Annex 1
Advanced manufacturing bibliography

Source	Reference number
ADS (2010), *UK Aerospace Industry Survey* Aerospace Defence Security (ADS), the UK's trade organisation for the UK aerospace, defence, security and space industries, publishes an annual survey of data taken from members and non-members in aerospace companies in the UK and throughout the world. The survey results focus on productivity, revenue and employment.	1
AIM (2009), *Plastic electronics in the UK, A guide to UK capability 2008/9* This document presents the UK's capabilities with regard to plastic electronics. It is intended for use by businesses and academic organisations. The guide lists companies in the sector and the services they offer, as well as UK universities and their involvement in sector-based research and development.	2
BERR, Technopolis Group (2009), *Identification of Expertise and Excellence in New Industry New Jobs Industrial Technologies: Advanced Manufacturing* Comprehensive report defining each technology area, centres of UK expertise and excellence in these field (including commercialisation, international/national standing); markets, drivers of demand, developing industrial capacity, position of UK technology by region; commercialisation, international/national standing. The report focuses on a sub-section of 'platform technologies' that have wide relevance and/or may significantly change the basis of manufacturing. This document comprises industrial biotechnology, micro and nanotechnology and additive manufacturing.	4
BERR (2009), *Manufacturing: New Challenges, New Opportunities* In section 2.55 the Strategy outlines the steps Government is taking to respond more flexibly to employer demand for skills, reflecting the more complex skills needs of the manufacturing sector. These steps will deliver a more flexible support framework for the Advanced Manufacturing and Process sectors respectively.	3

Annex 1
Advanced manufacturing bibliography

Source	Reference number
BIS (2009), *Building Britain's Future: Advanced Manufacturing* Summary document describing a package of measures put into place by the Government in 2009 to support British manufacturers to harness new technologies and the market opportunities they offer. This includes a summary of opportunities in advanced manufacturing, sector-specific challenges, skills requirements and take-up of new technology.	**5**
BIS (2010), *Growth Review Framework for Advanced Manufacturing* The Growth Review was launched on 29 November 2010 – described as "a fundamental assessment of what each part of Government is doing to provide the conditions for business success and address the barriers faced by industry". The Growth Review for Advanced Manufacturing is one of the first to take place, with a first report due in time for the Budget 2011. This initial framework document sets out the actions proposed by the Government as part of the Review, identifies key strengths of the Advanced Manufacturing sector as it stands and examines future long-term growth opportunities and challenges.	**7**
BIS, *Technology Strategy: Developing UK Capability, Key Technology Area - Design Engineering and Advanced Manufacturing* A short summary paper which identifies the key technologies likely to have an impact on design, engineering and advanced manufacturing over the next 3–5 years. This includes the market opportunities for the DEAM sector, priorities for action, trends in UK/EU manufacturing and the impact of R&D.	**6**

Annex 1
Advanced manufacturing bibliography

Source	Reference number
BIS (2010), *UK Aerospace Strategy* A presentation by Ray Kingcombe, Aerospace, Marine and Defence Unit, BIS Business Group, who was involved in developing the 2004 National Aerospace Technology Strategy (NATS – see above). The presentation updates on progress and where the sector is set to go next, including coverage of a number of further sub sectors and opportunities.	12
BIS (2009), *Plastic Electronics: A UK strategy for success* This report from BIS (published by the previous administration) highlights the opportunities available for growing the plastic electronics sector in the UK and globally. Section 5 includes considerations for skills development.	11
BIS (2009), *UK Composites Strategy* This strategy from BIS sets out the UK and global composites markets and the opportunities for the UK moving forward. It includes details of how the (previous) Government aimed to help realise those opportunities and develop the necessary skills.	13
BIS (2009), *UK Carbon Fibre Composites Industry Market Profile* Profiles the composites market in terms of structure, global position and key sector organisations.	10
BIS, IBIGT (2009), *IB 2025 Maximising UK Opportunities from Industrial Biotechnology in a Low Carbon Economy* This report to the (previous) government by the Industrial Biotechnology Innovation and Growth Team (IBIGT) sets out a vision for UK industrial biotechnology and recommendations for ensuring the UK is a world leader in the sector.	9
BIS (2009), *Government response to the Industrial Biotechnology – Innovation & Growth team report to Government - IB2025* This report is the Government's response to the IBIGT's IB2025 report.	8

Annex 1
Advanced manufacturing bibliography

Source	Reference number
BKTN (2008), *Assessment of current activity in the production of platform chemicals from renewable sources and horizon scan to forecast potential future developments in science and technology activity in biocatalysis, Bioscience for Business Knowledge Transfer Network* This report by the Bioscience KTN includes coverage of industrial biotechnology skills in the Trends and Drivers section starting on page 28.	**14**
BKTN (2009), *Analysis of the UK Capabilities in Industrial Biotechnology in Relation to the Rest of the World, Bioscience for Business Knowledge Transfer Network* Follow-up report to the assessment of current activity by the Bioscience KTN, including coverage of UK industrial and academic expertise.	**15**
BMG (2009), *Labour Market Survey* This report by BMG for Semta and Cogent includes findings from a survey undertaken with organisations in the biotechnology sector, including current skills, skills gaps and skills priorities.	**16**
CECIMO (2010), *Open Day on Advanced Manufacturing Systems: Discussing the future* A summary report on an event held by the European Commission's High-Level Expert Group for Key Enabling Technologies (KETs), focusing on advanced manufacturing systems. The event was attended by academics, researchers, consultants, and business representatives. Discussions took place around the needs of, and challenges facing, European advanced manufacturing technologies.	**35**

Annex 1
Advanced manufacturing bibliography

Source	Reference number
CEDEFOP (2006), *Identification of skill needs in nanotechnology* This study looks at the latest trends and developments in various fields of nanotechnology and their related skill needs. It examines potentials, trends and developments at international level and analyses labour market developments and the future demand for qualified workers. The analysis reviews research into specific and basic skills and, in particular, innovative skills and new occupations emerging in nanotechnology. Finally, it proposes qualification and training measures in nanotechnology at European level.	**17**
CIKTN (2009), *Survey to assess the Use and Awareness of Industrial Biotechnology in the Chemicals and Chemistry-using Industries in the UK, Chemistry Innovation Knowledge Transfer Network* This report details the results of a survey undertaken by the Chemical Innovation KTN to provide an evidence base for the use of industrial biotechnology (IB) in the Chemicals and Chemistry-using sectors in the United Kingdom, and to assist industry and Government to frame the conditions for developing competitive, IB-based chemicals production throughout the UK economy.	**19**
CIKTN (2009), *Industrial Biotechnology in the Chemicals and Chemistry-using Industries in the UK: Follow-up Survey to assess Barriers to Implementation and Opportunities for Growth* A report based on a follow-up survey by the CIKTN to the above work, conducted to provide more detailed information at a national level on the use of industrial biotechnology in the Chemicals and Chemistry-using sectors in the United Kingdom. The report includes coverage of skills needs and gaps and recommendations for growing the sector.	**18**
Cogent (2010), *Factsheet: Chemicals* This factsheet looks at skills levels and needs and skills demand/training. Relevant sectors are Chemicals – Industrial Biotechnology and Plastics b Composites.	**20**

Annex 1
Advanced manufacturing bibliography

Source	Reference number
Cogent (2010), *Factsheet: All Industries* This factsheet highlights that it is the skills of apprentices, technicians, scientists and engineers that add value to the science-based industries. Of relevance here is Chemicals – Industrial Biotechnology and Plastics – Composites. The Factsheet identifies the skills level of the Cogent workforce by occupation and industry, skills demand, skills gap/skills need (in the next 12 months and also one year ahead) and skills demand/training.	**21**
Cogent (2008), *Factsheet: Northern Ireland* This factsheet looks at skills gaps and skills demand in Northern Ireland. Relevant sectors are Chemicals – Industrial Biotechnology and Plastics – Composites.	**22**
Cogent (2010), *Factsheet: Scotland* This factsheet looks at skills gaps and skills demand in Scotland. Relevant sectors are Chemicals – Industrial Biotechnology and Plastics – Composites.	**24**
Cogent (2010), *Factsheet: Wales* This factsheet looks at skills gaps and skills demand in Wales. Relevant sectors are Chemicals – Industrial Biotechnology and Plastics – Composites.	**27**
Cogent (2008), *Factsheet: Polymer* This factsheet looks at skills levels, skills needs and skills demands/training.	**23**
Cogent, Skills Oracle 2010, *The Polymer Industry* This report reproduces some of the industry-wide findings from the Skills Oracle survey for 2009. The report looks at skills gaps, shortages, future skills needs (section 3.9) and skills needs and the economy (section 4.0).	**26**

Annex 1
Advanced manufacturing bibliography

Source	Reference number
CST (2007), *Strategic decision making for technology policy* The Council for Science and Technology (CST) is the UK Government's top advisory body on science and technology policy. As such the report focuses on some technology areas that, with significant investment from Government, could offer returns in the next 5–10 years. Plastic electronics is one such area, considered briefly in Section 3 and in detail in Appendix E, which also covers skills.	**28**
East of England Development Agency (2009), *East of England Technopole Report: An Overview of the UK's leading High-Technology Region* 'Technopoles' are centres of innovation and enterprise in High-Technology – the East of England being a hub of such activity. The purpose of this report is to provide a summary of the region's innovation and enterprise activities (including international start-ups) including: types and locations of activities going on, support available to technological innovation/enterprise in the East of England, and mechanisms being developed to offer a regional network of such support, highlighting successes and areas of ongoing need.	**30**
EEF (2007), *Global Challenge – Opportunities and Threats for UK Manufacturers* This report, developed by BDO Stoy Hayward for EEF (the manufacturers' association), sets out key considerations regarding the globalisation of manufacturing, opportunities for UK business and the threats faced from competitors abroad. It includes innovation in manufacturing across the continents and how the British sector compares.	**31**

Annex 1
Advanced manufacturing bibliography

Source	Reference number
EngineeringUK (2011), *Engineering UK 2011: The state of engineering* The latest annual report from EngineeringUK, an independent not-for-profit organisation promoting the contribution of engineering to society. It assesses existing engineering provision, highlighting areas where there are gaps in the current skills supply, and also where pockets of expertise can be found across the UK. It provides comprehensive analysis of the size of the engineering sector, perceptions of engineering, key trends and themes across the sector, grades achieved by engineering students (GCSE and A levels, Scottish Highers and Advanced Highers), further and higher education entrants, graduate destinations, numbers of professionally registered engineers, women in engineering and technology, and the challenges presented by low carbon, renewable energies and new technologies. In terms of advanced manufacturing, nanotechnology (engineering), lightweight composite materials (logistics) and smart food tags (food and drink) are noted as the current key developments.	**32**

Annex 1
Advanced manufacturing bibliography

Source	Reference number
Engineering and Technology Board (2009), *Backing Winners: The Changing Face of Manufacturing* Strategy paper focusing on the Government's five manufacturing 'dynamics': 1) the increasing prevalence and complexity of global manufacturing, underpinned by technological innovation; 2) accelerated pace of change in technological advances and demand for exploiting and implementing these changes; 3) increasing importance of investing in research, design, development and branding; 4) importance of investing in workforce development; and 5) the low carbon economy. The paper sets out the UK's position in relation to each of these five themes (and how well it may be able to capitalise on them) and the support initiatives Government has put into place. It provides recommendations on how the manufacturing sector can be supported in the future, particularly highlighting the need for UK manufacturers to focus on: advanced materials, electronics, photonics, electrical systems, biosciences, nanotechnology, high-value manufacturing and ICT.	**34**
European Commission (2010), *Communicating Nanotechnology: Why, to whom, saying what and how? An action-packed roadmap towards a brand new dialogue.* This document sets out the way in which the European Commission (EC) suggests knowledge and awareness of nanotechnology need to be communicated in the future. It describes a model of communicating messages to European citizens regarding advances in nanotechnology – and the EC's role in acting as a transparent and impartial communicator in these issues.	**43**

Annex 1
Advanced manufacturing bibliography

Source	Reference number
European Commission (2010), *Factories of the Future PPP: Strategic Multi-Annual Roadmap* This Roadmap was developed by industrial representatives of the Ad-Hoc Industrial Advisory Group for the EC's Factories of the Future (FoF) Public-Private Partnership (PPP). The FoF PPP addresses the development of the next generation of production technologies that will be applied from 2015 onwards. This Roadmap describes industrial research priority areas from 2010 to 2013. The focus is on supporting collaborative research projects on innovative technologies oriented towards industrial factory application. This includes industrially-relevant elements especially for the benefit of SMEs.	**38**
European Commission (2010), *Knowledge, Attitudes and Opinions on Nanotechnology across European Youth: Analysis from a specific survey carried out in 25 EU countries* This report reflects the findings of research involving 2000 respondents across 25 EU countries. Views were gathered through focus groups, interviews, surveys and knowledge quizzes. The survey was intended to examine the knowledge, interest, attitudes, opinions, concerns and expectations on nanotechnology among groups of young people. This project also produced a short film – NanoYou - (approx. 17 minutes) promoting nanotechnology to young people, and narrated by Stephen Fry. The **transcript of NanoYou** is available, along with a link to the film itself: http://nanoyou.eu/en/component/content/article/3-audiovisual-materials/79-nanoyou-film.html?directory=3&Itemid=3	**33, 39**

Annex 1
Advanced manufacturing bibliography

Source	Reference number
EU reports *(Various)* Reports summarising EU-funded research undertaken over the last decade in specific sub-sectors of advanced manufacturing: • European Commission (2009), *Downsizing: the march of micro- and nano-manufacture. EU funded research leads Europe into the world of the ultra-small.*	**37**
• European Commission (2009), *Transforming the tools of production: Strategy for a sustainable European machine tools industry*	**42**
• European Commission (2008), *Novel materials and sustainable chemistry: A decade of EU-funded research*	**40**
• European Commission (2008), *Success Stories in the materials field: A decade of EU-funded research*	**41**
• European Commission (2007), *Biomaterials for healthcare: A decade of EU-funded research*	**36**
Government (UK) (2005), Response to the Royal Society and Royal Academy of Engineers Report**:** *'Nanoscience and nanotechnologies: opportunities and uncertainties'* The (previous) Government's response to the nanotechnology report.	**44**
House of Commons Trade and Industry Committee (2005), *The UK Aerospace Industry Report* This report focuses on the state of the UK aerospace industry, with Chapter 5 including coverage of skills and people development.	**45**
IACG (year unknown), *Technology Needs to Support Advanced Composites in the UK* This report by the Inter-Agency Composites Group discusses composites technologies and the barriers and technology gaps faced by the UK sector and organisations. Section 2 includes an examination of the needs of the sector.	**108**

Annex 1
Advanced manufacturing bibliography

Source	Reference number
IB IGT (2009), *Final Report and Recommendations from the Industrial Biotechnology Innovation and Growth Team (IB IGT) Technology and Manufacturing Working Group* The purpose of this paper is to provide the IB IGT Steering Group with recommendations from the Technology and Manufacturing Working Group to determine the developments needed to enhance UK competitiveness in the area of industrial biotechnology.	46
INI (year unknown), *Northern Ireland Composites Sector Overview* An overview of the Northern Irish sector including key organisations, strengths, weaknesses, issues and future activities.	56
INN (2007), *Nanotechnology Skills and Training Survey.* Institute of Nanotechnology The objective of the nanotechnology skills and training survey was to identify the skills gaps and training needs of the workforce in the emerging area of nanoscience and nanotechnology. It also aimed to identify the current and prospective roles of graduates and postgraduates, along with professional development needs.	52
Institute for Manufacturing (2010), *Enabling economic growth: effective support for smaller manufacturing businesses – Insights from research and industrial engagements* A report detailing the findings of desk research and consultation with small and medium-sized enterprises (SMEs) on the support required (e.g. capability development and advice) to stimulate growth and employment against the backdrop of recession. It examines public support for SMEs, the challenges to designing and providing tailored support packages for SMEs and future implications.	48

Annex 1
Advanced manufacturing bibliography

Source	Reference number
Institute for Manufacturing (2010), *Value of Food and Drink Manufacturing to the UK* This report, commissioned by the Food and Drink Federation, examines the impact of food and drink manufacturers on the UK economy. The main aim of the work is to help develop understanding of the links between farming outputs and high street retailers, and how the impact of the industry (social and economic) can be improved in the future. It makes links between food and drink manufacturing and health and environmental outcomes (e.g. emissions from production and logistics). The report sets out key goals such as investing in innovation, and supporting low impact production technologies.	**51**
Institute for Manufacturing (2007), *Making the right things in the right places: A structured approach to developing and exploiting manufacturing footprint strategy* A set of guidelines produced by the IfM to assist manufacturers in understanding and best exploiting their 'international manufacturing footprint', i.e. the location of plants, what the roles of each should be and how they should interact. The guidelines are based on research undertaken by IfM over 15 years, and close engagement with multinational manufacturers over a period of four years, providing expertise on reviewing and restructuring manufacturing operations.	**49**
Intellect (2010), *Improving Cyber Security Partnerships: Government-industry information sharing mechanisms on cyber threats* In this report it sets out six priority areas for countering threats to 'cyberspace' through improving partnerships between government and the private sector in working together at a strategic level to promote and protect the UK's digital interests. The report describes the nature of the supposed threat and key recommendations to counter it: information sharing, quantifying the risk, raising awareness of cyber security, applying standards to cyber security products, supply chain management and research and development.	**53**

Annex 1
Advanced manufacturing bibliography

Source	Reference number
Intellect (2010), *The benefits of Information Superiority to the defence and security sectors of the United Kingdom* This document briefly summarises the types of high technology used by the UK's defence and security sectors to understand operational environments (i.e. to achieve 'information superiority'), and how/why they benefit defence and security operations. This includes electronic technologies capturing surveillance data and signals intelligence systems.	**54**
Intellect (2010), *The State of the UK Technology Sector 2010: President's Report* The annual report from Intellect – the trade association for the UK technology industry – representing approximately 750 companies across ICT, telecommunications and electronics. It examines: key sector drivers, commentary from members on how markets are responding, analysis of current and future demands in each of the sub-sectors and support in place to help technology companies develop against current economic conditions.	**55**
Lloyd's (2007), *Risks: Nanotechnology Recent Developments, Risks and Opportunities* Developed by Lloyd's of London, this report focuses on nanotechnology and the potential impact on the insurance industry of the risks and opportunities involved in working with the nanotechnology sector (particularly environmental and health effects).	**57**

Annex 1
Advanced manufacturing bibliography

Source	Reference number
LSIS (2010), *Skills for Economic growth – An overview of priority sectors* This research study is published by the Learning and Skills Improvement Service (LSIS). It aims to inform LSIS and providers in the learning and skills sector about the priority for future economic growth and future job growth in England, and how the opportunities arising for training and business services could be exploited. The research was conducted in March 2010, before the May general election. The study focuses on priority sectors, including advanced manufacturing, which were selected using a range of documents produced before March 2010. Section 3.1.1 of the document outlines the most important elements of current and future skills demand for advanced manufacturing. From section 3.1.2 onwards the future skills requirements for each of the six advanced manufacturing subsectors are summarised.	58
NACK (year unknown), *Skill Set for the Nanotechnology Workforce Defined by NSF NACK Centre at Penn State* This short document outlines the skills required to be a nanotechnician, as outlined by the Centre for National Nanotechnology Applications and Career Knowledge (NACK) at Penn State, USA.	59
National Council for Advanced Manufacturing (2006), *The Network-Centric Innovation Imperative: How Manufacturers work with their Suppliers to Develop New Products* Commissioned by the US National Institute of Standards and Technology, this report examines changes in product development innovation within manufacturing supply chains. In particular it examines how US manufacturers need to work to develop new products and processes in an increasingly competitive global environment. The report looks at each stage of manufacturing from supply chain management to technology development, cost reduction and product development processes.	61

Annex 1
Advanced manufacturing bibliography

Source	Reference number
National Council for Advanced Manufacturing (2010), *White Paper: Development, Release and Open-Sourcing of NACFAM's Sustainability Framework Model* The key objective of this model is to assist manufacturers in looking at sustainability across all projects and decision-making processes, from factory floor to high-level strategic management. The model illustrates financial benefits and environmental impacts of business decisions. The White Paper outlines when and why the model could/should be used, data required to use it and how manufacturers can use the information derived through using the framework.	**64**
NATS (2010), *National Aerospace Technology Strategy* The strategy is the result of a partnership between industry, Government and academia to address UK competitiveness in aerospace technology.	**62**
NATS (2010), *National Aerospace Technology Strategy Update* An updated version of the NATS strategy.	**63**
NMI-BERR (2009), *Electronics Systems Design: a Guide to UK Capability 2009/2010* This guide, produced by the National Microelectronics Institute and BERR, details the state of the electronics sector in the UK including an assessment of skills and training. It also profiles UK universities and companies and the different types of design skills they develop/use.	**68**
NMI (2008), *Learning Network for the Semiconductor Industry* This NMI paper explores the issue of demand for skilled staff in the semiconductor industry, describing how the UK industry has been collaborating with further education colleges, universities, regional development agencies, and educational and funding bodies to build a learning network capable of developing the skills required. It also considers issues that still need to be addressed and some potential solutions.	**119**

Annex 1
Advanced manufacturing bibliography

Source	Reference number
NWAA (2007), *The Aerospace Cluster Strategy 2007 to 2017* This report by the North West Aerospace Alliance examines how the region aims to continue developing the aerospace industry.	**66**
PWC (2009), *The future of UK manufacturing: Reports of its death are greatly exaggerated – Observations, analysis and recommendations* This report by PWC argues against the notion of UK manufacturing fighting its final demise. It sets out growth figures across industries, including aerospace, to highlight the argument, and uses findings from interviews with chief executives and board level directors of leading manufacturing companies to explore the challenges and opportunities facing the sector. The report also includes an extra appendix describing some sub sectors, including aerospace, in more detail in terms of current and future productivity, opportunities and threats and new skills and expertise.	**72**
Reading University (2008), *Plastic Electronics – Putting the UK at the forefront of a new technological revolution* This report outlines the plastic electronics sector and the opportunities for the UK in terms of a growing market.	**113**
Reading University (2008), *Plastic Electronics – Putting the UK at the forefront of a new technological revolution – competence matrix* This mapping work is part of the Plastic Electronics report above, detailing UK universities and companies involved in the plastic electronics sector and the products and materials they produce/develop.	**112**
RS & RAE (2004), *Nanoscience and nanotechnologies: opportunities and uncertainties* This report presents an overview of the (then) current research within the sector and range of industrial opportunities.	**74**

Annex 1
Advanced manufacturing bibliography

Source	Reference number
Science and Technology Institute (2010), *White Papers on Advanced Manufacturing Questions* Developed by the US Science and Technology Institute for use by the President's Council of Advisors on Science and Technology (PCAST), this document contains draft analysis of the scientific, technical, and policy issues regarding advanced manufacturing in the US. The analysis, intended to frame further discussion and debate, focuses on the following key questions: • What scientific and technical developments apply to a wide range of advanced manufacturing industries? What are the key advanced cutting-edge technologies, relevant across multiple industries that show the most potential for advanced manufacturing? • What are some possible new concepts of advanced manufacturing that might apply to a wide range of industries? • What is the appropriate role of Government science and technology programmes and policies in advanced manufacturing? • What are historical examples where Federal or state science and technology programmes, policies, or activities have enhanced advanced manufacturing? • What Federal Government science and technology programs or policies, if any, should be put into place to accelerate the development and adoption of advanced manufacturing technologies by industry? • How might the Government encourage increased funding for pre-competitive research by industry? • What broad infrastructural improvements are critical for new versus existing enterprises? • Where do public–private partnerships (PPP) play a crucial role?	65
Scottish Enterprise (year unknown), *Scotland Composites Sector Overview* A short overview of the Scottish composites sector including details of regional strengths.	75

Annex 1
Advanced manufacturing bibliography

Source	Reference number
SEMTA (2005), *Sector Skills Agreement, 10.1 Action Plan for England* The focus of this Action Plan is on national sector issues to be delivered in England at both regional and local level. The plan addresses the key skills issues identified by Sector Strategy Groups in the electronics, automotive and aerospace industries and sets out actions for employers, Trades Unions and individual delivery partners.	**101**
SEMTA (2007), *Sector Skills Agreement, 10.4 Action Plan for Northern Ireland* The focus of this Action Plan is on national sector issues to be delivered in Northern Ireland to address regional and local issues. The plan addresses the key skills issues identified by Sector Strategy Groups in the electronics, automotive and aerospace industries and sets out actions for employers, trade unions and individual delivery partners.	**104**
SEMTA (2009), *Skills and the Future of Advanced Manufacturing: A Summary Skills Assessment for the SSC Advanced Manufacturing Cluster* Report summarising collaborative work between Cogent, Improve, Proskills, SEMTA and Skillfast. It sets out the context and drivers behind advanced manufacturing (AM) technologies; types of AM technologies and how they affect economic life; related skills, demand and supply issues; priorities in supporting development of advanced manufacturing.	**100**
SEMTA (2005), *Sector Skills Agreement, 10.2 Action Plan for Scotland* The focus of this Action Plan is on national sector issues to be delivered in Scotland at both regional and local levels. The plan addresses the key skills issues identified by Sector Strategy Groups in the electronics, automotive and aerospace industries and sets out actions for employers, trade unions and individual delivery partners.	**102**

Annex 1
Advanced manufacturing bibliography

Source	Reference number
SEMTA (2005), *Sector Skills Agreement, 10.3 Action Plan for Wales* The focus of this action plan is on national sector issues to be delivered in Wales at both regional and local levels. The plan addresses the key skills issues identified by Sector Strategy Groups in the electronics, automotive and aerospace industries and sets out actions for employers, trade unions and individual delivery partners.	**103**
SEMTA (2006), *Sector Skills Agreement, Electronics, Automotive and Aerospace Industries* Section 4 of this report provides an assessment of current and future skills needs of the Electronics sector, using the Stage 1 report to analyse sector trends, drivers of productivity, areas of skills deficiencies and consequent workforce development required to increase competitiveness. (Draft reports were prepared for each sector and analyses in the reports were refined after discussions with the SSGs and other employer groups to produce final Stage 1 reports for each sector.) The key issues for the four UK countries are presented separately at the end. Sections 5 and 6 present similar information for the Automotive and Aerospace sectors respectively. Section 7 looks at training provision and supply. Section 8 presents a synopsis of the priority issues. Section 9 provides a gap analysis, stakeholder action plan and the employer scope for collaborative action.	**105**

Annex 1
Advanced manufacturing bibliography

Source	Reference number
SEMTA (2010), *The Sector Skills Assessment* The purpose of this report is to set out a detailed assessment of skills needs and current provision for Semta sectors, building on work undertaken previously in Sector Skills Agreements (SSAs). Section 6 look at skills issues including drivers of skills change, the workforce in Semta sectors, key realities for sound analysis, the current supply of skills, the evidence of mismatch; changing skills needs in the UK; recruitment issues; skills needs and gaps; and summary and conclusions.	**99**
SEMTA (2008), *Engineering Skills Balance Sheet – Wales* This document sets out the critical skills supply and demand issues facing the Engineering sector in Wales and the associated actions required by key stakeholders to address these issues. It has been produced by Semta and the National Skills Academy for Manufacturing to inform the implementation of the Semta Sector Skills Agreements.	**94**
SEMTA (2008), *Engineering Skills Balance Sheet, Executive Summary Northern Ireland* This document look at skills issues, recruitment issues, skills needs and gaps, implications for action, key messages for stakeholders and a summary of skills and workforce employment indicators in the engineering industry in Ireland.	**84**
SEMTA (2008), *Engineering Skills Balance Sheet Scotland* This document sets out the critical skill supply and demand issues facing the Engineering sector in Scotland and the associated actions required by key stakeholders to address these issues. It was produced by Semta and the National Skills Academy for Manufacturing to inform the implementation of the Semta Sector Skills Agreements.	**89**
SEMTA (2008), *Engineering Skills Balance Sheet, Executive Summary England* This document looks at skills issues, recruitment issues, skills needs and gaps, implications for action, key messages for stakeholders and a summary of skills and workforce employment indicators in the engineering industry in England.	**77**

Annex 1
Advanced manufacturing bibliography

Source	Reference number
SWDA (year unknown), *South West Composites Factsheet* This document is taken from the South West Development Agency Cluster Report and details the level of skills required in the sector, the skills gaps identified and existing provision at Apprenticeship level.	**93**
TSB (2008), *Electronics, Photonics and Electrical Systems, Key Technology Area, 2008-2011* This report sets out the current electronics market, including silicon electronics, and opportunities for growth.	**109**
TSB (2009), *Nanoscale Technologies Strategy 2009-12* The purpose of this document is to set out the way the Technology Strategy Board will support UK businesses to responsibly deliver market leading nanoscale technology solutions, channelled through high-value applications, to help solve society's greatest challenges. The strategy includes overviews of the UK market's capabilities, including in employment and academia.	**109**
UKCES (2010), *Skills for Jobs: Today and Tomorrow, The National Strategic Skills Audit for England 2010- Volume 1: Key Findings* This report is the first National Strategic Skills Audit. The Audit provides insight and foresight on skill needs and imbalances. It also identifies the sectors, occupations and skills that we need to prioritise to meet the changing needs of the economy and labour market. The Audit reports on the most critical subjects in advanced manufacturing (high-level skills in STEM subjects) and the skills that will become more important as the sector develops (page 25). Page 35 highlights specific management skills around data security management and exploitation of intellectual property as being high priority skills needs that are important rather than critical to the economy and/or distinct sectors because the ability to commercialise user-generated innovations and develop revenue streams may be a key source of profit generation within key parts of advanced manufacturing.	**110**

Annex 1
Advanced manufacturing bibliography

Source	Reference number
UKCES (2010), *Skills for Jobs: Today and Tomorrow. The National Strategic Skills Audit for England 2010 – Volume 1: The Evidence Report* Section 5.2.2. gives an overview of the current and future skills needs of the six sub sectors based on the Cluster Report (Semta et al, 2009). Intense R&D activity creating a need for high and intermediate-level STEM skills and the ability to commercialise innovation is common to all. It also highlights these conclusions from the Cluster Report: • high-level technical skills represent the most important element of skills demand. Flows of STEM graduates, postgraduates and post-doctoral researchers with an understanding of the specific technology or underlying sciences remain central and need to be monitored as products come to market; • the wide range of application areas for most of these technologies means that for effective and creative exploitation, expertise in the technology itself needs to be augmented by knowledge and understanding of the application areas, requiring a multidisciplinary approach; • while high-level technical skills are central to the development of new technologies, effective exploitation and commercialisation requires capable and competent technical support staff; • effective and fast commercialisation of new technologies also requires expertise beyond technical skills, including intellectual property (IP) management, new product and process development and implementation, production and manufacturing engineering, and marketing. Section 6.5 and Table 6.5 summarise likely future occupational demands and skill requirements in advanced manufacturing. Section 7.2 highlights science and technology professionals as high priority skills needs for immediate action in key parts of the traditional and advanced manufacturing sector. Figure 7.1 shows that there are several skill/occupational priority areas affecting the advanced manufacturing sector. Specific management skills around data security management and exploitation of intellectual property identified in the audit are high priority skills needs for advanced manufacturing which are important rather than critical to the economy and/or distinct sectors but where deficits are smaller and require a shorter lead time to rectify than for those rated red.	**111**

Annex 1
Advanced manufacturing bibliography

Source	Reference number
WAG (2009), *Wales Composites Sector Overview* An overview of the Welsh sector including current and future skills, employment projections and future training actions such as Apprenticeships.	**114**

Annex 1
Advanced manufacturing bibliography
References

Index item	Reference (source number)
Additive (Rapid) Manufacturing	29,34,35,42,
Advanced Manufacturing Skills	1,3,4,5,7,8,9,10,11,13,15,17,19,25,30,31,32, 38,45,47,48,49,50,52,58,59,64,68,69,70,71, 76,77,78,79,80,81,82,83,84,85,86,87,88,89, 90,91,92,93,94,95,96,97,98,99,100,101,102, 103,104,105,106,107,110,111,116,117,118
Aerospace	1,6,7,1230,45,56,60,61,62,63,66,72,73,75, 100,105
Artificial Intelligence	65
Automotive	2,7,72,73,105
Biotechnology	5,8,9,14,15,16,18,19,21,29,30,34,35,36,46, 100
Chemicals	2,6,7,14,18,19,20,21,22,23,24,25,27,40,42, 72,73,74,
Composites	5,6,10,13,56,75,100,108,114,119
Defence Equipment	12,55,56
Electronics	2,6,10,55,105,116,117,118,119
Food and Drink	2,5,6,7,30,51,
Green Technologies	3,5,9,30,32,56,67,
ICT	2,38,53,54,55,65,74,115,119
Integrated Systems	74
Life Sciences	7,16,30,115
Logistics and Supply Chain Management	6,61,65,100
Medical Devices/Instruments	2,16,21,28,36
Nano-technology	6,17,29,33,34,35,37,39,43,44,52,56,59,74, 100,109
Nuclear	22,24,27
Pharmaceuticals	6,7,16,21,22,24,27,30
Plastic Electronics	2,5,11,28,68,112,113
Production Planning and Control	49,64,65
Programme Control/Assembly	61,65
Robotics	6,65
Silicon Electronics	2,5,34,119
Smart Packaging	2,40,41,72,73
Space Technology	60