Manufacturing: New Challenges, New Opportunities

September 2008

Summary

BERR | Department for Business Enterprise & Regulatory Reform

Department for **Innovation, Universities** & **Skills**

Foreword

"...for this government manufacturing not only has been, but remains and will always be, critical to the success of the British economy...."

Gordon Brown

Manufacturing matters. It creates wealth, sustains jobs and is central to our economic success. It has been the foundation of our strength as a trading nation in both the past and the present.

UK manufacturing has been succeeding in a fiercely competitive global environment, with particular challenges from emerging economies. Manufacturing has made the changes – many of them difficult – to emerge as a major success story of the economy. That is often not recognised – too many still think of manufacturing wrongly as fixed in an era of heavy engineering and in decline. Modern manufacturing is at the frontier of new technologies, products and ways of working. Our future lies in a mixed and balanced economy with manufacturing and services reinforcing each other.

Manufacturers are clearly affected by the current global economic slowdown, and rising fuel and materials prices. The Government recognises that these are demanding times and is committed to helping manufacturers to get through them.

For the medium term, we have identified trends in global manufacturing that provide new challenges and opportunities, not least in the transition to a low carbon economy. The Government has reviewed and refreshed its medium term strategy for the sector to reflect these new dynamics and to adjust the way we support companies for future success. We want manufacturing to emerge from this challenging time stronger and fitter than before. To achieve that we are committed to building the best framework of support, developing the right skills and creating an environment in which British manufacturing can seize new opportunities and remain a global success.

John Hutton
Secretary of State for Business,
Enterprise & Regulatory Reform

John Denham
Secretary of State for Innovation,
Universities and Skills

INTRODUCTION

Manufacturing has been, and continues to be, critical to the success of the UK economy. Britain's strength as a prosperous trading nation over the past three centuries was built on manufacturing. Looking forward, a thriving modern manufacturing sector is central to the future success of the British economy.

Manufacturers face major challenges in the short-term – the global economic slowdown compounded by high input prices for energy and raw materials – and in the longer term, as the pace of globalisation continues to intensify. But at the same time, longer term changes in the global economy present tremendous opportunities from new and growing markets.[1] British manufacturing is well placed to succeed in the 21st century economy, with global connections providing ready access to global markets, and a flexible labour force and light touch regulatory environment enabling quicker, and more informed responses to changing demand.

It is therefore vital that British manufacturing continues to have the right long-term framework of support to ensure it emerges from the global slowdown stronger and fitter than ever, and better placed to exploit the new opportunities of an increasingly interconnected economy.

Based on extensive consultation and working with the Ministerial Advisory Group on Manufacturing[2] and other stakeholders,[3] the Government is launching a new Manufacturing Strategy. This builds on the foundation of the present strategy, launched in 2002.

The Government is clear that our future lies in a mixed and balanced economy, where manufacturing activities complement services to deliver the widest possible range of economic benefits across all regions, and create skilled jobs that span the entire value chain, from research through to fabrication, branding and sales. In addition, growth and demand in manufacturing and in new services reinforce each other. Manufacturing adds over £150 billion a year to the economy and accounts for half of the UK's exports.

Our vision is for a globally competitive manufacturing sector that leads the world in capturing higher value components of the global value chain, whilst consolidating areas of existing comparative advantage, including activities within high technology manufacturing. The UK can also be a world leader in manufacturing solutions for a low carbon economy and we want to see at least a million jobs in the green economy by 2030. To achieve these goals we need to ensure that we have the right skills mix, from engineering to design to project management. At the same time manufacturing must be seen as an attractive career option for the highest calibre individuals to ensure a multi-skilled, flexible workforce that underpins success in the global market place.

1 These changes are outlined in detail in the supporting BERR Economics Paper No. 2: 'Five Dynamics of Change in Global Manufacturing' – Underpinning Economic Analysis www.berr.gov.uk/files/file47663.pdf

2 www.berr.gov.uk/sectors/manufacturing/MAGonmanufacturing/page47668.html

3 www.berr.gov.uk/sectors/manufacturing/regionalevents/page47671.html

A MAJOR SUCCESS STORY

Manufacturing is a real, but not always recognised, success story. It accounts for 13% of UK GDP and has outstripped the rest of the economy by increasing its productivity by 50% since 1997. This has narrowed the overall economy's historic productivity gap with major competitors: between 1997-2004 average labour productivity in the UK grew by 4% more than the USA, 5% more than France and 15% more than in Germany over the same period.

The UK is the world's sixth largest manufacturer measured by output, and is now a world leading exporter of high-tech goods. In 2006, 25% of UK goods exports were high-tech, compared to 22% in the USA, 15% in France and 11% in Germany. Overall the sector contributes 75% of all business Research & Development (R&D) in the economy.

The UK outperforms every country in Europe in terms of attracting inward foreign direct investment to manufacturing, and is second globally only to the USA. In 2006, flows of manufacturing foreign direct investment into the UK exceeded £26 billion, compared to £15 billion into France and £3 billion into Germany.

This reality is very different from the popular misconception that manufacturing is in decline and actual activity does not fit the traditional image of manufacturing. This is in part because many successful firms have developed in new or unfamiliar sectors, such as in-flight refuelling systems, silicon design, Bluetooth technology, fuel cells and plastic electronics, or in sectors at the frontier of new technologies, such as information and communication, biotechnology, fuels and nanotechnology.

Many new firms are also part of fragmented supply chains and do not produce final consumer products, while others have successfully combined manufacturing and service activities, with distinctions between the two increasingly blurred. Aerospace, automotive, pharmaceuticals, food and drink, defence, telecommunications, and many more all have thriving manufacturing operations at their core or are part of a global value chain with links to manufacturing elsewhere in the economy.

The manufacturing workforce is also more diverse today, with increasing numbers of jobs in R&D, design, sales, services, after-care and supporting packages, alongside those in more traditional jobs in production and engineering.

Inevitably this success has meant significant restructuring in UK manufacturing with job losses affecting many communities. However, it has also meant the manufacturing sector is well placed to meet the challenges of an increasingly competitive global economy.

UK Manufacturing Success

- £150 billion per annum to the economy
- Half of UK exports
- 50% productivity growth since 1997
- 75% of business R&D
- 6th largest manufacturing output in the world
- Consistently in top rankings of high tech exports
- More foreign direct investment than any country apart from the USA

SUPPORTING MANUFACTURING SUCCESS

In 2002 we published a strategy for UK manufacturing industry. This identified seven critical success factors:

- **Macroeconomic Stability** – allowing businesses to plan for the long-term
- **Investment** – supporting investment in capital equipment and processes, leading edge technology, skills development, and Research and Development
- **Science and Innovation** – helping manufacturers exploit the UK's strong science base to create innovative, high value products
- **Best Practice** – helping companies to raise productivity through continuous improvement and lean manufacturing techniques
- **Skills and Education** – supporting the development of a skilled and flexible manufacturing workforce
- **Modern Infrastructure** – providing effective transport and communications networks
- **Right Market Framework** – providing the supportive business environment that manufacturing needs to compete globally

These factors remain as relevant today and the basis of Government support for the sector both regionally and nationally. In 2004 the Government expanded the role of the Manufacturing Advisory Service (MAS) which has helped thousands of businesses compete in existing and new markets and is available across all regions of the UK. Businesses that have followed the free or subsidised advice of MAS have saved over £500 million by improving their efficiency and effectiveness through the introduction of lean manufacturing techniques. The Government also introduced National Skills Academies, including the National Skills Academy for Manufacturing, and established the Technology Strategy Board to invest in new technologies and innovations for the benefit of business, which is key to such an R&D intensive sector.

Government support for manufacturing:

- R&D Tax Credits brought £2.3 billion of support for business R&D by 2005-6, with a significant proportion taken up by the manufacturing sector
- Repayable Launch Investment for civil aerospace projects. Over the past decade BERR has invested almost £1 billion. For example, in Airbus from the very first A320 to the recently launched A380 aircraft
- Selective Finance for Investment grants of £191 million from 2004-2007, 75% (£143 million) of which is to the manufacturing sector
- Since 2004 the Technology Strategy Board has invested in a portfolio worth more than £1 billion in collaborative business-business and business-academia partnership projects, predominantly in manufacturing
- Since 2002 and the creation of the Manufacturing Advisory Service Government and RDAs have invested £90 million in the service, helping 24,000 firms
- Since 1997/98 the number of people starting an apprenticeship has more than doubled from 75,000 to 184,000. In 2006/07 23,000 apprentices started learning in the manufacturing and engineering technologies sector
- Government has committed to investing £140 million over the next three years to increase science, technology, engineering and mathematics education in schools and help recruit and train more science and maths teachers

RESPONDING TO GLOBAL CHANGES IN MANUFACTURING

The environment facing manufacturers has undergone and continues to face significant change. Our consultations with the Ministerial Advisory Group on Manufacturing and other stakeholders, as well as academic and survey evidence, identified five major dynamics that are reshaping global manufacturing[4]:

- **The increasing prevalence and complexity of global value chains,** underpinned by developments in information and communication technology, and consequent fragmentation of processes, encouraging specialisation
- **The accelerated pace of technology exploitation** as the demand for change implementation has increased
- **The growing importance of investment in intangibles** such as design, branding and R&D
- **The increased recognition that investment in people and skills** is among the most important for companies to make
- **The move to a low carbon economy** as the response to climate change creates new challenges and opportunities for manufacturing firms

4 BERR Economics Paper No. 2: 'Five Dynamics of Change in Global Manufacturing' – Underpinning Economic Analysis www.berr.gov.uk/files/file47663.pdf

In response, the Government has reviewed and strengthened this strategy to focus support on helping manufacturers meet these challenges and seize the new opportunities they are creating. The new strategy sets out a framework that will inform a dynamic process of developing and implementing current and future policies and programmes for manufacturing.

By developing the right skills, using technological know-how and successfully exploiting Britain's world class science base, we can create the conditions in which firms can build on their success in high value-added sectors and realise their potential.

GLOBAL VALUE CHAINS: INTERNATIONAL FRAGMENTATION OF PRODUCTION

What is new about the current phase of globalisation is the increasingly global location of the production of intermediate goods such as components and parts production. This separation has included not only the physical component parts of products, but the accompanying knowledge intensive services, such as R&D, inventory management, quality control, and other professional and technical services.

This supply and sourcing of intermediate goods and services in overseas markets is called a 'global value chain'. Global sourcing gives British manufacturers the opportunity to reduce costs and specialise in activities where they have a global comparative advantage. It also challenges British firms to become globally competitive in their specialised areas.

As more firms globalise, Government may need to help businesses participate in global markets. SMEs in particular face barriers in accessing global value chains in high growth new emerging markets, for example in developing the skills and the collaborations needed to win access to global supply networks. This is an important policy issue because successful specialisation by British manufacturers in global markets will improve national productivity and lead to the development of new comparative advantages. Contrary to popular perception, therefore, growth in manufacturing in emerging markets can create significant opportunities for UK manufacturers, both by direct sales and through winning access to specialised supply chains.

UK Trade & Investment will allocate additional resource to target a package of new support for 600 UK companies of all sizes to identify manufacturing value chain opportunities in India and China, using newly recruited industry experts, and will promote UK manufacturing excellence internationally through a range of major marketing campaigns.

Participation in global value chains can also help manufacturers engage with other international networks, for example in different product markets, or as part of global innovation systems. Government can facilitate this process by helping firms exploit intellectual property internationally.

The Intellectual Property Office will take additional steps to publicise their newly produced guidance for UK companies on protecting and exploiting intellectual property in key emerging markets such as China, India and Brazil.

Specialised firm networks, labour pools and infrastructure can boost the attractiveness of different regions as locations for manufacturing. Although markets have become increasingly global, success in global value chains is in some cases supported by local clusters, which can provide the critical mass to attract investors and purchasers. Similarly, specialisation resulting from global value chains often involves early application of research and technology, and specialised firms can benefit from spillovers that occur from locating near, and sharing services and knowledge with, similar companies and universities.

To highlight and celebrate the best cluster activity the Government will therefore develop a new "Cluster Mark" award, which will raise the profile of manufacturers involved in the best clusters and support international marketing of local strengths.

At a national level, Government has recently sought to improve its understanding of issues that face inward investors and large-scale sourcers of products to enable strategic intervention to remove barriers and fill gaps in skills provision, for example through the Automotive Supply Chain Development Programme.

TECHNOLOGY EXPLOITATION: ACCELERATING THE SPREAD OF NEW TECHNOLOGIES

Technological change is reshaping manufacturing by creating the capacity to adopt more efficient processes and develop new or better products. In a fast changing global market the ability of firms of all sizes to exploit new technology is key to maintaining a competitive advantage.

The UK is taking the lead in adapting to increasingly globalised innovation platforms. It is also building on the success of its world class science and technology base, having made improvements in recent years in the levels of knowledge transfer from the UK research base to business. For example, the Higher Education Innovation Fund and the Public Sector Research Exploitation fund have invested in building capacity in universities and public laboratories to work with business and commercialise their research. The Research Councils have also been encouraging greater collaborative research with business and the Technology Strategy Board supports companies to work with the research base through its Knowledge Transfer Partnerships and Knowledge Transfer Networks. The Government believes both the research base and manufacturing can benefit from developing these links further.

The Government continues to play a key enabling role in ensuring markets act as powerful drivers of technological innovation. It supports broad-based science and technology research, and provides incentives to invest in technology. Government

has also set out policy commitments in its Innovation Nation White Paper to drive increased demand for innovative products through improved regulation and through procurement.

As a first step, each Government Department will produce an Innovation Procurement Plan, linked to its commercial strategy, setting out how it will drive innovation through procurement, where the Government is the UK's biggest customer, spending £150 billion per year. We are reforming and improving the Small Business Research Initiative (SBRI) in order to promote the development of innovative technology and products by SMEs. We are promoting the use of Forward Commitment Procurement techniques in the public sector, to encourage the development of innovative solutions in response to identified challenges and specified outcomes, rather than current capabilities. The Annual Innovation Report, to be published in October 2008 will showcase a wide range of Departmental activities that promote innovation and describe each Department's plans to do more.

The costs of demonstrating that a new technology or production process is viable can be a significant barrier to investment in the development of new products, especially for smaller manufacturers. To help overcome this, the UK has a number of leading technology bodies and Knowledge Transfer Networks. These enable manufacturers and their supply chains to work with academic institutions to prove concept, demonstrate and exploit new products, including the Advanced Manufacturing Park in Yorkshire, the Advanced Forming Research Centre near Glasgow, the National Composites Network and the Innovative Manufacturing Research Centres.

In 2010 Advantage West Midlands and the East Midlands Development Agency will deliver a new addition to this network, the Manufacturing Technology Centre at Coventry. The Centre will focus on the development and application of high integrity joining and fabrication, expertise in tooling, automation and operational performance with industrial scale pre-production and demonstration facilities. Over 10 years the Centre could see investment of £130 million in business-led applied research and its exploitation. Government would welcome proposals that widen the regional network of centres to specialise in key technology areas.

The costs of development for many complex modern technologies mean that co-ordination of funding is essential to make the most from resources, and since 2004 the Technology Strategy Board has invested in a portfolio now worth over £1 billion in collaborative business-business and business-academia partnership projects.

To increase further the focus of and access to public funds for collaborative R&D projects the Technology Strategy Board will invest a further £24 million in research central to high value manufacturing focused on Products, Production Processes and Services and Value Systems. In addition it will work with Government, the RDAs and Research Councils to offer a streamlined and simpler process for assessing the technological and business case for public sector investment in major collaborative R&D Projects, starting with those seeking over £10 million in public sector funding.

DIUS will work with the Technology Strategy Board to build on the already strong evidence of its impact to date and use this to leverage additional resources to support technology innovation.

INTANGIBLES: COMPETITIVE ADVANTAGE FROM NON-TRADITIONAL ELEMENTS OF MANUFACTURING

Firms in the UK and globally, including increasingly those in emerging economies, are growing their investment in intangible or knowledge assets, such as software, design and other aspects of product-development, brand-building, training and improvements to business processes, in order to improve their competitiveness and enable their product to meet the changing needs of consumers. Investment in intangibles by UK manufacturers increased to £32 billion in 2004, more than double the figure for traditional gross capital expenditures. Emerging evidence suggests that manufacturers invest more in intangibles than service firms. This trend is set to increase further, as a recent CBI survey[5] showed 55% of firms expect design and development to be their most important source of competitive advantage in five years.

In addition to their comparative advantages through specialisation, UK manufacturing firms are harnessing other areas of UK comparative strength, in particular the UK's creative and design expertise and world leading business services such as logistics, branding and consultancy. Combining the UK's strengths in the creative economy with those in manufacturing can help secure our long term competitiveness.

The Design Council and Regional Development Agencies will implement the findings of the current review of the Designing Demand programme to increase penetration of this successful programme across the regions as well as improve alignment with other relevant business support products such as the Manufacturing Advisory Service.

Government will ensure the UK design sector continues to develop the skills required by manufacturers, and ensure small and medium sized manufacturing companies continue to have access to support to develop their design capability.

5 'Understanding Modern Manufacturing', CBI, 2007.

The Creative and Cultural Skills Council and the Design Council will work to support the newly created UK Design Skills Alliance to ensure the UK design sector has the skills required by manufacturers to compete in global markets.

Government has an important role in ensuring that firms have the right incentives and information to continue investing in intangibles. A potential barrier to internationalisation for companies investing in intangible assets is the delay and backlog in processing international patent applications, which can cause uncertainty for innovators and investors.

The Government will lead the promotion of an international system of mutual recognition for the examination work of accredited patent offices.

Firms presently use a combination of formal intellectual property rights (IPR) and techniques such as speed to market and open innovation to capture value from intangible investments. Government has an important role in ensuring that firms have the right incentives and information to continue investing in intangibles. Manufacturers benefit from the UK's strong framework for the protection of IPR, together with valuable incentives for its creation. The Government is committed to maintaining a competitive tax environment that supports and encourages the creation or exploitation of IPR in the UK. Recent reforms have increased the level of the R&D tax credit and cut the UK's headline Corporation Tax (CT) rate to maintain its position as the lowest among the G7 nations.

The Government will continue to monitor and ensure the competitiveness of the UK's intellectual property tax structure and seek opportunities to lower the CT rate further.

PEOPLE: IMPROVING THE SKILLS BASE AND ATTRACTING TALENT INTO MANUFACTURING

A skilled workforce is essential for UK manufacturing to compete globally and for the UK to attract and retain high value added activities. Investment in skills is among the most important that manufacturers can make, and meeting the skills needs of companies and potential investors is central to the long term competitiveness of our economy. Evidence suggests that a transition in manufacturing is already taking place with an increasing proportion of employment being in more highly skilled occupations.

Modern manufacturing is projected to need an additional estimated 324,000 scientists and engineers by 2014, but manufacturers are also developing more complex requirements for skills in design and marketing, as well as teamwork, leadership and management and a more generic set of flexible skills that enable people to work more effectively across disciplines.

To reflect these more complex needs, Government is taking steps to respond more flexibly to employer demand for skills. Through sector skills compacts, agreed with SEMTA and Proskills, we are making available £127 million of the Train to Gain budget to deliver a more flexible support framework for the advanced manufacturing and process sectors.

The Government offers diverse support for specific manufacturing skills development, but employers, particularly SMEs, often report difficulties understanding and accessing the range of available support. Delivery partners and Government will ensure that manufacturers of all sizes can access seamless services for addressing their skills needs, whichever agency they approach.

From April 2009, with Business Link acting as the primary access point for integrated business support, manufacturers will be able to experience a single seamless service for addressing their skills needs, whichever skills body they approach. The Memorandum of Understanding[6] released with this strategy commits all those who interface with manufacturers to provide this immediate and seamless access to comprehensive and straightforward advice and support.

The UK Commission for Employment and Skills (UKCES) is developing proposals to simplify the skills system itself, building on recent reforms. UKCES will report to Government in autumn 2008, and will target the manufacturing sector as a first pilot for relevant proposals, including building Train to Gain as a more integrated service that offers a range of options for employers.

UKCES is also leading work to develop a Talent Map, providing employers with a single, clear visual representation of the education, employment and skills systems and how employers can work with Government. We will look to involve manufacturing employers in further trials of the Map.

We continue to promote University Enterprise Networks and RDAs are currently working on manufacturing and high-technology focused plans for the North West and South East regions, which will aim to increase the number of engineering and technology graduates going into manufacturing.

A further central element of the skills challenge for Britain is to increase opportunities for on-the-job learning for new entrants to the manufacturing sector. Government will build on the success of the Apprenticeships programme, under which there were already apprentices in learning in the manufacturing sector by 2006-7.

6 Memorandum of Understanding: Education and Training Support in the Manufacturing Sector www.berr.gov.uk/files/file47661.pdf

Working with industry, the trade unions and the Apprenticeship Ambassadors' Network, we will extend and expand high quality apprenticeships by approximately 1,500 new places, inviting bids from larger manufacturers to train additional apprentices, including for their supply chains. This will be in addition to the Government-supported 9,000 new apprentice enrolments for manufacturers over the next three years, recently announced by the Sector Skills Councils.

We need to improve fundamentally the image of manufacturing for future generations, and demonstrate to young people that choosing engineering is an attractive career path and will also help tackle the key challenges facing the world and that matter to them, from climate change to water shortages in the developing world.

Industry and representative bodies in partnership with the Government will establish Manufacturing Insight, a body tasked with making the public perception of manufacturing reflect the reality of a successful, modern and broad sector and ensuring young people are aware of the exciting career opportunities available. It will develop the evidence base and communication strategies to inform public debate, liaise with the media and work to improve careers guidance, strengthening links between schools and careers services and the manufacturing sector.

While government is investing heavily in ensuring the increased take up of STEM subjects in schools and universities, less than half of school leavers and graduates with engineering skills, for example, take up careers in manufacturing. The Science and Engineering Ambassadors programme has 20,000 Ambassadors (27,000 by 2011) who promote STEM subjects in schools and is a ready platform to promote the next step of careers in manufacturing.

We will launch a Manufacturing the Future campaign in schools to promote manufacturing careers prospects for young people. This will use the Science and Engineering Ambassadors and work with Manufacturing Insight. The campaign will build on the recently introduced engineering diploma for 14-19 year olds, the forthcoming manufacturing and product design diploma and the cross-Government project currently looking at labour market needs for STEM skills.

LOW CARBON ECONOMY: OPPORTUNITIES FOR MANUFACTURING

The transition to a low carbon economy will require a significant transformation in products, processes and organisations.

As manufacturers respond to higher energy prices by improving their energy efficiency and innovate to reduce their carbon emissions in line with national, EU and

international targets, they face challenges in revolutionising their production processes and technologies. But this will also create opportunities for jobs and growth as they build competitive advantage and respond to demand from businesses and consumers for low carbon and energy efficient products and processes.

The UK is already a net exporter of environmental goods and services, a sector that currently generates annual revenues of £25 billion in the economy. This could rise to over £45 billion by 2015 and create up to one million jobs by 2030. The UK also has the largest clean technology venture capital market in Europe with a cumulative investment of €186 million since 2001, accounting for 30% of the European total.

The UK Government is determined that UK manufacturing should be at the forefront of the low carbon revolution. Manufacturing has a significant role to play in lowering carbon and other greenhouse gas emissions through greater energy and resource efficiency and changing how resources are sourced and used across the supply chain. It is also well placed to take advantage of new markets.

Recent analysis[7] suggests that there are significant opportunities for UK manufacturers to benefit from developments in clean technologies and products in areas such as software and electronics, pharmaceuticals and chemicals. This is also the case with developments in the machinery equipment sector, especially those linked to electricity generation technologies, and in the aircraft sector, with change in many of these sectors and particularly in their leading companies already underway.

Within the framework of the Climate Change Bill and EU climate and energy goals the Government has therefore set out a long term regulatory and policy framework to provide clear signals to industry to help shape its future investment decisions. The policy framework also seeks to support and remove barriers to investments in the new technologies, innovations and skills that are needed to establish a low carbon economy.

The Government will consult and produce next year an integrated Low Carbon Industrial Strategy to achieve its vision of placing UK manufacturing at the forefront of the new low carbon revolution. It will bring together all levers of Government activity, such as regulation, procurement, education, standardisation and investment, that will help manufacturers adapt to the low carbon economy and to identify and respond to the growing market opportunities it will create.

The immediate focus of this strategy is on three key areas of manufacturing activity: supply chains for nuclear and renewable energy equipment; and low carbon vehicles.

Nuclear Energy

Facilitating new nuclear build is one of the key elements to the Government's energy strategy as it enables the UK to secure low carbon energy supplies. There is an opportunity for manufacturing to have a significant role in the construction, operation,

7 'Comparative Advantage and Green Business', Ernst & Young, June 2008 http://www.berr.gov.uk/files/file46793.pdf

and decommissioning of new nuclear power stations in the UK. Simply replacing existing nuclear stations in the UK, as they reach the end of their working lives, will require 11 GW of capacity, equivalent to seven large new reactors, at a cost of approximately £3 billion each. Worldwide the prospects are even greater, with an anticipated global nuclear renaissance. The International Energy Agency anticipates at least 60 new plants in the next 15 years, making 430GW in place in 2020 – 16% more than actually operating in 2006.

The Government's objective is to create a globally competitive supply chain in order to maximise the high value added activity captured by UK manufacturing from nuclear development in the UK and globally. Our strategy is modelled on the lessons learnt from the 1970s North Sea oil exploitation which, facilitated by the Offshore Supplies Office created in 1973, led to the birth of a globally competitive offshore supplies industry which is still a global leader and export earner for the UK.

The Government through the specially created Office of Nuclear Development (OND) will work with the supply chain and nuclear reactor vendors and operators to create and support a globally competitive supply chain, focusing on high value added. It will ensure that manufacturers in the supply chain have clarity and knowledge about the needs of the UK programme, anticipate and identify blockages. It will also assist manufacturers through existing and new programmes to develop capability where gaps are identified, assist manufacturers to work with the vendors, identify and help address skills and technology needs. It will also work with UKTI going forward to develop export strategies and develop targets and measures to measure the OND's progress against the goal of maximising value added to the economy. We are publishing today, as a start, a report by NAMTEC on the strengths and weaknesses of the supply chain[8].

The Government has also created the National Skills Academy for Nuclear to address the key skills and training challenges facing the nuclear industry.

Renewable Energy

There will be considerable commercial opportunities available to manufacturers as the UK builds the renewable infrastructure required to meet its 2020 energy and climate change targets. These opportunities will largely be around research, development and deployment of offshore wind technology, fabrication, assembly, installation, operation and maintenance and component supply for onshore and offshore wind, for example generators, castings, blades and cables. The investment required in the UK on renewables over the next twelve years will be in the order of £100 billion.

8 The Supply Chain for a UK Nuclear New Build Programme – NAMTEC report, September 2008 www.berr.gov.uk/files/file47664.pdf

The Renewable Energy Strategy will establish the Office for Renewable Energy Deployment (ORED) which will address barriers to deployment including supply chain, planning and grid issues. ORED, working with the Renewables Advisory Board, will help raise the domestic and global profile of manufacturing companies in the supply chain, identify and communicate potential opportunities and, with the Manufacturing Advisory Service and UKTI, advise manufacturers on how they can most effectively exploit the growing renewables market. ORED will also provide the right level of information and advice to UK manufacturers to help them compete with international component suppliers to the global renewables industry.

ORED will build on the work of the Renewables Trade Promotion Service (RTPS),[9] which has, for example, assisted some manufacturers not connected with the renewables industry in promoting new products for the global wind market. The Carbon Trust estimates that the UK could earn annual revenues from marine renewables alone ranging from £300-900 million by 2020.

Low Carbon Vehicles

The automotive sector is a pivotal part of UK manufacturing. It directly employs 194,000 people, and contributes around £9.6 billion added value to the economy. Low carbon vehicle technology is a key market opportunity for UK manufacturers. The internal combustion engine will remain at the core of car manufacturers for at least the next two decades. However, these engines will have to become more efficient, with emission savings of the order of 20-30% possible through technologies including downsizing, variable valve actuation, variable compression, direct injection, lighter weight materials and new efficient transmissions.

In the last six years the Engineering and Physical Sciences Research Council has allocated in excess of £250 million for research in basic technologies with potential applications in low carbon vehicles. The Technology Strategy Board's Low Carbon Vehicles Innovation Platform will provide an additional £70 million of funding for an Integrated Delivery Programme seeking to integrate university and industry R&D to accelerate the exploitation of more radical approaches to decarbonising road vehicles. The Government set up in 2008 the industry-led Automotive Innovation and Growth Team (IGT), which in collaboration with the Technology Strategy Board and other relevant bodies is developing a collective industry view on what the challenges and growth opportunities are for this sector. Advanced low carbon vehicles form a major strand of this IGT, with an emphasis on how the UK can improve its global competitiveness. The findings should be available in spring 2009.

To build on the work of the Automotive IGT we will accelerate development of new technologies where there is potential for UK manufacturers to succeed in areas such as control systems, advanced internal combustion engines, electric motors, energy storage and scavenging devices, and recycling of complex components.

9 www.ukrenewables.com/guides.htm

The Government is supporting a major new pilot programme for electric cars, including plug-in hybrids which can be fuelled by electricity from the grid or petrol. The Government will develop a programme, working with industry, the Energy Technologies Institute and the UK Centre of Excellence for low carbon and fuel cell technologies (CENEX), that it hopes will explore the role of electric cars in a sustainable transport system in a real-world demonstration.

We will also dedicate £20 million initially for the public procurement of innovative low carbon and zero emission vans.

SUPPLEMENTARY DOCUMENTS

'Manufacturing: New Challenges, New Opportunities' –
www.berr.gov.uk/files/file47660.pdf

BERR Economics Paper No. 2: 'Five Dynamics of Change in Global Manufacturing' – Underpinning Economic Analysis
www.berr.gov.uk/files/file47663.pdf

Memorandum of Understanding: Education and Training Support in the Manufacturing Sector
www.berr.gov.uk/files/file47661.pdf

Ministerial Advisory Group on Manufacturing

In November 2007 BERR established a Ministerial Advisory Group on Manufacturing to advise Ministers as an ad hoc expert advisory body. The members were:

Shriti Vadera, Parliamentary Under Secretary of State for Business and Competitiveness, BERR

Baroness Delyth Morgan, Parliamentary Under Secretary of State for Intellectual Property and Quality, DIUS

Andrew Churchill, Managing Director, JJ Churchill Ltd

Allan Cook, Chief Executive, Cobham plc

Phil Davies, National Secretary, GMB

Stella Layton, European President, Cookson Precious Metals

Iain Gray, Chief Executive, Technology Strategy Board

Professor Mike Gregory, Head, Cambridge Institute for Manufacturing

Garry Hodges, General Manager, Eisai Ltd

Bryan Jackson, Chairman, East Midlands Development Agency

Professor Julia King, Vice-Chancellor of Aston University

Ian McCafferty, Chief Economic Adviser, CBI

Trevor Mann, Senior Vice President - Manufacturing, Nissan UK

Tim Page, Senior Policy Officer, TUC

Andy Reynolds-Smith, Executive Director, GKN plc (also Chair of CBI Manufacturing Council)

Ian Shott, Chairman, Excelsyn

Martin Temple, Director General, EEF

Chris Tyas, UK Supply Chain Director, Nestle

John Wall, President, CSEU/Unite

Margaret Wall, SEMTA

Alan Wood, Chairman, Siemens UK

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