by best drawing on assets located within the region to help meet these challenges thereby helping to ensure young people could stay – living and working in the West Midlands -- enjoying a good quality of life and drawing on effective connectivity, learning opportunities, housing, and infrastructure.

The Three Sector Opportunity - Transport, Construction and Energy

Businesses discussed the links emerging between the three sectors of transport, construction and energy. One opportunity for the West Midlands was seen to be emerging by building on the region's global reputation and expertise in transport, and developing greater links into sustainable construction and energy formats, given the growing read-across between all three sectors. The region should, for example, be well-placed to take advantage of growing battery expertise within our world class automotive companies and research centres allied to our need for more homes to accommodate our growing population - especially in light of our newly elected Mayor's pledges to double housebuilding. With Jaguar Land Rover (JLR) announcing plans to move to all hybrid and electric vehicle production by 2020, which along with Nissan, the only UK based company to move into this market to-date and targeting £0.5bn sales over the next five years, there were opportunities for the West Midlands to develop greater self-sufficiency and explore new markets.

The key was the foresight possessed by our leadership, and their ability to set in place the conditions to facilitate this growth – to become the '*Silicon Valley for sustainable transport and the built environment*' – ensuring through a properly functioning 'ecosystem', ease of access to finance, talent, business support, delivering greater stability through the early start-up growth phase for companies by drawing on public-private sector collaborations and using procurement to facilitate greater competitiveness. For the businesses involved in this survey and workshop discussions, this was far from being the case for the West Midlands – firms within the existing innovation ecosystems were faring more strongly, however, in many instances the ecosystems were found to be incomplete.

Infrastructure for too long had been a drag on productivity impacting through an estimated annual cost of £3bn a year and following years of underinvestment into our transport systems. The West Midlands received around a third of infrastructure investment compared to London in 2016 at £228 per head compared to £688 per head in London, with this sum excluding £150bn investment into Cross Rail 1 and 2 (and the planned £18.5bn investment for Heathrow R3 access), even though 10m people lived in the Midlands compared to 8.7m in the London area, with the region handling over 30% of all road traffic and 80% of all rail freight movements nationally. As highlighted in the BCU Centre for Brexit Studies paper, '*Making a Success of Brexit*', the Midlands had over £2bn less spent on its transport infrastructure compared to London in 2014-15 alone despite its larger population. Over the past ten years this shortfall amounted cumulatively to almost £15.3bn. This failure to invest in transport infrastructure throughout the Midlands (including, but not limited to, the WMCA region) was recognised by the business community as having a highly negative impact on regional economic development and competitiveness. (8)

Summary of Three Sector Conclusions

The survey findings demonstrated that the *West Midlands ecosystem* was not working sufficiently well to support business development and in turn productivity. The West Midlands Combined Authority should be fighting to secure greater investment into our region which had been by-passed too often over the past thirty years. This was needed to promote required skills development, infrastructure, connectivity, and new start-ups. Arguments regarding the need to become a 'net contributor' needed to be contextualised appropriately by highlighting the region's contributions in spite of decades of underinvestment. Key results from the survey illustrated:

- West Midlands firms were highly competitive with average sales per employee at around £300k per head (on basis of total sales divided by all employees worldwide), well above UK average of £118k
- Manufacturing was a critical driver of productivity for the region accounting for around 30% of GVA taking into account secondary impacts
- Exports had grown from a pre-crisis peak by 58% based on successful new product development and market share acquisition overseas
- Businesses surveyed considered external factors as more significant in impacting on their productivity compared to internal factors, judging these at an 80/20 ratio in terms of overall impact
- Brexit posed a threat and was identified as the fourth highest barrier to growth. Business concerns were heightened should Brexit not be appropriately managed to assist key West Midlands sectors, especially transport accounting for 30% of West Midlands manufacturing and which required frictionless access to the Single Market if automotive investments were to be retained and grown, with evidence of fall-off already apparent and fears that it could have fallen to 1/3rd of 2015 levels by end 2017

- Skills deficits across the board were the single biggest barrier to growth with 30% of all businesses unable to recruit to meet their current needs and with 66% of transport companies unable to find technicians which were in critically short supply across all sectors
- Lack of appropriate business support was ranked as the third biggest barrier to growth, after skills shortages and economic uncertainty, with this being especially apparent for start-ups, but with many from more established businesses commenting on the complexity, bureaucracy and the fact that successful companies were unable to access any support
- Procurement was not used widely enough to assist regional growth with procurement by national or regional agencies of local products at under 30% and with almost three quarters of businesses rating procurement rules as overly complex
- Almost half companies found it difficult to access finance to meet their growth plans
- There were high levels of new product launches with a quarter of companies generating 40% of their revenues from products launched in the past three years and 40% of companies from 10-20% of new products during that period
- In light of the poorly functioning ecosystem low start-up levels were seen across all three sectors with over 66% companies commenting on small or very small amounts of start-up activity with those in mature markets commenting on high barriers to entry in traditional areas but with great opportunities for companies with digital expertise

Summary of Recommendations made by Transport, Construction and Energy Sectors

Transport Recommendations:

1. Delivering a '*mind to market*' culture across the West Midlands through a greater collaborative culture between education and industry. By working with schools and colleges leading to more business people entering the classroom to explain how industry worked, how products were developed and what innovations were coming through, they could help embed Industrial Strategy as part of the West Midlands culture, promote vocational opportunities and offer more insights for inclusive and 'circular' wealth creation to develop the *Self Made Place*
2. Forming a '*Regional Council for Growth*', setting out clear objectives for industry and transport across the West Midlands, and working in a proactive partnership with the WMCA, LEPs, and public sector organisations. Through this the region should set out to achieve agreed targets for industry in West Midlands across multiple areas such as planning, infrastructure, housing, skills, finance, business support and procurement, helping to develop an '*entrepreneurial*' and proactive public sector working with the private sector across the West Midlands
3. Delivering an *Industry Foresight* initiative, building on the Science & Innovation audit undertaken by partners including Birmingham Science City, helping to portray direction of travel and scenario-led visualisations aimed at younger generations and

assisting in retention of emerging talent whilst engaging the wider population in inclusive growth challenges

4. Auditing our companies (stated as being 160k in the recent Science & Innovation Audit whilst also being estimated at c80k across WMCA area in other statistical series, **Chart 4**), identifying those companies within transport, in particular those amongst our 7k manufacturers, 350 medium-sized manufacturers, to gain greater insights of their situations and ensure they were receiving appropriate support
5. Developing a '*Careers Enterprise Company*' to develop closer links between schools and industry, whilst ensuring *Careers Advisors* with relevant industry knowledge were (legally) required to work in every school to ensure every young person had up-to-date advice on opportunities for learning and working in our region as critical skills shortages represented the most pressing issue facing companies in the sector, with skills recommendations also included
6. Promoting a *strong image* and reputation for the automotive industry, building on initiatives such as *Birmingham Made Me*, *Made in the Midlands* and *Imagineering*, by ensuring a longer term view and helping to facilitate the provision of patient finance along with highlighting *Manufacturing Beacons* able to work more closely with organisations in their localities and promoted as exemplars attracting young people into the transport sector
7. Developing greater *commercial understanding* amongst those in the public sector making decisions regarding West Midlands-based manufacturers in transport sectors – perhaps through a programme of visits and exchanges between collaborative partners and the recruitment into the public sector of more people from automotive as a key strategic sector for regional inclusive growth
8. Providing greater focus on financial, business and export support for supply chain and start-up businesses in the sector, especially through equity finance for early stage ventures with greater longevity of support providing business users with more certainty in forward planning
9. Developing greater links between research assets such as *Catapults*, *Accelerators*, *Research organisations and Higher Education with industry* to improve knowledge of *mind-to-market* challenges and opportunities
10. Building on successful initiatives promoting collaborative partnerships and greater local sourcing such as *MAN Group* and *West Midlands Collaborative Commerce Market*, www.wmccm.co.uk

Construction Recommendations:

1. The construction sector was poorly serviced in terms of *skills provision*, representing their single most substantial challenge, with key issues including:

a. '*Parity of esteem*' – vocational and academic skills development required –

- *Quality Assurance* in vocational education
- *Clearing system* linking students to available course openings

- *Careers Enterprise Company* ensuring every pupil received timely and relevant Careers Advice on regional opportunities promoting construction as a *Career for life*, not simply a job, to students, teachers and parents
- *Links between employers and courses* ensuring course provision leads to appropriate career-oriented work opportunities
- *Re-writing qualifications to meet employers needs*

b.Apprenticeship Levy confusion was leading to lack of employer take up

- a. *Work-life balance* – was recognised as a growing feature amongst younger generations requiring appropriate policy responses from the sector

2.Industry Foresight: Businesses involved outlined the need to visualise the built environment and its changing requirements 20-30 years ahead, in particular through growing links between energy, transport and construction as energy provision and generation became further localised

3.Construction image and promotion: In light of poor industry perception it was felt a new approach was needed to pull the whole sector together more consistently and the *Building Alliance CIC* was taking the lead working with Birmingham City University by offering a '*free to join*' *built environment network* open to all construction companies, promoting it to regional organisations including LEPs and WMCA

4.Procurement:

- Use of s106 deals were not being fully utilised to incentivise companies to take on apprentices or to 'buy local' products where possible
- OJEU requirements needed to be revisited to assess whether greater local procurement was possible in the near future
- A '*cost first*' approach had been impacting H&S and needed a full overview, especially in light of recent tragic events at Grenfell Tower
- Widespread use of *Dynamic Procurement Framework* trialled by Birmingham Municipal Housing Trust

5. A 'Department for Import Substitution', was required as part of the Industrial Strategy

- Whilst 90% of what went into a house was made here, this was not the case with hs2 or other large scale infrastructure projects

6. In light of crisis in availability of affordable housing, it was proposed that institutional providers with multi-tenure options might provide part of the answer

7.Quality placemaking was important, policy makers needed to look more widely than housebuilding alone bringing together strong transport connections with social infrastructure to deliver truly flexible housing tenures at every level of affordability

8. Technology advances meant government needed to look at ongoing training and upskilling for the existing workforce and linking this into developing training and apprentices targeting young people

9. *Innovation*- Companies envisaged greater opportunities for innovation around and wanted to see greater investment, business support and linkages between supply side infrastructure and commercial activities around:

- Control Systems
- Sustainability
- Digital Design
- Quality of experience

Energy sector Recommendations:

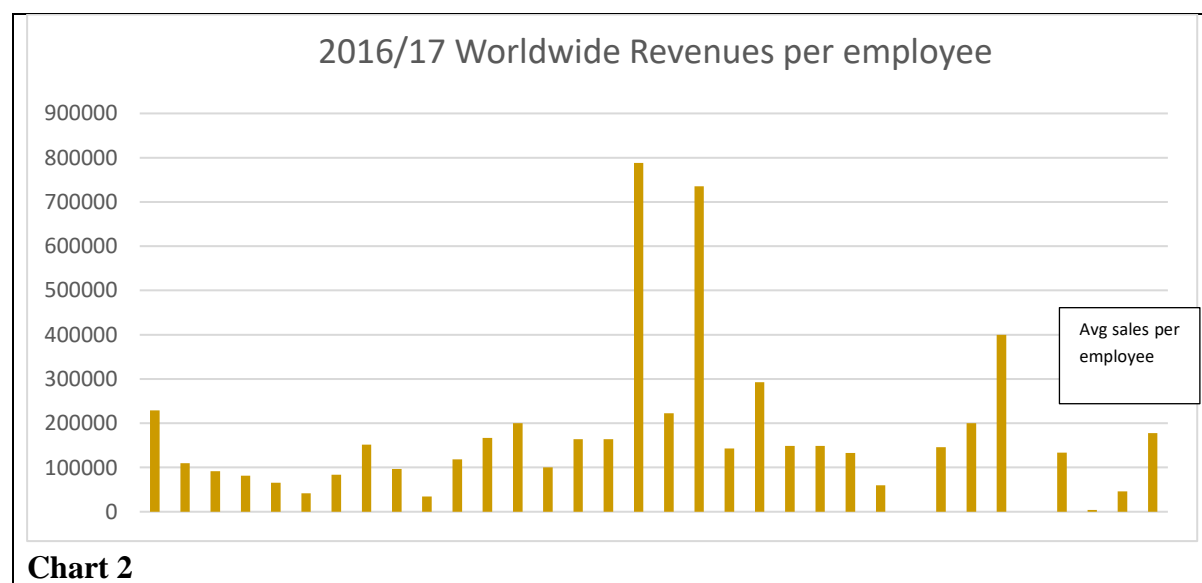
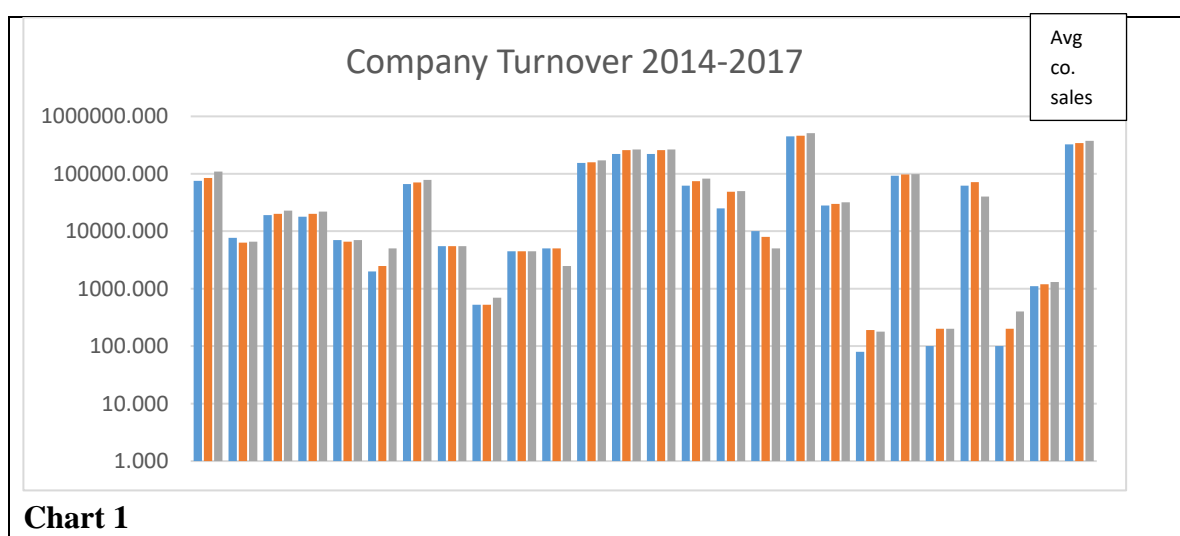
1. A longterm *20-year Energy Strategy* needed to be agreed – by political and regional partners in the West Midlands, working to support new energy start-ups moving towards self-sufficiency and supergrid strategies in tandem
2. *Smart cities and places* – were a focus for future competitiveness, interconnecting transport, construction and energy production/storage required spatial planning for the region
3. Promoting the West Midlands as a *Silicon Valley for energy entrepreneurship* and a place that stood out as a ‘*Beacon*’
4. *Sustainable energy innovations*, including battery storage, inverter technologies and aggregation systems were making the link between transport and construction. Planning needed to facilitate these links to be made for the region to take greatest opportunity
5. Whilst much investment was highlighted in research and development, Catapults and Accelerators, too few of the SMEs and micros/start-ups were aware of supply side investments or had any links to it. Too many *SMEs and start-ups were left to ‘get on with it’* despite the strategic significance of their efforts and the contribution they might be able to make with greater support. The links between the start-ups and the public sector supply side investment were also not being made well enough
6. *Building our energy ecosystem* was a priority with energy entrepreneurs sourcing vital services elsewhere – talent, finance, skills; we needed to keep them here growing more jobs and opportunity
7. *Tyseley Energy Park* was a template, acting as a magnet for like-minded energy entrepreneurs and a *Beacon* for other young businesses and people
8. *Procurement needed to encourage local innovation* and the example of the Olympics was cited which had engaged with few companies or people working on it from local or regionally-based companies.
9. *A Foresight Exercise* was required – for example, the Informed Traveller needed to be able to purchase through tickets, linking travel providers through integrated payment

systems was highlighted as a barrier to delivering ‘door-to-door’ connectivity and enabling low carbon energy transport alternatives.

10. *Fragmented business support* was part of a failing business support ecosystem; moving from one-size fits all to a fragmented energy system required more focus on helping our energy start-ups

2. Three Sector Findings

Companies and organisations were met with, attended workshops or responded to the online survey (35 companies participated in the online survey), with all 51 participating companies and organisations listed **Chart 3**. Of the sample 18% were newly formed companies, two were multi-billion multinationals, one a large company, and with the rest being SMEs which made up the backbone of the regional economy. Total company revenues from the online survey sample was £31.2bn with 104,337 employees worldwide, **Chart 1**. Average revenue per employee (as an average of all company averages) rounded to £200,000, **Chart 2**, well above the UK average of £118k. All-company sales growth was strong over the three years, accelerating strongly between 2014-17 by 14% across three years and by 5% between 2014-15, and by 9% between 2016-17.



Total Sample

- 1) Advanced Anaerobics Ltd
- 2) Afore UK
- 3) Aggregate Industries
- 4) Alcraft
- 5) Alucast
- 6) Black Country Chamber of Commerce
- 7) Building Alliance
- 8) Bosch Thermotechnology
- 9) BSA Technologies
- 10) Carvers Builders Merchants
- 11) C Brandauer Ltd
- 12) Clayton Equipment
- 13) Clevedon Fasteners
- 14) Colas
- 15) Colemore Tang
- 16) Conigital
- 17) Drive Midlands
- 18) EEF
- 19) Thomas Fattorini Ltd
- 20) Global Energy Efficiency Holdings (GEEH)
- 21) Gilca
- 22) GKN plc
- 23) Hodgkinson Builders
- 24) Industry Forum
- 25) Institute for Sustainable Futures, Birmingham City University
- 26) Jonathan Lee Group
- 27) Light Rail Partners
- 28) Marley Eternit
- 29) JRL Midgard
- 30) Midlands Heart
- 31) Morgan Technologies
- 32) National Federation of Builders
- 33) Parry People Movers
- 34) Pashley Holdings
- 35) Penso Consulting
- 36) Powerflow Energy
- 37) Pre-Metro Operations
- 38) Prime Hybrid Energy
- 39) ReallyGoodIdeas.biz
- 40) RenteCars
- 41) Renewable Risk Advisors
- 42) RPServices
- 43) Sustraco
- 44) Tyseley Energy Park
- 45) Wastemaster TM
- 46) Webster & Horsfall
- 47) Whg
- 48) W Kings Ltd
- 49) Wedge Group Galvanising
- 50) West Midlands Growth Company
- 51) University of Wolverhampton Built Environment and Climate Change Initiative Programme

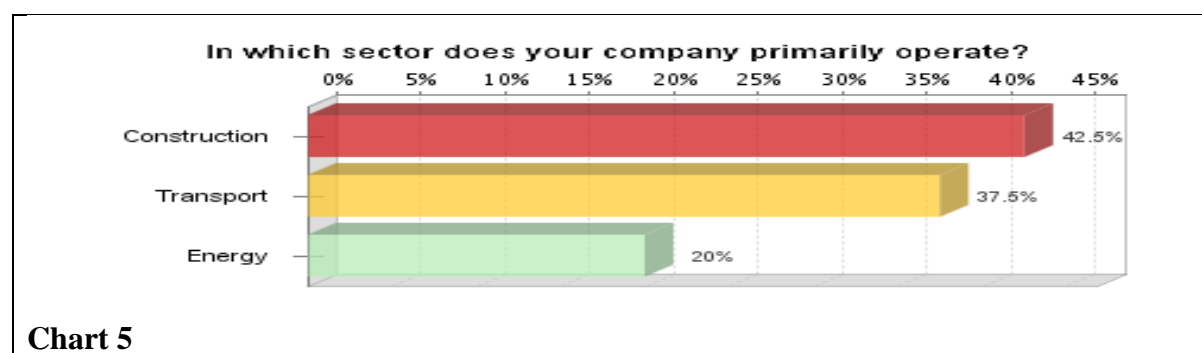
Chart 3

The total sample was viewed within the context of all West Midlands companies within WMCA region, although apparent inconsistency in data sets suggested further regional and

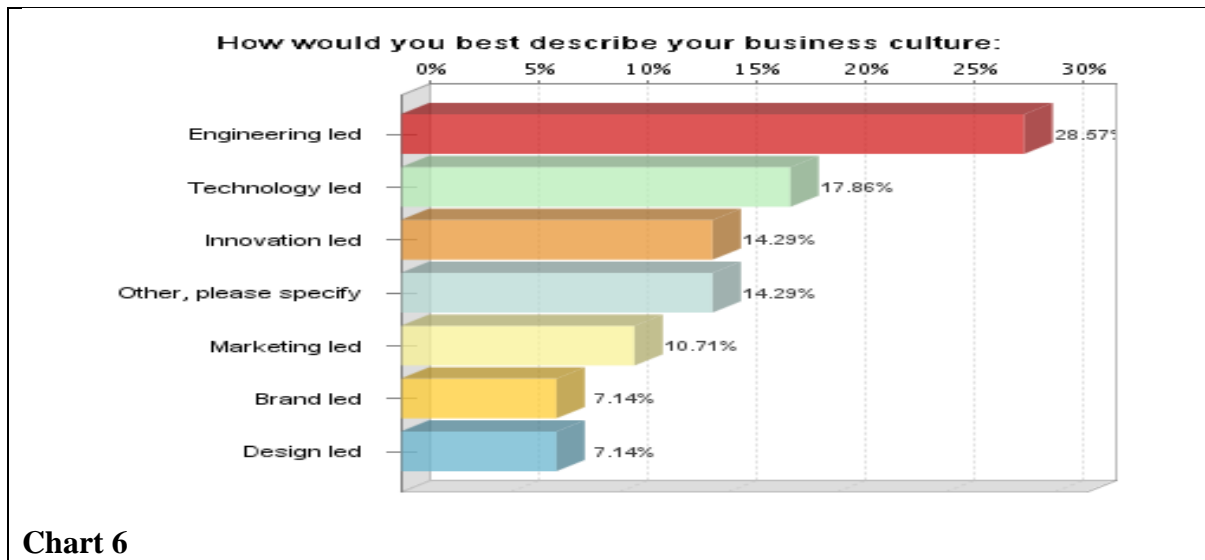
numerical clarification was required as NOMIS data suggested around 82,000 businesses across the WMCA region, **Chart 4**, the Science and Innovation Audit quoted around 160,000 businesses in the WMCA area, with a House of Commons Briefing Paper, No 06152, 23rd November 2016, listing 413,000 enterprises across the West Midlands.

Total Companies in WMCA region	81,755
Medium-sized (50-249 employees)	1,480
Large Companies (250 employees plus)	365
Manufacturing Companies	6,715
Micro (0 - 9 employees)	4,790
Small manufacturers (10-49)	1,505
Medium manufacturers (50-249)	350
Large Manufacturing Companies (250 +)	70
Chart 4	Source: NOMIS

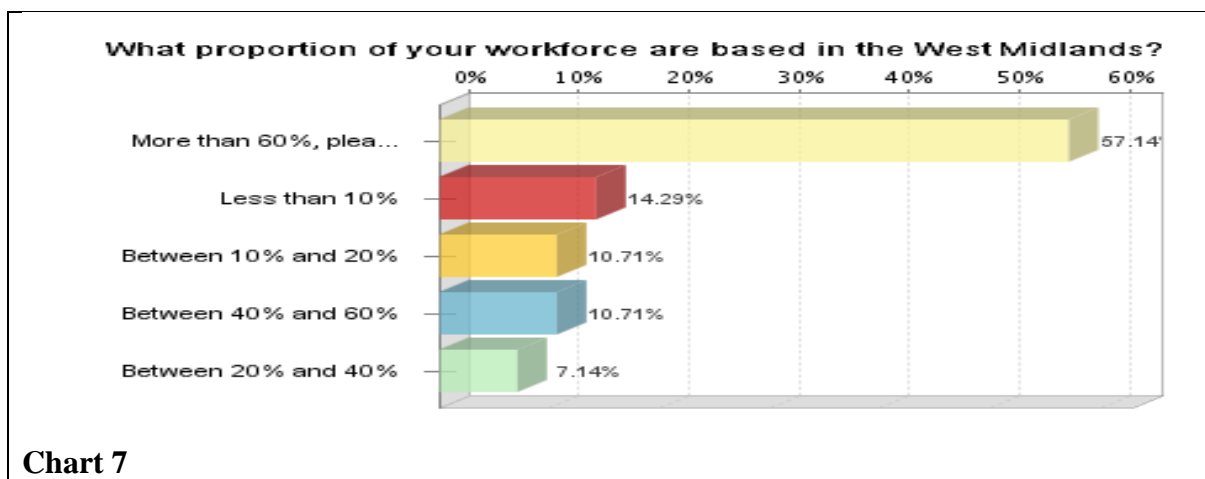
Of the online respondents the sample broke down into the following categories, with construction and transport each amounting to around 40% of the sample, with energy accounting for 20%, **Chart 5**:



Business culture: Almost a third of companies saw themselves as culturally ‘engineering led’, with just under 20% ‘technology led’ and around a sixth being ‘innovation led’. This suggested there may be further opportunities for adding value through greater ‘branding’ and ‘design led’ strategies, with only 14% of the sample claiming their culture was led through these approaches, **Chart 6**. Other business cultures listed amongst the sample included ‘experience’ and ‘customer led’ as well as ‘green technology-led’.



For the majority of companies almost 60% of respondents recruited well over 60% of their employees from across the West Midlands indicating their need for appropriately skilled local people, their commitment to the region and to continuing to invest in this place, **Chart 7**.



Collaboration: Companies were collaborating extensively, with over 85% of the online sample involved in collaborations of some sort (**Chart 8**) - although collaboration often meant ‘meeting customer requirements’ rather than broader forms of collaboration. External engagement was with partners including - WMG University of Warwick, BMet, AMRC, MAN Group, Dong Energy, Biffa Waste Services, Solvay, Construction UTC, Fraunhofer, KFB Technische Anlagen GmbH, Birmingham City University, Construction UTC, Chambers of Commerce and Local Enterprise Partnerships, amongst others.

Do you collaborate with other companies to provide these products / services?

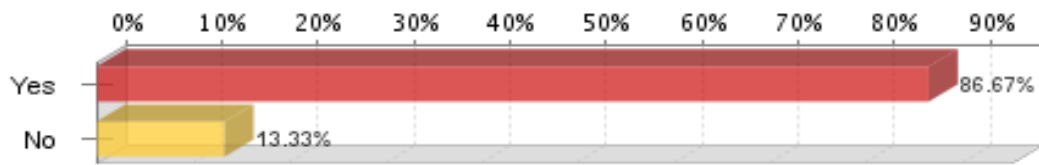


Chart 8

The majority of the sample, 60%, was selling into different sectors, with 40% focussed within one sector alone – twice as many of these companies were from construction as from either transport or energy, **Chart 9**. Corporate customers were wide ranging from OEMs, JLR, Aston Martin, Lagonda, and from Tiers 1, 2 and 3 represented in transport and construction sectors connecting to a huge network of global contacts. Sectors sold into ranged from automotive, rail, defence, retail, waste management technologies, recycling, renewables, residential and office construction, education, amongst others.

Do you provide products or services into several different sectors?

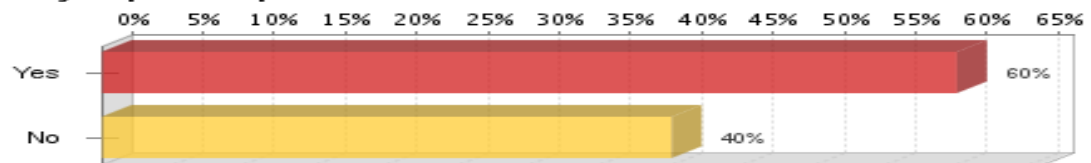


Chart 9

Supply Chain: Numbers of suppliers feeding into companies ranged from under ten to hundreds with most, SMEs in particular, citing a preference to source locally. The majority of operators felt there was an opportunity to source more from within the region, with little variation on this view between respondents from different sectors, **Chart 10**.

Opportunity to source more in the West Midlands

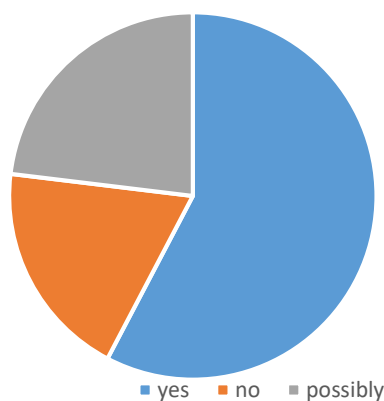
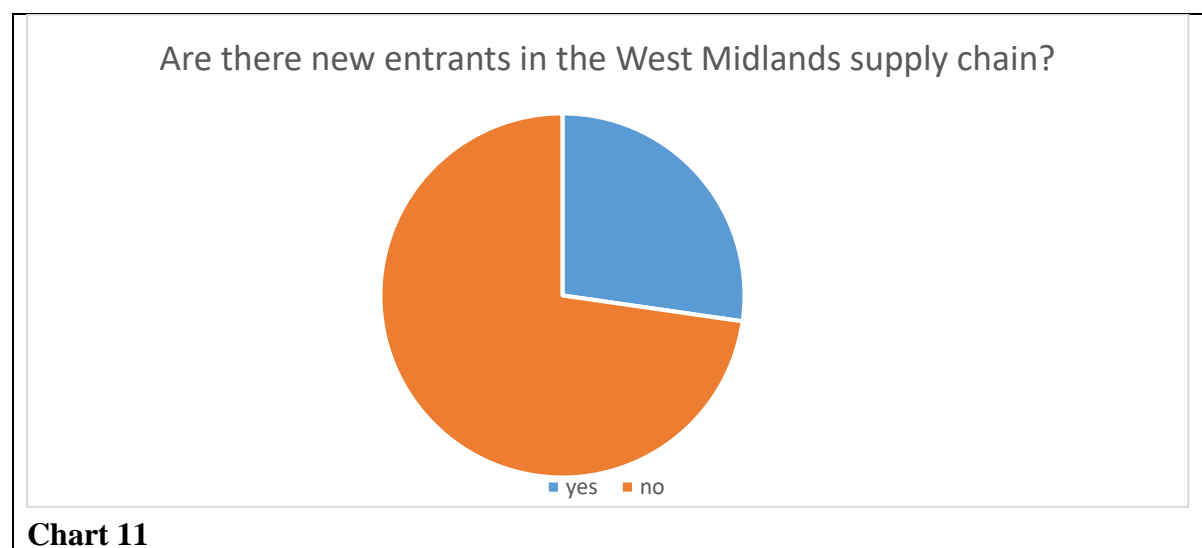


Chart 10

However, in spite of this, there were few new companies entering the supply chain, as a result of mature industries and high barriers in terms of specialist knowledge and expertise indicating, businesses felt, opportunities for coordinated activities to support strategic supply chain and new entrant activity, **Chart 11:**

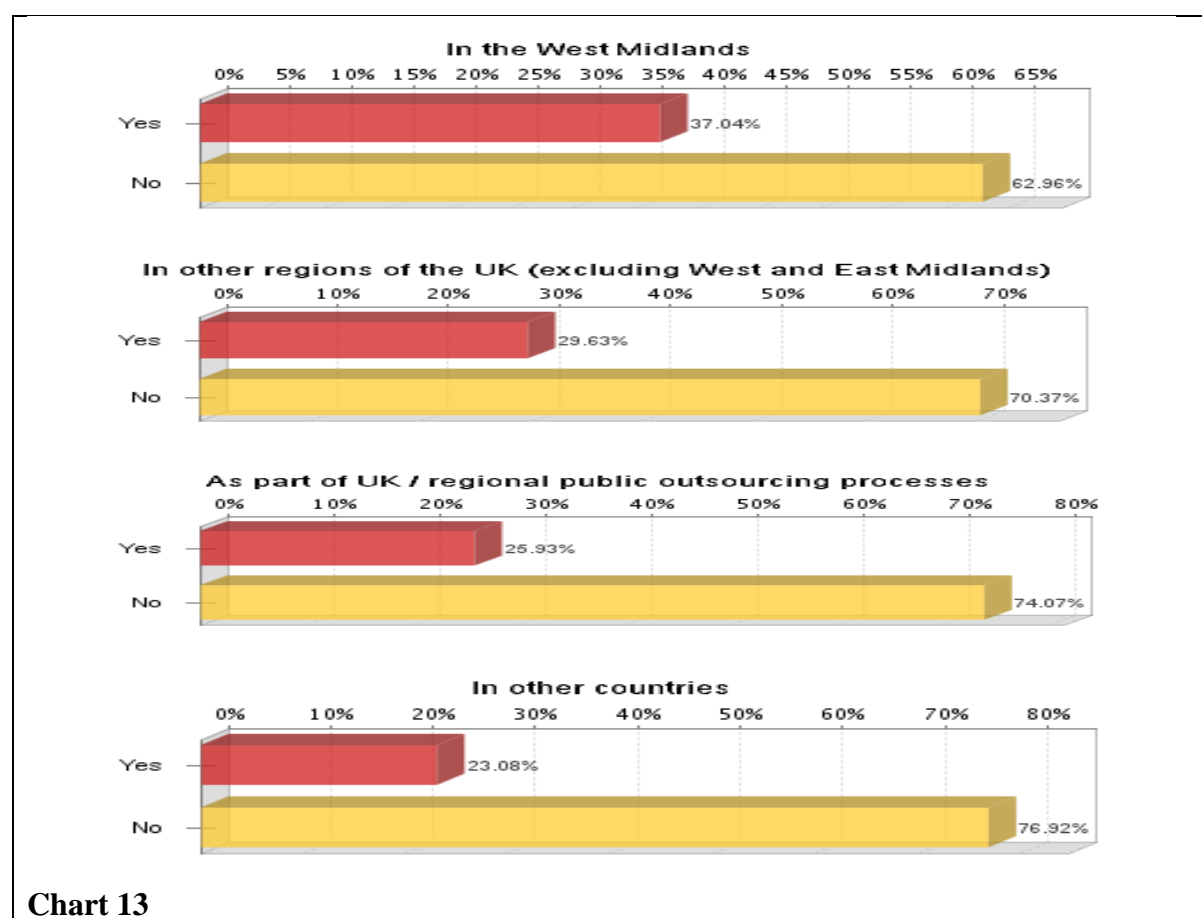


Many suggestions were made regarding the strategic opportunities to source more products and components from within the region, **Chart 12:**

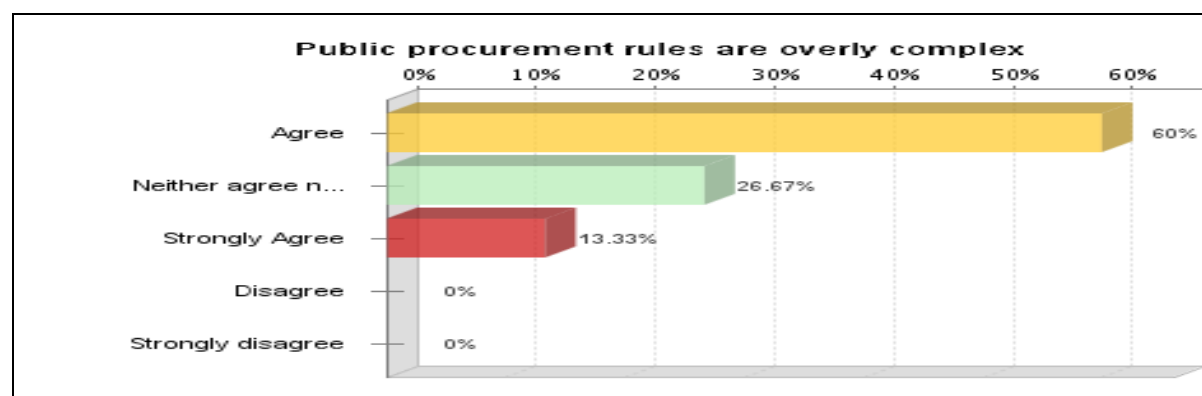


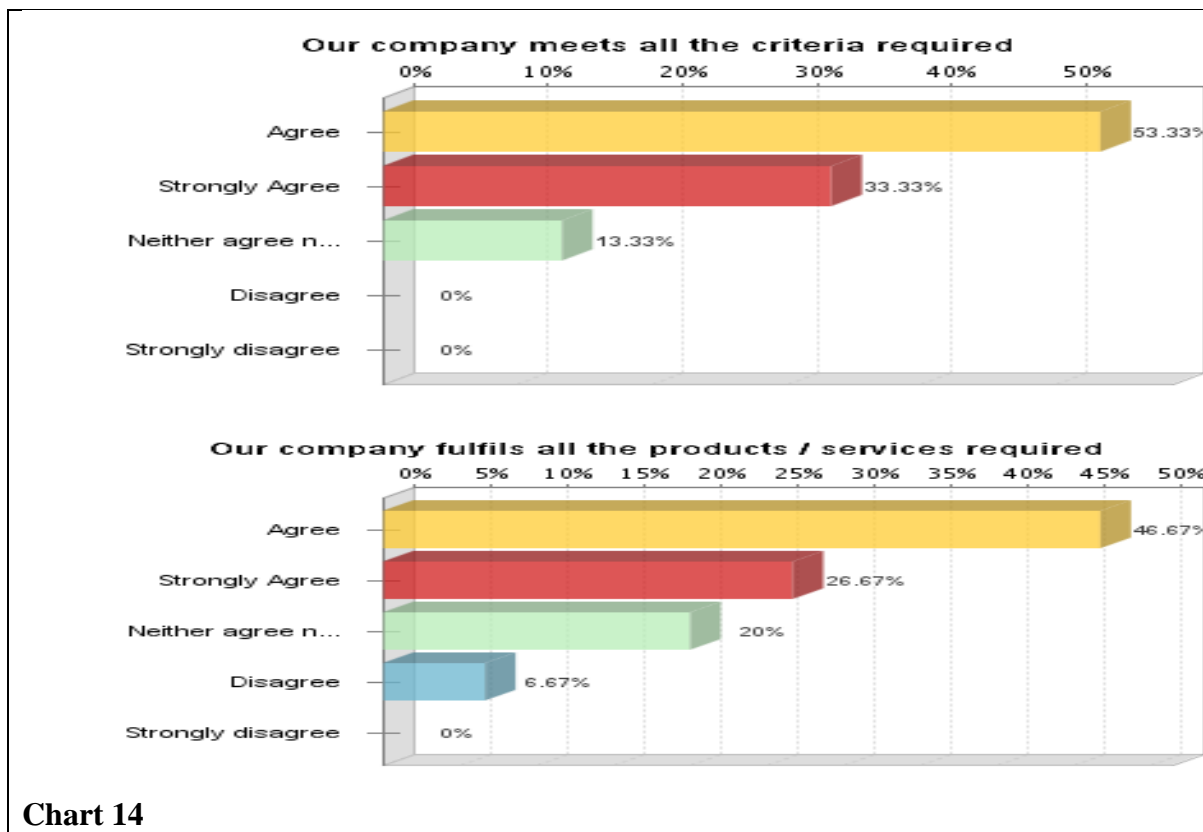
Public Procurement: In the majority of instances products produced in the West Midlands were not procured by the public sector in the region, or by the public sector based in other regions of the UK, or by agencies as part of national or regional procurement processes, with more public procurement in West Midlands at 37% reported levels, compared with 30% elsewhere in the country, with firms highlighting the need to roll out innovative approaches

such as Dynamic Procurement Frameworks enabling greater procurement amongst SMEs and local firms, **Chart 13**:



In the majority of cases companies felt, by 73% in total, that public procurement processes were overly complex; that their businesses, in 86% of cases, met the procurement criteria; that in over 70% of cases their products and services met the procurement criteria, indicating opportunities for greater UK procurement and resulting multiplier impact, **Chart 14**:





Skills Shortages: Companies were currently facing critical skills shortages with this cited as a top priority across all sectors. Technicians were most often required, mentioned in over 55% of cases, but with equal emphasis on the need for design, production and skilled crafts people, with some requirement for modern apprenticeships, **Chart 15**. Over a third of companies were unable to meet current and emerging skills needs, **Chart 16**, rising to a two thirds skills gaps in the transport sector for technicians, which were in very short supply across all sectors. This data was broadly in line with the recent *MHA Manufacturing and Engineering Annual Report, 2017/18* which highlighted that 22% of respondents put skills shortages at the top of their agenda, with 75% having a problem finding staff. Their report identified skilled machinists as the most difficult to recruit, with 46% companies stating this was a problem area for them, and with 39% unable to recruit experienced engineers. The biggest single problem identified by the Lloyds Annual report was the shortage of applicants with relevant skills along with the lack of appropriately motivated applicants for lower skilled jobs. Competition from larger businesses was accounting for recruitment challenges for 8% of respondents according to this report.(3)

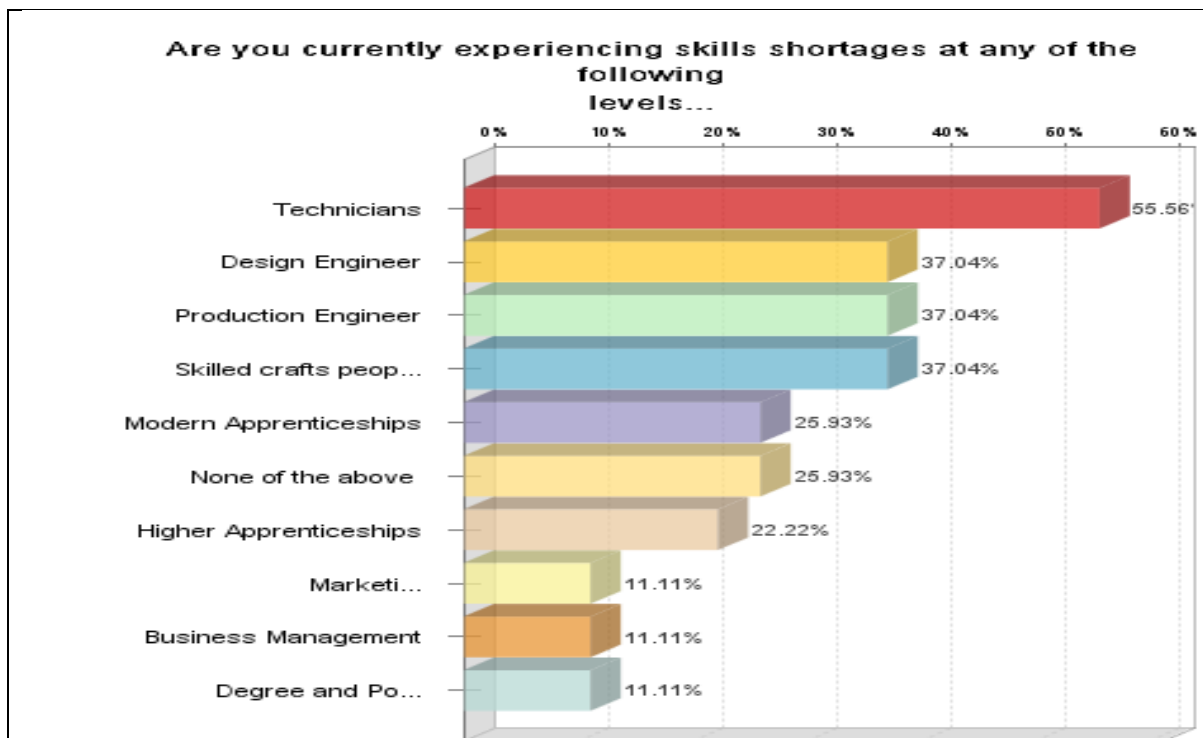


Chart 15

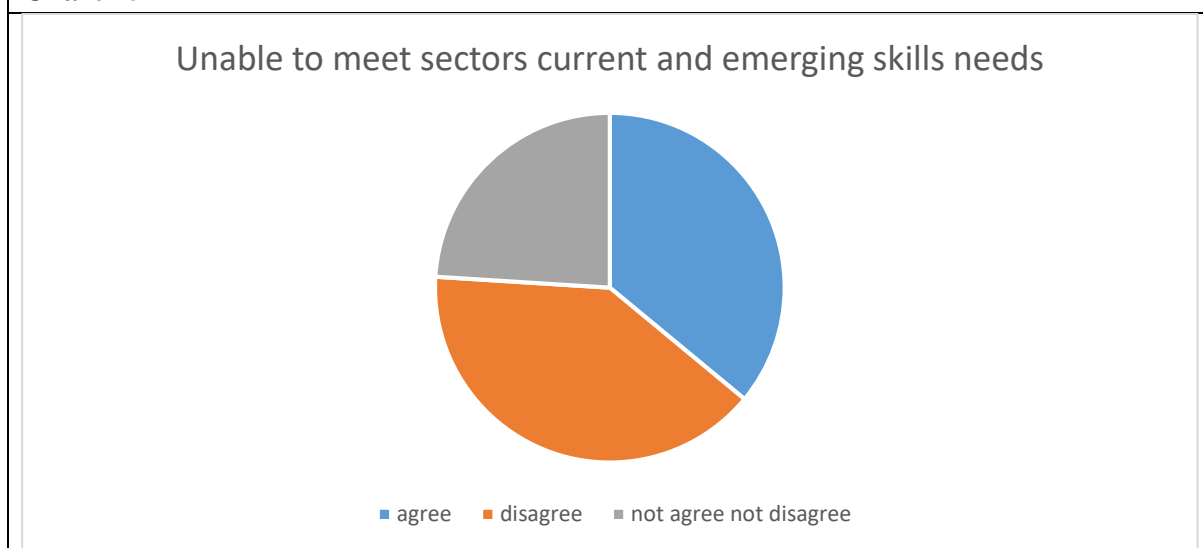


Chart 16

In terms of future skills shortages greater needs for technicians were anticipated amongst companies, as well as for production engineers and skilled crafts people and to a slightly lesser extent design engineers and higher apprenticeships, **Chart 17**.

Are you anticipating future skills shortages at any of the following levels...

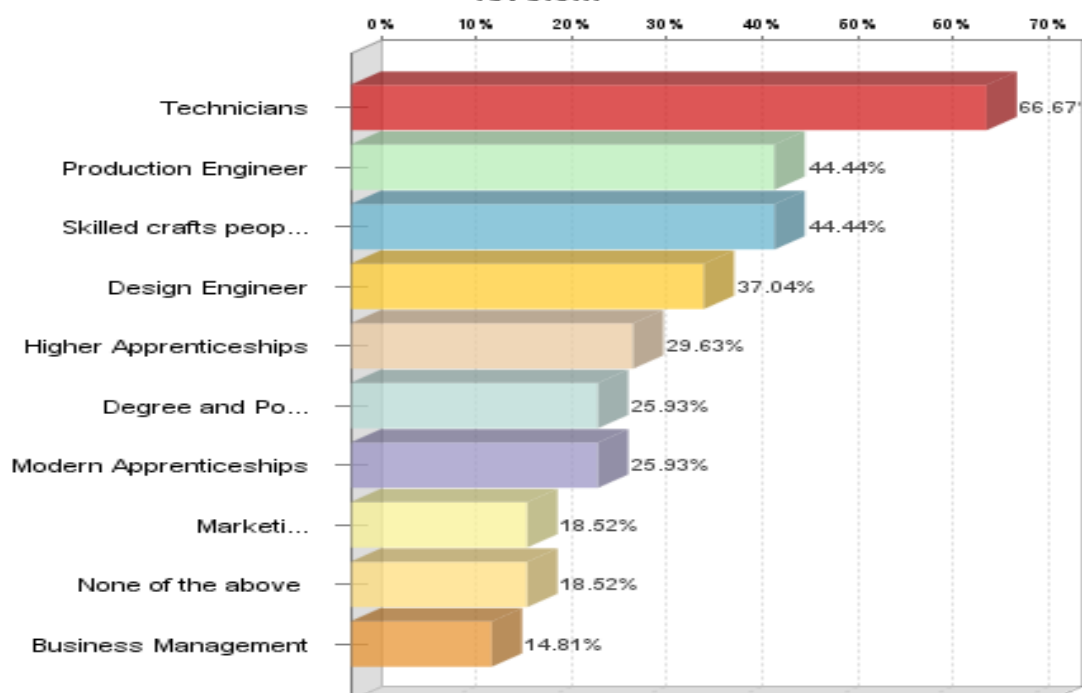


Chart 17

Companies wanted greater dialogue to take place between themselves and training organisations set up to meet their needs, with 40% agreeing or strongly agreeing with this, compared with 22% disagreeing, **Chart 18**.

There is a lack of appropriate dialogue between my company and training organisations

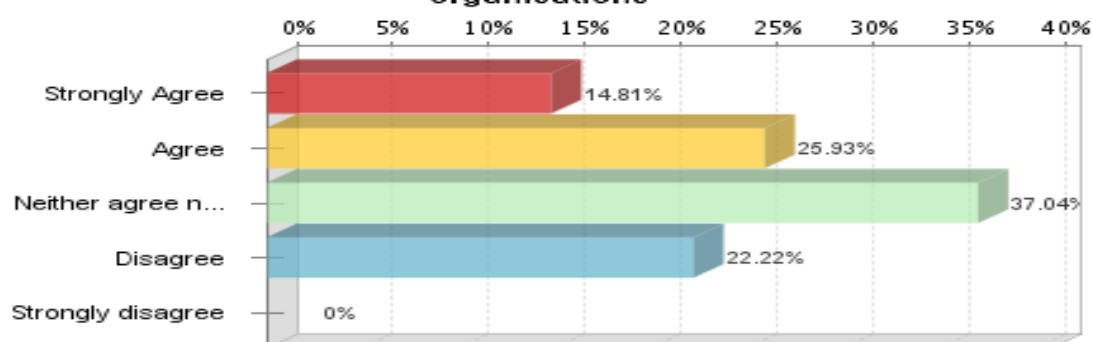
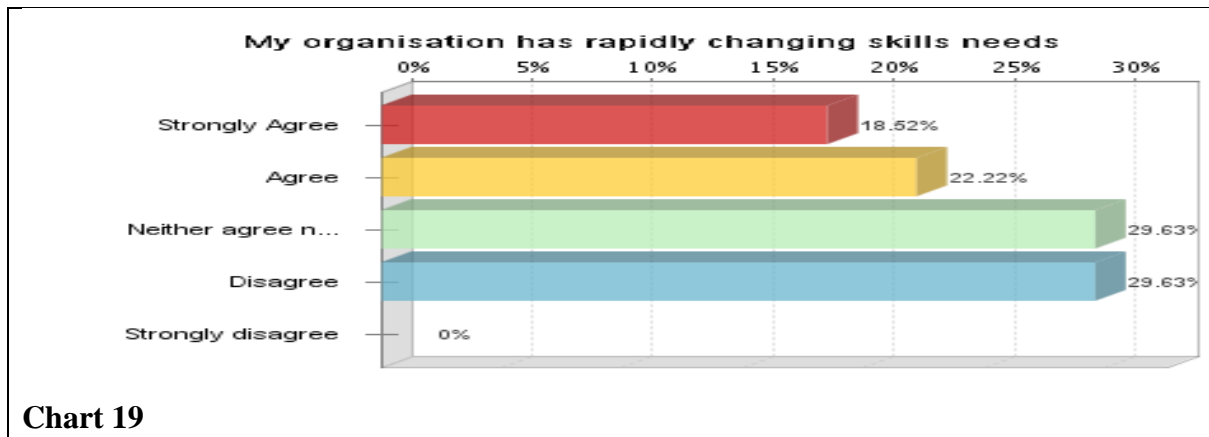
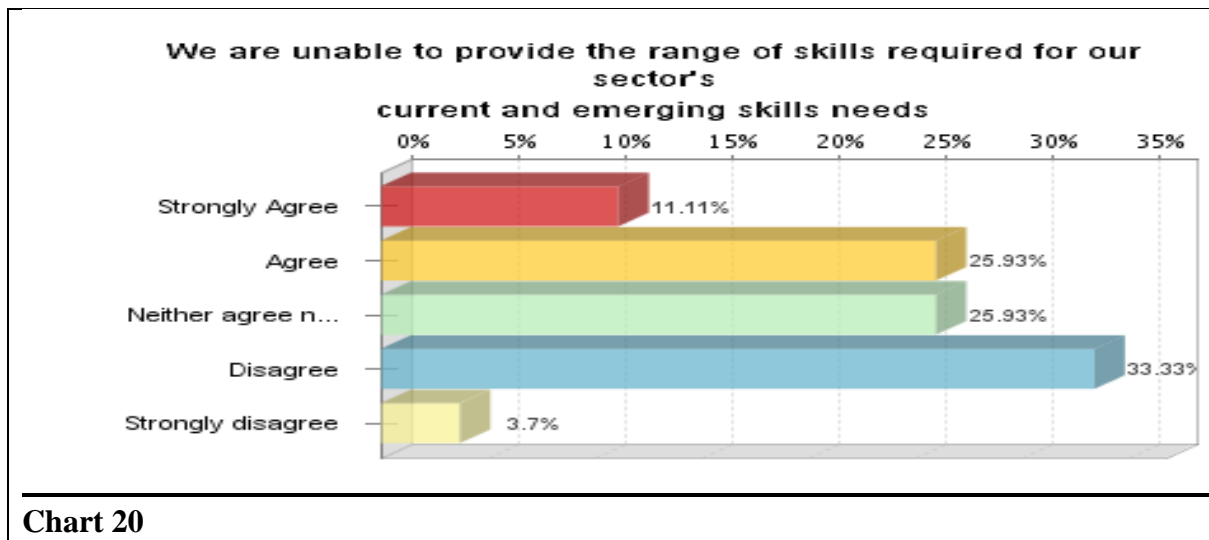


Chart 18

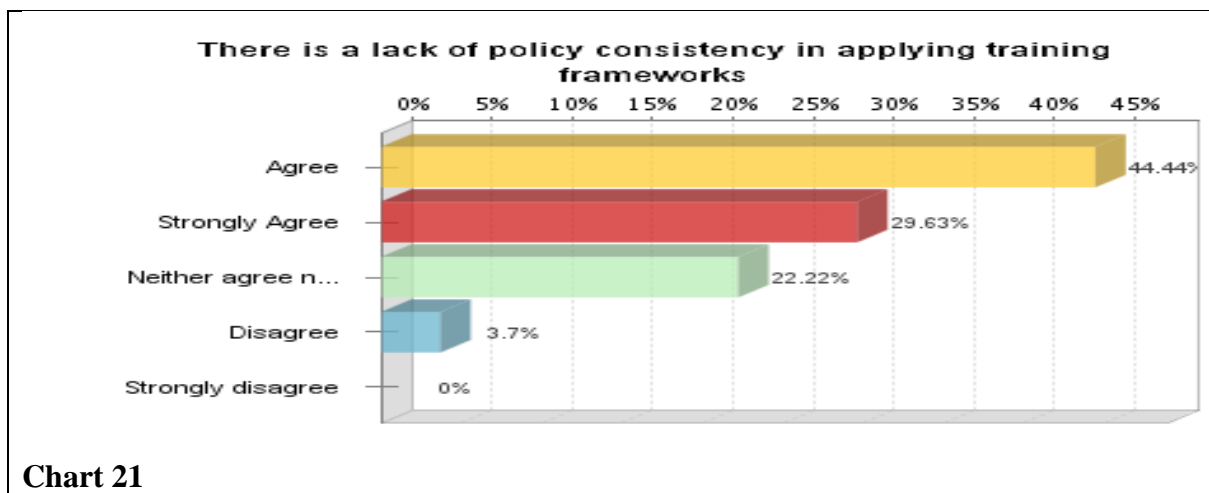
Over 40% of companies agreed or agreed strongly that skills needs were changing rapidly, demonstrating the need for agility and greater dialogue with training organisations and providers in Further and Higher Education in successfully meeting companies training needs, **Chart 19**.



In terms of meeting their current and emerging skills needs 37% agreed or strongly agreed that they were unable to meet these skills needs at present, **Chart 20**:



There was strong agreement when businesses were asked about the lack of policy consistency in applying training frameworks to meet their skills needs, with 74% of companies agreeing or strongly agreeing with this statement, **Chart 21**:



Building on Good Practice in Skills Development: A wide range of collaborations were enthusiastically supported by employers with many suggestions made by companies to overcome skills shortages into the future, including much closer working with Trade Associations to promote awareness amongst schools from an early age, **Chart 22**. Successful collaborations developed to-date included:

- WMG Academy
- JCB Academy
- Envisage Academy
- Metals Council – Vision 2030
- Elite Centre for Manufacturing Training
- National College for High Speed Rail
- Birmingham Centre for Railway Research & Education
- Dudley Innovation Centre for Light Rail
- EEF Technology & Training Centre
- Salop Design Academy
- Black Country LEP and Confederation of British Metalforming
- Construction Careers Week
- the Access Project; CITB Ambassadors
- Building Alliance CIC portal - developed with Birmingham City University through 2016-17 and supported by WMCA as ‘*free to join*’ *built environment network* and one-stop source of information on work experience, work placements and jobs using videos and social media packages to promote careers in construction to parents, teachers and young people

Suggestions for Improving Skills Shortages

- Overseas workers drying up because of Brexit
- Poor image of manufacturing
- Creating an ‘ecosystem’ that works for manufacturing economy
- Skills development needs to be incentivised to meet *our* needs
- Apprenticeship Levy could be an opportunity, if developed collaboratively
- Better funded approach for SMEs – government dialogue with larger companies
- More cohesion between Government and Academia to grow talent required for the future
- Improved dialogue between regional companies and universities
- Some sort of local training organisation - for example MAN Group consortium assisting in training development working with specialist providers, such as WMG
- Working closely with employers to meet exact needs and requirements
- Government needs to review strategy. The current focus on apprenticeships inadequate to deal with wide range of diverse skill needs required
- Second time around training – no apprenticeship funding so need to review

- Industry and Trade Associations could do a better job of communicating its needs to the education sector - particularly the formative school stages
- Lack of real meaningful dialogue with trainers/education to really work to supply young people with skills we need
- Need to incentivise bright young people to come into our sector

Chart 22

Business Support: It was difficult to find many positive comments relating to existing business support provision with business support being rated the third most significant barrier to growth after access to skills and economic uncertainty, **Chart 28**. Comments ranged from there being too much bureaucracy taking too long to assess applications to continuous ‘Chopping and changing’ in policies and initiatives. However, manufacturers did speak highly about the *Long Term Auto Supply Chain* programme developed by the Society of Motor Manufacturers & Traders (SMMT), the *Skills Factory*, and the *Manufacturing Advisory Service*, which they were pleased to see being revived. Typical comments included:

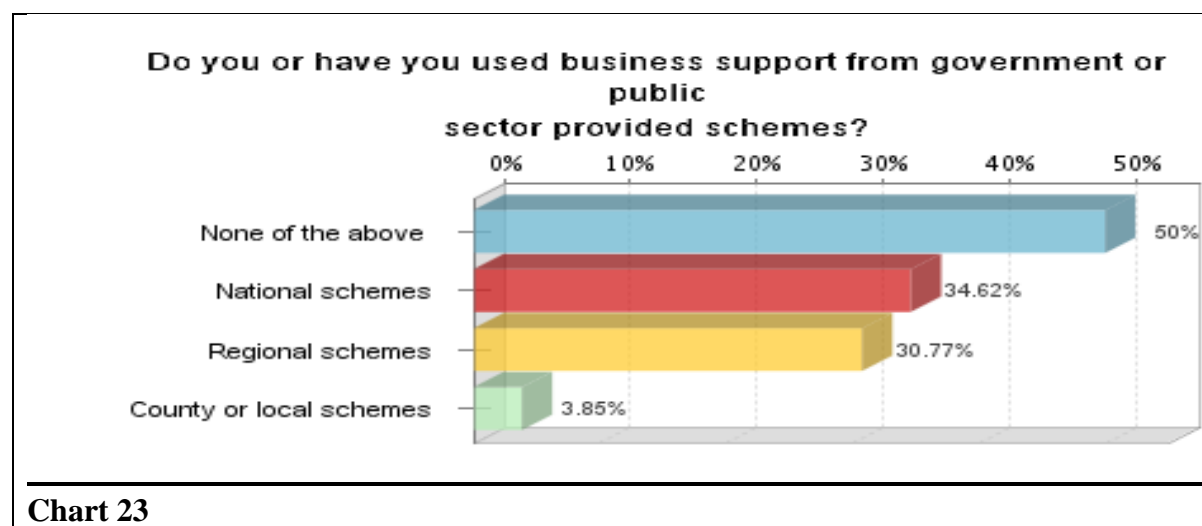
- FDI gets support but not indigenous business - e.g. Mazak, London Taxi
- Local authorities do not understand or support local business
- Lack of consistency in LEP programmes
- Much simpler in Europe to access business support
- Successful business are blocked from getting support
- Growth Hubs are not meeting business needs

Comment below made by businesses reflected their general despair about consistent failures to provide any meaningful support:

“If you get to that stage you are lost. It is provided on 'their terms' to tick a load of boxes not to provide any real support. Better taxing us less and letting us invest more in our businesses”

“It’s draining. I heard about this grant fund through our local *Growth Hub* which was aimed at companies creating more ‘suits on the street’ and we were told that we would fit well into this category offering a 70/30 funding split. After two initial meetings we were told we should apply. We received a 40 page application for £150k funding requiring a five year business plan for our start-up. We made it through the first stage proceeding to a presentation to a Panel in a meeting lasting 3 hours. They said they liked our proposal but it was ‘so good we didn’t need a grant but could apply for a loan, but we would need to pay £5k for some due diligence’....If we had known that we could have gone to our bank in the first place and saved a lot of time and effort. We decided in the end to fund it through organic growth but we were made to feel slightly apologetic for what we were doing and for being innovative. We were told that if we had done a poor presentation and business plan we would have got the grant funding!”

In light of their negative experiences with business support schemes very few firms had enough confidence to even approach the latest version of ‘support’ on offer, with half the sample never having used any government or public sector scheme and with just over 30% accessing either national or regional schemes, **Chart 23**.



Access to finance: Over 46% of companies found it either difficult or very difficult to access finance to meet their planned growth requirements, **Chart 24**. For companies in Tier 1 and below it was becoming more difficult, especially as funding for tooling had largely been withdrawn by OEMs and was ‘never coming back’. Suggestions made to assist these businesses included:

- providing greater access to grants to de-risk capital investment
- asset financing
- greater access to Innovate UK funding
- providing funding at reduced interest rates and with fewer funding guarantee requirements
- providing massively simplified access to funding and grants through government or regional banking schemes or by incentivising customers to invest in renewable energy schemes.

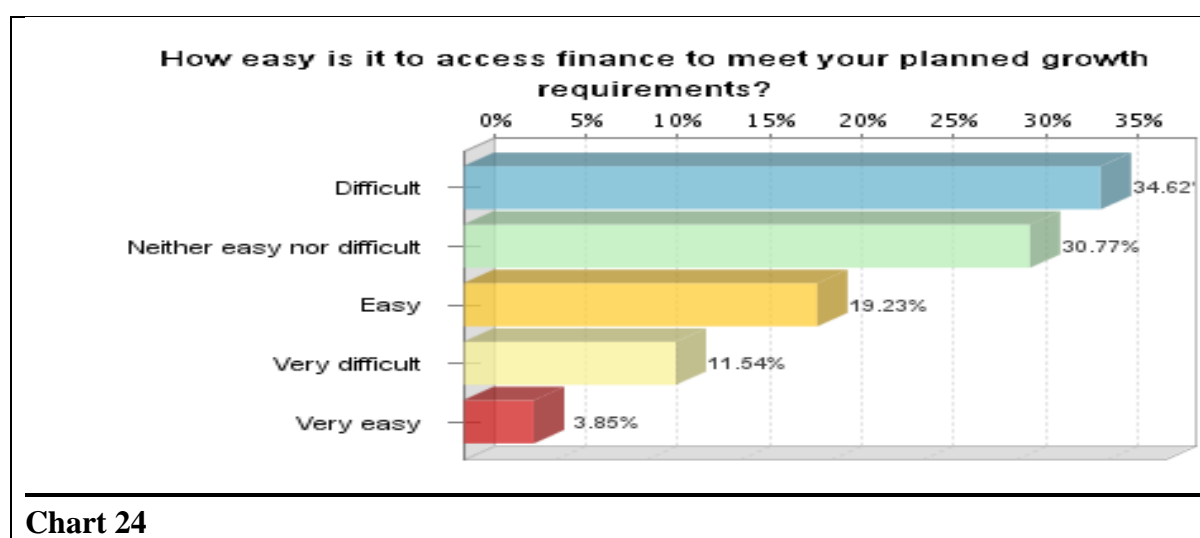
Whilst most businesses were undertaking development activities and launching new products a sizeable amount were not using R&D tax credits, claiming these were designed for the ‘big boys’, not with smaller companies in mind. This finding chimed with the *MHA Manufacturing and Engineering Annual Report, 2017/18*, which stated that whilst 88% of firms responding to their survey were innovating and investing in R&D, 43% of their sample did not claim for tax credits. The MHA report proposed to those businesses which were successful in claiming tax credits that they share their experiences widely across their supply chains.(3) Indeed it had been proposed in earlier IDEA workshop discussions that all businesses successfully securing business support should receive it only on the

‘precondition’ that they ‘*pass it on*’ within their sector providing the greatest possible benefit to as many businesses as possible.

Accessing supportive finance was especially important for those businesses best positioned for future growth, the medium-sized (50-249 employees) and scale-ups. Companies were concerned that this section of business was significantly under-represented in the UK in comparison to the German ‘mittelstand’, regarded as the backbone of their manufacturing economy. Whereas in UK just 1.6% of all businesses were medium-sized, in Germany this figure was closer to 4% of all business.

Businesses felt this was down, in large part, to greater access to patient finance enjoyed by German companies - from a wider mix of banks in their regions, notably via municipal savings banks, co-operatives and development banks, along with access to a well-established structure of nationwide grants, with governments at state and national level offering continued and long-term support substantially reducing risk factors.

This stability, it was felt had enabled the mittelstand to train the nation, with firms with fewer than 500 employees providing more than 80% of all training, equating to 1.27m of the 1.54m training places in German companies to the end 2013, whilst, according to an FSB survey in 2016, 52% of British SMEs were offering formal or paid training or development leading to accredited qualifications.(9)



New Products launched: In spite of the difficulties in accessing finance there was a tremendous amount of innovation with 24% of companies’ revenues generated from over 40% of new products over the past three years and with 40% turnover from between 10% 30% new products during that period. For companies within the energy sample where around half were start-ups, this rose to 100% turnover generated from new products and it was these companies that were most critical of their ability to access meaningful business support during this crucial early growth phase, **Chart 25**.

What percentage of turnover do new products launched represent over the past three years?

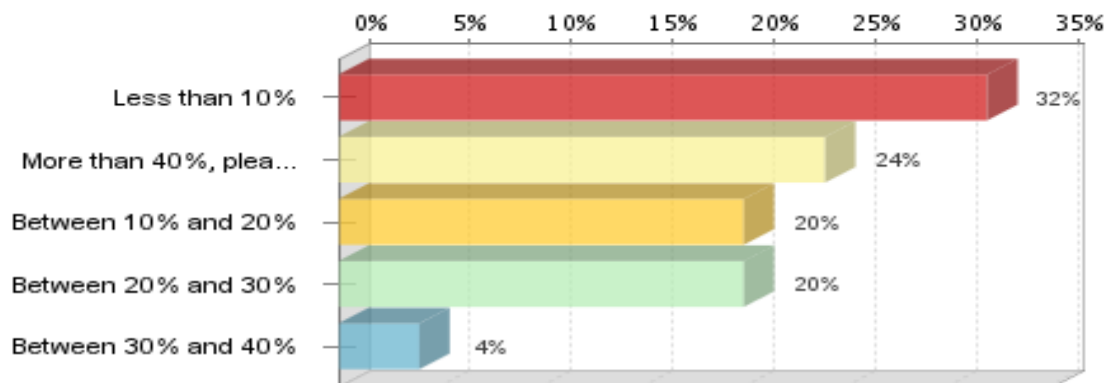


Chart 25

Start-up activity: More than 66% companies stated that there was either a small or very small amount of start-up activity in their sector or supply chain, with just over 22% reporting moderate amounts of start-up activity and in only 11% of responses considerable amount of start-up activity, **Chart 26**. In the more established markets it was noted that barriers to entry were high with high capital costs, design systems and expertise required. Opportunities for new companies offering greater service and online innovation aimed at improving customer experience were noted. For companies in the energy sector there was a high level of start-ups amounting to around half the sample, however the barriers to entry were noted as being skills and expertise required, access to patient finance, and stability of government policy.

How much start-up activity is there in your sector or in your supply chain?

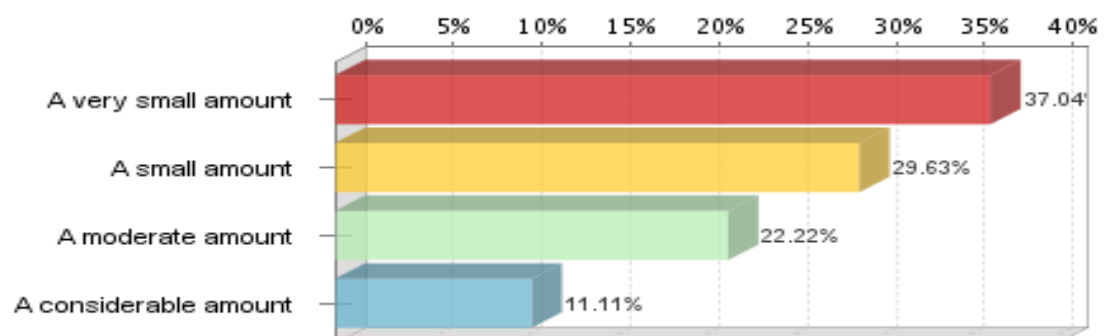
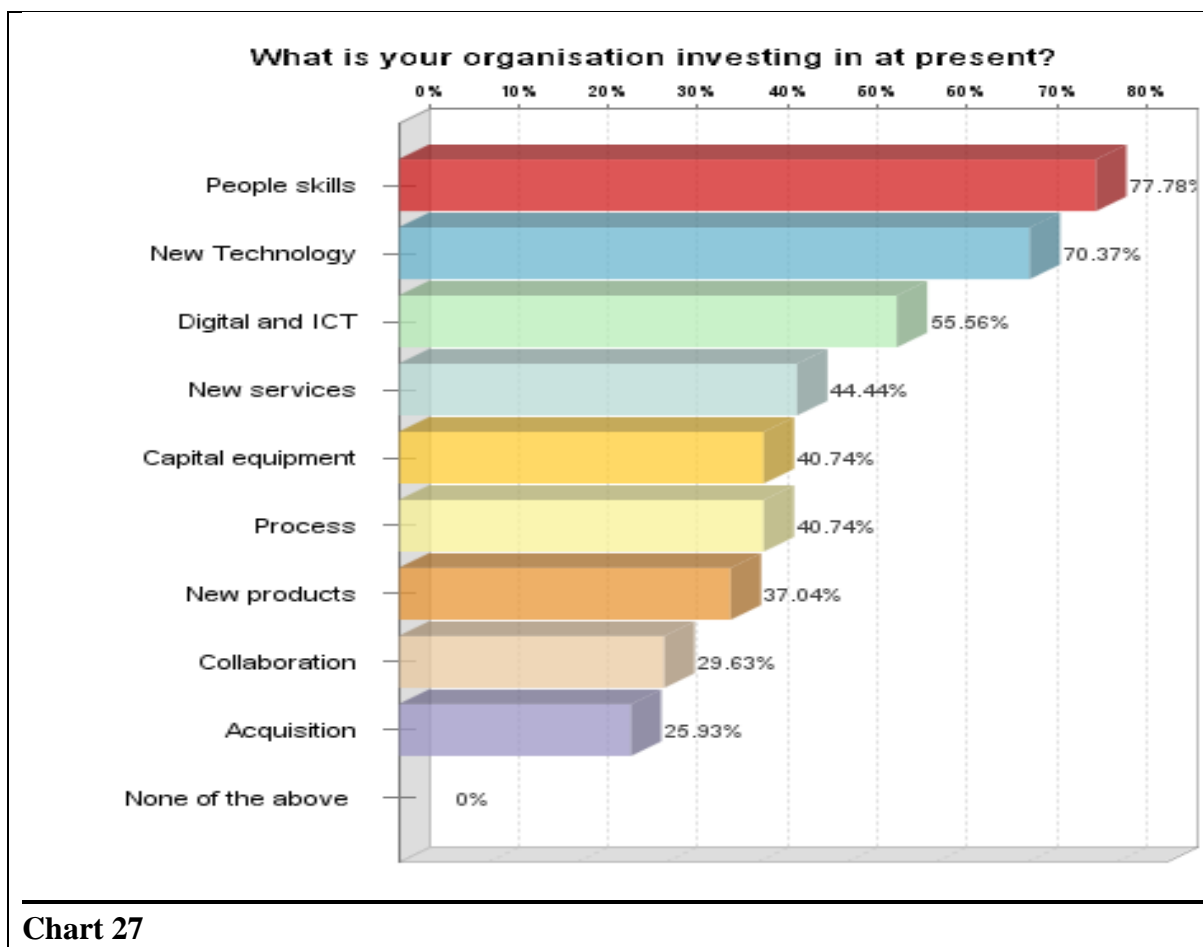
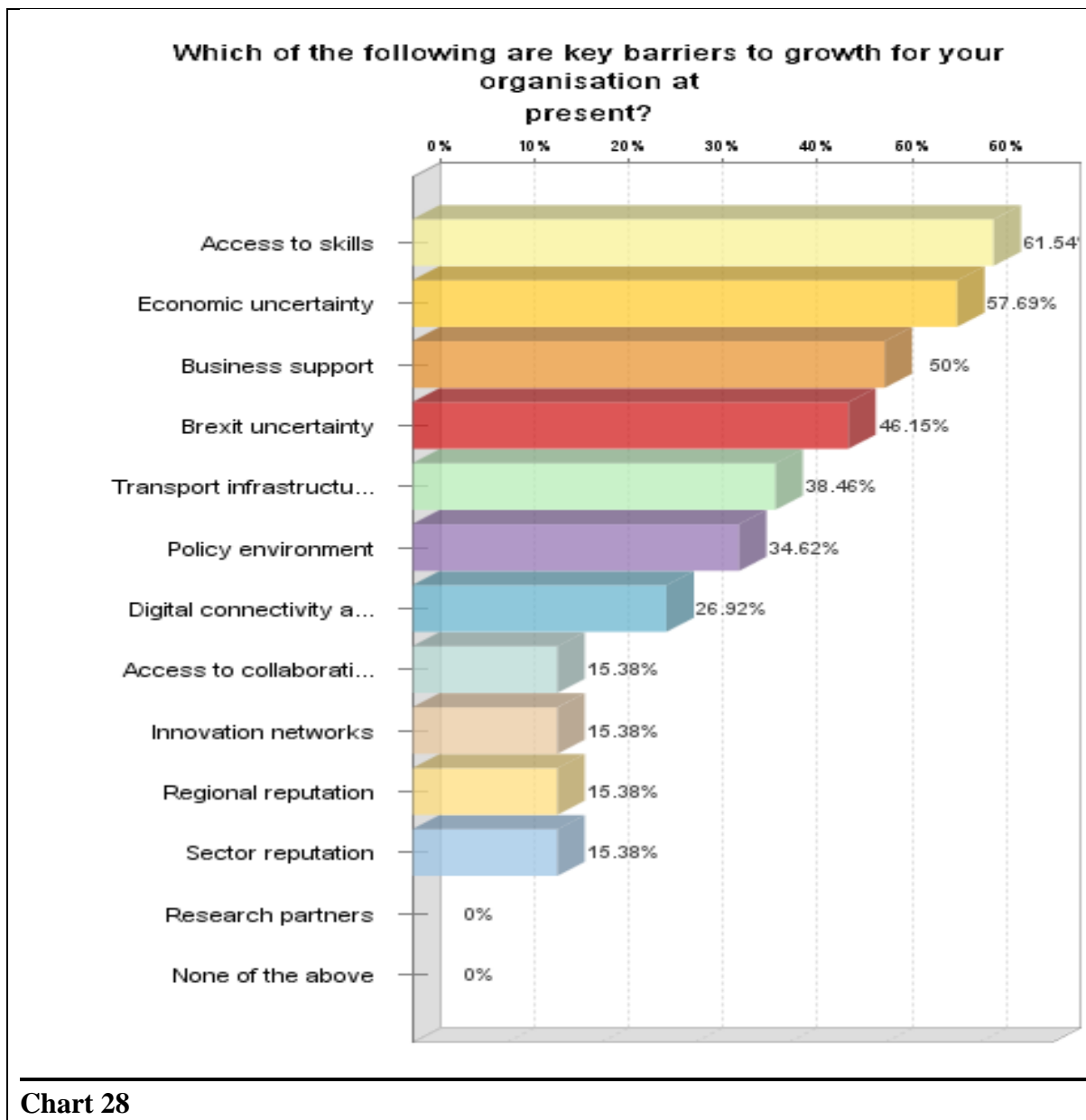


Chart 26

Current Investment intentions: Almost 80% of companies stated they were investing in people skills, with over 66% investing in new technology and over a half in digital and ICT. Service investment was high, along with capital, process and new product investment, with lowest levels of investment being made into collaboration and acquisition, mentioned by under 30% respondents, **Chart 27**.



Key Barriers to Growth: Access to skills required was the most pressing barrier to growth with economic uncertainty (brought about, it was claimed, largely as a result of Brexit), seen as the next highest barrier and with inadequate provision of business support being the third most significant barrier to growth. Brexit uncertainty, closely linked to economic uncertainty, was the fourth most significant barrier to growth followed by transport and infrastructure investment. The policy environment and continuing lack of policy stability was ranked as the sixth highest barrier to growth, followed by digital connectivity, innovation networks and regional reputation, **Chart 28**.



Respondents noted the following comments:

- “UK needs stability and continuity”
- “The political framework is such that investment decisions take far too long to manifest themselves in work programmes. Decisions on transport investment remain too centralised”
- “If we do not have an overnight service (in the transport sector) in the future then we will have to go elsewhere. It's exactly like the skills issue. If we do not have the skills here we will have to get these elsewhere. Transport has always been my biggest problem in WM and skills remain a huge issue -- if mum and dad do not believe in Manufacturing then their children will not go into it. This depends on perception. JLR roundabout off M54 is a nightmare and closed too often. If that goes down it's costing

JLR a lot of money. These issues need solving for our competitiveness and for jobs.”

- “Continued investment in the infrastructure sector is a key driver for our Company's potential growth”
- “We see Brexit as a big threat. Like many businesses we need certainty. We have been badly hit by the devaluation of the pound leading to the current economic uncertainty. Spikes and troughs are not helpful. If we are going down this route we need to get it done as quickly as possible. We think it will have limited impact on major mega trends. Shorter term the impact will be considerable. We are seeing it impact on investment in our business negatively because pound has wiped out huge chunks of our profitability so do not have money to invest in our business. In the future we do not want to be hit by tariffs on imports and exports or preventing the free movement of people”
- “Finding the right people to have the technical capability fused with the commercial potential or experience is a constant challenge for us. Economic uncertainty is not necessarily due to Brexit, I believe that our clients have commitment to programmes that they currently need to address with resource provision - these often have global stakeholders and are not confined to Europe.”

Brexit Impact - Threat or Opportunity: More businesses ranked Brexit as an immediate threat at roughly 60%/40% split in responses. 58% of businesses ranked Brexit as a high threat, at between 7-10 threat level, with 42% ranking it at a threat level of 5 and below, **Chart 29**.

These findings were echoed by FSB survey results (20 September 2017) showing confidence amongst small firms in the UK had fallen to their lowest level since the wake of the EU referendum amidst political and economic uncertainty, as indicated by their Small Business Index (SBI).(10)

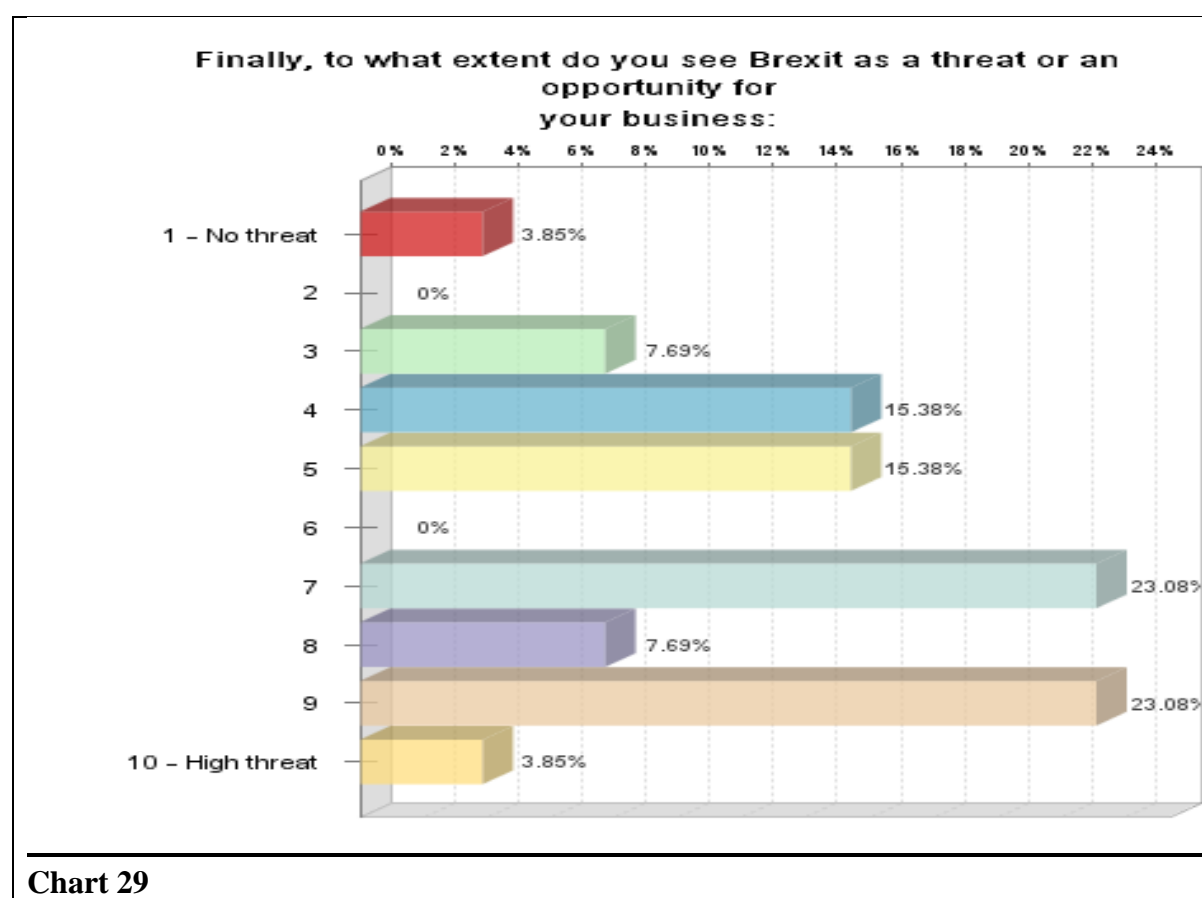
The SBI stood at +1 in Q3 2017, down from +15 in Q2, and close to the -3 level reported after last summer’s Brexit vote. One in eight small businesses (13%) were expecting to downsize, hand on or close their business. The figure was at its highest since the SBI launched in 2012. FSB National Chairman, Mike Cherry, said:

“The right Brexit deal, including a transition period of at least three years and a comprehensive Free Trade Agreement, will be critical to ensuring small firms can access key overseas markets. Bringing forward measures to improve exporting, such as tax credits and export vouchers, would encourage more businesses to seek international opportunities.”

The FSB research showed firms were being hit by the weakening domestic economy and falling confidence amongst business and consumers alike with a record number of businesses expecting to downsize, sell or shut up shop. A majority (70%) of small firms were reporting rises in operating costs compared to the same period last year. Labour costs (42%), taxation (21%) and rent (19%) were all mentioned as reasons for increased costs. The net balance of

firms reporting higher revenues hit a four-year low (2.6%), while the proportion applying for credit (12%) was at its lowest since 2014. Less than a third of small firms expected to increase investment in the next three months (27%), a five percentage point drop compared to Q2. Mike Cherry added:

"The drop-off in applications for external finance is a real concern. It's another area where Brexit could make or break small business prospects. A botched withdrawal from the European Investment Fund would create further barriers for small firms looking to access finance. Employment intentions are up, but so too are labour costs. This is causing significant problems in a number of sectors, not least hospitality and retail."



With the EU being the West Midlands' largest export market in 2015, accounting for 47% of exports, followed by the USA and China as the next two largest markets, and the three markets together making up around three quarters of the West Midlands' exports, there was a great deal of anxiety around access to EU markets post Brexit amongst companies participating in our online survey and workshops. In spite of continuing strong regional export performance, the West Midlands continued to run a merchandise trade deficit which, as a proportion of the regional economy, was equivalent to 3.6%. This was a 'best estimate', given that with the services export data it was only possible to estimate the external strength of the local economy. Global trade flows had changed markedly in recent years, with the Non-EU merchandise trade deficit growing smaller than the EU merchandise trade deficit since 2007, and turning to a surplus in 2013.(8)

Brexit Opportunity: The three sector sample was not exporting heavily with the average exports per firm at 8%, with many firms, especially in construction, not exporting anything and with around half the energy company as start-ups being at too early a stage to export. However, opportunities for exporting more were present, especially with greater support in terms of finance and accessing overseas markets, growing service and online opportunities as well as lateral products and services, especially in construction.

When asked about Brexit opportunities, business respondents flipped their answers with 60% ranking Brexit at between 5-10 for opportunity. 40% regarded Brexit as offering little opportunity for the UK, ranking this between 1-5, with 20% respondents ranking opportunity from Brexit at level 7 and 60% in total ranking Brexit opportunities between 5-10. Respondents emphasised in workshops that prior to opportunities coming through a period of some considerable turbulence was anticipated, especially in light of the current lack of clarity on the terms of departure, with businesses seeking to plan and be prepared for whatever outcomes were likely in their sector, **Chart 30**.

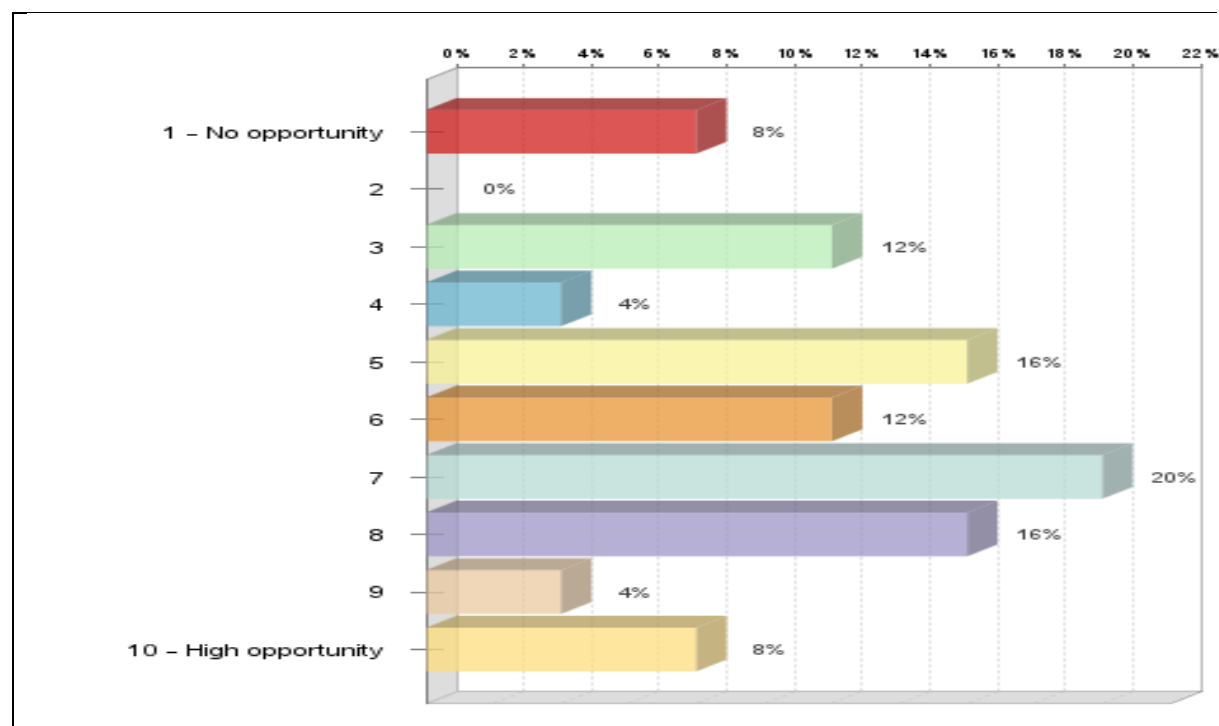


Chart 30

Respondents noted the following comments:

- Delivering a clear and concise message on the Terms of Reference of our Departure was essential
- Keeping an open market to ensure a free flow of goods was essential
- Providing more insight into likely outcomes for auto and manufacturing
- Completing our exit as quickly as possible and then negotiating realistic trading agreements based on practicality and the bargaining power provided by the importance of our market to major European industries
- Keeping an eye on the medium term implications would be essential

- Reducing Tariffs Keep £Sterling competitive and stable
- Delivering greater local devolution providing greater agility in terms of our ability to respond in light of our particular manufacturing requirements
- Brexit seen overall as an opportunity, although much material is sourced on mainland Europe which has increased in price
- Keeping government out of the negotiations
- Irrespective of the decision, just get on and do the deal! It seems we are looking to drag the negotiations out as we do not have a clear plan, we look weak and disorganised
- Deliver greater confidence, demonstrated by strong, prominent investment in new areas of manufacturing and engineering. Let's kick start the economy for the long game with bold, physical evidence of confidence, by investing in our ability to be world leaders in innovative manufacturing!

3.TRANSPORT

UK and West Midlands Automotive Industry Overview

The British automotive sector had enjoyed a renaissance over the past decade following the financial crash of 2008, with 1.72m cars produced in 2016 – the highest level since 1999. Of the 2.69m cars registered in the UK in 2016, up 2% on the previous year, more than 85% were imported according to the SMMT, despite recent price increases with sterling's recent fall in the value and 'home grown' production successes. Sales were fuelled by fleet purchases and some residual demand following the 2008 recession. The UK market was one of the most diverse in the world with some 44 brands offering 400 different model types. Of home produced output, two thirds of output was exported, amounting to 1.35m cars, or 12% of all British exports - an increase of over 10% on the previous year. One third of all cars made in the UK were produced in the West Midlands, with JLR manufacturing more cars than Nissan in 2016, at 544,401 cars compared to 507,444 produced at Nissan's Sunderland plant. Since Tata had purchased JLR from Ford in 2008 for £1.5bn, production had risen by +240% from its 2009 level of 158,000 vehicles.

The EU purchased more than half total UK automotive output, but in the West Midlands this figure was 41.5% of output. Across the whole sector British-produced cars contained 41% domestically produced parts, with JLR sourcing 50% from British component suppliers and with the industry stating that this needed to be closer to 55% for the industry to avoid tariffs under conventional free trade agreements. The SMMT had predicted automotive output rising to 2m cars by 2020, beating the last record of 1.9m British-produced cars in 1972. The growing prominence of the supply chain had been a feature of the past decade with greater focus by the OEMs, such as JLR, on the stability and quality of their suppliers in Tiers 1, 2, and 3, all feeding into their final assembly. Final goods accounted for around half of automotive output, with 40% consumed by domestic households and with 25% of output used as an intermediate good by other industries as varied as energy and renewables, consumer appliances, according to the EEF.

With ten new car models beginning production in the UK in 2016 – nine of them premium brands, Britain had become the second largest producer of premium cars in Europe after Germany and the third biggest car producer. China, the world's largest car market, remained the West Midlands third biggest trading partner at 14% export share, after the EU at 41% West Midlands' export share, followed by the USA taking 18% of West Midlands' exports as our second largest trading partner. One in seven cars registered by UK buyers was made in Britain, up from one in eight three years ago. (11)

The core sector was highly structured and interconnected. It was well represented and supported in the region through organisations including the *Industry Forum*, *Drive Midlands* and nationwide through the *Automotive Council*, *EEF* and *SMMT*.

Innovation was a strong feature of the sector, driven by standardisation, with recent legislation focussing on H&S and reducing carbon and other noxious emissions. In addition, moves to greater customisation enabled niche producers to play to their strengths. In second half 2017

the UK government announced plans to ban sales of petrol and diesel vehicles by 2040 motivated by demanding CO2 emissions targets requiring 50% cuts from 1990 levels by 2025, and 57% reductions in emissions by 2030. The UK market for electric vehicles (EVs) had been expanding rapidly, and whilst remaining a small share of the total market, a record 4.4% of new cars sold in May 2017 were hybrid or pure electric models. More than 100,000 electric cars had been sold in the UK under a grant scheme launched in 2011. (12)

Volvo and Jaguar Land Rover (JLR) announced, second half 2017, their plans to move to all-hybrid and EV production by 2019 and 2020 respectively, with connected autonomous vehicle technologies being developed across the West Midlands for modes as diverse as agriculture, heavy vehicles, people movers, such as PODs, and in automotive more generally.

Different EVs - all electric and hybrid energy formats - were continuing to emerge. The focus within automotive (and rail to a growing extent) had primarily been on lithium-ion batteries which had fallen in price by 50% since 2012, although other formats were available, and the performance of lead acid batteries continued to improve. These and developments such as 'vehicle to grid' were accelerating the accompanying requirement to install networked ultrafast electric charging points across the country and highlighting the growing links between transport, urban environments and residences, as it was anticipated most places would require ease of access to charging points in the near future. This would open up opportunities for greater local energy generation, use and distribution with new business models for energy storage, aggregation and smart apps facilitating remote control and usage.

As a result of sustained government and private investment, the UK network of EV charging points had increased from a few hundred in 2011 to more than 4,300 charging locations, 6,700 charging devices and 12,500 connectors by May 2017.(13) To-date within automotive only one company, Nissan, was providing a 'charge and discharge' battery, known as *xStorage*, offering second hand batteries to the housing market via a joint venture with Eaton, drawing on a Lithium Manganese format.(14) The concept was based on battery lifespan as batteries, whilst used in the Nissan LEAF car as their primary use for around eight to twelve years, still maintained more than 70% of their initial capacity following this, giving them potential for grid-connected and off-grid energy storage.

The storage units were being made at Nissan's Sunderland plant and assembled in Morocco, with Nissan and Eaton targeting 100,000 sales of the units within the first five years at a retail price of £5000 under a 10 year warranty targeting £500m sales. The *xStorage* would be in direct competition with Californian-based Tesla and their Powerwall lithium-ion wall-mounted battery, which had already been installed across the UK with the Powerwall 2, costing £5,400 due to be launched in 2017. Battery storage as a bi-product of automotive and as a standalone product, had the opportunity to grow in the West Midlands. This report deals with this growing market sector in the energy section. Start-up companies involved in battery storage and met with as part of the survey and workshops were growing on the back of investment in these technologies, but were struggling with little support or recognition of their strategic significance. In spite of this they were managing to make considerable strides forward. In

contrast some of the companies producing autonomous vehicles and related softwares had succeeded in attracting considerable funding, in particular from Innovate UK, and were moving forward strongly on the back of grant funding received. The issue was whether the growing pains felt by the start-ups could be eased, enabling faster and greater contributions by linking them into *networks for growth* or *manufacturing ecosystems*. It was their view that they could, and that bringing together market-focussed networks led by practitioners and supported by university expertise, it would be possible to have a significant impact on growth prospects.

Alongside automotive and the region's prowess in this sector, businesses recognised the need for greater emphasis on delivering a multi-modal shift with the challenge of making journeys on public transport as easy as by private car remaining. Through ticketing, universal fares, real-time travel information and updates were features of this challenge, along with intermediate and last mile modes requiring further attention, investment and integration and appearing overlooked when compared with the very substantial sums being spent on hs2, currently estimated at £55bn for phase 1 to Birmingham. The airport remained a strategic gateway and with hs2 passenger travel was anticipated to grow even faster than had been the case in the 30 months to September 2017. With Birmingham passenger growth averaging 12%, compared to 5% across UK airports, it was the fastest growing UK airport. Providing business with ease of access to international markets was a priority for regional competitiveness and considerable upside potential remained in terms of future developments at Birmingham Airport in the view of the companies consulted.

Summary of Sector Findings

The ***Transport Workshop*** was held 20th July 2017, a three hour discussion reviewing the online survey findings and enabling greater consideration of these as well as providing additional commentary.

Twenty one respondents took part in either workshops, online survey, face-to-face meetings or all of these activities, as listed, **Chart 31**. Of these, twelve responded directly to the online survey. A mix of manufacturers from automotive, aerospace, rail and tram, connected autonomous vehicles, electric vehicles and bicycles were represented – all that is required to deliver '*door to door*' connectivity – from supply chain and component manufacturers representing Tiers 1, 2 and 3 suppliers, to OEMs and those from industry lobbying bodies representing this sector.

Automotive Sample

Alcraft Automotive
Alucast
BSA Technologies
Clayton Equipment
Clevedon Fasteners
Conigital
Drive Midlands
EEF
Thomas Fattorini Ltd

Gilca
GKN plc
Light Rail Partners
Jonathan Lee Group
Industry Forum
Morgan Technologies
Parry People Movers
Pashley Holdings
Penso Consulting
Pre-Metro Operations
RenteCars
Sustraco
W Kings

Chart 31

During workshop discussions, it was emphasised by some businesses that with Brexit there was, at least, the chance to '*do something different*'; however, this was counter-balanced with an all-consuming '*Brexit worry*', causing uncertainty and preventing companies from performing well 'today'.

Leadership and sources of funds, both of which were available only on a short term basis, had led to a deficiency in long term planning along with no long term vision in any of the areas requiring greater certainty to ensure continued investment in capital and skills and enabling longer term promotion of this sector as a real career choice for rising talent.

Concerns over Brexit ranged from the transition period and its functionality, to 24 hour overnight access to EU markets – seen as critical; frictionless access to labour and service markets; delivering a Customs Declaration Service capable of handling anticipated numbers of transactions – projected as rising from 100m to 300m annually; planning for the cashflow implications resulting from VAT input and output implications; as well as required changes to Rules of Origin labelling.

There was a clear nervousness about the impact on investment by automotive FDI into the UK, with recent figures showing dramatic declines from £2.5bn in 2015 to £322m first half 2017 following one third declines year on year 2015-16. (15) Manufacturers suggested that if the UK did not have the access they required to the Single Market, they and others, would be forced to move offshore with resultant impact on jobs and supply chains. Recent statements by the SMMT emphasise these implications with Mike Hawes, CEO, stating that the costs regarding the implications of Brexit on the UK must be 'in the multi-millions of pounds already, including for consultants advising on Brexit implications. He stated:

"The work (following EU Referendum) is almost entirely negative because it involves looking at future possibilities all considered worse than the frictionless relationship the industry currently has with the EU....We always said there would not be an immediate closure of plants because the investments are fixed for many companies. The impact is always going to be more gradual, and you are seeing that now: prices going up, demand

softening, decisions on hold. If you weren't currently producing in the EU and you were looking to expand your presence in the EU, you probably wouldn't come to the UK first and foremost. We will rise to the challenge but ideally we want to have as many of the benefits as we currently enjoy because that has helped make the industry successful"

According to David Conn, writing in the Guardian, August 4th 2017, SMMT's most recent figures stated that 814,000 people were employed in the UK automotive industry, which turned over £72bn in 2015, exporting £34bn worth of products with 56% of car exports in total and 65% components going to EU countries (16). The SMMT reckoned that whilst larger companies were unlikely to divest from UK given large scale investments already made, there was a risk for smaller suppliers which were more 'fleet of foot'.

Sector Recommendations agreed amongst companies attending the transport workshop included:

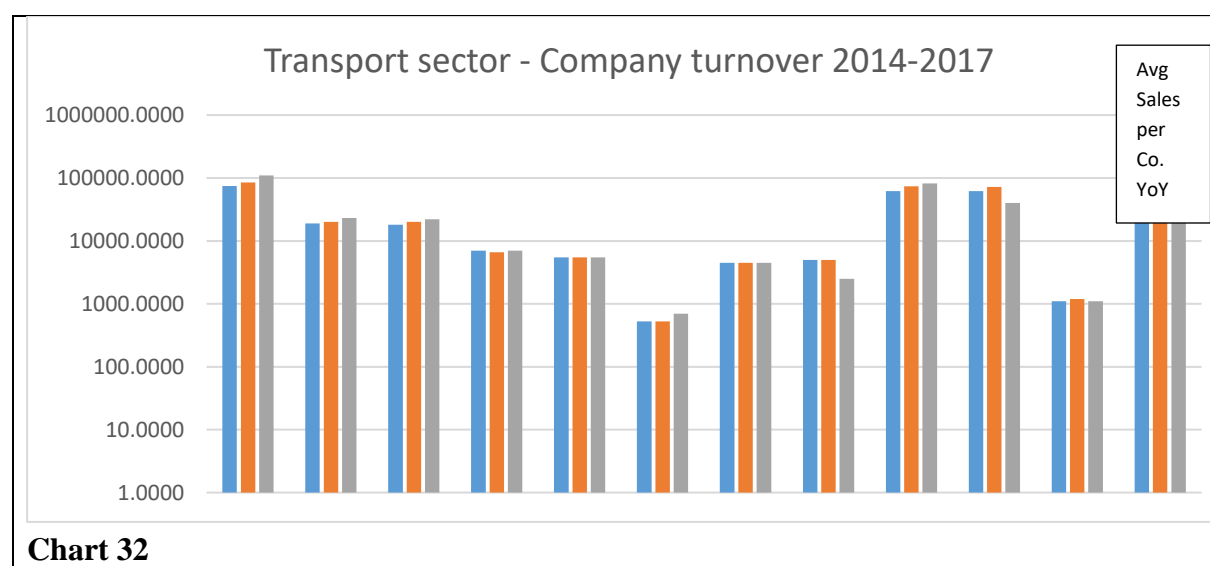
1. Delivering a '*mind to market*' culture across the West Midlands through a greater collaborative culture between education and industry. By working with schools and colleges leading to more business people entering the classroom to explain how industry worked, how products were developed and what innovations were coming through, they could help embed Industrial Strategy as part of the West Midlands culture, promote vocational opportunities and offer more insights for inclusive and 'circular' wealth creation to develop the *Self Made Place*
2. Forming a '*Regional Council for Growth*', setting out clear objectives for industry and the transport across the West Midlands and working in a proactive partnership with the WMCA, LEPs, and public sector organisations to achieve agreed targets in multiple areas such as planning, infrastructure, housing, skills, finance, business support and procurement, through a growing range of collaborative partnerships, would help to develop an '*entrepreneurial state*' across the West Midlands
3. Delivering an *Industry Foresight* initiative, building on the Science & Innovation audit undertaken by partners including Birmingham Science City, helping to portray direction of travel and scenario-led visualisations aimed at the younger generations would aim to retain emerging talent and engage a wider population in inclusive growth challenges.
4. Auditing our companies (stated as being 160k in the recent Science & Innovation Audit whilst also being estimated at c80k across WMCA area in other statistical series), identifying those companies within transport, in particular those amongst our 7k manufacturers, 350 medium-sized manufacturers, to gain greater insights of their situations and ensure they were receiving appropriate support
5. Developing a '*Careers Enterprise Company*' to develop closer links between schools and industry, whilst ensuring *Careers Advisors* with relevant industry knowledge were (legally) required to work in every school to ensure every young person had up-to-date advice on opportunities for learning and working in our region as critical skills shortages

represented the most pressing issue facing companies in the sector, with skills recommendations also included

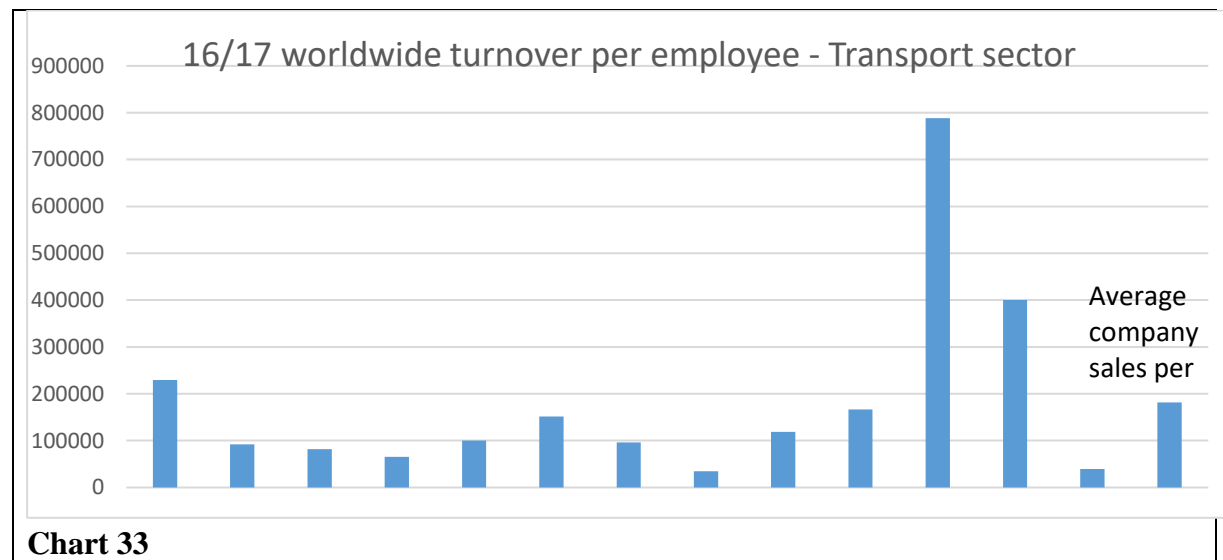
6. Promoting a *strong image* and reputation for the automotive industry, building on initiatives such as *Birmingham Made Me*, *Made in the Midlands* and *Imagineering*, by ensuring a longer term view and helping to facilitate the provision of patient finance along with highlighting *Manufacturing Beacons* able to work more closely with organisations in their localities and promoted as exemplars attracting young people into the transport sector
7. Developing greater *commercial understanding* amongst those in the public sector making decisions regarding West Midlands-based manufacturers in transport sectors – perhaps through a programme of visits and exchanges between collaborative partners and the recruitment into the public sector of more people from automotive as a key strategic sector for regional inclusive growth
8. Providing greater focus on financial, business and export support for supply chain and start-up businesses in the sector, especially through equity finance for early stage ventures with greater longevity of support providing business users with more certainty in forward planning
9. Developing greater links between research assets such as *Catapults*, *Accelerators*, *Research organisations* and *Higher Education* with *industry* to improve knowledge of *mind-to-market* challenges and opportunities
10. Building on successful initiatives promoting collaborative partnerships and greater local sourcing such as *MAN Group* and *West Midlands Collaborative Commerce Market*, www.wmccm.co.uk

Company Insights

For twelve companies participating in the survey, revenues had increased annually in the period 2014-2017 for eight companies, with average sales across all companies increasing in only two years, 2014-2016, as a result, **Chart 32**.



Sales per employee were used as a proxy for productivity, averaging £182k in 2016/17 across the sample, which included one start-up, as compared to a UK ‘revenue per employee’ average of £118k, **Chart 33**.



Customers and Services Provided: The sample provided an extensive range of products and services into internationally recognised and traded brands including Jaguar Land Rover, Roll-Royce, Aston Martin, Lagonda, Mercedes Benz within automotive, with firms representing rail and tram transport, cycling and autonomous vehicles, **Chart 34**.

Customers - Transport	Products / Services - Transport
Nissan, Honda, JLR	Metal processing
Tiers 1, 2 & 3	Precision tooling and stamped components
Rolls-Royce; Jaguar; mining and extraction; defence; aerospace; educational sector	Machine tools
JLR, Bentley, Aston Martin, Lagonda, London Underground, JLR Spec Ops, Mercedes Benz	1. Consultancy 2. Composites technologies and manufacture; 3. Special Niche Manufacture
Tier 1 to Aston Martin; Tier 2 to JLR Tier 1 into AP Racing, Tier 2 to Morgan, Tier 2 to Bentley	fully machined castings for trackside delivery
Rail & Tram operators	light rail consulting
OEMs	hot dip galvanising steel fabrications to metals manufacturers
Asser Abloy, TR Fasteners, Gripple Tier 2 Supplier	fasteners production

Tier 1 Auto and Aero supplier	driveline and torque management products; airframe structures, wiring systems transparencies
Royal Mail, Serco, Halfords, Evans Cycles	bicycles and tricycles
London & Birmingham Railway Ltd, Tier 1	Public Passenger Transport

Chart 34

Skills Shortages: This was the single most pressing issue facing all businesses. Two thirds were facing current skills shortages for technicians, half for production engineers, just under half for design engineers and a quarter for craft skills, with similar levels for modern and higher apprenticeships. For the future skills shortages of technicians rose to three quarters, with over half anticipating shortages of production engineers and just under half anticipating rising shortages for skilled crafts people.

Highlighted issues within transport companies included –

- Lack of any long term government policy stance and associated confusion regarding the status of UTCs, Academies, Technical Colleges , the Apprenticeship Levy along with Higher and Modern Apprenticeships
- Lack of long term investment by industry to support academia and lack of focus by academia on industry, with both operating as ‘*islands of independence*’
- Need to communicate industry needs more effectively to education – from formative school stages upwards
- The Brexit impact, resulting in a ‘flight of talent’
- ‘Apprenticeship gap’ as many approached retirement age with engineers of all disciplines in a critically short supply
- Vital, but diminishing, craft skills remaining essential in turning ‘ideas into reality’
- Short term impact of JLR success on supply chain, balanced, more recently by their oversupply to support local supply chains ongoing
- Delivery of engineers, with both practical and commercial skills, continued to prove challenging given narrow curriculum focus

When asked why businesses were experiencing skills shortages, companies’ responses echoed those outlined above stressing the need to promote the transport sector as a whole, communicating directly with schools, parents, young people, and gaining a higher visibility and respect:

“Firstly, we have to attract young people into the sector – it’s not always seen as an attractive option careerwise. Secondly, we have to ensure that training and development is better integrated with the sector to give the optimum blend of theory and practice.”

“Skills remain a huge issue – if ‘mum and dad’ do not believe in manufacturing then their children will not go into it. This depends on perception.”

“Skills remains a top priority. How do we get to ‘mum and dad’? We are not promoting manufacturing as it is today. Until we start at that level we will not succeed, not until it becomes something desirable. The German attitude is well understood and their manufacturing and associated professions are well-respected.”

Companies also stressed the need for greater vocational focus raising their concerns over the lack of understanding generally about the operation and remit of the **Apprenticeship Levy**, stating:

“The Apprenticeship Levy could help if people pick up on it and if larger companies are training more than they need. There has been too much university focus. We have had a lack of appropriate dialogue – there’s been a lot of ‘marketing’ from training establishments to us in business and a supply of people that do not have the skills we need. Even within FEI they’re struggling to meet our emerging needs. This is where we need to be getting to the next generation and selling our sector.”

A number of comments reflected the growing appetite for greater ‘*nuanced skills provision*’ for young adults, with apprenticeships seen as being too ‘narrow’ to deal with the wide ranges of skills needed in modern manufacturing and in particular by the vast numbers of SMEs. Connectivity was leading to greater need for craft-based work sitting alongside engineering skills. There was a pressing need for government to review strategy, along with focussing on continuous development and reskilling:

“Current work in the metals industries being done by the new UK Metals Council is demonstrating the continuing failure of government to address key issues, largely because the main business organisations that speak to government are big company-based and don’t have an effective interface with SMEs.”

“Technology develops very fast and we do a lot of work in R&D. A lot of the skills we need cannot be trained in school/college, but have to be learnt ‘on the job’ as they develop so fast. We need staff that are going to help us develop new technology and stay ahead of the game.”

“We require a lot of free thinking people... Free spirits of enterprise. They need to be very creative, producing products in a very different way. Our young design thinkers need to be more commercial and very entrepreneurial. There is a real need to get creative subjects linked into commercial markets because at some stage you have to link to reality if you want to change the world. You do have to be anchored in the real world where people want to buy something.”

“I have had a lot of second-time around people approach us for an apprenticeship, but there doesn’t seem to be any funding available for older people to come into the trade.”

The need for locally-based ‘*Manufacturing Beacons*’ was emphasised:

“The West Midlands doesn’t appear to have enough employers that draw out ‘focus and aspiration’ from our students. The perception of the automotive sector being prominent

in the south Midlands does not offer options to the Black Country based schools for instance, as access to these businesses is too remote.”

Examples of locally designed initiatives were numerous as highlighted in **Chart 35**, although the lack of coordination across the region remained a substantial issue.

Examples of practical initiatives addressing transport sector skills shortages

WMG Academy
JCB Academy
Envisage Academy
Metals Council – Vision 2030
Elite Centre for Manufacturing Training
Midlands Highways Alliance Skills Community
National College for High Speed Rail
Birmingham Centre for Railway Research& Education
Dudley Innovation Centre for Light Rail
EEF Technology & Training Centre
Engineering Industries Training Board
Salop Design Academy
In-Comm
The Access Project
Business in the Community

Chart 35

Industry 4.0: This was seen as both a threat and an opportunity – with some jobs being lost, whilst equally connecting manufacturers directly with customers allowing for significant productivity improvements. At the same time it was recognised Industry 4.0 would not eliminate the need for good engineers:

“We have invested in automation – Industry 4.0 – in our factories here and overseas. It has its advantages, but it doesn’t take away the need for the skills we have today and better. You can take jobs out, yes, but you still need people to fix the problems. We have a range of ages in our machines on the factory floor and you need people who understand these machines and who are able to fix them when they go wrong. You will always need that and people who understand the quirks of these different aged machines that keep our production lines working.”

Companies agreed on the need for a ‘more joined up’ approach between government and academia, with improved dialogue between regionally based companies and universities to better understand their skills-set requirements:

“We need to get into schools earlier. We need to act collectively, not in a random or individual way. We don’t do a good enough job at present. We need to do more where we are working one-to-one with teachers and pupils. We need a more ‘collective approach’. It is very difficult to describe what we do and simply not enough to say ‘I’m in manufacturing’. It’s a whole spectrum of skills so staff need to have a better picture of what we do. We need to capture the imagination of young people and present opportunities, differently from what we are doing now. The quality of apprenticeships

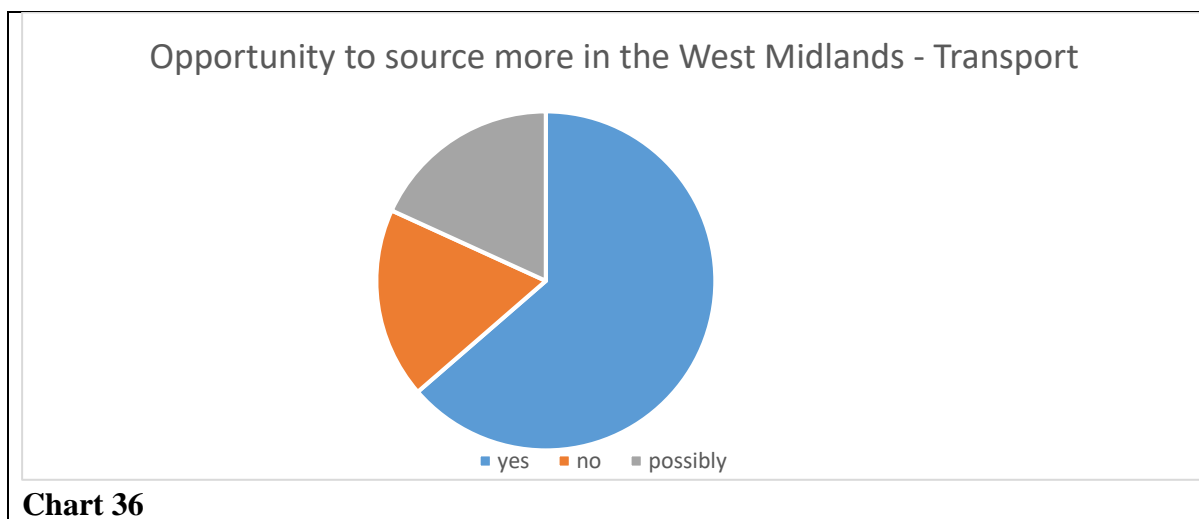
being offered is very patchy. We need to sell ourselves better. We need more insights into what young people want.”

Skills Recommendations:

- Need for WM ‘*skills ecosystem*’
- Working with schools and parents from young age to *highlight regional opportunities*
- Rebranding to improve engineering reputation and industry image (*Birmingham Made Me*’ cited as a ‘brilliant initiative – based on the history of Birmingham, with exhibitions, trade fairs and having a very big impact’; ‘*Imagineering* was a great initiative – really brilliant’)
- Providing careers advice, especially relating to careers based in the region through a *Careers Enterprise Company* as a means of coordinating the many LEP, JCP and other initiatives across the West Midlands and to ensure all schools have careers advisors
- Delivering more ‘*parity of esteem*’ between further and higher education provision by creating a shared regional clearing system working with local employers for degree and apprenticeship applicants in subject areas of greatest employer need, and deliver transparent quality assurance for apprentice qualifications
- *Paying off tuition fees* to retain bright young people
- Undertaking detailed *overview of future skills* needs across region
- Delivering greater focus on *STEM skills* training with practical focus drawing on industry associations including *IMechE, EITB, EEF* to work on curriculum design
- Scaling up initiatives which have worked, such as the *Skills Factory*, focussed on upskilling with others including *Cast Metals Federation*, illustrated **Chart 35**
- Promoting ‘*Manufacturing Beacons*’ as local exemplars for schools
- Promoting *craft skills* as essential element of connected experiential economy

Sourcing and on-shoring: Over 60% of firms felt there was an opportunity to source more in the West Midlands, **Chart 36**.

Referred to as a key area of concern and opportunity for those involved in the transport sector, comments highlighted the need to devote greater focus on attracting more Tier 1 producers, the businesses producing engine block or driveline elements, carburation and fuel system, fuel rails, electrical systems, all of which had ‘drifted away’ due to greater policy focus on services and the inconsistency of government policy towards the manufacturing and energy sectors.



Manufacturers welcomed the recent on-shoring focus which had led to JLR sourcing at least 50% of its components from within the UK and wider Midlands, compared to the national average of around 40% for the sector. Companies reiterated the need for a more concerted effort to understand existing operators within the supply chain, gaps in regional capability, opportunities for greater value add and diversification. This would, they estimated, enable more informed and proactive overseas recruitment, helping to meet supply chain needs whilst also highlighting the continuing difficulties of accessing appropriate patient finance to support growth plans for West Midlands-based manufacturers seeking to develop ‘closed loop’ value chains. These were providing greater flexibility, quicker lead times, lower levels of vulnerability to natural disaster and international events, greater visibility into quality control and more opportunity for co-development and collaborations on new products.

In light of sterling depreciation post the EU Referendum, increased costs were directly impacting companies’ profitability with price rises on imported components also leading to greater levels of off-shore sourcing. One producer commented that if prices had remained competitive they would have been able to source an additional amount from suppliers across the West Midlands, equivalent in value to at least 30% of total turnover. Many comments referred to the need for greater competitive pricing and timeliness in supplier input.

Closer networking opportunities were seen as important to stimulating more local sourcing – with examples of industry specific organisations cited including *Industry Forum*, *Drive Midlands*, *EEF* and *Black Country Chamber of Commerce* directly involved. Companies also repeatedly stressed the need for government procurement contracts to include ‘local content’ stipulations, They were unable to comprehend how Germany managed to draw on regional and national sourcing as a means of driving growth amongst their powerful ‘mittelstand’ in spite of frequently quoted OJEU rules, with their medium-sized companies regarded as the foundation for their manufacturing competitiveness and providing the bulk of vocational and apprenticeship training across a range of sectors together with quality jobs for local people. Amongst the transport sector the lion’s share of small and medium-sized employers were employing well over 60% people from within their localities, most usually over 90%, but were also conscious of the need to develop greater links with local trainers, colleges and schools.

Development of an Enterprise Company was cited as a priority to bridge this gap. Initiatives such as *MAN Group* and *WMCCM* were seen as a practical means of promoting greater focus on bringing together local networks facilitating collaborations.

Case Study: MAN Group

MAN Group is an innovative alliance of 11 companies operating within numerous supply chains, including transport and renewables, who have joined together as suppliers to share best practice and create a stronger combined force when tendering for contracts. They each pay an annual subscription, which when combined amounts to £100k a year, contributing to a small admin capability, marketing and promotion. The companies involved promote their mutual services through their own sales teams alongside a web presence. Business profile has increased significantly and they have gained over £1m additional sales for participants. One member business, Alucast, gained automotive accreditation TS16949 by working collectively within this group. Tony Hague, MAN Group Chairman and CEO, PP Electrical Systems stated:

“MAN Group has been set up as a non-legal membership entity to promote, market and develop business for its members. All members have complementary skills bases so that no two businesses compete directly with each other. I do see great opportunities for business, especially in some areas such as wind turbines.

“I am just back from a three-day visit to Meet the Mittelstand in Germany. If we look at how their supply chains are so joined up and financed for the longer term there – there is simply no comparison between us. In the UK we tend to have lots of little initiatives, not joined up, that come and go, running out of money, energy and steam. It is all very disjointed.

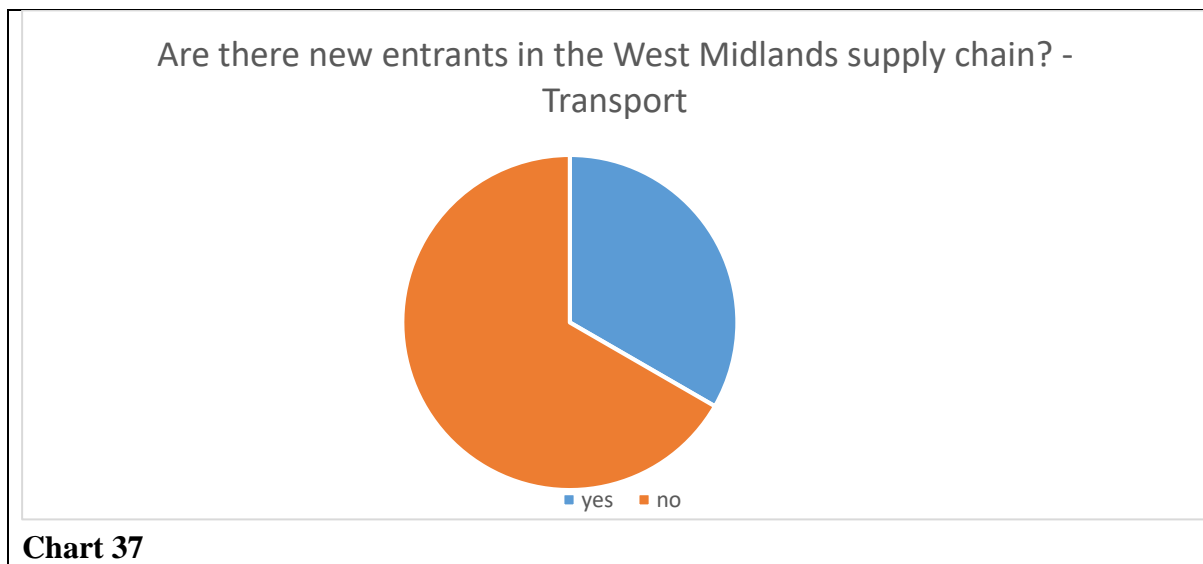
“We really do need initiatives that will carry on regardless of the colour of the government. We need continuity and clarity. We would like to be ‘worked with’ rather than ‘done unto’. It’s really about getting things done properly and in a business-like manner if we really want to change the picture and improve the chances for younger people coming through.”

Case Study: www.wmccm.co.uk

The West Midlands Collaborative Marketplace (WMCCM) at WMG has around 13,000 businesses registered as members of an innovative virtual business network leading to sales of around £6bn, with over 50,000 tenders per year flowing through the system and with over 20,000 users resulting from supplier collaborations and procurement tenders successfully won by companies making bids through this online network established in the early 2000s. The World Bank recognised WMCCM’s capacity as a new business incubation system and has been using it as an exemplar virtual business incubator in their training material. Professor Bal explained:

“Our members are three to five times more likely to get enquiries from this site than they were prior to registering. This is because of four elements of the functionality : 1) The system generates new business enquiries and is highly ranked by google and search engines. Tender feeds generate real business leads for members with each tender automatically analysed to identify the capabilities required to execute it. 2) Competency profiles were constructed for member companies, “Not just what you do today but what you are capable of doing”. 3) These are matched to tender requirements automatically by the system. The team recognised that Tier 1 businesses weren’t building the whole product themselves and increasingly many smaller businesses needed to collaborate and get a foothold in valuable tender generated business contracts. The system feeds tenders to companies it recognises as having some of the capability and skills required for any tender being circulated. 4) Member companies can assess if they want to cluster together and collaborate with other businesses to respond to the tender. The system will match them with ‘compatible businesses’.

In spite of perceived opportunities for on-shoring, there were not many new entrants coming into local supply chain, **Chart 37**, although this activity was slightly higher within the transport sector than across all three sectors at 33% compared to 27% for all sectors.



Business Support

The failure of business support to actually support local, home grown business in reality, was highlighted across the transport sector as the most mentioned issue, ahead of skills shortages cited by two thirds of businesses compared with over half when focussing on barriers to competitiveness, with operators emphasising the need for:

- Greater funding percentages in business support grant funding
- Longer term approach rather than constant 'reinvention'
- Greater focus on and understanding of local companies including an audit of regional Programmes to improve business capability based on informed knowledge and insight
- Reduction in bureaucracy and complexity of grant funding applications
- New innovation funds, such as those provided by Innovate UK, providing critical support for new developments and business start-ups
- Reassessment of funding for companies sitting below Tier1
- Public procurement focussed on local and regional sourcing with mandatory requirements for certain contracts with national and regional significance in light of contracts too often going to suppliers based out of the country – e.g. HS2, Cross Rail

Typical comments praised certain schemes which had been cut short and focussed in general on the lack of any quality in current business support, stating:

“Business support ended in 2008/09. We have seen nothing really since. There is far too much talk of support and far too little action. FDI can get support. Helle in Redditch or Mazak in Worcester which were given £ms to build a state-of-the-art factory 20 years

ago when we were on our knees as our PM at the time had said we're not doing manufacturing anymore. We have paid a fortune to bring our competitors over here."

"Some national schemes such as *Long Term Automotive Supply Chain Competitiveness Fund* – money from EU given to *SMMT* to work and deliver improvements in Auto supply chain as an initiative between government and *Automotive Council* -- have been a success. This was initiated to improve the auto industry in the UK and ensure our supply chain was beefed up -- all the more important now with Brexit hovering on the horizon. It was a very good scheme and the *Automotive Council* seems to have a good handle on what's required....If you give someone loads of money as a government you should say that X% of parts purchased should come from local business. They say they are giving value to the taxpayer but forget the cost of putting people on social security payments."

"Sometimes the business support can be overly risk-averse and bureaucratic to the point of becoming disruptive. They say 'you are too successful so you cannot be supported'.... Or the form filling can be so off-putting to SMEs they don't bother. In FR, GER, SPA, they would say – just sign on the dotted line. They put too many blocks in the way here. To me you should reward success. Why give someone money who is going to fail and not deliver jobs? There was one instance where we had a bank involved responsible for delivering grant aid in the Midlands. They took us through a six month application and then eventually said 'No'. This was a 'long no'. We wanted to expand the business to build a new factory. Subsequently we have had help but it was two or three years later and this slowed us down our expansion."

"As soon as we hit the recession the bank wanted Personal Guarantees. We are so short-term in the UK and have been for years."

"Have had some very helpful support from Wolverhampton University. They helped us buy a waterjet which enabled us to go forward with an order with JLR. They also helped us buy our factory as well as being very helpful with R&D and technical support."

Tier 1 and Below: Within automotive, funding had become more of an issue as cashflow considerations had resulted in OEMs pulling back funding support for tooling investments provided in previous years.

Recommendations made to support SMEs included:

- Greater upfront or pro-forma payment on order placement, along with recognition by OEMs of their need to support Tier 1s, SMEs and those operating in their supply chain
- Increased access to funding to assist with order fulfilment
- Improved access to asset funding and innovation grants

The importance of the **supply chain** was recognised as being key to ongoing success.

Comments outlining the challenges faced included:

“Small and Medium-sized companies and start-ups within our supply chain are vital to us and key to our innovation. Twenty one companies are critical along with their IP. We need to make sure SMEs are well-supported and can grow. MAS (Manufacturing Advisory Service) was good in ways but even with MAS the bureaucracy was poor.

“Some people really do struggle here and JLR, Ford and a lot of other businesses just do not fund tooling and it’s never going to come back. That means you’re only likely to see this funding after two years following your investment. You can get this funding from a bank but they will charge you with interest. We invoice on the basis of one thirds – one third when the tooling investment is made, one third when get pre-production approval – so that way at least we get 66% reasonably upfront, whereas Tier 1s will now have to fund all this themselves.”

“OEMs and Tier 1s have a responsibility to help ensure that supply chain companies below them are able to finance their growth, but in fact they have become ‘banks’ financing the larger companies and this is a ridiculous and unsustainable situation.”

Competition and start-ups: In transport, as a more established sector with generally higher barriers to entry, there were lower levels of competition with respondents commenting on much of the start-up activity being based within local subsidiaries within the regional supply chain.

Access to finance: Over half transport companies found it difficult or very difficult to access finance for growth commenting on the need for greater access to patient finance and with only 15% finding it easy to access required finance for growth, **Chart 38**.

Suggestions for Supporting Companies below Tier 1 access funding for development
- Get paid Upfront
- Access to asset financing and grants
- We have received several government support (Innovate UK, Finance Birmingham, LEP, APC etc) to support us in new innovation and advances in technology which has been very helpful
- Some companies really do struggle here and the OEMs just do not fund tooling and it's never going to come back. We do 1/3rd when get order; 1/3rd when tooling made and 1/3rd when get pre-production approval. So at least get 66% reasonably upfront, whereas first tiers would have to fund all this themselves.
- Tier 1 companies have a responsibility to help ensure that supply chain below them is able to finance its growth, but in fact what happens is we become the 'banks' financing the larger companies and this is a ridiculous and unsustainable situation.
- Tooling via the government bank scheme needs to be massively simplified - this type of scheme should be replicated via non-overly admin based schemes.

Chart 38

New product investment activity: one third company turnover was generated from 40% or more new product sales over the past three years, with a further 30% sales from 20% new products indicating high levels of investment required and active competition to gain and retain

market share. However, competition was highly focussed, with half the sample citing 10 or fewer competitors in their market segment.

Start-up initiatives: Examples included *E-Spark* run by RBS providing space, mentoring and seed funding which was welcomed. *Made in the Midlands* and *MAN Group* were noted for good work in supporting the transport sector. It was noted in general that there was next to government support being provided and apart from some limited initiatives, banks were generally not supporting new investments and new innovations. Government was seen as being solely focussed on productivity and jobs generation, not the lives of residents or any real focus on inclusive place-based developments. Most manufacturers did not ask for any support or funds as they were too difficult to access and ineffective to meet their business needs.

In spite of this disruptive innovations were taking shape, such as with *RenteCars*, looking to launch a new electric taxi service with vehicles leased by users on hourly, daily, or weekly rates.

Conigital was developing its business model based on ‘pay per click’ activities aimed at users within the connected and autonomous vehicle market and were working with Westfield Sports Cars. Westfield had already developed autonomous PODs being used by Heathrow Airport and transforming the way they had moved over 3.5m passengers around the Airport since their launch just two years ago. The Heathrow POD Platform had completed over 5.5 million kilometres of commercial service work and exceeded the distances covered by the well-known google driverless cars covering, to-date, over 3 million kilometres on public roads. More recently *Westfield Sports Cars*, the successful recipient of *Innovate UK* grant funding helping it to develop its radical innovations had secured a £30m export order for five autonomous electric PODs for initial testing from North Gyeongsang, a South Korean regional government, with automotive exports to South Korea having increased five-fold, making it the UK’s eighth largest export market outside of Europe – up from 16th in 2009.

Barriers to growth: Brexit and its impact was a cause of considerable concern to those operating in export markets within the transport sector, especially those companies whose business models had been built on the basis of ease of access to European labour and/ or service markets along with access to the Single Market, with overnight access to European markets stated as being essential for automotive companies in light of their supply chains spanning the continent.

For those with a large percentages of exports going to the European market, retention of frictionless access was considered essential. ‘JLR has to get a deal to stay’, was the generally held view, with tariff-free access seen as a ‘big deal’ through the Single Market or Customs Union. Greater certainty on the impact to legislation was a priority, along with clear messaging on the terms of reference for UK departure. It was noted that both Canada and Australia had proposed off-the-shelf trade deals through NAFTA or TPP, with Japan prioritising completing its trade deal with the EU ahead of any negotiations with the UK – although South Africa was prepared to discuss terms with the UK prior to Brexit and the European Court of Justice

surprised British trade negotiators by ruling that would make it harder for national parliaments to block key components of any future post-Brexit deal between the EU and the UK.

Businesses requested:

- More insight into likely specific outcomes for auto and manufacturing
- Clarity over medium-term implications for their sector
- Keeping government out of the Brexit negotiations passing this element over to larger business consultancies
- Avoiding, as far as possible, importing any inflationary impact on prices through supply chains
- Continuing to invest into construction and infrastructure
- Ensuring follow-through with the Industrial Strategy
- Retaining compliance with European BS EN Standards, seen as preferable to compliance with US standards, with particular concerns voiced over the potential impact of Non-Tariff Barriers
- Retaining freedom of labour movement, seen as being of paramount concern to businesses
- Retaining freedom of movement for services
- Kick-starting the economy through public private sector collaborations to drive prominent investments into innovations, for example into new areas of manufacturing and engineering such as those relating to sustainability, lower emissions and clean air, energy storage and user experience.

Brexit impact: Great concern was expressed over the falls in investment into the UK automotive sector, amounting to just £322m H1 2017 compared to £2.5bn full year 2015 and £1.66bn full year 2016 representing a one third decline during the year following the EU Referendum vote and the lowest investment since 2011. If second half 2017 was around same levels as first half, investment in the sector would have reduced to a quarter of 2016 levels, with the vast majority of the £322m spent in the first half of 2017 coming from a £240m investment to install new tooling in Toyota's Burnaston plant in Derbyshire.

Mike Hawes, CEO, SMMT was reported in the FT 2nd July 2017 as stating:

“It's very difficult to cost investment if you don't know what your output price is going to be. The industry wants a lot more certainty.” (15)

Although automotive output had enjoyed record highs for the past decade, SMMT reported in July 2016 that UK automotive output of UK had fallen almost 10 per cent in May compared with the previous year, the second straight month of year-on-year decline. With carmakers bidding in competition with other plants worldwide for new models, UK makers including Nissan, Honda, Toyota and Vauxhall, had seen their future investment decisions, including new model allocation, thrown into uncertainty following the Brexit vote. BMW hinted recently that the electric Mini may be made outside the UK, stating:

“The result of the EU referendum creates uncertainty for the automotive sector in general and for overseas investors in particular. Uncertainty is not helpful when it comes to making long-term business decisions.”

Nissan pledged to make two of its future models in the UK last year, but only after a range of measures was pledged by the British government guaranteeing that the carmaker’s Sunderland plant would be insulated from the effects of Brexit. The government has never disclosed the assurances given to Nissan.

The SMMT was reported as remaining concerned that Britain’s 57 free trade deals with other countries as part of current EU agreements would also fall away after Brexit. Mike Hawes expressed frustration over the views expressed by Brexiteers, including Nigel Farage and Boris Johnson, that the German car industry would press Angela Merkel to give Britain a good deal because they exported in such significant numbers to this country – a view they had not discussed with the SMMT prior to promoting it. The SMMT had consistently called for Britain to remain in the Single Market or the Customs Union, until any new trade agreement had been implemented with the EU, but the industry was very much of the view that it was better to remain in the EU. He said:

“We consistently said do not expect that. The European market and to a certain extent the European project is more important to them than the UK, so they want to safeguard the four freedoms which benefit them. If any sector has really benefitted from growth and development across Europe it’s the German car industry. It is frustrating and it also reveals a lack of understanding of the way markets operate. From our point of view we would be better off to stay. If the electorate decide they maybe didn’t understand the economic arguments or didn’t appreciate how severe the impact was going to be and we need to revisit this, then we will make clear again what the situation is.” (16)

Toyota, which had been producing cars in the UK since 1992 at its Burnaston plant in Derbyshire where the Auris and the Avensis models were manufactured, had also warned in September 2017 about ongoing uncertainty over Brexit and its impact on their investment intentions following announcements made in March for a £240m upgrade to their Burnaston plant, having received assurances from government about the direction of Brexit.

Toyota Executive Vice President, Didier Leroy, stated that ongoing uncertainty could lead them to shift some UK production elsewhere if the direction and timetable of the talks were not addressed. Whilst early government assurances that free trade with the European Union would survive Britain’s exit had reassured them, these had been replaced with references to a ‘transition period’ and they could not wait forever before deciding whether to build a new model at the Burnaston site.

Didier Leroy said, speaking to Reuters, Sept 14th 2017:

“A few months ago the UK government was saying, ‘We’re sure we’ll be able to negotiate (a deal) without any trade tax.’ They are not saying that any more. It’s clear that if

we have to wait two to three more years to have a clarity on this topic, we will have a big question-mark about our future investment in the country. We cannot take this kind of decision before we have clarity on the future trade relationship. We will not close the plant tomorrow morning, but if in two to three years we have to decide some future investments, of course the key point will be the competitiveness of this plant in future. The longer we have to wait, the more potential there is to move to another factory.” (17)

Barriers to Export: Companies looking to export commented on ‘patchy’ levels of support from DIT, with too little commercial, market knowledge based on or within overseas territories, this was in spite of the reported push to help British companies export overseas through schemes such as ‘*Passport to Export*’ and subsidised trade missions. In the recent *MHA Manufacturing and Engineering Annual Report, 2017/18*, 62% of their sample of 460 companies reporting nationally found exporting assistance from the government ‘useful’, compared to 38% who felt the help was not useful and which figure represented a 26% increase over their 2016/17 survey results.

4. CONSTRUCTION

Value of Construction and Overview: Although the construction industry represented about 7% of GDP, businesses considered it was not viewed as sufficiently 'strategic' by government in the sense of its contribution to overseas trade or development of exportable technologies. They highlighted:

- Construction's contribution to the domestic economy was also considered to be underestimated by government, although projects like HS2 and Hinkley suggested that major construction projects were still viewed as a lever for domestic economic stimulus
- The recent ARCADIS report, *Building Homes - Making Places*, 2017, articulated a case for the economic benefit of housing construction stating this to be equivalent to £316k per house built, with the economic benefit of building each home outstripping the cost of building them by 2:1.⁽¹⁸⁾ This ripple effect was generated through every newly-built house contributing £250,000 directly through job creation and taxes, with £53,000 contributed to businesses through direct spending, and £13,000 going into local communities through increased investment in local services, **Chart 40**
- The house building industry drew on a complex network of supply chains and contracting relationships, bringing together a vast array of trades, specialists and skills, from large manufacturers, right through to sole traders. The breadth and depth of these meant that domestic spin-off benefits from house building activity were far greater than for many other economic sectors as noted in the extract commentary from the Redrow 2017 Annual Report, below. Trades covered a wide range of craft-based activities including joiners, plumbers, carpenters, electricians, landscape gardeners, plasterers, painters, glaziers, installers and servicers, all impacting quality of life regionally.

Redrow Commentary, extract, Annual Report, 2017:

"The continued growth of the business has meant we have again expanded our workforce adding 228 new direct jobs, a 12% increase in the year. We now employ 2,200 people directly with over 30,000 jobs supported in total through our subcontractors and suppliers.

We continue to meet our commitment to having 15% of our workforce in training and development. A record number of 150 apprentices, trainees and graduates will join the Group at the start of this new training year."

- The vast majority of goods and services used in the sector, over 80%, were purchased and originated in the UK with the construction sector importing just 10% of supplies, compared for example to UK car manufacturing which imported around half. For every £1 spent in construction a multiplier of around 1.5 was generated in the supply chain and a combined employment multiplier of 2.5, according to EY and CEBR. There was a clear need to

support and invest in the sector in a post Brexit economy and to question the role of lightweight steel housing and other imports seen as ‘quick fixes’

- Whilst infrastructure and homes built in the UK were not exportable, Britain did have a reputation for exporting construction intelligence and knowledge overseas through infrastructure consultancy and construction project management expertise – it was noted that an increasing number of the UK’s civil engineering consultancies were owned by overseas groups, although staff numbers in the UK remained buoyant
- Infrastructure construction, mainly commissioned by the public sector, typically operated on low margins – 2% to 3% at best. The high profile problems of two of Britain’s biggest infrastructure contractors (Balfour Beatty and Carillion) served to underline the industry’s problems in the public eye and led to a perception of an industry and its actors being troublesome and of low economic value. However industry representatives outlined the difficulties of innovative developments or longer term supply chain relationships in this environment
- The issues of low margins extended to companies constructing private sector buildings for developers – where the construction element of the value chain could be seen as a necessary evil in relation to the development opportunity that existed in terms of land value uplift and lease/rental of floor space. Construction was a cost to be kept down, whilst land value and rent were to be maximised
- The segment of construction that did make higher margins was house-building where builders were able to exploit the land value uplift of land purchased by building on it. Again though, the construction cost was minimised to support maximum gain from land value uplift and house sale price, impacting on design and innovation potential
- The squeeze on ‘Tier 1’ supplier construction prices in each of the scenarios above resulted in a squeeze in prices throughout the supply chain. Even where ‘Tier 2 and 3’ supply chain margins were in the position of being able to be kept high during pricing – because of niche service or even ‘price norm’ – suppliers could suffer from late payments from squeezed Tier 1 suppliers that caused cash flow problems and eventual insolvency
- All of the above contributed to the view that construction was volatile, problematic and to be avoided as a career – unless operating as a well-paid professional in the industry or perhaps as a tradesman at micro-level, where opportunities for self-employment were high and there was the opportunity to establish relationships with a wide base of customers who were likely to be known as reliable payers.
- The value of the construction products segment of the industry was considered to lack investment as it was not traditionally seen as an export opportunity or an opportunity to develop and exploit new technologies – e.g. renewable energy storage, or buildings management systems, light weighting
- There was a movement to increase the adoption of technology within infrastructure and buildings construction – the former were limited by the market practices of public sector procurement which made investment decisions unattractive. The latter were limited by the value of houses or buildings being primarily attributed to or marketed by location, size and capital cost, as opposed to innovative lifestyle or whole-life cost features that could form part of an export industry.

- National Construction output value was estimated at £151bn in 2016. Of this, 41% was spent by the public sector, with the bulk of this on housing build, repair and maintenance, amounting to 23% of the total, with a further 18% of total spent on infrastructure development, **Chart 39**.

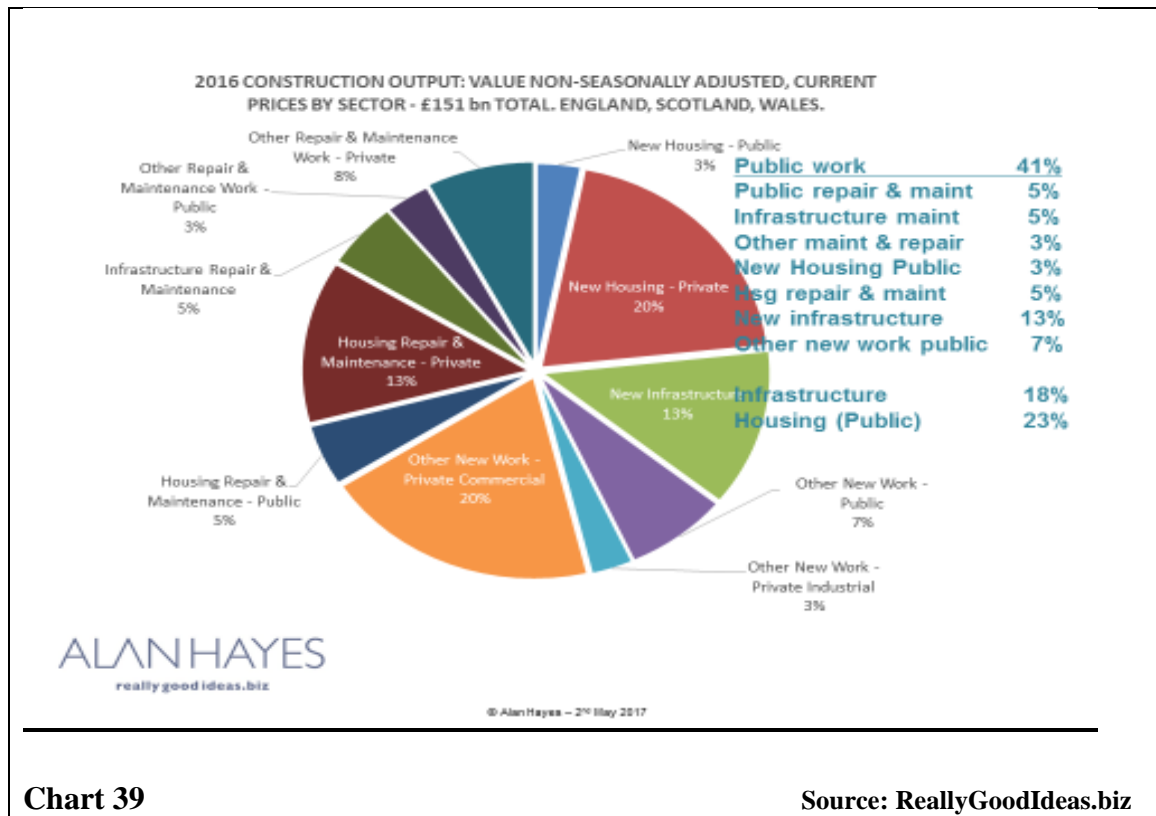


Chart 39

Source: ReallyGoodIdeas.biz

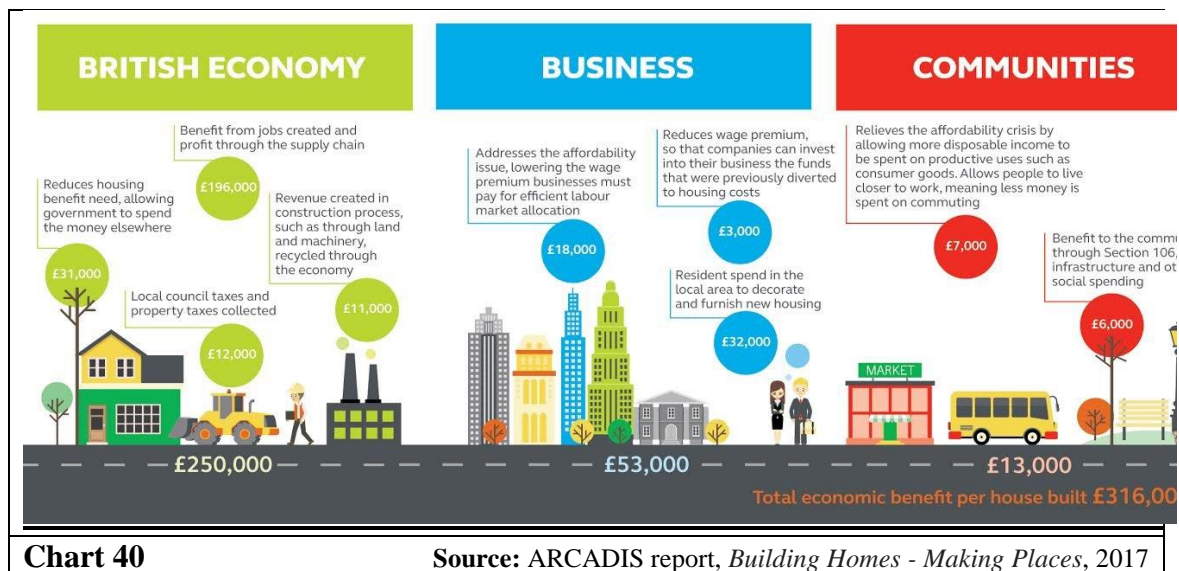


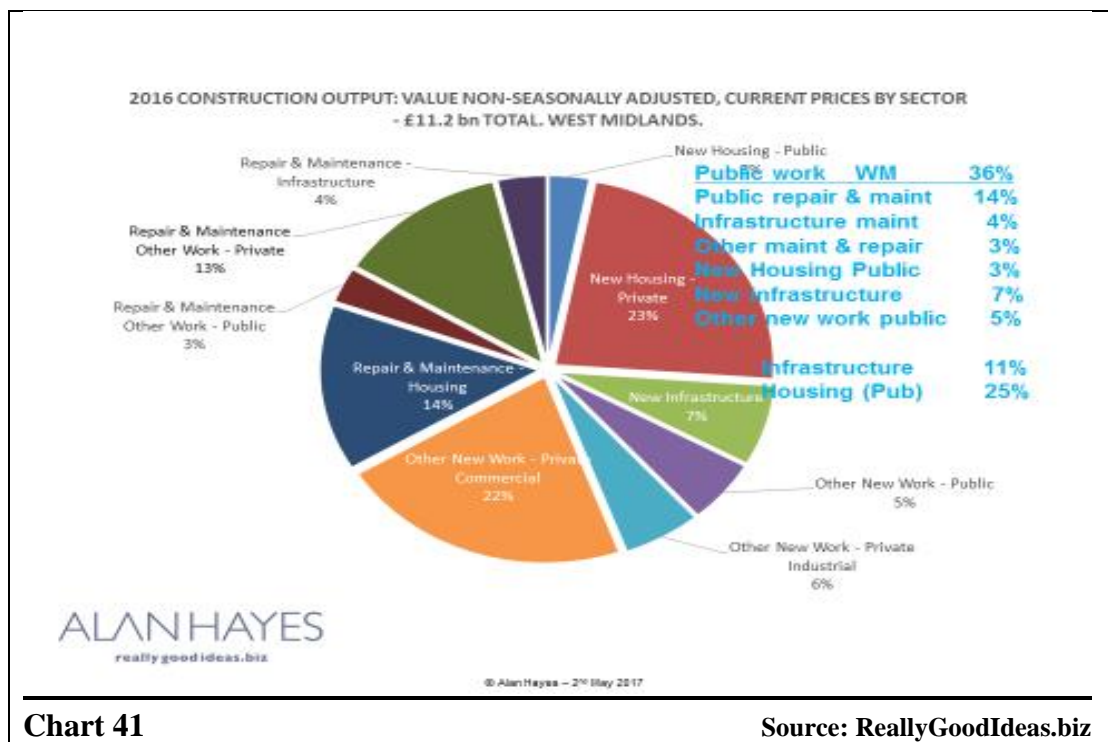
Chart 40

Source: ARCADIS report, *Building Homes - Making Places*, 2017

In the West Midlands total construction spend amounted to £11.2bn in 2016, **Chart 41**, of which 36% was spent from within the public sector. Infrastructure accounted for 11% of public sector spend and housing a further 25%. Across total spend, ONS figures suggested about 40%

was on housebuilding and 49% on buildings of other types (offices, factories, schools, etc). Businesses emphasised the importance of this sector within any regional economy impacting as it did in three main ways on regional success through investment on:

- housing (and the wider construction) sector
- housing wealth on consumption behaviour
- the economic competitiveness of our place



- The problem of housing affordability was having a negative impact on the West Midlands competitiveness, with companies complaining about their ability to attract and retain mid-range skills and management. New housing, along with other developments, was crucial in helping to support investment in local infrastructure, including transport, public realm, and social and community facilities. Similarly, the delivery of new housing played a critical role in bringing forward sites for economic and commercial development, creating new jobs and economic growth, **Chart 42**.
- The housebuilding industry (and construction industry more widely) provided a crucial labour market entry point for young, lower skilled workers and those moving out of unemployment, and supported significant numbers of Apprenticeships each year. The construction industry as a whole (as well as house building more specifically) relied on a high degree of subcontracting to specialist firms to carry out the bulk of housing construction on a site-by-site basis.

National Housebuilding Employment	Totals
Total Direct employment supported (i.e. by house builders and their subcontractors)	233,300
Indirect employment supported (i.e. in the house building supply chain)	116,650 – 181,970
Induced employment supported (i.e. in the wider economy)	235,630 – 191,310
Total employment supported (direct, indirect and induced)	585,580 – 606,580
<i>Source:</i> Summary of House Building Employment Source: NLP analysis (based on the range of sources and employment multipliers)	Chart 42

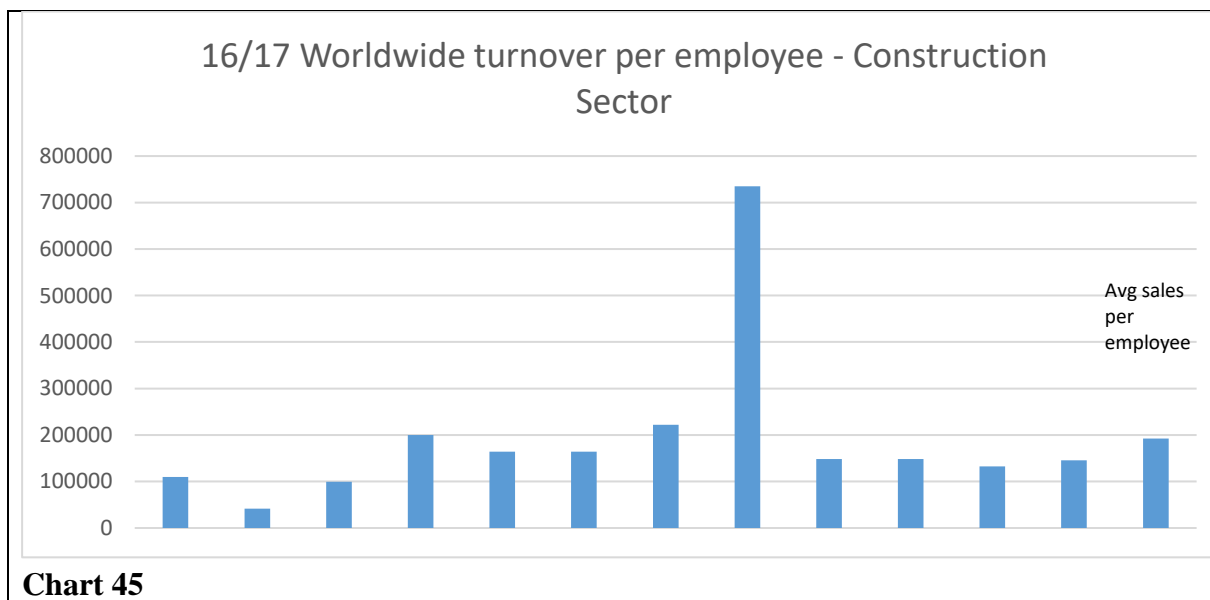
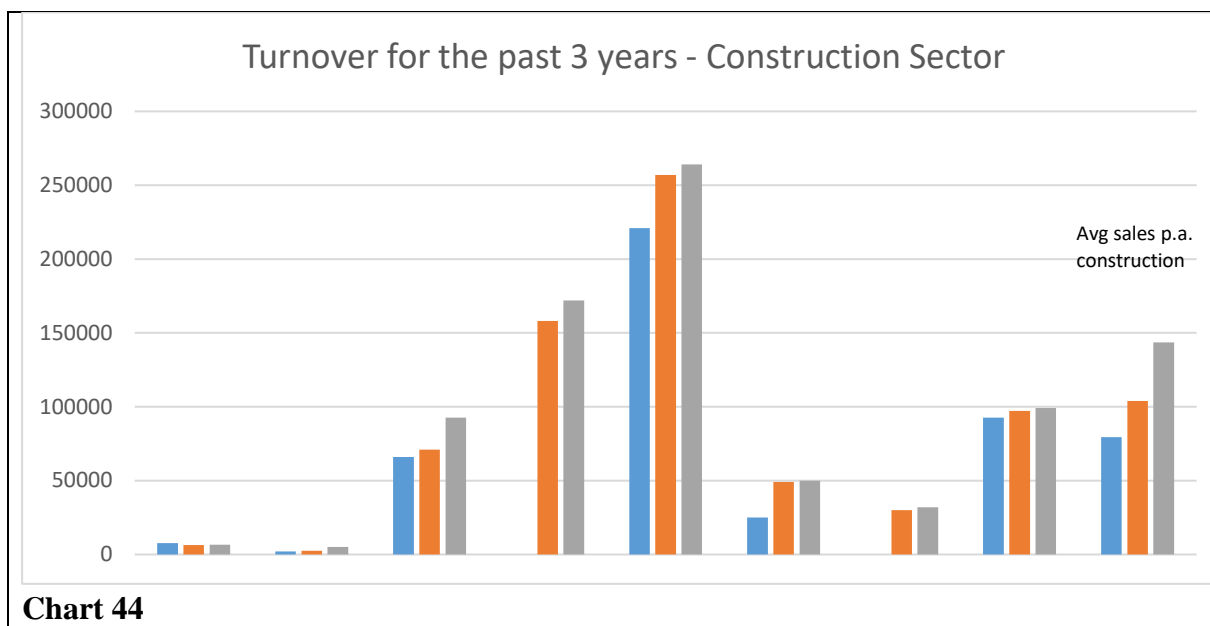
Construction Sector Findings

The Construction Workshop met 5th August 2017, and overall fifteen companies and representative organisations were consulted, **Chart 43**, covering infrastructure, housebuilding, office/factory construction, and including a regionally headquartered builders' merchants. Despite the challenges within the sector those represented had delivered annual increases in revenues over the past three years, **Chart 44**. Sales across the sample had increased 30% during the three year period, 192,702 were employed worldwide and average sales per employee amongst the companies was £193k per head, compared to the UK average of £118k, **Chart 45**.

Construction Sample

Aggregate Industries
Building Alliance
Carvers Builders Merchants
C Brandauer
Colas
Colemore Tang
Hodgkinson Builders
Marley Eternit
JRL Midgard
Midlands Heart
National Federation of Builders
ReallyGoodIdeas.biz|
RPServices
Webster & Horsfall
Wedge Group Galvanising
Wolverhampton University BECCI Programme

Chart 43



The companies responding were working with a range of brands representing the industry and producing a wide range of goods and services, **Chart 46**.

Customers - Construction	Products and Services - Construction
Galiford, McCarthy and Stone, Bowmer and Kirkland, Futurers Housing Group	Social Housing, House Building and bricklaying services
Tier 1: 70% by value	Hot dip galvanizing, steel fabrications to metals manufacturers.
SIG Travis Perkins Jewson Tarmac Wincanton Hanson Moelvan Versowood	Roofing materials

Tier 1,2&3	Precision Components	Progression	Tooling	and	Stamped
Transport for West Midlands Products	Midland Quarry	Highway maintenance engineering	Traffic management	Civil	
Highways England	Crossrail	HSR2	Barretts	concrete	
Bellway	McCarthy & Stone	Chart 46	Aggregates	Readymix Concrete	Asphalt
			Concrete products -	Bradstone, Charcon	Cement
					Precast flooring

Those attending from the sector were motivated by the urgent need for new homes – targeted to double by 2020 by the newly elected West Midlands Mayor for the Combined Authority, Andy Street - along with the associated connectivity and infrastructure required. There was clear demand for new homes but numbers coming forward remained problematic. This could be for reasons associated with available land with planning permission, or could be associated with developers taking a strategic approach to releasing the land available. Concerns were expressed regarding the ‘big seven’ – *Taylor Wimpey, Barratt, David Wilson, CALA, Persimmon, Berkeley Group and Bovis Homes*, whose large land banks were failing to be deployed to meet underlying demand for new homes following decades of under supply. Bovis Homes in its latest annual statement, 2017, noted that the average cost of each consented land plot was £52,000 with the average consented land plot valued at selling price at £276,000.

Companies felt that the big seven were able to operate more flexibly on their own terms with more control over their end product. They were able to purchase land more easily, decided when and what to build on it – subject to planning approval. And this put them in an advantageous position at the current time when a lot of people needed homes with interest rates and government schemes making them more affordable, whilst recognising considerable issues around sufficient availability to meet overall demand.

The infrastructure side of construction was, by contrast, not in control of its product – it had to respond to government tenders. Frequently this was limited by public spending concerns and political indecision and uncertainty around economic return.

An article in Construction News, September 2017, highlighted calls by industry leaders for ‘fundamental change’ to improve collaboration and risk management following the publication of the CN100 index covering financial results from the UK’s largest contractors. It showed that ranked by turnover the top 100 contractors – including Balfour Beatty, Carillion, Kier and Laing O’Rourke – posted a combined turnover of £31.9bn with a pre-tax loss of £52.9m or an average profit margin of -0.5%. National Infrastructure Commission Deputy Chairman, Sir John Armitt called on contractors and clients to collaborate further to manage risk on projects more effectively stating:

“The dilemma is there needs to be a fundamental change if you are going to see a reduction in the risk taken on by contractors and that can only come from clients. Clients have got to come to terms with more collaborative forms of contract and they need to recognise that if contracts are going to have a sustainable business, taking work at 2% margins is not sustainable for them or their shareholders.”

Of the housebuilding side of the industry the *Farmer Review* observed:

*“The industry’s low level of self-esteem and poor image is further reinforced by the generally poor relations it has with its own clients. It is in many quarters not valued by commissioning clients who accept and often even plan for poor performance. It is often seen as a ‘necessary evil’ in the value creation chain. **This is reinforced in the real estate market where land promoters and traders whose model is purely to secure planning consent related to speculative-led land value uplift, and who see physical development of built assets as a risk diluting returns and not a value adding process.** That is a sad indictment of the industry’s standing as part of the wider built environment planning, creation and operation cycle.”* (19)

Linking design through to construction from early stages with the aim of providing greatest user satisfaction was seen as part of the solution. Sir John Armitt had noted the ‘irrational’ approach to design and construction with too few projects involving main contractors in building design at an early stage, noting that ‘all other industries have integrated design and manufacturing teams’ which lay at the heart of delivery of a successful product. (20)

Infrastructure appeared better networked in terms of policy representation. The housebuilding sector appeared more fragmented with the big seven housebuilders working in a highly competitive arena and with smaller housebuilders working to generate the business required for survival. Policy approaches were noted as lacking longevity or the strategic nature required to solve the systemic problems outlined.

All companies involved stressed the importance of being able to gain planning permissions in a timely and politically acceptable manner, as well as their concerns with the move towards localism which relied on local political accountability and was seen as holding back timely planning consents. A Regional Spatial Plan enabling small and medium brownfield sites to be brought forward for development, aligned with low-cost infrastructure transport nodes, was seen as essential to overcome the hurdles holding back much needed development.

Those present cited their concerns around:

- ‘Hollowing out’ of SME house builders
- Cyclical nature of the industry
- Low operating margins, especially in infrastructure sector
- Poor availability of finance to SME builders
- Lack of visibility in planning ahead
- Difficulties in accessing new land for development
- Accessing planning permission in timely manner
- Developer (and planner) preference for large rather than small scale developments
- Lack of public sector procurement from SMEs in light of overly complex processes
- Talent retention challenges
- Image and perception of the sector holding back recruitment of quality people into the sector.

Summary of Sector Recommendations:

1. The construction sector was poorly serviced in terms of *skills provision*, representing their single most substantial challenge, with key issues including:

a. *'Parity of esteem'* – vocational and academic skills development required –

- *Quality Assurance* in vocational education
- *Clearing system* linking students to available course openings
- *Careers Enterprise Company* ensuring every pupil received timely and relevant Careers Advice on regional opportunities promoting construction as a *Career for life*, not simply a job, to students, teachers and parents
- *Links between employers and courses* ensuring course provision leads to appropriate career-oriented work opportunities
- *Re-writing qualifications to meet employers needs*

b. *Apprenticeship Levy* confusion was leading to lack of employer take up

b. *Work-life balance* – was recognised as a growing feature amongst younger generations requiring appropriate policy responses from the sector

2. *Industry Foresight*: Businesses involved outlined the need to visualise the built environment and its changing requirements 20-30 years ahead, in particular through growing links between energy, transport and construction as energy provision and generation became further localised

3. *Construction image and promotion*: In light of poor industry perception it was felt a new approach was needed to pull the whole sector together more consistently and the *Building Alliance CIC* was taking the lead working with Birmingham City University by offering a *'free to join' built environment network* open to all construction companies, promoting it to regional organisations including LEPs and WMCA

4. *Procurement*:

- Use of s106 deals were not being fully utilised to incentivise companies to take on apprentices or to 'buy local' products where possible

- OJEU requirements needed to be revisited to assess whether greater local procurement was possible in the near future

- A *'cost first'* approach had been impacting H&S and needed a full overview, especially in light of recent tragic events at Grenfell Tower

- Widespread use of *Dynamic Procurement Framework* trialled by Birmingham Municipal Housing Trust

5. A *'Department for Import Substitution'*, was required as part of the Industrial Strategy

- Whilst 90% of what went into a house was made here, this was not the case with HS2 or other large scale infrastructure projects

6. In light of crisis in availability of affordable housing, it was proposed that institutional providers with multi-tenure options might provide part of the answer

7. *Quality placemaking* was important, policy makers needed to look more widely than housebuilding alone bringing together strong transport connections with social infrastructure to deliver truly flexible housing tenures at every level of affordability

8. Technology advances meant skills providers, especially in Further and Higher Education, needed to look at ongoing training and upskilling for the existing workforce and linking this into developing training and apprentices targeting young people

9. *Innovation*- Companies envisaged greater opportunities for innovation around and wanted to see greater investment, business support and linkages between supply side infrastructure and commercial activities around:

- Control Systems
- Sustainability
- Digital Design
- Quality of experience

Skills Shortages: Skills shortages represented the single biggest challenge facing the sector with a 1m gap nationally in people required over the next ten years and 370k people a year needed within housebuilding. Within the sample the largest current skills gaps were identified as being for technicians and skilled crafts people, mentioned as outstanding by half the sample, with accelerating requirements anticipated for technicians and crafts people into the future.

Skills shortages were being driven by 700k people leaving the industry through early retirement, accompanied by the uplift taking place in major construction projects across the West Midlands, including HS2, representing one of seven identified priority action areas for growth within the WMCA's Super Strategic Plan, *Making Our Mark*, agreed by the three LEPs and WMCA board representatives.

Perception of the sector by the public was poor. Construction was seen as an option of 'last choice' for many young people, especially amongst ethnic communities. One representative at the workshop commented on construction having been referred to in terms of the '4Ds' at a recent workshop he had attended – '*Dirty, Dangerous, Demeaning, Depressing*'. Within infrastructure, representing a lower share of national and regional spend, there were seen to be fewer opportunities for skilled trades, however, housebuilding offered many vocational openings, which if accompanied by communications and messaging targeting young people could improve uptake and help to meet industry needs. Promoting a stronger reputation for the trades and the flexibility to work on a self-employed basis as a brick-layer, joiner, plasterer, painter, landscape gardener, interior designer, combined with the ability to stay in a local area close to family in friends could help to promote a stronger image for the sector and the opportunities within it. It was pointed out that being self-employed within the

construction industry could be a flexible and attractive way to make a living whilst choosing the hours work during any week. One person asked:

“Why should moving into management be seen as a progression? What is wrong with staying a joiner, or other type of craftsman and taking pride in being that for life and becoming a better and better craftsman, gaining tremendous personal satisfaction in doing something really well. Being self-employed makes making a home and staying in an area close to family and friends much easier too. ”

Speaking of the skills shortages in the sector Mike Leonard, CEO, Building Alliance, outlined the work he was leading with Birmingham City University (BCU) to promote the sector by launching an industry portal free and open to all members based in the Midlands. The University had engaged students to produce a video promoting the sector using social media and linking back to the BCU generated portal. It would be ‘*selling the dream*’ of a career in construction and sent as a DVD to all 14 year old pupils across the West Midlands. He stated:

“We have a 26% youth unemployment rate in Birmingham alone. There are a lot of people who are not fulfilling their potential. Construction can offer a route for them to raise their prospects. Government is targeting 3m apprenticeships by 2020. The Apprenticeship Levy is causing a lot of confusion. It is not translating into what was intended. There is confusion with the Construction Industry Training Board Levy which has been operating since the 1960s to help pay for training in the construction industry and the newly introduced Apprenticeship Levy, meaning some companies are hit with two levies.”

Future Skills Shortages: With Brexit, and since the EU Referendum, the sector which relied heavily on European skills, was now seeing people returning to Europe. If the country was to become more self-sufficient then links into schools and persuading parents of the opportunity for their children to work in construction would be critical. One project, the development of a Construction Campus by City & South Birmingham College at Bordesley Green was highlighted as not being sufficiently well used as both larger contractors, parents and children in local communities did not know about it. Picking out young people at an early age with a leaning towards construction and the related trades and linking them up with relevant employers was seen as a priority.

Comments from businesses included:

“Construction is not seen as an attractive career choice. Black Minority Ethnic (BME) parents do not embrace construction, seeing it as a poor choice and new entrants into this sector are low.”

“Employability skills development in schools is essential. Pre-2010 this was working well in the West Midlands. Cost savings from government and local government scrapped all the good work. We need to make technical subjects exciting to all youngsters and train teachers.”

“There is a lack of meaningful dialogue with trainers and education to really work to supply young people with the skills we need. The Colleges have become financial establishments needing to turn out people in considerable numbers for their models to work. They are not integrated to meet our needs.”

There were examples of good practice which needed greater promotion and more visibility. The National Construction Academy was delivering Traineeships and Apprenticeships and working with employers to ensure that young people, on leaving, were ‘work ready’. Taking young people from primary schools and giving them a flavour of equipment in operation on site had been shown to be motivational. However it was noted that some Further Education Colleges were unable to get into schools to, ‘show off their wares’, due to a lack of any careers advice and the pressure of getting young people to enrol in Sixth Form Colleges before undertaking university degrees. One business commented:

“A lot who are good with their hands get left behind. If you can get them onto site they can be very good. It took my nephew until 29 years of age to find this out and to develop a career as a wood joiner. He was doing his CITB NVQs but he wasted 10 years to get there. Had he been able to get these introductions whilst at school this would have helped him get there a lot quicker.”

Supply Chain: Inability to develop longer term plans with suppliers was put down to lack of longer term contracts, especially procurement contracts. One contractor stated:

“Supply chain companies won’t invest in our business unless they get 3-4 years foresight into our commitments to them.”

Public Procurement: SMEs were desperate to win work, but found it difficult to get to the procurers and bodies such as the Local Enterprise Partnerships (LEPs). It was stated that all the big name procurers had their ‘favourite’ framework partners and did not like having to scale down orders to attract SMEs with too many barriers preventing SMEs from competing. Concerns were expressed about larger infrastructure and office construction work not being awarded to local contractors based in Birmingham and instead to London-based practices which might already be preferred partners due to the amount of previous construction spend in London and the South East.

However whilst some construction companies were building up sub-contractors based regionally to draw upon for use as part of their framework procurement teams, it was felt much more could, and needed to be done with the public sector, working to support local capital investment enabling innovations, such as off-site modular construction, light weighting materials and other innovations. Whilst OJEU was cited as a reason for contracting out of region it was seen as a powerful tool to support local companies, supply chains and innovations, with many present querying the perceived ability of the Germans to source more locally in spite of EU procurement rules along with the perceived inability of many companies from within supply chains in construction failing to be selected in terms of overseas procurement exercises. Similarly it was felt S106 agreements were not systematically being used to ensure apprenticeship employment and a recommended percentage of local materials being sourced.

Much of procurement process was down to who specified the products required and this required educating the clients, the planners and demonstrating the advantages of new products and processes, with most preferring to stick with tried and tested solutions.

Import Substitution: Whereas the government had failed in the eyes of those present to prevent Chinese steel being dumped in Britain due to the perceived need to do trade deals, it was felt DFID was not interested in import substitution, only export opportunities. There was nothing being made abroad that could not, in theory, be made in the UK, but our lack of belief in manufacturing was holding back investment into products required by the sector. It was strongly agreed by all present that we needed a **Department for Import Substitution** to promote internal businesses looking at the opportunities for domestically sourced products. The Industrial strategy was seen to be linked to this objective.

Business Support: Frustration was expressed regarding subsidies provided to inward investors compared to a complete lack of support for indigenous business was expressed:

“Think of the subsidies available to inward investors and how these distort the market. Ibstock are investing £50m into the world’s best brick factory based in the West Midlands. It’s a fantastic investment but there’s not one penny of government investment behind it. Chinese cab maker can get £75m to support their investment in Coventry. There is a lot of work within BEIS to support the Barcelona Housing System. (<http://www.barcelonahousingsystems.com/>) Chinese steel frame housing is coming to the UK. They are investing a significant amount into this rather than investing in our own building materials, skills and sector.”

“There is a lack of consistency in the Local Enterprise Partnership (LEP) programmes meaning there is no level playing field in terms of value of support they can offer across our region.”

Start-ups: There was very little start-up activity identified by those participating with 50% of companies stating it amounted to a ‘very small amount’ and with just 20% listing it as a ‘moderate amount’. Access to funding was highlighted as difficult amongst 25% respondents, with 37% stating it was neither difficult nor easy, with a further 25% stating it was easy to access.

Innovation opportunities: Innovating by designing new sustainable products for use within the home was seen as an opportunity to generate products which could be exported along with the chance to take advantage of reigniting the **Foresight programme** of the 1990s, building on the recommendations and scoping within the *Science & Innovation Audit for the West Midlands*. Making the West Midlands a ‘low carbon lifestyle hub’ was one of the thoughts prompted in workshop discussion enabling our manufacturers to develop more products for export. This would enable greater exploration of practical developments based in the region looking 20-30 years hence. It could start bringing together transport, construction and energy companies to design and develop affordable and sustainable homes and systems, enabling

people of all means across the West Midlands to live and travel to work in places drawing on carbon neutral technologies designed here.

One company referenced the former Building Research Establishment which had previously operated with an Overseas Division helping to commercialise innovations for export. The recent Innovation Audit, June 2017, noted the market strengths in the region focussed around the R&D and commercial deployment by the industry of energy efficient and lower carbon building technologies, across commercial and residential construction and infrastructure, leveraging the scale and quality of our education, research and technology transfer base.

In terms of assets based in the region, University of Birmingham was ranked as one of the top higher education institutions for civil and construction engineering. The Manufacturing Technology Centre (MTC) also worked extensively with the construction sector bringing expertise in BIM and modelling. Other complementary assets included – *The Built Environment, Information Systems & Learning Technology Research Centre* at University of Wolverhampton and their programme for the *Built Environment and Climate Change Initiative*, BECCI; *The Centre for the Environment and Society Research* (CESR) and *Institute for Sustainable Futures*, (ISF), at Birmingham City University; *The Centre for Low Impact Buildings* at Coventry University; *Construction Centre* at Stourbridge College; *The National Low Carbon Centre* being established at Stoneleigh Park; with projects including hs2 headquartered in the region and the National College for High Speed Rail based in Birmingham, these would also provide significant sustainable construction research focus.

Sustainability: Innovations such as control systems linking into local battery storage systems and solar thermal/ PVs could enable greater off-grid energy use; light weighting of bricks could enable firing to take place at much lower temperatures with considerable energy savings; systems developments including mobile apps could enable remote control of cooking, heating and boiler systems, optimal off-grid energy downloads to battery storage points, linking into PV and local energy sources during daytime hours. The Building Alliance were collaborating with BCU on the ‘digital home’. Greater work was required in new service-focussed business models.

Health & Safety: Serious concerns were raised following the Grenfell Tower fire with the following points highlighted:

- PFI had taken the procurement process away from the client, too often leaving this responsibility with bankers and framework managers
- Building Controls had been subject to cutbacks, being outsourced and subject to budget pressures which had been accompanied by falling standards
- The strategy to drive out costs had resulted in outsourcing of safety standards and processes to those who had not looked at whole systems being installed but elements within them.

Brexit Impact – Threat or Opportunity: As construction, in terms of built environment was not an exported product, concerns in this sector as interviewed focussed primarily on access to

skills, imported inflation and impact on input costs, as well as ongoing uncertainty. Comments noted by participants included:

- “We’re concerned about our access to funding for training builders and bricklayers .. access to funds for land purchase and building costs.”
- “We need to complete our exit as quickly as possible and then negotiate realistic trading agreements based on practicality and the bargaining power provided by the importance of our market to major European industries (e.g. automotive). Also we have bargaining power from the fishing waters issue. However, we need to move on identifying wider opportunity in world markets open to us post-Brexit. There is an opportunity to significantly improve the proportion of GDP resulting from manufacturing. We should remember that pre-Common Market, 55% of our trade was with Europe, it is now 40%, so there is a case for saying that it hasn't worked for us, although Germany has done very well out of it.”
- “We need to avoid importing inflation.” Continuous and stable economic growth is our priority.”
- “Continued investment in infrastructure and construction remains our focus”
- “Irrespective of the decision, just get on and do the deal! It seems we are looking to drag the negotiations out as we do not have a clear plan, we look weak and unorganised”
- “Freedom of movement (FoM) is of paramount concern to businesses. We would like to see government renegotiating on this point so that FoM remains central.”

5. ENERGY

Energy Sector Overview

The energy system was recognised as being in a period of rapid change bringing tremendous opportunity for the region and the nation to gain greater energy self-sufficiency, supporting innovation and in turn helping eliminate fuel poverty. A combination of measures within existing and new build, aimed at better insulation drawing from renewable energy sources, working with integrated smart control systems, heat pumps, bioenergy and renewables - including potential innovations such as solar roof tiles linking into battery storage along with opportunities for local shared energy systems, could work together to achieve this goal,

Chart 47.

The Innovation Audit for the West Midlands focussed on two key related areas of activity within the energy market for the region:

- Energy storage including batteries and hydrogen storage, noting that in the domestic sector responsible for 40% of UK energy demand there were, ‘significant innovation opportunities existing in designing and delivering low-carbon energy services to consumers that use Energy Storage as part of the answer
- Energy Systems focussed on development, deployment and use of intelligence to integrate the actions of all the components in the energy system. Innovation opportunities existed at the ‘system edge’ in the ‘last mile’ of supply adjacent to the point of use in the consumer’s home or premises.

The report noted the development of *Energy Capital* launched in early 2017 and focussed on promoting energy innovation across the West Midlands and the needs of the 1.7m homes in the region, supporting this through competitive energy systems development and helping to make the region the most attractive location to develop and build an innovative, smart energy technology company.

Future Energy Scenarios, National Grid, July 2017 :

1. An energy system with high levels of distributed and renewable generation has become a reality. This growth is set to continue, increasing the complexity of operating a secure and cost-effective energy system.
2. New technologies and evolving business models are rapidly transforming the energy sector. Market and regulatory arrangements need to adapt swiftly to support a flexible energy system with an increasing number of participants.
3. Electricity demand has the potential to increase significantly and the shape of demand will also change. This is driven initially by electric vehicles and later on by heat demand. It will require a range of solutions to deliver best value for consumers, including a coordinated approach across the whole system; investment in smart technologies, transmission and distribution infrastructure; and commercial approaches such as consumer behaviour change.
4. Gas is critical to security of supply now and as Britain continues the transition to a low carbon future. It will have a long-term role as a flexible, reliable and cost-effective energy source favoured by many consumers. They note: Gas supplies more than twice as much energy annually as electricity today and could still provide more energy than electricity in 2050. (21)

Chart 47

Estimates of final energy consumption by end use indicated space heating was the biggest area of use at around 40%, water heating amounted to 13% of use, lighting and appliances 9%, process use around 15% with 'other uses' making up 23% of energy use. Final energy use by sector suggested industry consumed 25% of energy, transport 26%, domestic 31% and services 18% (Figures from DTI archived files, 2001). Low carbon generation, much of it located close to people's homes and businesses, was producing varying amounts of electricity depending on factors such as Time of Use (ToU), or the weather.

By second half 2017 renewable energy sources had generated more electricity than coal and gas in Britain for the first time with power from wind, solar, hydro and wood pellet burning supplying 50.7% of energy, and taken together with nuclear amounting to 72.1% of electricity produced nationally. (22) The National Grid, West Midlands-based and owning and managing the power supply around the UK, was moving towards managing a diverse well-balanced generation mix of low carbon generation and storage solutions, with a tenth of the UK's power coming from offshore wind farms - a relative newcomer on the energy scene, with costs plunging far faster than had been expected, with prices having fallen to a tenth of their normal level as output had increased substantially. This built on government statistics showing renewables' share of electricity generation at 26.6% in Quarter 1 2017.

Energy sources were subsidised through auctions with nuclear receiving a £92.50 subsidy /Mega Watt hour (MWh) – the price guaranteed to the French and Chinese developers for the Hinkley Point C nuclear power plant. Offshore wind in latest auctions (Sept 2017) had seen the subsidy cut to £57.50/MWh (from £117.14 MWh awarded in the last comparable subsidy auction in 2015); solar subsidies paid to consumers through the Feed in Tariff had been virtually scrapped on new build; with onshore wind being the cheapest energy with zero subsidy. Eleven energy projects had been awarded through auction in September 2017, worth up to £176m a year, including alongside those awarded to offshore wind, a project for 'advanced conversion technologies' – a method of treating waste. All projects taken together would generate three gigawatts of electricity, enough to power 3.6m homes. (23)

New technologies such as energy storage were emerging and the costs of many of these technologies continued to fall. However, in spite of this, just 1% of demand was met by storage which would be required to increase hugely if Britain were to move towards an effective low-carbon electricity system. The development of affordable, safe domestic storage solutions would be crucial to expanding this, as would "smart grid" and vehicle to grid' connectivity to electric vehicle batteries as part of a storage network.

A report for government by Ofgem for the government, *Upgrading Our Energy System Smart Systems and Flexibility Plan July 2017*, stated, that by growing off the opportunities provided, the UK could create many new businesses and jobs, empower consumers and help people save an estimated £40bn off their energy bills to 2050.(24)

Renewable UK had recently demonstrated that British companies were securing almost half of the billions of pounds spent each year on offshore wind farms in the UK with £11.5bn due to

be spent on offshore wind to 2021. About 48% of the money spent planning, building and operating the projects supported through UK government subsidies benefited British companies, just short of a 50% target the industry had set for 2020, and compared to 43% in 2015 when the last comparable study of multiple projects had been produced. (25)

The '*Clean Growth Plan*', due to be published as part of the *Industrial Strategy* and a component of future-facing enabling work on energy system transition had been delayed although linked to government increases in public research and innovation spend, including on new storage technologies across the West Midlands. (26) Recent investment had been made into – the *Energy Systems Catapult*, *Energy Research Accelerator*, *Centre for Doctoral Training focussing on Carbon Capture and Cleaner Fossil Fuel Energy*, *Fuel Cells and their Fuels* at University of Birmingham, *European Bioenergy Research Institute* at Aston University, *Willenhall Battery Storage Test Facility*, *Energy Innovation Centre* at WMG, *Centre for Cryogenic Energy Storage* and *Centre for Fuel Cell Research* at University of Birmingham. Universities have also been involved in the *SUPERGEN Programme* with Aston a partner of the *Bio-Energy Hub* and Birmingham and Warwick partners in the *Energy Storage Hub*. (2)

Wolverhampton University's *Built Environment & Climate Change Initiative*, BECCI, were amongst those noting that despite the investment in supply side technologies, entrepreneurial companies taking innovative products and services to market, outside of those benefitting from Innovate UK funding, were often hard to reach and receiving little attention. The BECCI team noted the fragmentation occurring in different battery technologies with Lithium-ion being used primarily in automotive applications and Lithium Iron Phosphate tending to be used more frequently in home applications.

Market Background

The market was in a state of rapid emergence with further new opportunities anticipated to arise for existing manufacturers and for start-ups. Renewables were becoming mainstream although further solutions were still required to wean us off fossil fuels. Opportunities for smaller nuclear facilities were also envisaged.

Within the home storage battery market companies were generally working with Grade A and B batteries. Companies involved in this market more widely included Tesla, BYD Energy Storage Solutions, Pylon Technical, Mercedes and Moxia Home Energy. Batteries taken from previous use in the automotive market were more usually Grade B standard, incapable of '*full cycling*', discharging energy into the home at lower levels usually amounting to a 0.5kw discharge at any time. Companies such as Afore UK and Prime Hybrid were working with Grade A batteries which could discharge 2.5kw into the home energy system and had generated a hybrid inverter to match their battery storage system. This was significant when considering kettles, dishwashers, washing machines and tumble dryers all consumed 2.5-3kw energy, hair dryers 1.8kw and plasma TVs around 0.6-0.8kw.

Lead acid batteries could be used, but their lifecycle was limited to 1500-2000 cycles. Lithium-ion and Lithium Iron Phosphate batteries which were still 80% efficient following 6000 cycles;

had been in use in the home for 10 years and in light of attributed fire risks were designed to cut out at 50C degree temperatures.

The inverter market had also been developing rapidly. In the Midlands, Afore UK, based in Burton-on-Trent which had partnered with Afore in China, based in Shanghai, had been working in partnership for the past 6-7 years with the UK manufacturing arm producing standard string inverters. Two years earlier Afore UK had started development work on a hybrid inverter system capable of switching between AC and DC current linking into battery storage and registering this as Prime Hybrid Energy following considerable investment.

The Feed in Tariff (FiT) was providing payments to those generating energy in the home regardless of whether the energy was used at home or fed back into the grid – even though the capacity of the grid to ‘take back’ energy was questioned. The amounts paid from government had fallen from £0.43p when the scheme was launched to £0.0485 for export and £0.0407 for home use. Following this collapse in pricing support to the home user, those questioned stated 80% of the producer market had disappeared.

Aggregation services were seen as the next area of opportunity with Housing Associations beginning to assess bulk purchase options, in turn enabling their residents to take advantage of lower energy costs drawing on battery storage and overnight tariffs. Off-site build was also seen by some as a means of incorporating more of these technologies at the build stage, although Birmingham City University Centre for the Built Environment was researching the practical means for driving greater digital integration within traditional construction methods.

Prices were falling rapidly as the technologies were becoming more established. Photo Voltaics (PVs) had quartered in price in the past 7 years following economies of scale in production being achieved largely by producers based in the Far East. Prime Hybrid Energy estimated that typical home energy users would save around £400-500 per annum using their systems with an 8 year payback. It proved difficult to access new companies working in battery storage, aggregation services or bioenergy across the Midlands in spite of the fact that National Grid, Eon and Centrica are headquartered in the region and investment in research assets has been a source of considerable focus in recent years as outlined above.

The environmental and energy efficiency market, was projected to grow in the UK from £2bn to over £50bn in three years 2017-2020. Companies such as GEEH and Wastermaster TM were investing in R&D and trialling prototypes across the UK with energy efficient solutions provided to locally based organisations as food waste management solutions.

Amongst energy sector companies, **Chart 48**, thirteen organisations were consulted with six being new start-ups, of the rest three were under ten years old, with two further being specialists from Universities.

Energy Sector Sample

Advanced Anaerobics
Afore UK
Bosch Thermotechnology
Conigital
Global Energy Efficiency Holdings (GEEH)
Institute For Sustainable Futures, Birmingham City University
Powerflow Energy
Prime Hybrid Energy
Renewable Risk Advisors
Tyseley Energy Park
Wastemasters TM
Webster & Horsfall
University of Wolverhampton BECCI programme

Chart 48

Energy sector Recommendations:

1. A longterm *20-year Energy Strategy* needed to be agreed – by political and regional partners in the West Midlands, working to support new energy start-ups moving towards self-sufficiency and supergrid strategies in tandem
2. *Smart cities and places* – were a focus for future competitiveness, interconnecting transport, construction and energy production/storage required spatial planning for the region
3. Promoting the West Midlands as a *Silicon Valley for energy entrepreneurship* and a place that stood out as a '*Beacon*'
4. *Sustainable energy innovations*, including battery storage, inverter technologies and aggregation systems were making the link between transport and construction. Planning needed to facilitate these links to be made for the region to take greatest opportunity
5. Whilst much investment was highlighted in research and development, Catapults and Accelerators, too few of the SMEs and micros/start-ups were aware of supply side investments or had any links to it. Too many *SMEs and start-ups were left to 'get on with it'* despite the strategic significance of their efforts and the contribution they might be able to make with greater support. The links between the start-ups and the public sector supply side investment were also not being made well enough
6. *Building our energy ecosystem* was a priority with energy entrepreneurs sourcing vital services elsewhere – talent, finance, skills; we needed to keep them here growing more jobs and opportunity
7. *Tyseley Energy Park* was a template, acting as a magnet for like-minded energy entrepreneurs and a *Beacon* for other young businesses and people

8. *Procurement needed to encourage local innovation* and the example of the Olympics was cited which had engaged with few companies or people working on it from local or regionally-based companies.

9. A *Foresight Exercise* was required – for example, the Informed Traveller needed to be able to purchase through tickets, linking travel providers through integrated payment systems was highlighted as a barrier to delivering ‘door-to-door’ connectivity and enabling low carbon energy transport alternatives.

10. *Fragmented business support* was part of a failing business support ecosystem; moving from one-size fits all to a fragmented energy system required more focus on helping our energy start-ups

Business Start-up support, policy stability and investment: Business concerns regarding the state of current business support provision reflected the lack of effective and linked business support systems, lack of policy stability – especially following the recent move of energy from Dept of Energy & Climate Change, DECC, to Business Environment and Industrial Strategy (BEIS). It was not clear to businesses attending the workshop if the best strategy was to continue as part of the EU Supergrid or move towards greater self-sufficiency – on balance they felt both options needed to be pursued. They felt emerging technologies were enabling greater self-sufficiency although this was being let down through a lack of serious business and start-up support, apart from a few notable exceptions:

“Our (UK) grant structure is so impossible to administer. Three quarters of funding gets soaked up in admin teams in lovely new offices handing out grants with one quarter possibly reaching the new companies personally risking huge amounts to try to make a real difference.”

“If we have a smart transport and smart grid we can have smart energy and marry them up so we can use vehicles as spare capacity points and then let them release or store energy overnight.”

I cannot speak highly enough of the support we have received from the team within the *BECCI* programme at Wolverhampton University. Most business support is of no support and completely misplaced. But BECCI have really helped us to access funding and support which we’d otherwise never have been able to gain. They worked through the paperwork helping us to process and complete this when our new business was consuming all our time.”

“Business support is handled in fragments and ultimately comes down to who you know. In some organisations they are very proactive and in others like the Council they don’t want to know who you are.”

“We need a 20 year plan to inspire confidence so people will invest. We cannot do this on the basis of a 1-2 year rolling plan.”

“The recent lack of political certainty in both membership of the EU and Energy policy has significantly reduced investor confidence in the UK. We are expanding our international network to try to compensate.”

“We need a strategy for the sector as a whole. Is there an energy strategy for the UK as a whole or is the government just being influenced too heavily by the big energy providers. We need to reduce barriers to entry in this market with less reliance on the grid becoming more self-sufficient through running prototype projects and educating councils and Housing Associations to help them take the steps to eradicate fuel poverty building localised smart grids and virtual power plants.”

“Government have not produced the White Paper for the domestic aggregation services which is our market. There is no legislation in place at present. It needs a relaxation in the commodities market which Ofgem are talking about doing to reduce barriers to entry.”

“We are moving from a one-size fits all economy with energy to a more localised and fragmented world where there are lots of different ways of doing things. Frequency of response, on-site power, solar, wind and CHP are all options.”

Grant-led innovation: Social housing was cited as leading innovations in the built environment through the adoption of new technologies. This was seen as largely ‘grant-led’ although it was agreed the sector had put much of the grant funding to good use it was also commented on that much of the funding was spent on purchasing products produced in China and the Far East such as Photo Voltaics, rather than sourcing more from domestic producers.

On-shoring: Businesses noted that as much of the energy sector is largely publicly-funded that they should be encouraged to ‘*Buy British*’ over imported products on the basis of cost within a certain percentage and noted recent successes following the publication of the RenewableUK report. Whilst recognising in some areas, such as with volume production, imports might be necessary there should be far greater attention paid to making every effort to source from home producers :

“We are constantly competing with really cheap Chinese imported stuff and the company round the corner is buying that. For the public sector it might be negligible in terms of cost – it might mean less than 1% additional costs, but it could mean thousands of jobs.”

“There is an opportunity to onshore more of my supply chain. Initially no, because we have to procure everything we have overseas as it’s not located here and we do not have the skills at present – lithium ion cell tech and inverter tech which is massively complicated. There guy who designed the kit we buy is one of just a handful in the world.”

“We need to invest more in manufacturing and assembly in the businesses based in the West Midlands. I would like to set up a manufacturing and assembly plant here – at

present I cannot do this as I have no funds to do it. If I could get some grants I would set up manufacturing in the Midlands and it would be brilliant but at present it's easier doing assembly. I have been approached by investors but they will take my technology overseas again. I am looking for some ethical investor who wants to help solve some of the problems in the Housing Association markets and the other challenges we face here in the Midlands and the UK."

Public Procurement: Public procurement was considered very important, especially to the emerging areas of opportunity and the SMEs leading this.

"I was involved in the Olympics as a procurement manager to ensure that sustainability was at the heart of this. There were very few local people involved in the team. The nearest was from Watford. Now with HS2 the railway will be built by the Chinese and we might play a bit part. How do we turn this around?"

"Something the public sector can do is plan for '*agri-villages*'. Planners can create and enhance economies by 'livening' things up. Spatial planning is critical in linking the three sectors of transport, construction and energy. Planners need to be creating the template for wealth creation opportunities as well as places for our population to live.

"One of the plus points is Brexit and how our public spend rules may be relieved to factor in local sourcing."

Skills Shortages: Energy Businesses were facing most skills shortages for design engineers with half the sample highlighting these along with a third highlighting the need for technicians and production engineers. Firms commented on the impact of the lack of parity of esteem between those pursuing vocational and academic routes:

"We can overcome our skills shortages into the future by having some proper training in place for those pursuing vocational options. We have lost most of our trades in this country. I was one of the last people to do an electrical apprenticeship in 1988/89. When I finished training I did not want to follow that career then and went on to do some other qualifications, but this apprenticeship has served me well now. We have no proper ground level qualifications for the new energy systems which are developing. There are no training courses in this area at present. We are being led by government legislation and Ofgem on the basis of short-term strategies whereas we require a much longer term plan."

"Employers in our local area had been collaborating to form a UTC but now these no longer seem to be favoured and so we are trying to find out what is the latest favoured mechanism – is it a Free School, Technical College or what? Five engineering companies in non-competitive areas have come together to try to provide the solutions we require."

"I have lived in the West Midlands all my life. I have two small children but I am struggling to find where to focus their energy and interest. I am struggling to find *icons*

for manufacturing and for new areas of activity such as energy. Birmingham is the opposite of Silicon Valley.”

“Apprenticeships have not been a high priority because the Levy has been so complex employers have not known how to use it. It’s been getting in the way and employers have not been able to make a quick enough turnaround.”

Start-ups: There was very little start-up activity in the market compared to the scale of the challenge facing the region and the country as a whole. Two thirds of the sample commented on a ‘very small amount’ of start-up activity with just a third stating there was a ‘considerable amount of activity. Companies stated this was due to lack of skills, lack of funding, lack of available start-up spaces with one or two notable exceptions including iCentrum and Innovation Birmingham Campus, and lack of consistency in government policy. The companies that had persevered had received little support or attention. The ecosystem was completely underdeveloped:

“We need all the new money we can get into our new companies and SMEs to get them going. We have to outsource all our needs to London because we can’t get it here because there has been so little investment here in Birmingham. There is no start-up ecosystem just some pockets of activity.”

“We had to go outside Birmingham for the best people as many of the best people here are taken up at once by larger companies. We were lucky to get local investment for seed, but for the next phase of our growth we are having to look outside Birmingham.”

“Conigital has based itself at iCentrum in order to be involved in the business start-up support network in Birmingham. It’s also part of *Silicon Canal* in Birmingham. We created our own support network, the *Midlands Connected & Autonomous Vehicle Cluster* and invited along relevant partners and customers with over 200 attending our first meeting. One of our projects is a 200m journey. There are lots of projects – Conigital is about the ‘last mile’. Initially funding was there to develop connectivity. Government saw this as a high tech manufacturing opportunity for the UK, with a lot of cross over from the automotive manufacturing sector so early stage development funding has been available.”

Energy storage was seen as ‘*the neglected fourth utility*’ and an area with great potential for new companies and investment:

“Sometimes you need to look back to look forward. Energy storage is a way of making money. A great business lead. How to store heat or to sell it as a versatile energy for traction. It’s a great opportunity for the West Midlands given how innovative our abilities are with our engineers. Can they be diverted into areas where we can see not what’s just ahead but what’s over the brow of the hill? Where does this create opportunities for jobs, not only for the super clever people but for ordinary people too.”

“Energy storage is important. We have the holes in the ground (mines). What we have day and night is this cyclical change in supply and demand. Storage represents great opportunities because of heat and pressure.”

New waste conversion technologies, such as super-ionisation, were beginning to gain a foothold in the UK market with companies such as Wastemaster TM bringing innovative new opportunities to market enabling food waste to be reduced and reconfigured into high grade biofuel suitable for anaerobic digesters in 12-24 hour periods through a ‘closed loop’ solution producing zero emissions or odours. With £19bn of food purchased in the UK going to waste and 40% of this ending in landfill - becoming increasingly restricted as an option, this technology was predicted to rapidly gain market share. However, as with other new companies those involved could find little positive to say about business support provided to their start-up:

“It’s draining. I heard about this grant fund through our local *Growth Hub* which was aimed at companies creating more ‘suits on the street’ and we were told that we would fit well into this category offering a 70/30 funding split. After two initial meetings we were told we should apply. We received a 40 page application for £150k funding requiring a five year business plan for our start-up. We made it through the first stage proceeding to a presentation to a Panel in a meeting lasting 3 hours. They said they liked our proposal but it was ‘so good we didn’t need a grant but could apply for a loan, but we would need to pay £5k for some due diligence’....If we had known that we could have gone to our bank in the first place and saved a lot of time and effort. We decided in the end to fund it through organic growth but we were made to feel slightly apologetic for what we were doing and for being innovative. We were told that if we had done a poor presentation and business plan we would have got the grant funding!”

The importance of *anchor institutions* and centres, pulling together the elements of the start-up ecosystem for energy, transport and construction, was highlighted. *Tyseley Energy Park* was seen as an early stage anchor, capable of pulling partners together. David Horsfall, Director, outlined how its development had arisen from the legacy of the Webster & Horsfall family business making, ‘beading wire for Dunlop and manufacturing rope for the 360 mines across the UK’. But they had since seen everything go to the Far East, employing just 30 people today, some in manufacturing, but primarily in distribution.

“We own our site and the machinery that once was the foundation of a large and thriving business now owes us nothing. But we have hung onto it in the hope that something would come back. We have a bit of land beside the *Energy from Waste* plant. The chrysalis emerged from an organisation approaching us that wanted to process waste from timber and provide us with power at half price so that our manufacturing could reduce the unit price. Following this we took some money out of the capital plan and started bringing green power investments together with green transport fuel as a priority. Hydrogen with low cost power was one such investment and there are now 22 hydrogen fuel cell buses and waste lorries with compressed natural gas. Bio-diesel is another and now we are looking at rapid chargers for taxis given the RenteCar

investment. People are beginning to find out about us. A lot of people with ideas that don't always come together are coalescing around our site. We see our site working as part of an *Industrial Strategy* and a *Clean Air Zone*. The Big City Plan recognised Energy as a growth area in our very depressed and deprived part of the city and the City Council has since granted permitted development for energy and recycling.”

Tyseley Energy Park was acting as an anchor to pull together people from energy, construction, transport and concerned with air quality through the land they owned and in light of its strategic position close to the *Energy from Waste* plant, whilst also having the ear of Birmingham City Council, the Local Enterprise Partnership and the Combined Authority. This 10-acre site represented a development template for our city and region as we moved to attract and encourage investments into emerging sustainable and locally-based energy systems. Owned by one of the oldest manufacturing firms in Birmingham, Webster & Horsfall, this company, through its innovative vision, was aligning their business to the UK's dynamic renewables sector. By opening up their site to businesses operating within the green technologies sector and looking to locate themselves alongside others as part of a growing cluster, Webster & Horsfall were offering space at the heart of this established industrial regeneration zone, known as the Tyseley Environment Enterprise District (TEED). With TEED aiming to develop Tyseley as the principal location in Birmingham for low carbon, recycling, energy production and renewables businesses, including manufacturing and supply chain development, it was combining the principles of Business Parks with development zones to become a *Beacon* for the energy sector. This in turn was stimulating greater combined focus on activities aimed at attracting research and development projects aligned to new investment, start-ups and stimulating a multiplier impact to regenerate one of the most seriously deprived areas within the City of Birmingham. Businesses applauded the vision sitting at the heart of this bold move by the directors of Webster & Horsfall, hoping that their endeavours would be fully supported by City and regional leadership given the tremendous growth potential represented in green and low carbon technologies.

Energy Foresight: Companies queried how public transport journeys could become more convenient and less costly than journeys made by car, bringing together a '*public transport cascade*' joining this up 'door to door' with the user and placing their needs at the very heart of every journey. One of the big blockages to this happening was outlined as being related to payment systems:

“As a user you need to be able to map out your entire journey and understand how all the connections are made between the different providers as well as the timetabling. This is difficult because every provider has to come together and share their data and passenger information, real time, and through a connected pathway. The big blocker at present is payment. The inability to break down a payment for an entire journey into the different provider components and their payment systems is an issue so you cannot buy a through ticket for the entire journey until you can sort out who gets payment for which element. That is the key to getting this to work. There are just a handful of operators working on this, '*mobility as service*'.

Impact of Brexit:

Companies views on this diverged. Some of the start-ups saw it as an opportunity, some a threat, for all uncertainty was unhelpful. Amongst the established companies ‘certainty’ – or the lack of it - was considered the biggest issue. Many bemoaned the fact that the Referendum had not clarified the position regarding the Single Market or the Customs Union with big assumptions being made by government. Questions were asked as to whether we preferred the ‘hegemony’ of the ECJ or the USA on standards...Some cited overseas money from Qatar and Saudi Arabia as well as from China being key to opening up big opportunities; for others investors were looking elsewhere following Brexit:

“We see Brexit as a big threat. Like many businesses we need certainty. We have been badly hit by the devaluation of the pound leading to the current economic uncertainty. Spikes and troughs are not helpful. If we are going down this route (Brexit) we need to get it done as quickly as possible. We think it will have limited impact on major mega trends. Shorter term impact will be considerable. We are seeing it impact negatively on investment in our business because the pound has wiped out huge chunks of our profitability so we do not have the money to invest in our business. We import parts from the EU and then send the fully manufactured goods to the EU so we are hit at both sides. In future we do not want to be hit by tariffs on imports and exports or the prevention of free movement of people.”

“Freedom of Movement is of paramount concern to our business. We would like to see government renegotiation on this point so that Freedom of movement remains central but enabling governments to be able to negotiate how much freedom of movement is appropriate to meet economic needs.”

“Freedom of Services across Europe has been critical for our existing business – both for existing business and for the larger pipeline of business that we have developed. If we are unable to conduct such activity in the EU, much of that pipeline will be lost. A mechanism that retains access to freedom of services mechanisms would significantly limit the damage to our company from Brexit.”

“We need greater insights into policy certainty for the future of British farming as a key customer for small-scale anaerobic digestion.”

“We would like to see greater confidence demonstrated through strong, prominent investment in new areas of manufacturing and engineering. Let’s kick-start the economy for the long game with bold, physical evidence of confidence, by investing in our abilities as world leaders in innovative manufacturing.”

“We need to invest in energy and production of energy, reducing carbon emissions and solving fuel poverty.”

“We need to get on with Brexit. We found that with being in the EU it has become impossible for a little company like us to get going. Tests are so complicated and costly, not because they have to be, but because they have been written by someone who does

not understand what they are doing. Layer upon layer of regulation. It needs to change. Aids big business and hampers small business. To be a small business is almost impossible.”

“The traditional way business finances growth is through a loan, but with Brexit we will see rising interest rates not only for homeowners but for new businesses and start-ups.”

“Bankers are looking at farmers and about altering the criteria used as the way they value their loans by moving away from asset based valuations to affordability. More farmers are having their loan facilities withdrawn. Banks have lent trillions to farmers. This could trigger another crash if the land assets are revalued through an affordability basis.”

“Fundamentally, the question was should the UK government assist manufacturing? The money should come from within our own shores because when the money comes from elsewhere we are not masters of our own destiny. We need to think about the fundamentals of energy supply when the coal-fired stations are turned off in 2025. Renewables will require a big push to supply the energy we need then. Where is the investment for the longer term?”

“How long do people think it will take to replace a substantial chunk of our EU-related trade with new trade from outside of the EU? Even assuming we have products and services that we have failed to promote more widely it takes years or even decades to build commercial, logistical and supply chain links and to forge alliances with new commercial partners around the world. I see no realistic evidence that UK trade with the rest of the world has been held back by membership of the EU, especially to the extent that leaving the EU will result in a rapid leap in that trade.”

“Leads we had in Greece seem to have dried up since the EU Referendum and we are concerned that it could be a barrier to new business. We have heard anecdotally about banking investment going offshore, especially to Dublin.”

Associate Professor Beverley Nielsen, September 2017

References:

- (1) WMCA, 2017, Productivity & Skills Commission, Call for Evidence, West Midlands Combined Authority
- (2) SQW, June 2017, A Science & Innovation Audit for the West Midlands, West Midlands Combined Authority, Greater Birmingham & Solihull Local Enterprise Partnership (GBSLEP), Coventry & Warwickshire Local Enterprise Partnership (CWLEP) Black Country Local Enterprise Partnership (BCLEP) and Birmingham Science City
- (3) MHA, Sept 2017, Manufacturing and Engineering Annual Report 2017/18, Lloyds Bank and Institution of Mechanical Engineers
- (4) WMCA, 2016, Making Our Mark...The West Midlands, The Best Region in the UK to do Business, West Midlands Combined Authority Strategic Economic Plan, West Midlands Combined Authority
- (5) Idea Birmingham, 3rd October 2015, The West Midlands Economy: Access to Growth, West Midlands Economic Forum, <http://birmingham-made-me.org/wp-content/uploads/2015/10/Queen-Elizabeth-Conference-October-2015.pdf> , Birmingham City University
- (6) Beverland, Nielsen, Pryce (2014) Redesigning Manufacturing, Reimagining the Business of Making in the UK, Palgrave Macmillan
- (7) HMG, January 2017, Building Our Industrial Strategy, Green Paper, Her Majesty's Government
- (8) Centre for Brexit Studies, WMEF (2017) Making a Success of Brexit, Evaluating the impact on the region of the WMCA and wider region, Birmingham City University
- (9) FSB, The FSB Voice of Small Business Member Survey, 2013-14, Research by Design Ltd, Federation of Small Business
- (10) FSB, 20th September 2017, Small business confidence plummets as economy slows and costs rise, <https://www.fsb.org.uk/media-centre/press-releases/small-business-confidence-plummets-as-economy-slows-and-costs-rise>, Federation of Small Business
- (11) SMMT, January 2017, 17 Year High For British Car Manufacturing with US Demand Up Nearly 50% - the UK's Single Biggest Export Country, <https://www.smmmt.co.uk/2017/01/17-year-high-for-british-car-manufacturing-with-us-demand-up-nearly-50-the-uks-single-biggest-export-country/> , Society of Motor Manufacturers & Traders
- (12) Vaughan, Adam, June 2017, Electric Cars Accelerate Past 2m Mark Globally, The Guardian
- (13) Lily, Chris, 19th April 2017, Electric Market Statistics, <http://www.nextgreencar.com/electric-cars/statistics/> , Next Greencar TM
- (14) Vaughan, Adam, 4th May 2017, Nissan Launches British-made home battery to rival Tesla's Powerwall, The Guardian
- (15) Campbell, Peter, 2nd July 2017, Investment in UK Car Industry Plummets amid Brexit Uncertainty, Financial Times

- (16) Conn, David, 4th August 2017, UK Car Industry Facing an ‘Utterly Demoralising Brexit’, The Guardian
- (17) Frost, Laurence, Flak, Agnieszka, 12th September 2017, Toyota says Brexit talks drift could threaten production, Reuters
- (18) Arcadis, June 2017, Building Homes Making Places,
- (19) Farmer, Mark, October 2016, The Farmer Review of the UK Construction Labour Model, Modernise of Die, Time to Decide the Industry’s Future, Construction Leadership Council,
- (20) Construction News, 1 September 2017, CN100 Leaders Call for ‘fundamental’ Change
- (21) National Grid, 13th September 2017, Future Energy Scenarios, <http://fes.nationalgrid.com/fes-document/>
- (22) Harrabin, Roger, 8 June 2017, Renewables provide more than half UK electricity for the first time, BBC
- (23) Thomas, Nathalie, 11th September 2017, Renewable Energy Case boosted by sharp subsidy fall, Financial Times
- (24) Ofgem, HMG, July 2017, Upgrading our Energy System, Smart Systems and Flexibility Plan, Her Majesty’s Government
- (25) Thomas, Nathalie, 8th September 2017, British Companies Reap Almost Half of UK’s Renewables Deals, Financial Times
- (26) Stoker, Liam, 13th September 2017, Publication of clean growth plan remains unclear as BEIS ducks questions, Clean Energy News

Many thanks to the following for their support and input:

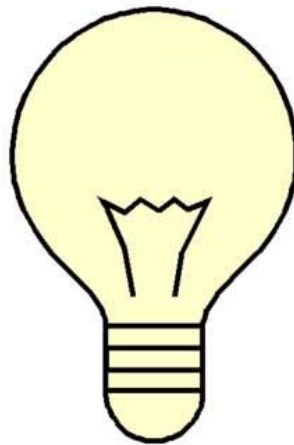
Mike Leonard, Building Alliance; John Parry, MBE, Parry People Movers; Niels Emmerson, University of Surrey; Alan Hayes, ReallyGoodIdeas.biz; Michael Bullock, Renewable Risk Advisers; Jason Ware, Prime Hybrid Energy; Robert Stuart and Neil Young, Built Environment & Climate Change Initiative, (BECCI), University of Wolverhampton; Prof Paul Maropolous, Aston University; Bob Joyce, W Kings; Tony Sartorius, Alucast; Rowan Crozier, C Brandauer; Adrian Williams, Pashley Cycles; Monique Seth, Conigital; Carl Arntzen, Bosch Thermotechnology; Henry Carver, Carvers Builders Merchants; Jeremy Wooldridge and Colin Leighfield, BE Wedge Holdings; Dr Paul Behrens, Edinburgh Law School, University of Edinburgh; David Shepherd, Drive Midlands; David Atkinson, Lloyds Bank; Steve Brittan, BSA Technologies; Richard Parker, RPServices; Kevin Smith and Lez Coupland, Gilca; David Horsfall, Tyseley Energy Park; Leon Groom, Wastemaster TM; Steven Norgrove, GKN plc, Michael Collins and Andrea Czapova, Penso Consulting; Greg Fattorini, Thomas Fattorini Ltd; Charles Morgan, Alcraft / Morgan Technologies; David Woakes and Jason Cole, Jonathan Lee Group; Paul Dockerill and Steve Davis, whg; Rob Jolly RenteCars; Steve Gretton, Clayton Equipment; James Skinner, Sustraco; David Kaner, Advanced Anaerobics Ltd; Ian Murray, Powerflow Energy; Neil Walter, Colemore Tang; Joe Reeves, Julie Brennan and Brendan Hele, Midland Heart; Jonathan Fletcher, Colas; Phil Evans, Pre-Metro Operations; Ian Hodgkinson, Hodgkinson Builders; Paul Reed, Marley Eternit; Mark Pinder, Midgard, Geoff Inskip, UK Tram; Corin Crane, Black Country Chamber of Commerce; Charlotte Horobin, EEF WM; Chris Owen, Industry Forum; Laura Shoaf, Transport for West Midlands; Colleagues at Birmingham City University including - Dr Umar Daraz, Institute for Sustainable Futures, Prof Alex de Ruyter, Centre for Brexit Studies, Dr. Steve McCabe, Business School, Caroline Norman, MA Design Management, Jude Pearson and David Hearne, Business Intelligence, Birmingham City University.

IDEA, The Institute for Design & Economic Acceleration, has been established at Birmingham City University as a practice-led research institute working across disciplines and faculties to promote innovation and brand-led management strategies with a particular focus on manufacturing, championing stronger regional reputation, social cohesion and sustainable economic growth across the Midlands.



**INSTITUTE FOR DESIGN &
ECONOMIC ACCELERATION**

I D E A



**Building
Alliance BA**