



The Future of Business 2011

HSBC Business

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Foreword



Jacques Emmanuel Blanchet
Head of HSBC Commercial Banking UK

Two years ago HSBC launched its first Future of Business Report, identifying where the future potential of our companies, entrepreneurs and industry lay. We have revisited our report in 2011 in light of the extraordinary economic events that we have been through. Having just moved to the UK to lead HSBC's Commercial Banking arm I am hugely excited by the findings and prospects this report reveals.

Evident within the report is that despite a uniquely challenging international economic environment we have seen the emergence of new sectors and regional clusters across the country. Revolutionary industries such as plastronics, advanced composites and renewable energy are all helping to drive the UK economy forward.

At HSBC we firmly believe that we have a role to play in helping UK businesses lead the way into these new industries and sectors and the opportunities they present - identifying them is just the first step.



The report highlights the British cities and regions that have become vital hubs for new growth industries. Two new cities emerge above the others – Bristol and Glasgow – joining the list of British super-cities. These cities are key for British business development and specialise in different innovations and industries and are already being shaped by today's new entrepreneurs.

We hope you find this report useful and inspiring. At HSBC we are working constantly with our clients to develop products and working practices that support businesses at every stage of their development. We know that no two days in business are the same, but through research and preparation we can ensure that, together, we are best placed to make the most of the opportunities that the business landscape presents as we shape it into the future.



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Introduction

In 2009, HSBC commissioned The Future Laboratory to produce the first Future of Business report, in which we discussed how British business was undergoing a decade of turbulence and transformation. Since then, the UK has emerged from recession, although some economic risks remain. This 2011 report by Future Poll, the new research division of The Future Laboratory assesses the progress and the possibilities, as a new economic landscape begins to emerge.

To inform this latest report, we have again surveyed 500 entrepreneurs and business decision-makers from small and medium-sized businesses across Britain. The study investigated how business attitudes have changed since the previous report. It also explored perceptions and outlooks at a regional level, highlighting significant differences across the UK.

This quantitative research is augmented by extensive desk research, and is further informed by qualitative interviews with a broad range of leading experts. These experts come from the fields of innovation, entrepreneurship and economic policy, and offer original insights. They include Dr Lynda Gratton of the London Business School, Andrea Nixon, executive director of Tate Liverpool and the pioneering entrepreneur and industrial designer Sir James Dyson.

Future Poll conducted the quantitative online survey for HSBC in February 2011. The survey polled the opinion of 500 owners and business decision makers from small and medium-sized businesses across Britain. We define medium-sized businesses as those with fewer than 250 employees. Unless otherwise stated, all statistics in the report refer to this survey, and should be credited as such thereafter.



Key findings

British business is innovating its way to recovery

'In the big industries of the future, the UK already has a track record, and is incredibly well positioned,' says Dr Lynda Gratton of the London Business School.

Entrepreneurs believe that industries such as digital communications (68%), biotechnology (65%) and low-carbon technology (60%) will grow strongly over the next decade. The number of business leaders who think that the UK should be known for innovation and entrepreneurialism has risen markedly – from 46% to 62% – since 2009.

The coming decades will see a revival of high-tech British manufacturing

'There will be a repatriation in some manufacturing, leading to a renaissance in those regions that already have the necessary skills and infrastructure,' believes Tony Greenham, head of finance and business at the New Economics Foundation.

Almost three-quarters (74%) of business leaders believe it is important that British businesses make their goods here in the UK. This trend will be driven by a need for resilient supply chains capable of withstanding economic shocks and rising energy prices. Repatriated manufacturing will also enable the flexibility for rapid product personalisation.

Introduction



A Trust Economy of regional collaboration is emerging

'The recession has encouraged trust. In developing regional clusters, companies are collaborating to help their industries achieve critical mass,' observes Dr Caroline Chapain of the Centre for Urban and Regional Studies at the University of Birmingham.

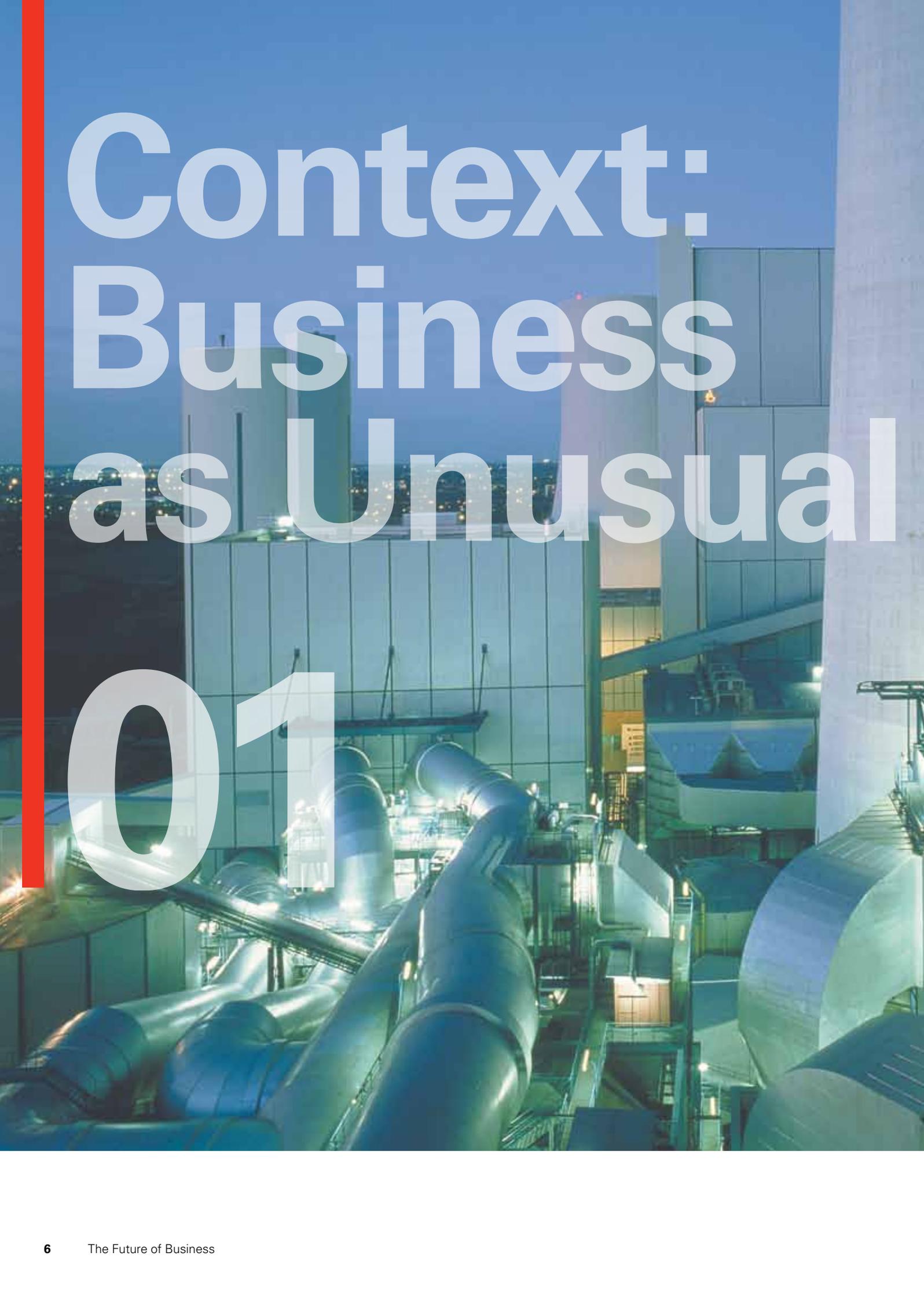
Our survey found that strong personal networks (26%) were more important to business leaders than financial backing (18%), or even having a good business idea (16%). One in three (33%) of business leaders spends time out of the office consulting for other firms, volunteering or working in academia.

Businesses must expand their horizons and look to new export markets

'The success of future technologies will depend on an education system that prioritises creativity. Exportable inventions are our way towards a safer, more intelligent future,' says Sir James Dyson, inventor and industrial designer.

More than half (52%) of business leaders see exports to emerging economies as the greatest opportunity for UK entrepreneurs, but only 19% are primarily focusing on customers and competitors abroad.





Context: Business as Unusual

01

Context: Business as Unusual

- **Recession marks period of transformation for UK business landscape**
- **Downturn acts as catalyst for growth for entrepreneurs and small businesses**
- **Inter-connected world drives new ways of working**

'We're out of recession, but not out of risk,' says Mark Berrisford-Smith, senior economist at HSBC. *'One thing is for certain: the new normal will not look the same as it did before 2007.'* While the past few years have presented many challenges, they have also been a period of transformation. A new generation of industries will drive the economic recovery over the next decade, fuelled by long-term changes in technology, society and geopolitics.

The recession was not only a point of change. Many experts argue that it has acted as a catalyst for growth. John Owrid, founder of small-business collaboration forum Index B, observes: *'We are in the midst of a technological revolution, and that has been promoted by the recession. Smaller companies are often more able to adapt, which makes them better-placed to take advantage of change.'*

In our previous report, we highlighted how a new breed of tech-savvy innovators would redefine and re-energise the business environment, and we are now seeing strong

signs of this growing trend. Our latest survey revealed that 62% of business leaders believe Britain will increasingly stand for 'innovation and entrepreneurship', compared with 46% previously

As the business landscape alters, we will see the emergence of new ways of doing business in an increasingly interconnected world. *'Industrial life is at a tipping point,'* believes Dr Lynda Gratton of the London Business School. *'We are seeing a fundamental shift from the individual to the connected, from the generalist to the specialist, and from a simple desire for money to a focus on experience,'* she says. *'Over the next decade, people will have to adapt abruptly.'*

'People have got to get out of their silos and work together,' states Robin Wight, instigator of the Ideas Foundation, a charity that nurtures young, creative talent. *'A new generation of renaissance communicators will be multi-skilled and multi-disciplined,'* he observes.

02

Engines for Growth

- **UK must now compete at a global level**
- **Capitalising on next-generation industries will drive competitive advantage**
- **New business models to develop, updating traditional skills for the 21st Century**

Tony Greenham, of the New Economics Foundation, believes that the search for new markets is essential. *'There is an assumption by many business leaders that their company exists in an economy that is growing,'* he says. *'At least in the West, companies will increasingly have to assume 0% growth, unless they have found a competitive advantage they can exploit.'*

Moreover, with the traditional UK economy remaining flat, and with government spending cuts happening now, the importance of dynamic next-generation industries has never been greater. *'Research is risky; it's a long-term endeavour,'* observes entrepreneur and industrial designer Sir James Dyson. *'Relying on digital fads will not benefit the economy in the long run, but research and exports will. We need to compete at a global level and we need to start now.'*

British companies should expand their horizons and seize export opportunities. Only 19% of entrepreneurs said that international customers were their primary targets, similarly, only one in five saw international businesses as their main competitors. The next decade will bring awareness, and see it turned into action. As we shall

'Technology that draws on mechanics and materials science is showing the most growth and offering practical solutions to international problems'

see, some regions are already seeing a change in mindset, while others lag behind.

The next decade will therefore be a period of profound change, as British business seeks to gain or maintain leadership in the nascent industries of the future. Our survey reveals that 52% of business leaders see exporting to emerging economies as one of the greatest opportunities for UK entrepreneurs. Reducing CO2 emissions (48%), providing healthcare for the West's ageing populations (43%) and the development of advanced materials and manufacturing (41%) are also seen as holding huge potential.



Engines for Growth

Our 2009 report highlighted a number of new business models that will develop as the UK's economic landscape is transformed. In that report we identified Micro-multinationals to which we now add a new generation of emerging typologies:

Micro-multinationals

hyper-flexible, hyper-connected companies with a footloose ethos and an international perspective. We are seeing this model pioneered by the creative industries.

Tryotechs

research-led companies, which will be pushing the boundaries of biomedicine, nanotechnology and materials science to unlock new solutions.

Radicals

creative innovators, reapplying traditional skills in radical new ways in order to reach new markets. Craft industries will emerge as key players in redefining the national and international image of British regions.

Freenewables

pioneers who are harnessing Britain's renewable energy resources will help the UK escape what Energy and Climate Change Secretary Chris Huhne recently described as the 'oil hook'. In an age of rising energy costs, the need for sustainability will fundamentally alter the economic landscape. The vulnerability of global supply chains has been starkly illustrated by civil unrest and natural disasters in a number of countries.

The business leaders questioned in our survey saw digital communications (68%), biotechnology (65%) and low-carbon industries (60%) as the sectors providing the best prospects for growth over the coming decade. In addition, we anticipate that a range of industries, from wave energy and solar farms to electronic paper and cybersecurity, now in the early stages of commercialisation, or completely unknown to the public at large, will come to the fore.

By 2020, it will become apparent that decentralisation will foster a renaissance in manufacturing, albeit one that places fresh emphasis on new technology. The business decision-makers surveyed as part of this report are already beginning to sense this change. Almost three-quarters (74%) regard it as important that British businesses manufacture their goods in the UK, and 54% believe this trend will increase over the coming decade.

Inventor and industrial designer Sir James Dyson believes the UK economy is refocusing on tangible as opposed to virtual products. *'Technology that draws on mechanics and materials science is showing the most growth and offering practical solutions to international problems,'* he says. *'If the government backs these initiatives and encourages long-term growth, it will reshape the economy into one that is based on exports.'*



New Entrepreneurial Tribes

New Entrepreneurial Tribes

New business models demand new mindsets and new ways of doing business. In response, new breeds of entrepreneur will come into their own over the next decade, as the impetus to develop networks and compete internationally grows. Emerging 'tribes' emphasise the need to collaborate and broaden personal horizons – something required of all of us if we are to compete effectively in the future.

Collaborateers: We first identified this new breed of entrepreneur in our 2009 Future of Business report. Since then, we have seen this agile, collaborative and opportunistic business approach flourish. Our survey regards strong personal networks (29%) as more important than having a great business idea (16%) or having good business acumen (17%).

Dr Lynda Gratton of the London Business School believes that virtual technology is making it easier for entrepreneurs to link up with talent around the world. *'As a result, leadership will increasingly emphasise the management of networks and eco-systems of talent, rather than just permanent employees,'* she believes.

Hybrid entrepreneurs: The need for business, government and academia to work together means that entrepreneurs will need to develop increasingly multi-faceted lives. Eight in 10 (80%) of business decision-makers in our survey took time out from their main job to nurture their personal networks. Four in 10 (41%) spent their time working with other companies, volunteering or teaching. Our respondents were also highly positive about the networking skills possessed by the UK's business leaders, ranking this attribute second after determination.

Local Heroes: In 2009, we highlighted how a Fourth Sector would emerge as companies focused on doing good as well as making profits. This desire to develop business models based on fairness and sustainability will increasingly combine with the development of robust and resilient, regionally based supply chains. Entrepreneurs will become more focused as a dynamic force within their regional economy.



Craft and creative industries will play a strong role in promoting localities and regions. *'The arts are essential for investment,'* says Tate Liverpool's Andrea Nixon. *'Culture is vital for a city's brand.'* These industries are central to quality of life, and to a region's ability to attract and retain skilled workers. *'Good galleries, a proactive music scene and excellent performing arts is part of being a civilised city,'* observes Nixon.

Exportentials: A new breed of export-orientated businessperson will come to the fore over the next 10 years. Awareness of export opportunities will develop into positive action during the decade. John Owrid of Index B, asserts that *'global trade is part of this country's DNA. The increasing ability to trade where ever you want is something that suits the UK.'*

'A new breed of export-orientated businessperson will come to the fore over the next 10 years'



04

Super-cities

Super-cities

- **Glasgow and Bristol added to 2009 super-cities**

Britain's 11 largest cities provide 37% of all private sector jobs. Although these cities are important hubs within regional economies, our survey of business leaders revealed significant variations in the perception of different urban centres. London (49%), Manchester (42%) and Bristol (41%) are expected to grow in importance, but Glasgow (22%), Liverpool (21%) and Dundee (14%) are not perceived as being equally dynamic. Our research challenges these findings, with experts expecting cities like Glasgow, Liverpool and Dundee to be at the forefront of growth industries over the next decade.

Among the regions, there were also considerable variations in attitude and perception:

- Only 8% of entrepreneurs in Yorkshire and the East Midlands see their main competition coming from abroad, compared with 19% for all regions – and 29% for London.
- Businesspeople in Scotland and the East Midlands were the most likely (37%) to say their customers were primarily local. In contrast, 29% of London respondents said their primary customers were international.
- 71% of entrepreneurs in the West Midlands regard exporting to emerging economies as one of the biggest opportunities for the UK, compared with 52% overall, 41% in the South West and 39% in Scotland. Only 10% of respondents in the West Midlands saw potential for exporting to established economies.

- Only 4% of respondents in the North West, and 5% in Scotland, believe that they will be more risk-averse in the future.
- Competition from the developing world was considered a threat for 60% of respondents overall. This was highest in Yorkshire/Humber (71%), the North West (69%) and London (67%). It was lowest in Wales (45%) and Scotland (51%).

In our 2009 report, we described how resurgent regional economies would be led by a number of upwardly mobile cities that were vigorous centres for growth industries. We dubbed these urban areas ‘super-cities’, and described how their development would be characterised.

We identified five super-cities:

Newcastle: A science city producing world-class scientific research

Leeds: A provincial hub of financial companies and ancillary services

Liverpool: A dynamic centre of cultural and branding businesses

Brighton: The capital of the UK’s rebellious, alternative economy

London: A city state, where the creative sector will take a preeminent position

We have continued to monitor the progress of these super-cities, and they continue to develop as envisaged – albeit with different levels of public awareness. The evolution of these urban centres is a continuing process, as is the recognition of these

changes, which will continue to increase over the remainder of this decade.

Our additional research since 2009 has enabled us to identify two more super-cities. Glasgow and Bristol will play an increasingly prominent role on the national and international economic stage, thanks to their strengths in key growth industries.

Glasgow: A leading international force in the renewable energy sector

Bristol: Pioneering new materials to become a centre of advanced manufacturing

We anticipate that Glasgow will emerge as a new renewable-energy super-city. Despite only 22% of our survey group regarding the city as likely to grow over the next 10 years, Glasgow is set for a dynamic decade. The reason is more apparent locally than nationally, at present. Four out of 10 (41%) of Scottish respondents believe Scotland is the ideal location for low-carbon industries, compared with 11% overall.

The revival we foresee in British manufacturing in an era of higher energy costs will harness new processes and technologies – including manufacturing on demand, 3D printing and rapid prototyping. Over the next 20 years, Bristol will emerge as a leading centre of research and production. Bristol’s continued growth is reflected in our survey, with 41% of business leaders expecting its role to increase compared to just 15% who expect it to decrease.

New Super-cities

'Our additional research since 2009 has enabled us to identify two more super-cities'

Glasgow

Renewable-energy super-city

The Scottish government has predicted that 26,000 jobs will be created in Scotland by 2020, and that many of these will be in Glasgow. The city is using the opportunity of renewable energy to repurpose and revitalise its traditional strengths in engineering.

The rapid growth we will see in offshore wind farms over the coming decade is already attracting new investment to Glasgow. In January, Spanish wind turbine manufacturer Gamesa announced a £40m investment in Scotland, including a centre for offshore engineering in Glasgow that will create 170 jobs. Gamesa is the third major company after ScottishPower/Iberdrola and Scottish and Southern Energy to locate a centre of excellence in Glasgow.

The city's research capabilities are what will ensure its leadership position in the coming decade. Rival renewable energy clusters, such as Hull, may be closer to the planned offshore farms, but at present they lack a facility on a par with the world-class electrical engineering department at Strathclyde University. With 210 staff, it is the largest such facility in Europe.

The university leads the Sustainable Glasgow consortium, which estimates that green energy projects will bring £1.5bn of new investment to the city by 2020. Several municipal projects will come to fruition during this period, including plans to turn the city's waste into biogas and the development of smart grids and district heating systems.

Scientists at Glasgow University are working with EADS Innovation Works on the use of hydrogen fuels. They are investigating nanotechnology as a means of storing hydrogen in a solid state – opening up the possibility of developing fuel cells light enough to use on aircraft.

Meanwhile, Edinburgh-based companies such as Pelamis and Aquamarine Power are developing capabilities in the field of wave energy.



Bristol

Advanced Manufacturing super-city

Manufacturing has declined from 29% of UK output in 1979 to 13% in 2007. But the next decade will be a tipping point in this trend as a dynamic high-tech industrial base takes shape. We expect to see Bristol leading this rebalancing in British manufacturing, a process that the National Endowment for Science, Technology and the Arts (NESTA) calculates could create as many as 2.4m additional jobs nationally.

Bristol's tradition of high-tech production, primarily associated with the aerospace and Information and Communication Technologies (ICT) industries, makes it ideally placed to benefit. The repatriation of manufacturing from low-cost overseas centres is not just driven by rising transport and energy costs nor the desire to manage political and economic shocks. New technological advances will enable just-in-time logistics to be superseded by just-in-time manufacturing, capable of providing personalised products to local customers.

The opening later this year of the National Composites Centre outside Bristol will provide prototyping and validation facilities to turn the city's world-leading research into materials science into commercial success. Researchers at the University of Bristol have been developing morphing structures that can quickly and dramatically change shape. They predict basic shape-shifting vehicles by 2020.

3D additive manufacturing is also being pioneered in Bristol and promises to revolutionise production processes. Rather than being hewn from raw materials, components and products are 'printed' from a wide range of materials including metals and plastic. Items from mobile phones and medical implants to football boots and watches have already been produced. Bristol-based EADS hopes to reduce waste by up to 90% in the production of titanium aircraft parts by using additive manufacturing.

As a result of Britain's relatively high labour costs, automation will be a key component in the UK's manufacturing renaissance. Bristol is also a major centre in the development of advanced robotics. The Bristol Robotics Laboratory will host the world's most advanced autonomous robots in 2012 for the FIRA RoboWorld Cup. The Lab is now conducting work on robots that are able to convert food into energy.

What makes a super-city distinctive is not just a strong presence of growth industries, but also the quality of life it offers. *'The reason people move to these cities is because of their professional networks,'* says Dr Caroline Chapain of the University of Birmingham, *'but what makes them stay is the atmosphere.'* With the boundaries between business and leisure time continuing to blur, the importance of lifestyle as a means of retaining talented staff continues to rise.

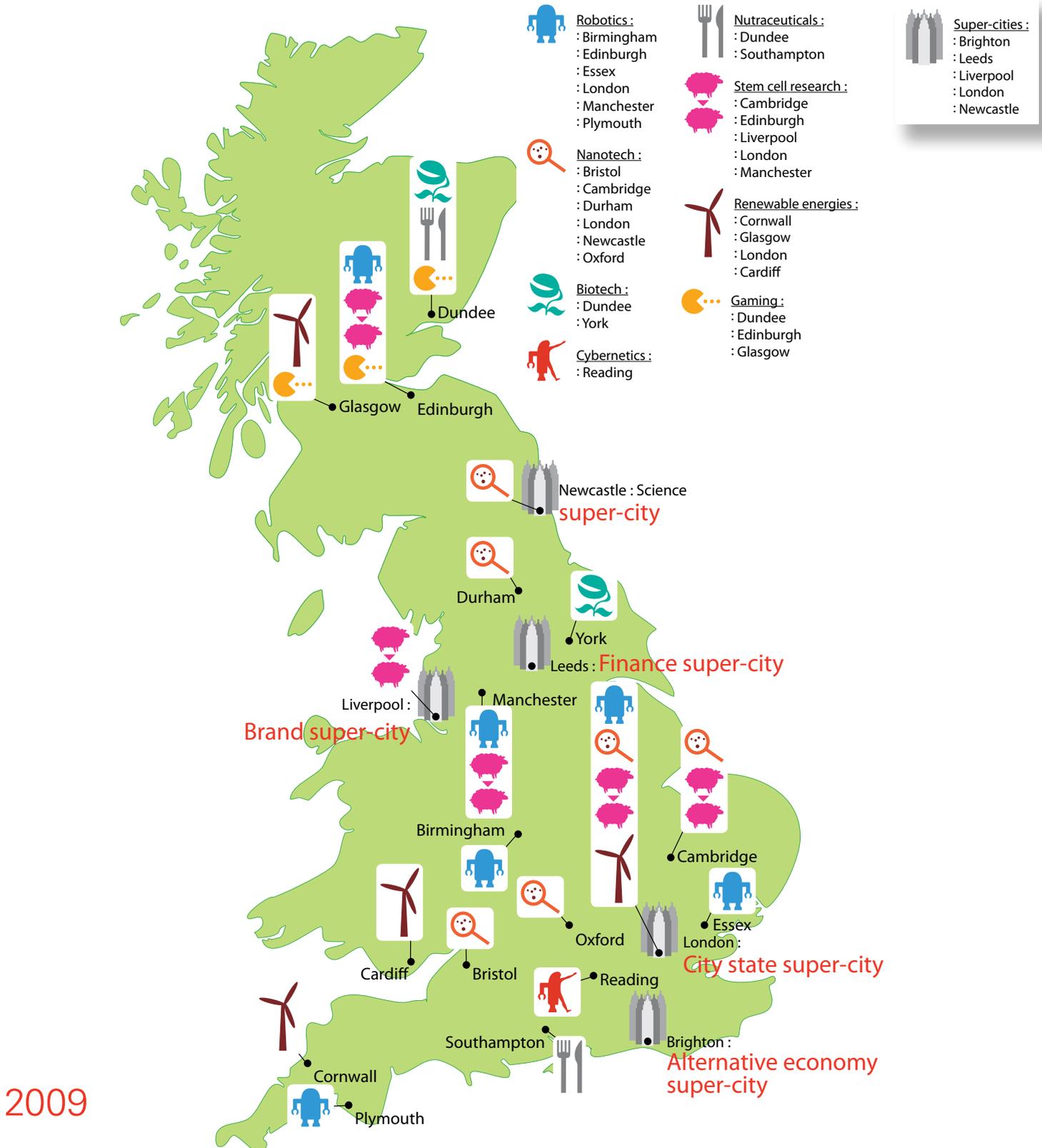
In this regard, the creative industries are an engine of growth – not only in their own right, but also for their effect on other growth industries. *'People are used to a certain quality of life elsewhere in the world, and they expect great facilities, even if they don't personally go to them,'* says Andrea Nixon, executive director of Tate Liverpool. *'Culture underpins a sense of civic pride, and is also how the rest of the world knows what your city stands for. Football and the Beatles may seem obvious examples, but they are a part of what makes this city special.'*

Future Business Landscape

The industrial map of Britain was once dominated by raw materials, and this is still true as some of the most valuable resources today are wind, waves and solar power.

More than ever before, the driving forces behind British businesses are knowledge and creativity.

In 2009 we introduced our map of next-generation innovations and their centres of gravity across the UK. Our latest atlas of the British economic landscape explores the developments of these industries in the intervening years as new technologies emerge from the R&D laboratory and begin to form future facing and commercially focused businesses.





Renewable Energy

Orkney Sea Power
Glasgow Green Supercity
Humber Marine Energy Park
North Wales Solar
Cornwall Wave Hub



Regenerative Healthcare

Edinburgh Science Triangle
Newcastle Science City
York Regenerative Health Hub
Atlantic Gateway Biomedical
Nottingham BioCity
Cambridge Re-gen Fen



Advanced Composites

West Midlands Composites
Bristol Composites Cluster



Creative Industries

Dundee Digital Gaming
Manchester MediaCityUK
Creative Cardiff
East London Tech City



Low-Carbon Transport

Sunderland Low-Carbon
Norwich Low-Carbon



Space Industries

Thames Valley Space



Biochemicals

Yorkshire Biochemicals
Humber Biochemical Cluster



Plastronics

Durham Printable Electronics
Cambridge Plastronics
Swansea Plastronics Hub
London Plastronics Hub



Photonics

Strathclyde Photonics
West Midlands Photonics
Cotswolds Cyber Security
Thames Valley CyberCrime
Southampton Hyper Highway



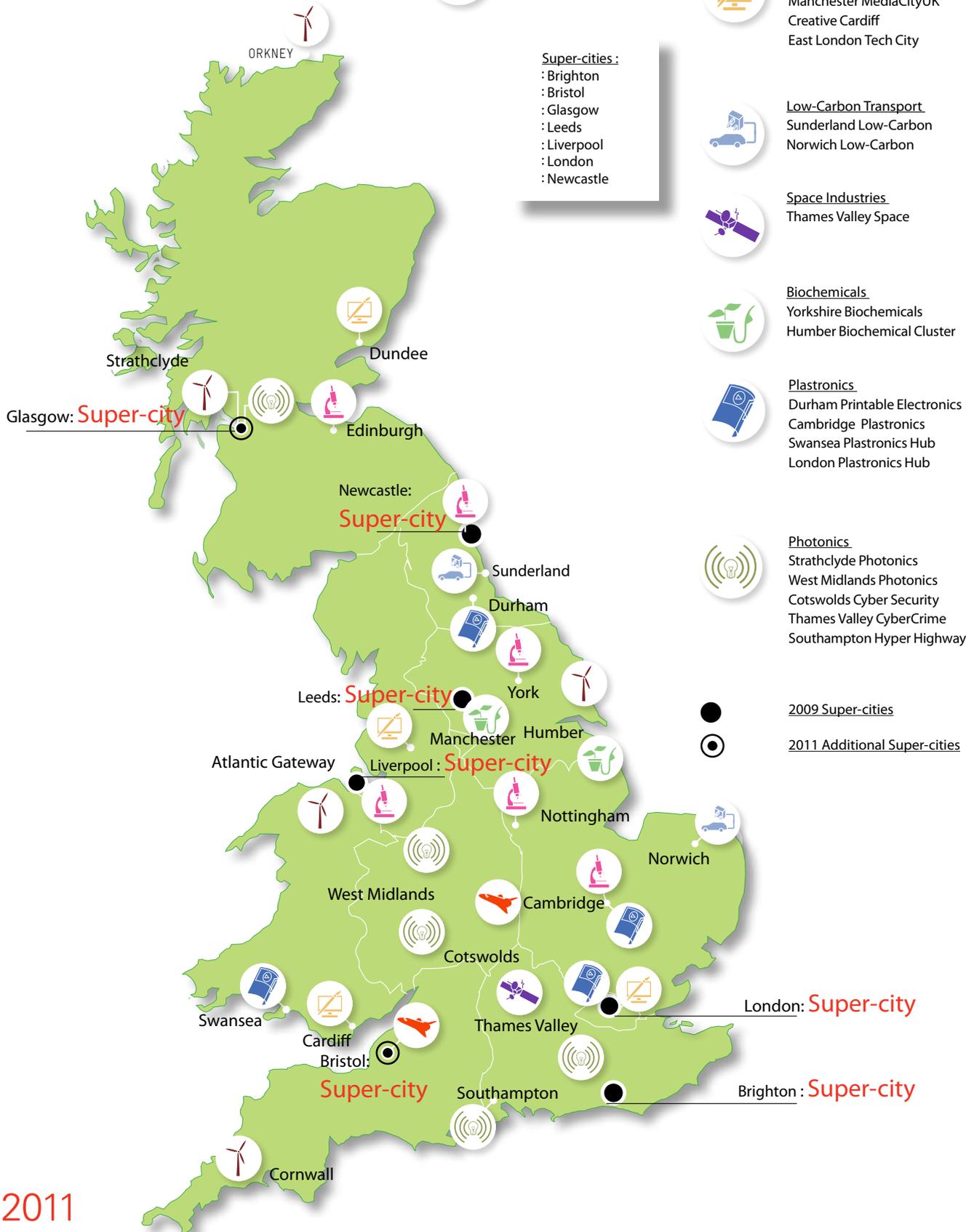
2009 Super-cities



2011 Additional Super-cities

Super-cities :

- : Brighton
- : Bristol
- : Glasgow
- : Leeds
- : Liverpool
- : London
- : Newcastle



2011



Growth Sectors

Growth Sectors

- **Nine next-generation growth sectors identified**
- **Business, academia and government to work together for success**
- **New industry 'clusters' to grow around UK**

Britain's future economic competitiveness will be determined not by its success in existing sectors, but by its ability to seize the opportunities presented by next-generation industries. To achieve this, business, government and academia must work closely together in the face of fierce international competition.

There are already grounds for cautious optimism. *'We will see the rise of clusters of industries that the UK excels in,'* says the London Business School's Dr Gratton. *'The UK already has a track record in sectors such as creativity, renewable energy and medicine, so it is incredibly well positioned for the future.'* Building on these strengths is an essential objective of the next decade.

The rise of rapid manufacturing

Just as the introduction of mass production led to the advent of the industrial revolution, the development of rapid prototyping and 3D printing will have a similarly profound effect on the British economy.

The next 10 years will see this manufacturing technique develop as rapidly as computing has evolved over recent decades. According to the Department for Business, Innovation and Skills the cost of 3D printers has fallen from £500,000 in 1999 to less than £10,000 today. Open-source projects like RepRap founded by Dr Adrian Bowyer at the University of Bath allow enthusiasts to build their own 3D printing device for around £300.

Bath is one of a number of UK academic institutions that is working with corporate partners to develop commercial uses for the technology. The Additive Manufacturing Research Group at Loughborough University is working with Adidas to investigate how rapid manufacturing can be used to produce tailored sports garments to prevent injury. The group is also developing laser-fused polymers to make ski bindings for Burton. Costs are dramatically reduced compared with the price of using the injection-moulding process.

The Advanced Manufacturing Research Centre at the University of Sheffield is backed by commercial partners such as Boeing. It is seen as the blueprint for technology and innovation centres which expect £200m of government investment over the next four years.

Sheffield is also the location of the Rolls-Royce Factory of the Future, which is conducting research into a wide range of advanced manufacturing processes.



Plastronics

Electronics that can be printed onto a range of different surfaces are recognised as having huge potential, even if they have only recently emerged from the R&D lab. Plastronics promise to be cheap to produce and easy to customise, unleashing a huge range of new applications thanks to their robust, yet thin and lightweight, properties. This versatility makes them suitable for disposable electronics such as digital posters, smart packaging and next-generation textiles.

The Technology Strategy Board states that the global market for plastronics could rise from the current £1.3bn to £80bn by 2020, and create 20,000 jobs in the UK in the process. Britain already has world-class capabilities in this transformative technology.

Plastic Logic

In 2000 Plastic Logic was spun out of the Cavendish Laboratory at Cambridge University following pioneering research into printing electronics onto flexible plastic. Plastic Logic maintains a strong research and development capability in Cambridge. Seamus Burn, director of display engineering, points to the partnership the company has with the university: *'This collaboration benefits Cambridge University as well because it gives its research a much clearer path to commercialisation.'*

In 2008 the company opened the world's first commercial scale, plastic electronics factory. The decision for this to be in the German city of Dresden was partly influenced by factors such as government funding and access to a highly skilled workforce. The company recently announced it would also open a production facility in Zelenograd near Moscow in 2013 as part of a further £430m investment.

Although the company is involved in several UK partnerships Burns describes how collaboration with industrial partners is on a global scale, too. *'There is the capability to work with partners around the world now, so we go with the ones that have the most appropriate technology.'*



Growth Sectors

Regenerative Healthcare

The UK life sciences industry, which consists of 3,600 companies and employs 120,000 people, is set for a decade of strong growth. As populations in the West continue to age, the sector is developing healthcare products to treat chronic conditions and improve people's long-term wellbeing. The Technology Strategy Board forecasts that the worldwide market for regenerative healthcare will grow by 7–12% a year for the foreseeable future.

Intercytex

Based in Alderley Edge, south of Manchester, Intercytex is a regenerative medicine company focusing on the development of skin repair and rejuvenation technology. Its leading product, Vavelta, is now being evaluated by the US military to treat soldiers suffering from burns and scarring. Trials are scheduled to begin in the UK later this year and the product also has potential as a treatment for cosmetic skin conditions.

Bringing a product to market, however, can take 10–15 years. *'It's a time-consuming and expensive process,'* says Dr Paul Kemp, CEO and chief scientific officer of Intercytex. As the research process has changed, small and medium-sized enterprises in the sector have had to adapt. *'Companies are developing more capital-efficient business models, including collaborating more and working together to lobby the government,'* says Dr Kemp. Firms such as Intercytex are maximising ties to local academic institutions, clinical research clusters and hospitals. Dr Kemp is on the board of directors of the University of Manchester Incubator Company and shares his expertise by mentoring other biomedical firms.

Space Industries

NASA's space shuttle programme will launch its final mission later this year, but, in the UK, space industries continue to strengthen: growth has averaged 9% a year over the past decade. The sector is now worth £5.6bn a year, and provides highly skilled employment to 68,000 people. Britain may have no manned space missions, but it is a world leader in satellite technology, remote sensing and components.

At £206m, the 2011 budget of the new UK Space Agency (UKSA), based in Harwell in Oxfordshire, is only a fraction of those of its German and French counterparts, but it has big ambitions. The agency expects the global space industry to grow from £160bn in 2008 to £400bn by 2030, and it aims to capture 10% of this market, creating 100,000 jobs.

Biochemicals

As well as the life sciences sector, industrial biotechnology can be used for the sustainable production of chemicals, materials and fuels. With annual sales of £56bn, the UK chemicals sector is already the seventh largest in the world. The industry already represents 11% of all British manufacturing, and employs 170,000 people. The chemicals industry is also highly export-orientated, with 90% of firms supplying overseas markets – accounting for 15% of all UK exports.

Yet, with the sector also responsible for 7% of greenhouse gas emissions, it is under considerable pressure to reduce its environmental impact. The UK leads the way in harnessing industrial biotechnology to produce more sustainable chemicals. It is hoped that, by using plants, fungi, algae and micro-organisms, industry emissions of greenhouse gases can be reduced by up to 2.5bn tonnes by 2030. The Department for Business, Innovation and Skills reports that the industrial biotechnology market is worth £35–53bn worldwide. It has the potential to increase to £350bn by 2025.

Britain is exceptionally well placed to take advantage of this growth, with one in four European medical technology companies currently based in the UK. As well as the £15.6bn pharmaceutical sector, which employs 67,000 people, a further 24,000 people are employed in medical biotechnology, which is worth £4.2bn a year to the UK economy. The Department for Business, Innovation and Skills anticipates that regenerative healthcare will add £5bn, and 15,000 skilled jobs, in the next decade.

Renewable energy

The UK's blustery weather and turbulent seas provide rich sources of renewable energy, and harnessing them is a priority – both in order to reduce the country's dependence on oil imports and to promote a low-carbon economy. The UK government has pledged to obtain 15% of our energy from renewables, compared with just 2.3% in 2008. The sector is already worth over £33bn year, and employs more than 250,000 people. It is expected to reach an annual growth rate of 5% by 2015.

Industry body RenewableUK says that employment in renewables has increased by 91% since 2007, with many of the jobs in offshore wind energy. By 2020, offshore wind could be worth £8bn, generating 32GW of electricity and employing 70,000 people. RenewableUK believes that, by 2050, it could be worth as much as £65bn to the UK economy.

Solarcentury

Named last year in the Global Cleantech 100, which lists the world's top 100 clean technology companies, Solarcentury is the UK's leading solar energy firm. The company has developed a range of solar building products, designed to turn buildings into energy generators.

Since 2007 the company has used the Sony UK Technology Centre near Bridgend in South Wales to produce some of its solar roof tiles. The combination of high-quality manufacturing and flexibility is the key attraction. Solarcentury believes this makes trialing or modifying products much easier. *'Products that are large and expensive to ship are better manufactured locally too, and our industrial roofing products are also frequently made to order so it's hard to imagine manufacturing such custom kits abroad,'* observes chief innovation officer, Adam South. Solarcentury does make some products in China but only when the technology and volumes are stable enough to justify the considerable investment required.

Solarcentury also has a global perspective when collaborating with companies in related fields. It partnered with California's Tesla electric sports car company at the recent 2011 Ecobuild conference in London. *'We're looking to create scale and critical mass for the solar energy industry and having these partnerships helps us to do this,'* believes South.

Mojo Maritime

Based in Falmouth in Cornwall, Mojo Maritime provides project management and consultancy services to the offshore renewable energy sector. Uniquely for the industry, Mojo combines its consultancy services with considerable engineering capabilities, which means it can also deliver projects from initial concept to final installation.

Cornwall has a long heritage of submarine cable-handling, which is highly compatible with the technology required for the marine energy sector. Since 2008 Mojo Maritime has been closely involved in the world's first commercial tidal stream power station, the 1.2MW SeaGen project in Strangford Loch in Northern Ireland. The company's other projects include the DeltaStream 1.2MW tidal energy project in Pembrokeshire, Wales and the Santoña wave power buoy off the north coast of Spain.

The company is now working on The Skerries Project, a 10.5MW tidal energy farm off the coast of Anglesey, partly funded by the Carbon Trust Marine Accelerator fund. This part of the Welsh coast has some of the strongest tidal currents in the British Isles. *'Tidal energy has the potential to become cost-effective in the near future and we'll see commercial arrays of up to 20MW within the next five years,'* predicts Captain Richard Parkinson of Mojo Maritime.

Parkinson says partnerships with government, academia and the financial sector need to be developed further and he cites how Mojo Maritime has developed a good relationship with the University of Exeter. *'There is a role to play for industry to work with the universities. They have geared up around our requirements and we get a lot more support that way,'* Parkinson observes. If the UK is able to develop an infrastructure that other European countries have already created it will dramatically increase the potential of the British marine renewables sector.

Low-carbon vehicles

Nearly a fifth (19%) of CO2 emissions come from road vehicles. This is spurring a strong push for low-carbon transport, with over £1bn in research and development spent each year in the UK alone. The Department of Business, Innovation and Skills estimates that over £150bn will be invested in low-carbon vehicle technologies over the next 20 years.

The UK already maintains strong capabilities in the automotive industry, which employs 180,000 people and adds £9.5bn to the British economy. Over the next decade, engines will become much more efficient, and technology such as the Kinetic Energy Recovery System (KERS) – now largely confined to the UK's high-performance motorsport industry – will become increasingly commonplace.

The UK's strength lies even more in engines than in finished vehicles. In 2009, more than 2m engines were produced in Britain, compared to 1m cars. The result of a £130m investment programme, Ford's highly efficient Duratorq turbo diesel engines are in production at the wind-powered Dagenham Diesel Engine Centre in Essex. The Staffordshire-based ZYTEK Group is an electric drive specialist, whose seven-seat Mercedes taxi scooped the most economical multi-purpose electric vehicle prize at the inaugural RAC Future Car Challenge. The vehicle completed the London to Brighton run with 30% of its battery capacity to spare.

Alexander Technologies Ltd

Founded 26 years ago in Peterlee, County Durham, Alexander Technologies is a leading designer and manufacturer of portable batteries for devices such as scanners and hand-held electronics. The company employs 70 staff, and supplies a global client base from production facilities in Malaysia, the UK and Mexico.

Created by inward investment from the US during an era of industrial decline in the Northeast, Alexander Technologies is now leading the trend of manufacturing repatriation that will develop over the next decade. *'It's more cost-effective for us to manufacture in the UK,'* says managing director Tania Cooper. *'It also gives us greater speed and flexibility to respond to the specific needs of European customers.'*

Alexander Technologies is very much part of the regional economy, too. *'If we can, we*

buy locally, and if we can't buy locally, we buy regionally,' says Cooper. The availability and responsiveness of this local network is a key advantage, especially when suppliers need to be accredited. The adaptability and varied skills of the local workforce are also key advantages, and the company has an almost zero turnover of staff.

Advanced composites

A new generation of super-light, super-strong materials is revolutionising a wide range of manufacturing sectors. The worldwide market for such high-performance advanced composites is predicted to grow 40% by 2013, to £74bn. In the UK, the industry employs 40,000 people, and is worth about £1bn to the economy.

Aerospace has pioneered the use of these materials, and demand is expected to grow at 15% a year over the coming decade, half the weight of modern aircraft such as the Airbus A350 XWB being made from advanced composites. The aircraft's wings are made in the UK, and Airbus opened a specialist training and development facility in Broughton, Flintshire, in October, to help employees and apprentices develop the necessary skills.

Bladen Jets

The unveiling of the Jaguar C-X75 electric concept car at the Paris Motor Show in October last year was certainly eye-catching, but the real revolution was under the bonnet. The car's battery pack is recharged by a micro-jet engine designed by Bladen Jets.

By charging the batteries on the go, the lightweight turbine engine extends the range of electric vehicles from 150 miles to over 600 miles. Jaguar's parent company, Tata, has recently taken a minority shareholding, and is interested in developing the technology to generate electricity at a local level in markets such as India. Bladen Jets also believes that its engines could be used in the aerospace and marine industries.

Courtenay Heading the company's business development director thinks that large firms would struggle to develop such a disruptive innovation. *'Small companies can ask 'what if?' in a way that large companies can't. Our research was based on friendship and personal enthusiasm, rather than focusing just on the bottom line.'*

Photonics and digital services

Our survey of business leaders shows that the largest proportion (68%) believe that digital communications and services will become more prominent over the next 10 years. This will be essential if, for example, the UK is to accommodate an estimated increase – from 8% to 20% – in the proportion of online commerce by 2012.

The UK already has a highly developed communications infrastructure, including more than 19m broadband lines. As a result of increasing efficiency and productivity, the World Bank estimates that every 10% increase in the penetration of broadband leads to a 1% increase in GDP. Seven in 10 (71%) of UK households have broadband access, compared with a European average of 56%.

The Office of National Statistics (ONS) found that 62% of UK adults had ordered goods or services online in 2010, the highest in the EU. The National Endowment for Science, Technology and the Arts (NESTA) believes that the roll-out of a national, super-fast broadband network would create 600,000 jobs and add £18bn to GDP.

Substantial private sector investment by BT and Virgin Media will see super-fast services made available to 50% of the UK population by 2013, and to 19m premises (66% of the population) by 2015.

Bounce Mobile

Bounce is an entrepreneurial start-up in London's Shoreditch. The company provides apps that enable users to interact with music in new ways on digital devices. Its Fireplayer product lets people create custom mixes, and then publish and share them via social networks. Bounce is indicative of the innovative, technology-focused firms that will be established in the East London Tech City, a British Silicon Valley, which, by 2020, will stretch from Shoreditch to the Olympic Park in Stratford.

The technological revolution is the foundation of this rapidly emerging cluster of innovation, making it easier to create music, discover new bands and promote artists via social media. It also allows Bounce to trail and test new ideas quickly and cheaply. 'The hurdles to innovation are coming down, and in that sense it's disrupting the industry in a positive way,' says Macmillan.

'Two-thirds of international advertising and branding agencies have their European headquarters in London.'

Creative industries

At 6.2% of the economy, the UK's creative industries are proportionally the largest of any in the world, with 2m people employed across a broad range of industries, from video gaming to crafts and the performing arts. Britain's leading position is reflected in the fact that over two-thirds of international advertising and branding agencies have their European headquarters in London. The UK is the third-largest music market, and the second-biggest exporter of tv programming, in the world.

The National Endowment for Science, Technology and the Arts (NESTA) reports that the creative industries are growing at twice the rate of other sectors. 150,000 new jobs will be created by 2017.

With global sales of £2bn, the video games sector is larger than film or music. NESTA anticipates that the video games industry will generate £1bn more sales by 2014. Already, 10,000 people are employed, producing smash hits such as Lemmings and Grand Theft Auto. Outplay Entertainment, in Dundee, is a new start-up aiming for a slice of the £620m global market for social gaming played via platforms such as Facebook.

Propellernet

Brighton is an 'alternative economy super-city' and a dynamic centre for innovative companies forging novel ways of doing business. Propellernet is one of a new breed of online marketing agencies that have been attracted to the city. The company, with 30 staff, is growing by 50% a year. *'Our market simply didn't exist a few years ago, and its rapid development shows innovation is key,'* says Jack Hubbard, managing director

Propellernet also thrives on the local network, which they believe is far more open and collaborative than the 'cut-throat vibe' in the capital. The company is an active part of a mentoring system that includes Wired Sussex, a Brighton-based organisation that works to promote the development of a regional digital cluster. *'The city's social scene is very accessible,'* observes Jack Hubbard. *'This helps us tap into Brighton's creative energy, and enables us to crowdsource expertise through a wide network of freelancers.'*

05

Conclusion

The growth industries, supercities and regional clusters reviewed in this report illustrate how the business landscape will be transformed over the coming decade and beyond. New entrepreneurial tribes will emerge as the rules of business are rewritten. Leading experts and thinkers, innovative companies and our survey of business decision makers from across the UK have informed and illustrated the opportunities presented by an age of change.

The UK economy has emerged from recession, but risk and uncertainty are likely to remain characteristics of the British and the global economy for the foreseeable future. The need for clarity of vision and a broad, future-facing perspective has never been greater. By learning the lessons of the past and meeting the challenges of the present the British business community will continue to ensure its success in the future.

There are many reasons to look to the future with optimism. Our 2009 report highlighted how innovative growth industries would drive recovery, create employment and increase competitiveness. The UK already excels in many of these sectors and the last few years have seen the country build on this pioneering advantage. We also showed how super-cities would evolve as powerful engines of dynamic growth. This report illustrates how we now see these industries and supercities broadening and developing further, forging regional clusters and networks to achieve critical mass and compete internationally.

The need for collaboration has been consistently emphasised by the experts and business leaders who have contributed to this report. Partnership between business, academia and government is an essential ingredient in commercialising and developing the growth industries of the future. As a result, qualities such as trust, personal networks, mentoring and cultural sensitivity will be every bit as prized as business acumen or technical know-how.

In turbulent times the need for adaptability and flexibility is paramount. Technology is rapidly decreasing the cost of competition and inspiring a new fleet-footed generation of micro-entrepreneurs. Business leaders will increasingly need to manage footloose talent rather than static teams and must develop lean, low-carbon and highly responsive business models. Some of the more brittle global supply chains will be replaced by a revival in flexible British manufacturing.

More than ever, the ingenuity, creativity and adaptability of British businesspeople will be the country's most important asset. By nurturing, supporting and developing these qualities the UK will remain well placed to compete over the coming decade.

Glossary

Collaborateer: an agile, tech-savvy, breed of entrepreneur that combines the actions and ideas of the open-source business sector with more traditional business models

Exportential: business leaders who prioritise the search for new audiences abroad, particularly in emerging markets, in order to grow their businesses

Fourth Sector: companies that are for-profit, but are also doing good through a relationship between business and philanthropy

Freenewables: entrepreneurs who are seizing the advantage the UK possesses in renewable energy and adapting to the coming era of higher energy costs

Hybrid Entrepreneur: a businessperson with a multi-faceted business life designed to foster personal networks between the business, academic and government realms

Local Hero: an entrepreneur who is firmly embedded in the regional economy and local supply chains

Micro-multinational: hyper-flexible, hyper-connected companies that are using technology's ability to reduce barriers in order to enter new markets

Slash/Slash: a term used to describe workers who have a series of related or non-related careers (CEO/producer/manufacturer/ad agent)

Super-city: a dynamic urban area that is the preeminent centre of a regional economy and a centre of gravity for growth industries and world-class research. Super-cities are important players at the international, as well as national, level

Tradicals: creative innovators, reapplying traditional skills in radical new ways in order to reach new markets. Craft industries will emerge as key players in redefining the national and international image of British regions

Trust Economy: an economy in which trust, fostered by open collaborative networks and partnerships, is a vital business asset

Tryotechs: small or medium-sized companies focused on long-term scientific research in fields such as biomedicine, nanotechnology and materials science. These companies normally work with larger corporations at the full commercialisation phase

Consultant Experts

For this report, we have interviewed nine experts whose knowledge and expertise span the worlds of business, economics, technology and public policy.

Andrea Nixon is executive director of Tate Liverpool, a fellow of the Royal Academy of Arts and a trustee of the Crafts Council. Andrea is also a member of the board of Renaissance North West, and of the tourism panel for the Northwest Development Agency.

Dr Caroline Chapain is a member of the Centre for Urban and Regional Studies at the University of Birmingham, and the author of the recent Creative Clusters and Innovation report for the National Endowment for Science, Technology and the Arts (NESTA). Dr Chapain's specialisms include regional economic development and policy, and the role of creative industries and creative cities.

Sir James Dyson is a leading entrepreneur, inventor and industrial designer. In 2002, he created the Dyson Foundation, to support design and engineering education. In 2010, following an invitation from David Cameron, Sir James produced the Ingenious Britain report, which set out proposals for making the UK the leading high-tech exporter in Europe.

John Owrid is founder of CultureMap, an SME think-tank and publisher of the British Culture Index. John has also established Index B, an information platform to foster collaboration among small and medium-sized companies.

Dr Lynda Gratton is professor of management practice at the London Business School, and founder of the Hot Spots Movement – a consulting team that bridges academia and management practice. A leading authority on people in organisations, in 2008 she was selected by The Financial Times as the business thinker most likely to make a real difference over the next decade.

Professor Mariana Mazzucato is an industrial economist, and professor of economics at the Open University. She is also economics director of the Economic and Social Research Council's (ESRC) Innogen programme, which investigates interactions between scientists, industry and private-interest groups.

Mark Berrisford-Smith is senior economist within the Business Economics Unit at HSBC Bank plc. He advises on UK, European and global economic issues and is a regular speaker at conferences and seminars.

Robin Wight is president of The Engine Group and advertising agency WCRS, and is the former chairman of the Duke of Edinburgh's Award, Charter for Business. A campaigner for the promotion of innovation and creativity in the education system, Robin set up the Ideas Foundation – a charity which helps identify and nurture creatively gifted young people – in 2003.

Tony Greenham is head of finance and business at the New Economics Foundation, and has experience as a corporate stockbroker, a commercial accountant and a sustainability consultant. Tony has also worked as a director of the Transition Towns movement in the southwest.

Referenced Organisations

National Endowment for Science, Technology and the Arts (NESTA) is an independent body with a mission to make the UK more innovative. They invest in early-stage companies, inform policy, and deliver practical programmes that inspire others to solve the big challenges of the future.

RenewableUK is the trade and professional body for the UK wind and marine renewables industries. Formed in 1978, and with 658 corporate members, RenewableUK is the leading renewable energy trade association in the UK.

The Department of Business, Innovation and Skills (BIS) is building a dynamic and competitive UK economy by: creating the conditions for business success; promoting innovation, enterprise and science; and giving everyone the skills and opportunities to succeed. To achieve this it will foster world-class universities and promote an open global economy.

The Office of National Statistics (ONS) is the executive office of the UK Statistics Authority, a non-ministerial department which reports directly to Parliament. The Office for National Statistics produces independent information to improve our understanding of the UK's economy and society.

The Technology Strategy Board is the UK's national innovation agency. Its goal is to accelerate economic growth by stimulating and supporting business-led innovation.

UK Space Agency (UKSA) is an executive agency under the Department for Business, Innovation & Skills. The Agency has responsibility for strategic decisions on the UK civil space programme and will target areas that have the greatest potential for delivering scientific excellence, economic benefits and national security.

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