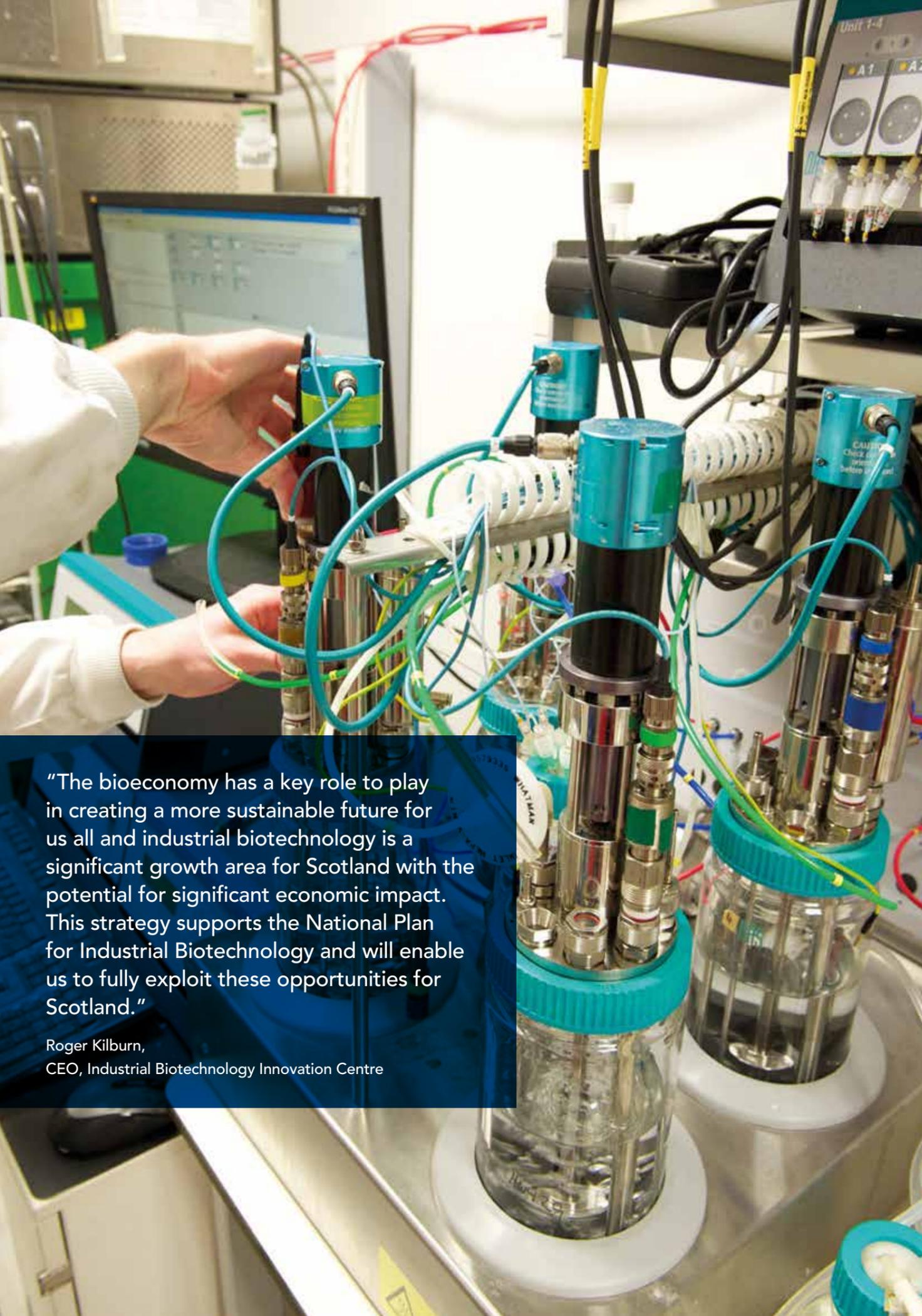


Life Sciences Strategy for Scotland 2025 Vision

Accelerating Growth,
Driving Innovation





“The bioeconomy has a key role to play in creating a more sustainable future for us all and industrial biotechnology is a significant growth area for Scotland with the potential for significant economic impact. This strategy supports the National Plan for Industrial Biotechnology and will enable us to fully exploit these opportunities for Scotland.”

Roger Kilburn,
CEO, Industrial Biotechnology Innovation Centre

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“The 2017 refresh of the Life Sciences strategy is a visible indicator of the commitment of the Life Sciences community to an ongoing cycle of Plan, Do, Check and Act; ensuring that we continue to move in the right direction whilst striving to ensure that Scotland remains at the cutting edge of scientific innovation, delivering better patient outcomes.”

Dave Scott,
Senior Director, Tepnel Pharma Services

FOREWORD



Left: Paul Wheelhouse, MSP, Minister for Business, Innovation and Energy
Right: Dave Tudor, VP of Primary Supply Chain at GSK

Within this document we present our refreshed strategy to build on our successes, to take advantage of the opportunities presented in the rapidly changing environment and to grow the Life Sciences sector in Scotland to £8bn by 2025.

The vision in our 2011 Strategy: ‘*Creating Wealth, Promoting Health*’ remains the same: to make Scotland the location of choice for businesses, researchers, healthcare professionals and investors, while increasing Life Sciences contribution to Scotland’s economic growth.

Life Sciences in Scotland is broader than many people perceive. It includes all life and health

sciences; human, animal and plant. Scotland operates as a single Life Sciences cluster engaging with small, medium and large enterprises, business entrepreneurs, investors, colleges and universities, researchers, clinicians as well as those out-with Scotland who want to do business here.

We are not short of ambition or inventiveness and we want to promote our potential through greater international engagement.

Globally recognised for our impact, we are ambitious to build on Scotland’s strengths and we ask our Life Sciences community to push boundaries further; to think bigger; and to take the next leap of faith with the investment and support available to them.

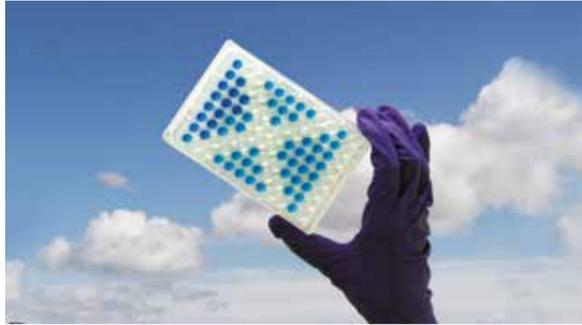
Scotland has a world-wide reputation for its inclusiveness, openness and integrity. As joint co-chairs of Life Sciences Scotland we, on behalf of all members and our partners, will be working to build on Scotland’s significant competitive advantages, to improve the health, wellbeing, environment and food security of citizens at home and across the globe.

This is an exciting time for Life Sciences in Scotland. We look forward to working with you in delivering this refreshed strategy to take the sector to the next level.

Dave Tudor, VP of Primary Supply Chain at GSK

Paul Wheelhouse, MSP, Minister for Business, Innovation and Energy

INTRODUCTION



In 2011, the Scottish Life Sciences Strategy set out a bold vision to strengthen the economic impact of the sector during a period of deep global recession.

The overarching aim of the strategy was to focus on the areas with greatest impact to expand the role of the industry as a dynamic contributor to Scotland's economic growth and social wellbeing with 3 core objectives: to *Anchor, Build and Attract* a sustainable Life Sciences sector in Scotland.

Since 2010 these collective efforts have resulted in 29% growth in turnover and 24% growth in gross value added (GVA), with current turnover in excess of £4.2bn and GVA of about £2bn¹.

Over the past 6 years, the global economy has stabilised, with GDP per head in the UK returning almost to its pre-recession level. In this time, focussing on highly competitive subsectors, creating an environment for growth and building on core capabilities has ensured a solid platform for the sector.

In refreshing the strategy we recognise and respond to emerging global trends. The ageing population, proliferation of chronic diseases and increasing cost

pressures on healthcare payers are now some of the biggest challenges for the Life Sciences sector. These new challenges are creating emerging markets and opportunities, such as:

- digital technologies, creating a paradigm shift in healthcare by assisting patients to be monitored and treated out-with the hospital setting through patient empowered healthcare management;
- advances in genomics and big data, making the future for precision medicine, companion diagnostics, animal and crop health look bright;
- developments in high value manufacturing, including the use of enzymes and continuous manufacturing techniques, driving down costs and creating opportunities for re-shoring production; and
- innovations in the bioeconomy addressing environmental and food security concerns through industrial biotechnology, agritech and animal health.

In order to exploit these opportunities, four strategic themes and priorities have been developed by Life Sciences Scotland, the sector's Industry Leadership Group, with active support and contributions from the Life Sciences community in Scotland:

- Innovation and Commercialisation
- Sustainable Production
- Internationalisation
- Business Environment

Collectively, these themes will form the framework to accelerate the growth and success of the sector.

"The updated strategy for the Life Sciences sector in Scotland recognises the distance we've already travelled and the opportunities ahead. The challenge of delivering good healthcare with constrained resources is a global reality that we must face, but in my own sector of digital health and analytics I am convinced that we have the knowledge and skills in Scotland to support a real transition into the age of precision medicine. I believe we now have a realistic plan which has the potential to deliver significant benefits to Life Sciences companies in Scotland and support improved healthcare outcomes for the people of Scotland."

Ken Sutherland,
President, Toshiba Medical (Edinburgh)

1. <http://www.gov.scot/Topics/Statistics/Browse/Business/Publications/GrowthSectors/LifeSciencesSourcebook>

OUR VISION



To make Scotland the location of choice for Life Sciences businesses, researchers, healthcare professionals and investors while increasing

Life Sciences contribution to Scotland's economic growth.

Scotland is already a leading global cluster for Life Sciences but to achieve this vision, Scotland needs to become the most effective place to develop innovations and commercial enterprise, setting us ahead of our global competitors.

This requires an ecosystem where scientific endeavour leads to economic growth across the Life Sciences spectrum producing more indigenous companies of scale with international growth potential and increasing manufacturing output of high-value products.

Key components of this ecosystem include a strong base of talented and inventive people, an array of impactful research supported by robust domestic and international partnerships, and high quality infrastructures underpinned by a skilled workforce with dynamic leadership to drive the sector forward.

Scotland needs to build on its supportive investment community, National Health Service acting as both a pivotal stimulator and adopter of innovative health products, and proactive public sector and Government.

All aspects of the Scottish Life Sciences ecosystem will be nurtured and strengthened and the enthusiasm of all stakeholders harnessed to change today's vision in tomorrow's reality.

OUR MISSION



To increase the Life Sciences industry contribution to the Scottish economy to £8bn² by 2025. This will be achieved through the creation of a dynamic

and competitive environment with a robust business base capable of attracting key skills, talent and investment.

The Life Sciences sector in Scotland is defined as a priority sector of economic significance by the Scottish Government. The strength and future potential of the Life Sciences sector within the Scottish economic landscape is evident – currently 34% of Business Enterprise Research and Development (BERD) spending in Scotland is attributed to Life Sciences³. It is for this reason we will continue on the journey set out in the 2011 strategy, to significantly increase the economic contribution made by Scotland's Life Sciences industry.

Building on Scotland's existing competitive advantages, we will work with all members of, and stakeholders in, the Life Sciences ecosystem to:

Anchor

Scotland's Life Sciences company base, continuing to develop a sustainable environment for companies to flourish;



Build

on our core capabilities, focusing on themes and priorities that are relevant to the sector as a whole;



Attract

Life Sciences investment to Scotland by highlighting the strengths and assets that make Scotland a choice location for growth.

2. Contribution to the Scottish economy measured by industrial turnover.
 3. Growth Sector Briefing – Life Sciences, Office of the Chief Economic Adviser, Scottish Government, 2015
 4. Scottish Enterprise Internal Research, 2016
 5. BioCity UK Life Science Start-up Report, 2015
 6. Investment in UK and Irish, Private Life Sciences and Health Business 2013-15, Ascendant Corporate Finance report for Scottish Investment Bank

An Ecosystem for Growth

Between 2009 and 2015, Scotland created more than 170 life sciences start ups with a success rate of 85%, demonstrating Scotland's supportive environment for Life Sciences ventures⁴.

In the same period Scotland generated over 60 university Life Sciences spin-outs, more than any other region of the UK.

Edinburgh, Strathclyde and Dundee all feature in the top 10 UK universities generating Life Sciences spin-outs⁵.

Supporting this growth, Scotland has enhanced its investment offering, attracting Epidarex Capital, a £50m venture fund supported by a diverse range of investors, including Eli Lilly's first venture fund investment within the UK. With 30% of its portfolio in Life Sciences, the Scottish Investment Bank is the most active investor in Life Sciences in the UK⁶.



Research at the Centre for Innovative Manufacturing in Continuous Manufacturing and Crystallisation

SCOTLAND'S ADVANTAGES



VIBRANT, DIVERSE AND GROWING COMPANY BASE

One of the largest Life Sciences clusters in Europe, Scotland employs over 37,000 people across some 700 organisations. Companies in the sector contribute in excess of £4.2bn turnover and about £2bn gross value added to the Scottish economy. Since 2010, company turnover increased by 29%, gross value added by 24% and total employment in companies by 13%¹.

Scotland is home to a range of multinationals and small and medium enterprises (SMEs) with a strong track record of creating and growing start ups. A thriving entrepreneurial culture in our universities creates more spin-outs than any other region of the UK⁵.

Scotland has comprehensive supply chains and world-class manufacturing expertise supplying chemical and healthcare equipment, pharmaceutical services, medicines, vaccines and diagnostics to the world.



ACCESS TO WORLD LEADING RESEARCH

Scotland is an ideal location to source partners for major Life Sciences projects, with world leading research expertise across human healthcare, animal and plant sciences, aquaculture, agritech and industrial biotechnology.



PROVEN TRACK RECORD OF INVENTION AND MEDICAL ADVANCES

Scotland has a proven track record over centuries of pioneering invention and medical innovation and is well positioned to revolutionise the Life Sciences landscape of the future.

Scotland ranks worldwide among the top three for research productivity and impact⁷, with 19 universities and higher education institutions, and world leading research centers, that attract some of the brightest international scientists. For example, Scotland has the largest concentration of animal health and aquaculture researchers in Europe.

Scotland has invested heavily to develop innovation and excellence centres to catalyse collaborations between industry and academia. These interactions support business performance through the rapid and efficient translation of solutions to industrial and scientific challenges.



STRONG EVOLVING INVESTMENT ENVIRONMENT

Scotland has one of the most active business angel networks in Europe and is only second to London in the UK in terms of the number of Life Sciences companies receiving venture finance. The Scottish Investment Bank is the most active Life Sciences investor in the UK⁶.

Scotland also provides a range of supportive mechanisms to enable businesses to prosper including Regional Selective Assistance, Training Plus grants, R&D grants, Patent Box (UK) and the lowest rate of corporation tax of the G20 countries.



INNOVATION READY UNIFIED HEALTH SERVICE

Scotland has an invaluable resource for the data-driven approach to healthcare of the future, with all patients in NHS Scotland having a unique identifier and electronic health record.

Through NHS Research Scotland (NRS) our health service has a single access point for industry, dedicated clinical research facilities and globally competitive approval and start-up times. We also encourage innovators within NHS Scotland to work with industry partners, both through the Health Innovation Partnership (HIP) and also through Scottish Health Innovations Ltd (SHIL) which supports the development, protection and appropriate commercialisation of innovative ideas arising from healthcare professionals.

Scotland has a wealth of clinical expertise, a stable population actively engaged in clinical research and a growing registry of patients willing to share e-health records for the development of novel treatments and therapies.



SKILLED AND DYNAMIC WORKFORCE

Scotland has a cohort of ambitious, passionate and globally connected leaders across academia and industry, working to ensure that Scotland is well positioned to seize future opportunities.

Our Life Sciences skills investment plan, developed in partnership with industry, ensures Scotland is prepared for the future needs of the sector.

Our universities generate highly skilled graduates and PhDs, and our colleges train technicians and modern apprentices in strategic collaboration with industry.



NETWORKS, CONNECTIONS AND BUSINESS ENVIRONMENT

As well as being one of the largest, Scotland is recognised as one of the most accessible, well-connected and collaborative Life Sciences clusters in Europe.

With a compact geography, engaged and connected industry leaders and strong and active support from the Scottish Government, Scotland can quickly respond to business needs and global opportunities.

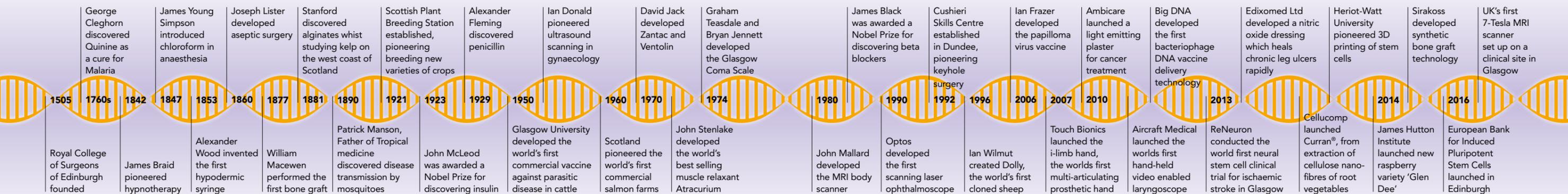
Scotland has a network of business incubators and science parks providing the ideal environment for growth, and has been demonstrated to be one of the most cost effective manufacturing locations in Europe.



QUALITY OF LIFE

Scotland is a great place to live and work. Recognised globally for its history, heritage and culture, Scotland is a truly international and cosmopolitan country offering an exceptional and affordable location for global business. Short commute times, affordable housing, excellent education and healthcare, combined with easy access to breathtaking scenery and a range of leisure and sporting activities makes Scotland a fantastic place for a fast paced, low stress living experience, ensuring a stable workforce and high staff retention.

7. International Comparative Performance of the Scottish Performance in Life sciences, 2013, Elsevier, report for Scottish Enterprise





“At James Hutton Limited we fully support the dynamic vision of Scotland’s Life Sciences Strategy which inspires and builds on our outstanding capabilities with ambition and synergy.”

Fraser Black,
Managing Director, James Hutton Limited

“We are very happy to endorse this strategy refresh which places Scotland firmly on the international Life Sciences Map”

John Mackenzie,
CEO, Roslin Innovation Centre

STRATEGIC PLAN

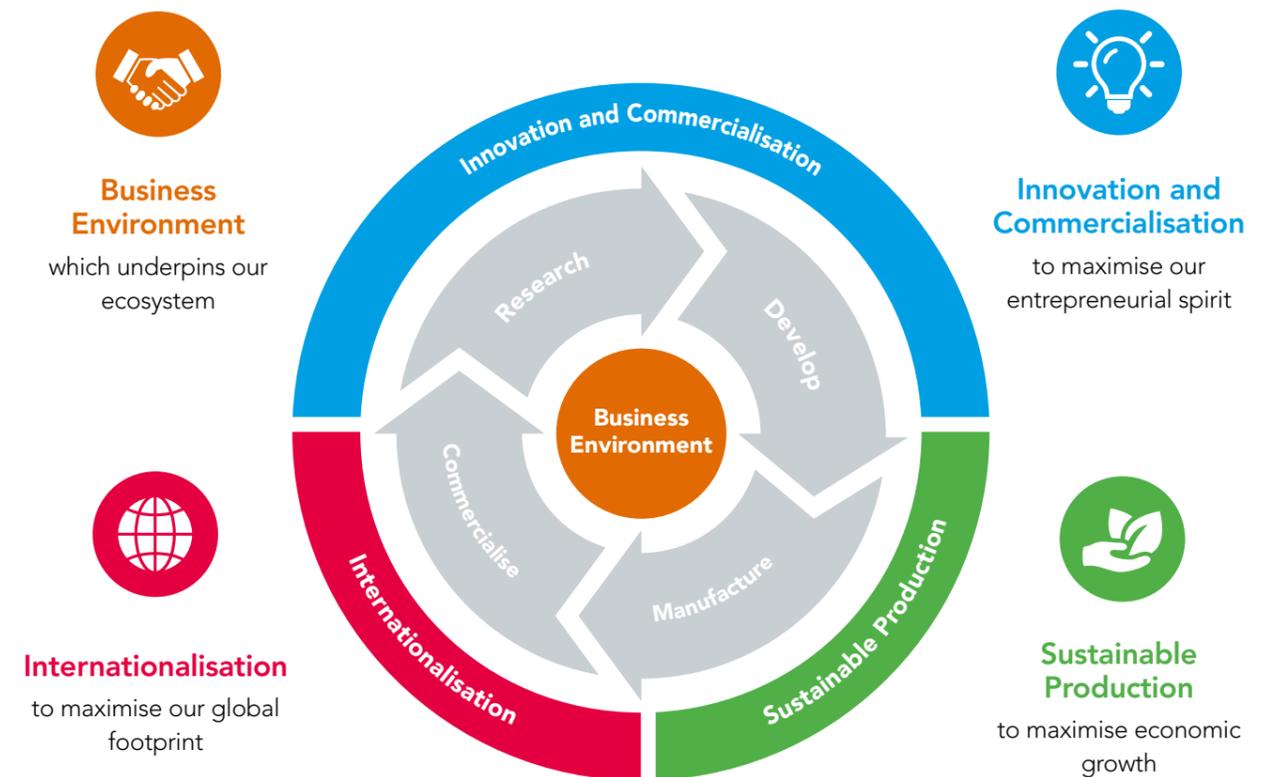
To make Scotland the location of choice for Life Sciences and in the process, increase the sector’s economic contribution to £8bn by 2025, it is vital to focus on all elements of the enterprise lifecycle: research, develop, manufacture and commercialise.

Accordingly, four strategic themes have been selected as key and relevant to the Life Sciences sector as a whole.

Within each theme, key priorities have been identified. These priorities are aligned with the overarching focuses of our mission: *Anchor, Build and Attract*.

The Industry Leadership Group will work in partnership with the life sciences community to drive these priorities and deliver our mission and vision.

The themes and priorities are presented on the following pages.



Innovation and Commercialisation



Scotland is a world-leading entrepreneurial nation - a CAN DO place for business, and the Scotland Can Do: An Innovation Action Plan outlines the national priorities for innovation. In the Scottish Life Sciences sector, our priorities for action will include capitalising on the work of the innovation and excellence centres, supporting scale-up operations to maximise the impact on our economy, and growing and strengthening our entrepreneurial base.

PRIORITIES

- **Drive growth through collaboration to commercialise the output of innovation and excellence centres**

We will support and facilitate development and deployment of commercialisation strategies for key centres for innovation and research excellence. We will work across the sector to transfer know-how and facilitate exploitation of existing intellectual assets into sustainable production.

- **Improve on the current ecosystem to maximise economic growth and create more companies of scale**

We will ensure Scottish businesses have both the infrastructure and support required for scale up; we will support the engagement of Scottish

companies with recognised international investors to generate larger deal opportunities; we will build on the Health Innovation Partnership model to develop and pilot Scottish innovation and increase awareness of the health technology assessment process.

- **Attract, develop and retain entrepreneurial leadership across academia, the health service and industry**

We will encourage and reward the entrepreneurial flair of our business, academic and clinical leaders, nurturing the serial entrepreneurs who will continue to contribute to the growth of the sector. We will create a more supportive environment for entrepreneurs; enabling the transfer of key individuals between industry and academia to create a seamless flow of ideas and experience across the sector.

Research Excellence

Scottish institutions continue to deliver world class research excellence. With only 8% of UK population, Scotland captures 19% of the biosciences funding attracted by UK universities⁸, making Scotland a prime location for research partnerships.

Over the past 10 years, Scotland has developed new clusters of research excellence. For instance, Edinburgh BioQuarter has now the largest cohort of stem cell scientists on one site in Europe. In synergy with the growth of this research expertise, more than forty Scottish companies have developed their commercial activities around stem cells and regenerative medicine.

A Culture of Innovation

In the last five years Scotland has created 6 Innovation Centres directly aligned to Life Sciences, with a core funding of around £100m.

- Stratified Medicine Scotland Innovation Centre
- Industrial Biotechnology Innovation Centre
- Digital Health and Care Institute
- Scottish Aquaculture Innovation Centre
- Centre for Sensor and Imaging Systems
- The Data Lab

These centres are designed to link academia and industry to turn innovation into commercial value, making Scotland more competitive within the UK and internationally.

Data Room at the at the Stratified Medicine Scotland Innovation Centre

Sustainable Production



Changing the environment for, and approach to, the production of Life Sciences products will enable more of the intellectual assets developed in Scotland to lead to production in Scotland. We will continue to support the delivery of the Life and Chemical Sciences Manufacturing strategy, launched in September 2015, focusing on its four main priorities.

PRIORITIES

- **Leadership confidence and promoting manufacturing**

We will empower companies and their leaders to promote Scotland as a key international location for sustainable high-value manufacturing. We will seek to develop a 'product design to manufacture' mindset and a comprehensive skills pipeline.

- **Research commercialisation, technology development and scale up**

We will work with stakeholders to improve Scotland's innovation performance by

reviewing existing support mechanisms and developing new ones.

- **Supply chains and re-shoring**

We will ensure access to key Scottish academic and technological expertise to solve industry issues. We will expand the provision of facilities based on industry needs and promote innovative manufacturing approaches.

- **Investing in Scotland**

We will support development of innovative supply chains. We will share best practice, knowledge and expertise between businesses, and build up Scotland's services offering.

Internationalisation



Life Sciences is a global market and we will increase the number of Scottish companies and organisations successfully operating overseas, and promote Scotland as a location of choice for Life Sciences, building on existing networks and connections and creating new strategic relationships.

PRIORITIES

- **Leverage Scotland's networks**

We will maximize the use of our existing network of contacts and information within the Scottish Life Sciences community (industry, academia, and government) to enable and facilitate business development across the sector with overseas organisations, helping to create "international" SMEs.

- **Promote Life Sciences in Scotland**

We will continue to actively promote Scotland as a leading Life Sciences location, ensuring that we market, support and highlight the success of our companies, research base, health service innovations and clinical research.

- **Develop an international mindset**

We will continue to support our company base to raise their ambition and confidence to exploit international markets and opportunities by sharing valuable in-market experience and international networks.

Business Environment



We will focus on some core aspects of the business environment that are critical to support the sector's growth.

PRIORITIES

- **Develop Scotland's Life Sciences infrastructure plan**

To support the continued growth of the sector, we will map out the key infrastructure developments required, seeking appropriate investment for our ambitious plans. These could include scale up facilities, clean rooms, digital infrastructure, start-up and follow-on space to support growth.

- **Maintain a world class regulatory environment**

We will continue to maintain our globally recognised regulatory standards to ensure Scottish products are of significant quality and continue to be globally competitive.

- **Support the delivery of the Life Sciences Skills Investment Plan**

Our people are still our greatest asset and the Skills Investment Plan, developed in partnership with Skills Development Scotland, provides a framework to ensure continued supply of a highly skilled and educated workforce to meet the needs of the sector. We will continue to support the implementation of the current plan and the development of future plans as required by our dynamic sector.

- **Improve access to funding and investment**

Scotland is only second to London in the UK for numbers of companies receiving venture finance⁶. However, deal sizes are still smaller compared to competing regions in the UK. We will support Scottish companies helping them to engage with international investors to generate larger deal opportunities.

Strategic Partnerships

The Health Innovation Partnerships (HIP) is a unique liaison service that identifies, supports and coordinates the formation of specific partnerships between NHS Scotland and the Life Sciences industry to advance health and social care challenges.

As of January 2017 the HIP, coordinated by the Scottish Lifesciences Association, supported 150 projects with involvement of around 200 companies and over 1,000 clinical and allied staff.

In the last 24 months our Pharma Services companies have formed an industry led steering group with a key objective of uniting the sector through collaborative working and partnership projects. The goal is to link our companies together into a demonstrable supply chain attracting high value pharmaceutical development projects to Scotland while supporting our manufacturing strategy.

LIFE SCIENCES SCOTLAND INDUSTRY LEADERSHIP GROUP



The Life Sciences Scotland Industry Leadership Group (LSS ILG), formerly the Life Sciences Advisory Board, is a joint industry, enterprise agencies and government strategy team with an active remit to develop, drive and deliver the Life Sciences strategy in Scotland; developing an environment where ingenuity and innovation can create jobs and wealth for Scotland, as well as genuine benefits for the

global community. It fosters support and discussion between key players in the Life Sciences sector and those responsible for government policy-making at the very highest level to ensure Scotland has the best possible environment for fledgling technologies and established players alike.

The LSS ILG is currently chaired by Dave Tudor, VP, Primary Supply Chain at GSK, and co-chaired by Paul Wheelhouse, MSP, Minister for Business, Innovation and Energy, supported by Ms Aileen Campbell MSP, Minister for Public Health and Sport.

The LSS ILG consists of senior representatives from stakeholders across the spectrum of the Life Sciences community: CEOs and Directors from pharmaceutical, biotechnology, medical devices and diagnostics companies; research organisations and academic institutions; Scottish Enterprise, Highlands and Islands Enterprise, the Scottish Government and Scotland's National Health Service.

MOVING FORWARD TO DELIVER OUR STRATEGY

This strategy sets out Scotland's ambitions for the future and presents a refreshed vision for economic growth.

It is an exciting time for Life Sciences in Scotland – our community is geared and prepared to take this sector to the next level to produce a sustainable environment for our companies to grow, our population to benefit, and the global community to engage.

Our next steps are for the development and delivery of action plans for each of these priorities. Working groups will be formed with the Life Sciences Scotland Industry Leadership Group and members of the broader Life Sciences community to plan and coordinate the delivery of agreed actions under each priority.

The journey continues, and we invite you to join us.

For further information on the Life Sciences Strategy for Scotland please contact: ILG@scotent.co.uk

SUPPORTING LIFE SCIENCES STRATEGY DOCUMENTS



* Strategies in development

If you require this publication in an alternative format and/or language please contact ILG@scotent.co.uk