



Glasgow Economic
Leadership

**Engineering, Design & Manufacturing
Draft Action Plan
June 2012**

Chair: Bob Duff, Group Vice President, Jacobs Engineering

Engineering, Design & Manufacturing Executive Summary

Introduction

The Engineering, Design & Manufacturing work stream's Action Plan has two key proposals, that:

Scottish Government recognises Engineering & Advanced Manufacturing as a key sector in its Government Economic Strategy (GES) both as a sector in its own right and as an underpinning capability that supports success across other key sectors [e.g. Energy, Low Carbon Industries, Food + Drink and Life Sciences (e.g. MedTech)].

The work stream form the nucleus of new Leadership Group for Engineering & Advanced Manufacturing in Glasgow / Clyde Valley, with its work supported by Leadership Board partners – SE, Skills Development Scotland (SDS), Glasgow City Council – and, that it help to form / shape the Industry Leadership Board and its strategy for Engineering in Scotland.

The work stream was struck by the absence of an explicit public policy focus in Scotland that recognises the importance of the scale and potential of the Engineering sector to Scotland's current and future economic success. The work stream's view is that the absence of such a policy has resulted in a critical underestimation of this scale and of the significant economic contribution the engineering and advanced manufacturing sector presently makes to the Scottish/ West of Scotland economy and will continue to make in the future if the opportunity to leverage its potential is seized.

Yet notwithstanding this, several of the most exciting and important industrial developments in Scotland to promote innovation, industrial research and skills are supported by the skills and enterprise of the engineering sector: and, Glasgow and the Clyde Valley is central to this work with the £30M **Advanced Forming Research Centre (AFRC)** at Inchinnan; the **Power Networks Demonstration Centre (PNDC)** in Cumbernauld and the £79m **Technology Innovation Centre (TIC)** at the University of Strathclyde – which is also to be the HQ of a £50 million, UK-wide renewable energy technology centre: the **Offshore Renewable Energy (ORE) 'Catapult Centre'**. Scotland – and Glasgow – needs to capitalise on its engineering heritage, international companies, skills supply and research – to generate future wealth, jobs and prosperity.

As to the immediate tasks that the work stream proposes, these have been developed through three sub-groups that whilst distinct, have as their primary focus the key interlocking actions required to drive economic growth, prosperity and job creation within the sector and more broadly, the Glasgow region. The sub-groups and their key proposals are set out below:

1. Marketing Sub-group:

- **Map and market Glasgow / Clyde Valley's Engineering excellence and capabilities**, working with SE / SDI, GCC and Glasgow City Marketing Bureau

2. Skills Sub-group

- **Support SDS to develop a Skills Investment Plan (SIP) for Engineering in Scotland** that identifies demand for engineering skills from school, to College and universities

3. Innovation/ Collaboration Sub-group

- **Promote more inter-company and company-university collaboration in Glasgow / Clyde Valley** to boost innovation, develop skills and promote competitiveness.

It should be noted that the **Low Carbon Industries** work stream looked to the Engineering work stream to develop a skills agenda for the sector. Both work streams note the current Scottish Government caps on Scottish student undergraduate places in Engineering and the very strong industry demand, driven especially by the Oil & Gas / Energy sector as well as by the fast-developing renewables / Low Carbon Industries sector; similarly, the universities report their courses to be highly over-subscribed. The Engineering, Design & Manufacturing and Low Carbon Industries work streams are of the view that with political will, college / university flexibility and articulation and industry resources that by **using innovative approaches to funding and Post-16 college-university articulation that undergraduate engineering places in Scotland could be significantly expanded in the short term using Glasgow as a pilot with a view to setting a longer term, national growth target for the next 3 to 5 years.**

The templates that follow outline the initial proposals of the work stream in more detail. It is recognised that these need to be shaped further.

BOB DUFF

**Chair, Engineering, Design & Manufacturing Work Stream
Glasgow Economic Leadership**

Engineering, Design & Manufacturing Work Stream Members:

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Skills Development Scotland

Skills Investment Plan

High Value Manufacturing and Engineering

Introduction

- .1 This paper has been produced to provide an update on progress with delivery of the Skills Investment Plan for the High Value manufacturing and Engineering Sector. Following initial discussions with the Engineering, Design and Manufacturing work stream of the Glasgow Economic Commission, SDS has agreed to establish clear proposals for delivering a Skills Investment Plan process for the Engineering and Advanced Manufacturing sector at the Scottish level.
- .2 This paper is set out in the following sections:
 - The context for Skills Investment Plans
 - What should a Skills Investment Plan contain
 - How are Skills Investment Plans developed
 - Progress to date for Skills Investment Plans
 - Timetable for SIP delivery
 - Resource implications and other issues

Context for SIPs and Purpose

- .3 The Scottish Government's Skills Strategy Refresh (2010) notes that Skills Investment Plans (SIPs) should be developed to support Key Sectors, in order to clearly communicate the skill needs for these sectors. As the national agency for skills, Skills Development Scotland (SDS) has been tasked with leading on the development of SIPs.
- .4 The key purpose of the SIP is to clearly identify the current and future skills needs of the sector to support the future growth of the sector. A SIP sets out to be complementary to the work of Sector Skills Councils and build upon the growth ambition or growth strategy for the sector.]
- .5 SIPs should:

- Be developed through a collaborative approach which involves employers, trade bodies, public agencies, and the FE and HE sector;
- Reflect the potential economic contribution of the sector and growth ambition;
- Have national coverage, while reflecting the geography of the industry;
- Clearly articulate the skills needs of the sector, drawing on existing LMI and direct engagement with businesses in the sector;
- Identify existing skills supply to meet those needs, as well as any gaps and barriers to demand;
- Identify any gaps in the skills pipeline and coordinate a pathway for students to follow as they progress from school to further and higher education, training and employment;
- Be supported by an agreed implementation plan with clear roles and responsibilities.

How will the Advanced Manufacturing and Engineering SIP be delivered

SIP Development and Delivery

- .6 SDS will have lead responsibility for the preparation of the SIP document, however the *process* to develop the SIP will involve a wide range of partners including companies, Scottish Enterprise, SEMTA, the Glasgow Economic Leadership's Design and Manufacturing Workstream, Scottish Engineering and once launched the new national industry led Forum for advanced Engineering Manufacturing and Engineering Skills.
- .7 SDS will co-ordinate the formation of a small project steering group, with membership drawn from the above partner organisations, to co-ordinate the development of the SIP.

What evidence will inform the SIP

- 1.8 SDS have carried out a review of available evidence to support the development of the SIP. Potential sources will include:
- Analysis of Scottish Government Source Book data, carried out by Scottish Enterprise's Economic and Research team on the Advanced Manufacturing and Engineering sector
 - Data from the Scottish Employers Skills Survey returns for 2010, via SDS
 - Analysis of ABI data on the geography of the industry across Scotland, via SDS
 - Evidence on existing investment to support skills for the sector through SDS and SFC
 - SEMTA's Skills Balance Sheet for Scotland (which is due to be published in June 2012) and includes analysis of:
 - the Scottish engineering industry in terms of employment and businesses;
 - workforce demographics by gender, disability, occupation, ethnicity and age;
 - historical and recent employment trends;
 - competitiveness and productivity within each engineering sub-sector;
 - skills issues including skills needs and gaps;
 - training and qualification provision in relation to the engineering industry;
 - uptake and assessment of provision in: vocational education and training (VET) including apprenticeships; secondary education; and higher education.;

- evidence on satisfaction and quality.
- 1.9 We will also draw on the evidence in a number of recent studies which cover parts of the sector's footprint and/or examine skills issues in the sector, to inform the SIP for High Value Manufacturing and Engineering. These include:
- The Skills Investment Plan for the Energy Sector, (Skills Development Scotland)
 - Increasing Engineering Capacity and Capability – Graduate Recruitment and Employment (Scottish Enterprise)
 - Industry Baseline Study for the Aerospace, Defence and Marine (AD&M) Sector in Scotland (Scottish Enterprise)
- 1.10 SDS will produce a summary of the available evidence on the scale of the sector and the particular skills needs of the sector to support future growth by the **end of July 2012**
- How will we engage companies and Industry Leadership in the development of the SIP?**
- 1.11 There are a number of routes that will be used to test and refine the evidence on skills for growth issues. These include:
- Interviews with companies in the sector to explore current and future skills needs
 - Focus groups with businesses
 - Consultation with industry representative organisations, including Scottish Engineering and Ceed Scotland
- 1.12 SDS will identify whether the company engagement process can be delivered through existing resources or whether there is a need to engage an external resource to supplement this part of the development of the SIP. The identification of priority skills for growth issues, informed by the businesses consultations will be completed by the end of August 2012.
- 1.13 The findings from the earlier parts of the work programme will provide the basis for producing a draft SIP. This draft SIP will be presented to the national industry leadership group(s) in September 2012. Potential industry leadership groups with an interest in the SIP could include Technology Advisory Group and the newly formed Forum for Advanced Manufacturing and Engineering Skills.

Action Plan 1/4 : “Engineering as a Key Sector”

Action	Related Tasks	Proposed Outcomes	Lead Responsibility	By When	Estimated Costs
<p>Scottish Government to recognise Engineering and Advanced Manufacturing as a key sector in its Government Economic Strategy, both as a sector in its own right, and as an underpinning capability that supports success across other key sectors. (e.g. Energy, Low Carbon, Life Sciences, Food & Drink)</p>	<p>a) Economic Leadership Board to escalate/ champion Engineering & Advanced Manufacturing to Scottish Government/ Ministers</p>	<p>Engineering:</p> <ul style="list-style-type: none"> • To be included in G.E.S.; • Given full strategic support of Scottish Gov’t, SE/SDI & SDS • Industry to identify an industry growth target (to 2017 (tbc)) • Generate a sustainable focus on and commitment to developing, connecting, and maintaining the area’s Engineering capability to enhance company collaboration, innovation and perception. 	<p>Glasgow Economic Leadership Board</p>	<p>September 2012</p>	<p>n/c</p>

<p>EDM work stream to be nucleus of a new Leadership Group for Engineering & Advanced Manufacturing in Glasgow/ Clyde Valley</p>	<p>a) Establish “Glasgow Engineering Leadership” Board, make-up and required resources.</p> <p>b) Define the objectives, scope and terms of reference for the new board</p> <p>c) Whilst industry led, seek additional representation from industry (large <u>and</u> SME), academia, government, existing regional/ professional engineering organisations (e.g. Scottish Engineering, SEMTA, CEED).</p>	<ul style="list-style-type: none"> • Enhance awareness of existing regional capability at Leadership level. • Create a stronger identity for the Glasgow engineering community which will facilitate and drive enhanced: <ul style="list-style-type: none"> - Skills development and employment growth opportunities. - Collaboration between industry and HE/FE as a basis for increased innovation - Internal and external marketing to increase inward investment • Enable clearer and more consistent requirements to be placed onto both academia and government agencies including the resources required to drive sectoral growth. • A clear governance framework through which to drive, further develop, implement and monitor the key recommendations identified through the GEL work stream process. 	<p>Big 5 industrial leaders (Jacobs, Weirs, Babcock, Thales, BAE) + SE / GCC</p>	<p>Oct 2012</p>	<p>£tba</p>
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EDM Action Plan 2/4: “Engineering Marketing Plan”
Babcock International Group

Chair: John Howie, MD, Marine

Action	Related Tasks	Proposed Outcomes	Lead Responsibility	By When	Estimated Costs
Develop an external and internal marketing strategy for EDM in Glasgow / Clyde Valley to leverage its reputation as global centre of engineering excellence and to attract new investment.	a. Define the scope, scale, technologies in of the Engineering & Advanced Manufacturing sector in Glasgow and Clyde Valley + its hi-growth companies	<ul style="list-style-type: none"> Identify the scale and growth potential of the EDM sector in Glasgow / Clyde Valley. Marketing campaign for Engineering Advanced Manufacturing with: <ul style="list-style-type: none"> – agreed key messages – company testimonials etc Enhanced global promotion of the EDM sector and its capabilities as a catalyst for increasing inward investment and job creation, and attracting top talent. 	SE / SDI (+ Scottish Engineering, ILGs etc.)	By end 2012	Tbc
	b. Develop a branded narrative for EDM in Glasgow / Clyde Valley building on engineering heritage and identifying 21 st century USP's [e.g. company base, skills & talent, can-do culture, skills, academic and innovation base (AFRC, TIC, Catapult Centre etc.)] to attract inward / investment, promote career opportunities to local and international talent.		GCMB (SE/ SDI + industry)	In 2013	tbc
Engineering industry with industry bodies, schools, colleges and universities to market Engineering to young talent (esp. women & ethnic minorities)	<p>a. Exploit Glasgow Science Centre as a “showcase” for Engineering, Design & Manufacturing</p> <p>b. Rationalise STEM promotion in schools (?- tbc)</p> <p>c. Companies to promote attraction of new talent (esp. women & ethnic minorities)</p>	<ul style="list-style-type: none"> Develop Engineering showcase at GSC Expand no.’s attracted to study STEM subjects @ S2 by x percent Increase attraction and entry of female + ethnic minorities into sector from school, college & university by x percent 	<p>Work stream reps. / GCC Education</p> <p>Industry / SDS / GCC Education</p> <p>Industry and individual companies</p>	Identify early win proposals by end 2012.	Up to £50k (GCC), match-funded by industry (tbc).

Action Plan 3/4: “Engineering Skills Investment Plan”

Action	Related Tasks	Proposed Outcomes	Lead Responsibility	By When	Estimated Costs
<p>Develop a Skills Investment Plan (SIP) for the Engineering and Advanced Manufacturing sector</p> <p>(Refer to preceding SDS document – Skills Investment Plan for High Value Manufacturing * & Engineering)</p>	<p>a. Consult with the Glasgow Economic Leadership, Sector Skill Councils and appropriate Industry Advisory Groups to agree a definition of the sector;</p> <p>b. Carry out a critical review of available evidence to support the development of the SIP and identify potential gaps;</p> <p>c. Identify an appropriate national industry body to guide the SIP development process;</p> <p>d. Identify resource requirements for the development of the SIP and the potential contributions that partners can make to this process; and</p> <p>e. Develop a clear work plan and timescale for agreeing the SIP for Engineering and Advanced Manufacturing by end of 2012</p>	<p>An agreed Skills Investment Plan for Engineering and Advanced Manufacturing which will clearly:</p> <ul style="list-style-type: none"> • Articulate the current and future skills needs of businesses in the sector covering the full horizontal and vertical skills spectrum (post-school, apprenticeship, HND, graduate, to post-graduate and CPD). • Analyse the key gaps between supply and demand at all levels: apprentices, technicians and graduates including under-representation of women and ethnic minorities (i.e., the leaky pipeline) • Identify specific actions to be undertaken to ensure that these skills and supply/ demand needs are met. • Feature a local profile/ analysis for the Glasgow/ Clyde area as one of the main hubs for engineering in Scotland. 	<p>Skills Development Scotland (plus Industry, Sector Skills Councils, IAGs, HE/ FE, GCC)</p>	<p>June 2012 (initial proposal)</p>	<p>Tba</p>

<p>Promote Engineering in SDS's online career portal My World of Work as a distinct Industry Zone.</p>	<p>a. Articulate the full range/levels of career opportunities available in the engineering sector, highlighting opportunities in key growth sectors such as Low Carbon, Offshore energy, Biomedical Engineering etc.</p> <p>b. Develop and include a spectrum of individual/ industry case studies/ videos to promote engineering career opportunities and the associated pathways/ progression opportunities.</p> <p>c. Define the career pathways into engineering for a range of end users including young people/ teachers and their guidance advisors, colleges and others such as adult careers changers.</p> <p>d. Launch/ promote Engineering Industry Zone via a range of media used by potential entrants and professionals with a role for careers/ employment guidance e.g., social media.</p>	<ul style="list-style-type: none"> • Increase awareness and understanding of the 21st century engineering profession; entry and skills requirements and associated career pathways as a tool to meet industry skills and labour demands. • Monitor and increase usage of the engineering industry zone by the full range of end users by x per cent by March 2014. 	<p>Skills Development Scotland (plus Industry and in consultation with potential end users (e.g., young people))</p>	<p>March 2013</p> <p>March 2014</p>	<p>Tba?</p>
<p>Develop a specific Post-16 Engineering proposal in Glasgow to expand training provision and progression in and b/ w college + university to meet industry demand</p>	<p>a. Baseline engineering training at College and university</p>	<ul style="list-style-type: none"> • Expand engineering places and progression by X/Y% by expanding industry-funded training places. 	<p>SDS, new Glasgow Colleges Board and Universities of Glasgow, Strathclyde, Glasgow Caledonian (plus Industry)</p>	<p>By session start 2012/13</p>	<p>tbc</p>

<p>Expand undergraduate engineering places in Scotland in the short term using Glasgow as a pilot with a view to setting a longer term, national growth target for the next 3 to 5 years.</p>	<p>a. Use innovative approaches to funding, industry resources, and post-16 college to university articulation to expand undergraduate engineering places in Glasgow on a pilot basis to meet current and future demand from industry (e.g., from growth areas such as the energy sector/ renewables/ low carbon industries).</p>	<ul style="list-style-type: none"> • Increase undergraduate engineering places at Glasgow universities by x percent to meet replacement and growth demand from industry. • Use Glasgow as a pilot, establish a Scottish growth target for engineering undergraduate places for the next 3 to 5 years. 	<p>University of Glasgow/ University of Strathclyde/ Glasgow Caledonian University/ Glasgow's Colleges / Industry</p>	<p>For session start 2012/13</p>	<p>tba</p>
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Action Plan 4/4: “Engineering Collaboration & Innovation”
Weir Power & Industrial

Chair: Luke Logan, Engineering Director,

Action	Related Tasks	Proposed Outcomes (what are we trying to make happen? Targets?)	Lead Responsibility	By When	Estimated Costs
<p>Establish a Collaboration & Innovation “Market-Place”</p> <p>Concept: Utilise IT/Social Media approaches to facilitate a more “Open” forum for collaboration and innovation.</p>	<p>a. Define the objectives, scope & terms of reference</p> <p>b. Seek guidance/lessons-learned from existing/previous approaches (e.g. CEED network, SE Industry Leadership Group)</p> <p>c. Propose concept, establish value proposition/business case and conduct critical review to determine Go/No-Go</p>	<ul style="list-style-type: none"> • Create 5 open source industry innovation challenges in Glasgow/ Clyde Valley • Enhanced awareness and connection of existing capability and opportunities • A visible, effective and attractive vehicle to stimulate self-sustainable collaboration and catalyse innovation • A vehicle for cross-sector talent acquisition, capability connection and marketing 	<p>Scottish Enterprise / CEED/ Industry/ HE&FE</p>	<p>Nov 2012 ?</p>	<p>£?</p>

<p>Establish a cross-sector/industry-academia “Glasgow Engineering Development Scheme” for early (& mid)-career Engineers/ Innovators / academics</p> <p>Concept: Leverage existing industry graduate/high-apprentice programmes to enable a mechanism for cross-sector experiences/placements</p>	<p>a. Understand the current landscape of the region’s graduate/higher-apprentice development programmes</p> <p>b. Gain appropriate level of endorsement to launch for graduate intake/ international timescales.</p>	<ul style="list-style-type: none"> • Increase Higher and Graduate Apprenticeships from X to Y by 2013. • Foundation for increased collaboration at working-level • Vehicle for enhanced and structured interaction between academia and industry • Framework for talent acquisition and retention • Support for Continuous Professional Development (CPD) 	<p>Industry / SDS/ HE&FE</p>	<p>Oct 2012</p>	<p>£000k pa</p>
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<p>Facilitate structured professional development/"up-skilling" specifically in innovation management, collaboration & systems-thinking</p> <p>Industry/delivery relevance assured by forming cross-sector teams charged with addressing a specific collaboration/innovation challenge set by the "Glasgow Engineering Leadership" body</p>	<p>a. Develop the concept with key stakeholder representatives</p> <p>b. Identify the risks & opportunities (e.g. I.P. management and personnel retention)</p> <p>c. Identify x number of industrial challenges for 2013-2014</p> <p>d. Establish cross-sector teams to address challenge within set timescales maximising use of pre-existing teams based within existing innovation centres (e.g., AFRC, TIC etc).</p>	<ul style="list-style-type: none"> • Develops "Broader" Engineers and hence increases innovation potential • Establishes a mechanism for more "Open" innovation and solution identification • Targeted "up-skilling" in the enabling disciplines of innovation management, collaboration & systems thinking • Demonstrates the added value and industrial relevance of the area's TICs/ catapult centres 	<p>Industry/ HE&FE</p>	<p>Dec 2012?</p>	<p>?</p>
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