

## BRIEFING FOR THE FIRST MINISTER

### VISIT TO STRATHCLYDE UNIVERSITY ADVANCED FORMING RESEARCH CENTRE

29<sup>th</sup> March 2017

<b>Key message</b>	<ul style="list-style-type: none"> <li>• Delighted to have an opportunity to visit AFRC to hear of the work you are undertaking and your achievements to date.</li> <li>• Interested in your thoughts on key areas of opportunity for Scotland in the advanced manufacturing field going forward.</li> <li>• Interested in your plans for AFRC's future development.</li> <li>• I know that my officials are liaising with you as we consider options for the National Manufacturing Institute for Scotland.</li> <li>• Thank you for the work you are undertaking to help inform our thinking in this important area of work.</li> <li>• I look forward to hearing of developments going forward.</li> </ul>
<b>What</b>	Visit to Strathclyde University's AFRC, a globally-recognised centre of excellence for manufacturing technologies, R&D, and metal forming & forging research. You will have a tour of AFRC and discussion with the Principal and AFRC senior team on opportunities and challenges for Scotland in this important area going forward.
<b>Why</b>	This is part of your Business Engagement programme facilitated by SE and also builds on your visit to the AMRC in Sheffield. As part of the visit, AFRC will also offer their perspective on the proposed development of a National Manufacturing Institute for Scotland.
<b>Who</b>	<p><b>Prof Sir Jim McDonald</b> <i>Principal Strathclyde University</i></p> <p><b>Prof Keith Ridgeway</b> <i>Executive Chairman, AFRC</i></p> <p><b>Dr Lynn O'Hare</b> <i>Chief Business Development Officer, AFRC</i></p>
<b>Where</b>	<b>Advanced Forming Research Centre, 85 Inchinnan Drive Inchinnan, Renfrewshire, PA4 9LJ</b>
<b>When</b>	<b>10:30- 11:30am</b>
<b>Likely themes</b>	<ul style="list-style-type: none"> <li>• Overview of the work and key achievements of the AFRC.</li> <li>• Future development of the AFRC (including NMIS project).</li> <li>• Opportunities and challenges for Scotland in the advanced manufacturing area.</li> </ul>
<b>Media</b>	No media will be invited. An official photographer will be present to capture the visit for SG social media and internal university PR.
<b>Supporting official</b>	<p><b>Adrian Gillespie</b>, <i>Managing Director, Scottish Enterprise</i></p> <p><b>Leslie Evans</b>, <i>Permanent Secretary, Scottish Government</i></p>
<b>Attached documents</b>	<p>Annex A Advanced Manufacturing- Key Opportunities for Scotland</p> <p>Annex B Advanced Forming Research Centre Overview</p> <p>Annex C National Manufacturing Institute for Scotland</p> <p>Annex D Scotland's Manufacturing Action Plan</p> <p>Annex E Strathclyde University – Key Facts</p> <p>Annex F Biographies</p>

Scotland's long-term success in advanced manufacturing will depend on our ability to exploit **global niche opportunities for high value products** where our sector and manufacturing innovation expertise can be combined to deliver world-class performance at competitive rates.

Opportunities for long-term growth exist across several manufacturing-intensive sectors including:

- Novel methods of manufacturing **pharmaceuticals** for enhanced global competitiveness;
- A \$3.5T global order book for **commercial aircraft** moving towards light-weight, high-integrity composite aerostructures;
- Expertise from the **oil and gas** industry in robust engineering for harsh environments as an advantageous entry to the growing subsea market opportunity;
- Productivity improvements in **Food & Drink** manufacturing leading to increased exports;
- Opportunities for substantial improvements in efficiency, productivity and waste reduction in the **Construction** industry.

A common characteristic of these opportunities is the **increasing importance of digital technologies** across connected supply chains, advanced manufacturing processes and post-manufacturing services. This trend offers a timely opportunity to align the strengths of Scotland's digital and manufacturing economy in a new and powerful way to better compete at a global level.

This poses **challenges for manufacturers** as they explore the **transition towards a digital manufacturing future**. Manufacturing leaders are facing investment decisions to develop new skills, technologies (robotics and 3D printing) and to implement digital strategies that enable them to connect their business seamlessly to the global supply chains demanded by large companies.

The **Manufacturing Action Plan (MAP)** aims to help companies develop a clear investment plan with public sector support. Similarly, the proposed **National Manufacturing Institute for Scotland (NMIS)** will provide access to advanced manufacturing innovation/skills to help de-risk investment by engaging businesses with highly skilled practitioners in a world-class environment.

Good progress has been made by SE in supporting the sector since the MAP launch including:

- A major conference was held by the SE SMAS team in September attended by 400 manufacturing leaders to reinforce the importance of manufacturing to the economy.
- Over 125 business leaders have taken part in workshops and learning journeys to strengthen ambition and increase understanding of the latest available technologies.
- A new Capital Asset Review service was launched by SE SMAS in 2016 and 40 reviews have been carried out to support manufacturers to develop investment plans to future proof their businesses. SMAS aims to complete over 600 reviews in the next 3 years.
- Nine proposals for manufacturing have reached the final stage of evaluation for funding from the new £18M Circular Economy Investment Fund and the new Circular Economy Business Service will support manufacturers to adopt Circular Economy business practices.

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Strathclyde University's Advanced Forming Research Centre (AFRC) is a globally-recognised **centre of excellence in innovative manufacturing technologies**, R&D, metal forming/forging research.

As the **only centre of its kind in Scotland**, AFRC is at the heart of Scotland's manufacturing research and development sector working with all types of companies: from global original equipment manufacturers (OEMs) through to smaller local manufacturing businesses.

The **£60 million facility was established in 2009** with 12 members of staff. **It now employs 133 highly skilled engineers**, researchers and business professionals and is proud of its diverse and international community. It forms **part of the UK's High Value Manufacturing (HVM) Catapult**.

The Centre's physical presence doubled in size in 2014 to meet industry demand, and now consists of 5,680m<sup>2</sup> dedicated research space with multiple pieces of one-of-a-kind industrial scale kit. **It has annual turnover of over £22 million, an increase of c38% in the past five years.**

**AFRC has a £40 million project portfolio** and, in the past year alone, **engaged with 166 Scottish SMEs**. The centre also has collaborations with leading industrial partners like Rolls Royce, Spirit Aerospace and BAE Systems.

**Scottish Enterprise works closely with AFRC** and is in the process of **finalising contracts to invest** alongside Innovate UK (ATI), the University of Strathclyde and AFRC through its HVM catapult funds to help support the creation of a **new forging capability - the 'High Integrity Validated Engineering Space' (HIVES)** as an opportunity to secure new digital forging capability with advanced alloy materials.

**SE's funding once finalised will contribute to the cost of a new building to house the forge, essential ancillary equipment and pre-validation testing.** The project will enable AFRC to maintain its position as the leading forging and forming research centre in the UK and give Scotland unique global research capability at the centre with an industry focus.

AFRC aims to work with the Scottish Government, its agencies and Scottish industry more generally to help deliver the Manufacturing Action Plan: A Manufacturing Future for Scotland.

**AFRC is also supporting the Scottish Government to help create the National Manufacturing Institute for Scotland as a catalyst for the country's first Manufacturing Innovation District.**

The AFRC team will brief you on their thinking in this area at the end of your tour of the facility.

From an SG perspective there is still work to be done in establishing a business case for the location of the new facility. It is also important the new institute, regardless of location, capitalises on the full breadth of research capability within Scotland's universities and benefits all of Scotland.

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- On **15 February 2016** we launched the manufacturing action plan for Scotland – '**A Manufacturing Future for Scotland**', a **commitment in the previous Programme for Government**.
- Development of the plan has been led by Scottish Enterprise in partnership with Highlands & Islands Enterprise, the Scottish Funding Council, Skills Development Scotland, Zero Waste Scotland and the Scottish Government.
- A key commitment in the plan was for a new joint centre for manufacturing excellence and skills academy, a **National Manufacturing Institute for Scotland (NMIS)**.
- The **Programme for Government** published on 6 September 2016 states that **developing the business case** for the NMIS is '**a key action for the forthcoming year**'. This commitment was confirmed in the draft Budget 2017/18, published on 15 December 2016.

#### Top Lines:

- There should be no doubt about **the importance of our manufacturing industry** - which **employs over 180,000 people** in Scotland - to our future success.
- The manufacturing action plan 'A Manufacturing Future for Scotland' reaffirms the **government's commitment to growing and investing in the sector**.
- A key commitment in the plan is for a **new centre for manufacturing excellence and skills academy**, the **National Manufacturing Institute for Scotland (NMIS)**.
- This is a **significant proposal** with the potential to **support step-changes in the efficiency and productivity of Scotland's manufacturing sector**. Decisions on its establishment and location(s) will depend on the business case, which will be published later this year (2017).

#### The National Manufacturing Institute for Scotland will help strengthen the sector in Scotland:

- We will establish a new National Manufacturing Institute for Scotland to act as a **hub for continuous innovation in manufacturing** that can **sustain globally competitive businesses in Scotland**
- Such an institute is intended to equip manufacturers of all sizes to **compete in future international markets** and support the transformation of Scotland's manufacturing industry in terms of **innovation and digital opportunities**, creating **sustainable, high-value and highly skilled jobs**.

#### We are working in partnership with the public and private sectors to deliver on this ambition:

- We have established a multi-partner approach to take forward the development of the **National Manufacturing Institute for Scotland (NMIS)**.
- The partners include; Scottish Enterprise, Highlands and Islands Enterprise, Scottish Funding Council, Skills Development Scotland, Zero Waste Scotland, the wider innovation network including the Advanced Forming Research Centre, part of the High Value Manufacturing Catapult, and the Scottish Government.
- We are taking an **evidence-based approach** to the establishment of the institute to ensure that we achieve our ambition of **manufacturing growth**.
- The first stage is the **development of a detailed business plan in consultation with business**. As an initial step, Scottish Enterprise has been working to **identify industry needs and demand, targeting large scale businesses** in a range of sectors including defence; automotive; space; and oil and gas. These businesses would then **attract others and their supply chains, helping SMEs access support**.
- The expectation is that this is a **co-funding/ co-investment model between the public and private sectors**. We are also assessing the potential for UK and EU funding streams.
- Options for the **location/s of NMIS** will be **considered as part of the business case process**. Wherever the Institute is located we are determined it will be **for the benefit for the whole of Scotland**.

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- On **15 February 2016** we launched the manufacturing action plan (MAP) for Scotland – ‘**A Manufacturing Future for Scotland**’, a **commitment in the Programme for Government**.
- Development of the plan has been led by Scottish Enterprise in partnership with Highlands & Islands Enterprise, the Scottish Funding Council, Skills Development Scotland, Zero Waste Scotland and the Scottish Government.
- As part of the launch the First Minister announced **£70m of funding for the circular economy**: £30m of European Structural Funds, and £40m of public sector match-funding, to 2018.

### Top Lines

- There should be no doubt about **the importance of our manufacturing industry** - which **employs over 180,000 people** in Scotland - to our future success.
- This plan reaffirms the **government's commitment to growing and investing in the sector**.
- The action plan is based on a commitment to **raising productivity through increased investment and innovation** and a long-term **partnership between government, industry, our Enterprise Agencies and other key stakeholders**.

### The strategy sets out the following actions to help strengthen the sector in Scotland:

- A new joint centre for manufacturing excellence and skills academy, the **National Manufacturing Institute for Scotland**. The new institute will aim to **stimulate innovation, improve productivity and increase investment in the Scottish manufacturing sector**.
- Scottish Enterprise and Zero Waste Scotland's new **Circular Economy Investment Fund and Service**, helping businesses to design new products and change their business models helping to improve productivity, open up new markets, create jobs and improve business resilience
- A new **capital asset review service** to assist companies in assessing the benefits of investing in advanced manufacturing technologies and equipment, delivered through an enhanced Scottish Manufacturing Advisory Service (SMAS). The **review is free** to all manufacturers. Following the review, businesses are encouraged to **develop compelling investment plans to drive their competitiveness** through plant, machinery and new technology options **to aid overall effectiveness and productivity**.
- Setting up **advanced manufacturing demonstrator facilities** to support companies to evaluate and de-risk acquisition of new process equipment.
- Tackle long-term future skills shortages by **promoting STEM subjects** throughout the school curriculum and improving engagement between industry and education.
- The new **Workplace Innovation service** to provide support for firms to increase workplace innovation.
- Support manufacturing SMEs to keep pace with technology and process developments by working in partnership with industry to develop and deliver a **Smart Manufacturing Excellence Programme**.
- Support more Scottish companies to achieve **supply chain excellence** by reviewing sector and cross-sector supply chain capabilities; and launching two re-shoring pilot projects.

### We are determined to progress this work quickly

- On **23 February 2016** we launched ‘**Making Things Last – A Circular Economy Strategy for Scotland**’, taking forward our commitment to the **Circular Economy Investment Fund and Service**.
- On **18 March 2016** Zero Waste Scotland launched the **£18m Circular Economy Fund for business**
- On **1 June 2016** the Scottish Manufacturing Advisory Service (SMAS) launched the new capital asset review service - close to 40 reviews have already been carried out
- On **22 August 2016** Scottish Enterprise launched the new **Workplace Innovation service**
- We have established a multi-partner approach to take forward the development of a **National Manufacturing Institute for Scotland (NMIS)**. The Programme for Government published on 6 September 2016 states that **developing the business case for the NMIS is ‘a key action for the forthcoming year’**. This commitment was **confirmed in the draft Budget 2017/18**, published on 15 December 2016
- A **major conference** was **held by SMAS** in **September 2016** attended by **around 400 manufacturing leaders** to reinforce the importance of manufacturing to the economy and the ambitions of the MAP
- On **7 November 2016** I [First Minister] **visited the Advanced Manufacturing Research Centre (AMRC)** in Sheffield. The AMRC is a world leading research facility that researches and resolves advanced manufacturing problems, and it is **one potential model** that we are considering **for Scotland**.  
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Strathclyde University has **4 faculties/departments**: Strathclyde **Business School**, Faculty of **Science**, Faculty of **Engineering** and Faculty of **Humanities & Social Sciences**.

### Background

- Established as Anderson's University in 1796, granted University status by Royal Charter in 1964.
- Around **3,500 staff** (Strathclyde website)
- Over **21,000 students** (HESA 2014/15 figures)
- **Annual income of £281 million in 2015/16** (Strathclyde accounts) (made up of SFC 36%; Tuition fees 29%; Research 22%; other income 13%).
- **Indicative SFC funding of £113M in 2017/18** (including teaching, research & Innovation and estimated tuition fee income for funded places). – an increase of 1.9% on the previous year (SFC).

### Reputation

- The University is a **leading international technological university** which is recognised for strong research links with business and industry, commitment to enterprise and skills development, and knowledge sharing with the private and public sectors.
- **Strathclyde Technology and Innovation Centre (TIC)** has secured success in 3 prestigious national award schemes – The British Council for Offices has nominated the Centre for the prestigious innovation trophy at its UK awards, the Centre was also given a commendation award at the 2016 Civil Trust Awards and it also received an Honourable Mention in the 2016 ISPE Facility of the Year Awards.
- **Strathclyde Business School is triple accredited**, holding accreditation from the international bodies, AMBA, AACSB and EQUIS. The first business school in Scotland to hold this accolade, and one of only 74 in the world (2016).
- Notable alumni include: **John Logie Baird** (TV inventor), **Sir Tom Hunter** (entrepreneur and Philanthropist), **Aileen McGlynn OBE** (Paralympic cycling gold medallist).

### University League tables

The Guardian's University League Table 2017 – UK 51st (33rd in 2016)

Times/Sunday Times University Guide 2017 – UK 48th (46th in 2016)

### Research

Ranked **37th** (out of 128) for **research quality of all UK universities** (sixth in Scotland) in THE's table based on the 2014 Research Excellence Framework (REF). This represented a rise of 13 places on Strathclyde's relative position since 2008. The University was ranked **31st** (out of 128) **for research power** (or strength which takes account of the number of researchers submitted) of all UK universities (fourth in Scotland) in THE's table based on the 2014 Research Excellence Framework. Ranked in the UK. 1st for Physics, 8th for Civil Engineering, 10th for Business, 11th for Politics, 13th for Aeronautical Engineering and 15th for Electrical Engineering. The University has its highest proportion (25% or above) of world-leading (4\*) research in the REF2014 in Allied Health, Physics, Business, Politics, Social Work, English and History.

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**Professor Sir Jim McDonald is Principal and Vice Chancellor of Strathclyde University.** Sir Jim joined the University in 1984 following six years in the UK electricity supply industry, with SSEB and Scottish Hydro Electric. He was appointed to the Rolls-Royce Chair in Electrical Power Systems in 1993 and led research in advanced electrical power systems. He advises government, industry and commerce on the generation, transmission and distribution of electrical energy. He became Principal and Vice-Chancellor of Strathclyde University in 2009. He is Chairman of two Scottish research pools the Research Partnership in Engineering (SRPE); and Energy Technology Partnership (ETP). He is a member of the Scottish Enterprise Board. He co-chairs - with you - the Energy Advisory Board. He is Chairman of the Glasgow Economic Leadership Board for the City of Glasgow and, in 2011, was appointed Chairman of the Board of the Glasgow Science Centre. In 2013, he was appointed Non-Executive Director of the UK Offshore Renewable Energy Catapult. In June 2012, he was awarded a Knighthood for services to education, engineering and the economy.



**Professor Keith Ridgway is the Executive Chair of the AFRC** at the University of Strathclyde where he is also a Professor of Manufacturing in the Department of Design Manufacture and Engineering Management. He is also Professor of Design and Manufacture and Executive Dean of the Advanced Manufacturing Research Centre (AMRC) at the University of Sheffield. The AMRC comprises the AMRC with Boeing, the Nuclear AMRC and the AMRC Apprentice Training Centre. Professor Ridgway is a Fellow of the Royal Academy of Engineering, a Fellow of the Institution of Mechanical Engineers and a Fellow of the Royal Institute of Naval Architects. In 2012 he was awarded the prestigious Honorary Fellowship of the Royal Aeronautical Society. He was awarded the OBE for services to UK manufacturing industry in June 2005 and a CBE for services to Manufacturing Research In January 2012. Professor Ridgway has produced over 200 publications.

**Professor Graham Wren is Special Advisor to the Principal,** Chairman of the Business



Engagement Group and Major Projects Director at the University of Strathclyde in the UK. Graham has 35 years of engineering business experience, most of which has been spent in the nuclear industry. He has

been a member of more than 30 company and research centre boards. He has represented the UK Government on OECD and NEA committees as an expert in nuclear technology, has given evidence to UK Parliamentary select committees and has sat on numerous government and industry committees. Within the University of Strathclyde Graham has overseen a number of ambitious projects where the University is engaging with industry to produce innovative technology in areas such as renewable energy, aerospace, nuclear and pharmaceutical manufacturing. Within the last five years, these have included: the £100M Technology and Innovation Centre at Strathclyde; the £85M Advanced Forming Research Centre; the £63M Centre for Continuous Manufacturing and Crystallisation; a £15M Power Networks Demonstration Centre.

**David Jones, has been Chief Operating Officer at AFRC since 2016.** He has a BSc (Hons) in



Chemistry with Materials Science from the University of Liverpool and has had a varied career in metals and advanced materials businesses. Immediately prior to joining the AFRC David worked for Rio Tinto Aluminium running the smelter and hydro power

assets in Scotland, primarily based at the Fort William site which was recently acquired by the GFG Alliance. While at Rio Tinto Aluminium David gained an MBA and also held senior roles in commercial, HR and operations management. Before Rio Tinto Aluminium David spent 10 years with the Debeers Group of Companies in the industrial diamond division. Since joining AFRC, David's focus has been on cementing AFRC's world class reputation for industrial scale research.



**Dr Lynne O'Hare, Chief Business Development Officer** at AFRC is a Chartered Engineer



responsible for developing the AFRC's commercial business. Lynne is also heavily involved in supporting SG with the development of a National Manufacturing Institute for Scotland (NMIS). Lynne joined the AFRC as part of its launch team in 2009, delivering research in superplastic forming to some of the world's leading aerospace companies. As a Senior Manufacturing Engineer at the AFRC, she went on to deliver full-scale production capabilities within the £60m centre that bring academic-level research to an industrial client base. In 2014 Lynne moved from the AFRC's engineering team to a new role focused on business development. In 2016, Lynne took on full responsibility for the commercial business and continues to engage with the world's leading manufacturing companies, across all sectors, helping to identify engineering solutions for the AFRC team to deliver cutting-edge R&D with real industrial impact.

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