SCIENCE FOR SCOTLAND: BACKGROUND

Contents

Introduction

1. This background paper provides additional context and detail relating to *Science for Scotland*, the strategic framework for science published by the Scottish Government in November 2008.

2. Science, engineering and technology have shaped the world we all live in today and will have an increasing influence on all our futures.

3. The impact and importance of science[1] seems certain to increase further, with basic and applied scientific research being key to addressing major global and local challenges including climate change, sustainable energy and life-threatening disease, while also providing ever-improving computing and communications technologies. No one can say that science is irrelevant to their life, their future and their ambitions.

4. Recognising that, countries around the world are investing substantially in building or growing their scientific capacity and its economic and commercial relevance. They want to be better able to shape and respond to the challenges of the future. They aim to develop and attract scientific talent, investment and high-value jobs. Ambitious businesses want to develop new or improved products or services, and increase their productivity, competitive advantage, market share and profitability. Ambitious Governments support that, and want their citizens to have the scientific knowledge, understanding, and skills which will increasingly underpin economic prosperity and international competitiveness. Governments also recognise the democratic importance of that same scientific insight facilitating informed political and ethical debate about complex science-based issues, for example, climate change, GM food or nuclear energy.

5. Scotland has a proud heritage of excellence in basic and applied science supporting innovative businesses and economic prosperity and to this day has a science base which stands comparison with the world's best.

6. *Science for Scotland* is focused on sustaining, enhancing and - more effectively - exploiting that comparative advantage.

7. The starting point is the Government's Economic Strategy (GES) and National Performance Framework (NPF). They confirm a single overarching Purpose: creating a more successful country, with opportunities for all of Scotland to flourish, through increasing sustainable economic growth.

Fig 1 - the strategic approach

[1] In the remainder of this document science is used as shorthand for science, engineering, and technology (SET) and where appropriate social sciences.

That means building a dynamic and growing economy which will provide prosperity and opportunities for all, while ensuring that future generations can enjoy a better quality of life too. Government invests more that £300 million in scientific research infrastructure and projects and Scottish Enterprise and Highlands and Islands Enterprise and Scottish Development International use a considerable element of their budget allocations to promote science-related company and sector growth and inward investment. The Government wants the public money it allocates to support its Purpose and Strategic Objectives and deliver the National Outcomes and Indicators.

8. The GES recognised the need for a new science framework outlining how science will underpin Scotland's success as a nation through:

- **developing the science base**.
  Outcome – We are better educated, more skilled and more successful, renowned for our research and innovation
  Indicator/Target - at least halve the gap in total R&D spending compared with the EU average by 2011.

- **developing knowledge exchange between academia and business**
  Outcomes – We are better educated, more skilled and more successful, renowned for our research and innovation
  We realise our full economic potential with more and better employment opportunities for our people
  Indicator/Target - Improve knowledge transfer from research activity in universities.

- **increasing the flow of overseas investment into Scotland's R&D base**
  Outcomes – We are better educated, more skilled and more successful, renowned for our research and innovation
  We realise our full economic potential with more and better employment opportunities for our people
  We live in a Scotland which is the most attractive place to do business in Europe
  Indicator/Target - at least halve the gap in total research and development spending compared with EU average by 2011;
  Improve people's perceptions, attitudes and awareness of Scotland's reputation.

9. GES also promised a broader approach to business innovation that moves beyond viewing innovation as the domain of science and technology alone and recognises the importance of working with customers, suppliers and competitors to stimulate and sustain innovation. Science for Scotland is focussed on science innovation and science skills.

10. An innovation framework is currently being developed. It will setting out plans for improving Scotland's absorptive capacity, the ability of a business to recognise the value of new, external information, assimilate it, and apply it to commercial ends.

11. *Skills for Scotland* aims to deliver a smarter Scotland with a globally competitive economy, driven by high levels of skills acquisition and utilisation, where:

- people can work in teams, are creative and enterprising, motivated and confident to contribute to Scotland's future;
- people are entrepreneurial and innovative and all businesses are encouraged to grow by utilising their workforce; where employers improve productivity by investing in their staff's skills, knowledge and development;
- learning and training providers work as one flexible, coherent system focused on the needs of individuals and businesses.

The relevance to science is clear. *Skills for Scotland* aims to create a learning and skills system that places the individual at its centre and which is determined by economic demand.

12. *Science for Scotland* sets out what Government – often in partnership - can and will do to sustain, enhance and more effectively exploit Scottish science. It is of course focused on key principles set out in GES: alignment of resource and policy with the delivery of priorities; and greater emphasis on effectiveness and on achieving a real difference for the people and businesses of Scotland. It is deliberately strategic in nature, with an outcomes-focus which will influence more detailed corporate and policy plans which support and use science to help achieve the Scottish Government's Purpose and Objectives. *Science for Scotland* sets challenges for us all.

Building on success

13. Scotland has been long recognised as a science nation. The work of Hutton and Lyell - the founding fathers of modern geology – James Clerk Maxwell, James Watt, Alexander Fleming, John Logie Baird and a host of others give Scotland a proud record of achievement in science and engineering. More recently the invention of MRI scanners, the creation of Dolly the sheep and the discovery of the p53 cancer suppressor gene demonstrate that science in Scotland remains world-class.

14. Excellence in scientific teaching, research, and commercialisation are key factors in Scotland's current international and economic position - in terms of:

- International recognition, reputation and influence;
- provision of teaching, learning, qualifications and practical skills;
- research partnerships;
- securing sustainable inward investment;
- supporting innovation and growth in keys sectors of our economy.

15. Scotland's schools, colleges and universities provide distinctive global advantages in the supply of human and intellectual capital.

16. In the last international study of secondary pupils' performance in science - Programme for International Student Assessment (PISA) 2006 - only 4 countries (of the 57) involved were significantly ahead of Scotland in science.

17. Scotland's colleges teach a broad range of science subjects. They deliver over 25% of Scotland's higher education and they are building partnerships with schools across the country consistent with their key role in the delivery of Curriculum for Excellence (including Skills for Work courses) and Skills for Scotland. They also work with a wide spectrum of businesses to both up-skill their workforce and increasingly to support knowledge exchange and innovative processes.

18. Scotland has 5 Universities in the World's Top 200. Scotland's scientific research base is ranked first in the world in terms of the rate our research papers are cited relative to our GDP, and second in the world behind only Switzerland and ahead of the USA in terms of impact (measured as the average number of citations per paper)[2]. The best performing research fields, in terms of impact, are health and related sciences (1st), clinical sciences (2nd in the world) and biological sciences (3rd). In addition, of course, Scotland's Universities produce a stream of highly educated and skilled graduates and increasingly work with businesses of all sizes, supporting knowledge exchange and research commercialisation.

19. Scotland also has a number of key business sectors whose success is underpinned by the scientific knowledge and the practical expertise of the science base and workforce. For example, Scotland is home to one of the most sizeable and rapidly growing life sciences communities. Life Sciences in Scotland has sustained annual GVA Growth Rates of 7-8 per cent - four times the medium term, average

[2] Metrics for the Scottish Research Base, February 2008

growth rate of the Scottish economy. 70% of Scotland's exports from come from science, engineering and technology related sectors of the economy.

20. Scotland is a small country. Our science serves Scotland and the world.

21. The Scottish Government will build on that success.

22. The Economic Strategy defined the Government's Purpose and said there would be a new science framework outlining how science will underpin Scotland's success as a nation through: developing knowledge exchange between academia and business; increasing the flow of overseas investment into Scotland's R&D base; and developing the science base. However, because science is an integral element of life in Scotland, science policy development and delivery does not exist in a vacuum. A number of Government policies or actions already initiated will have a positive impact on science and how it contributes to accelerated economic growth in Scotland. Key examples include:

- The £10 million Saltire Prize – the world's largest prize for marine renewable energy innovation - has been announced by the Scottish Government. It aims to push the boundaries of research in the global fight against climate change. It is a competition which is open to all, but it provides an incentive for both the academic science and business communities in Scotland to work with each other and with international partners. The Scottish European Green Energy Centre will develop international networks and partnerships to promote the deployment of green energy technologies and contribute towards the new European energy targets. The new Energy Technology Partnership (ETP) draws together all the key Scottish university based research and development teams involved in energy technologies. In Scotland, we have first class energy research going on in Scottish universities, with centres of expertise in Glasgow (Strathclyde), Edinburgh, Aberdeen and the Highlands and Islands, with a focus on areas such as marine renewables, long distance electricity transmission and smart grids, carbon capture and storage and tackling barriers to renewable energy deployment. The European Marine Energy Centre (EMEC) in Orkney is the first of its kind in the world, a unique facility for testing full scale wave and tidal device prototypes. With 16% of electricity already generated by from renewable sources, Scotland is a world-leader in sustainable energy generation. The Saltire Prize is focusing the excellence of our science base on a key economic and social challenge for Scotland and the world, promoting knowledge exchange and commercialisation. It capitalises on Scotland's strengths and provides opportunities for the economy and for energy independence. while making a substantial contribution to the world's most pressing challenges.

- The introduction of a new Science Baccalaureate, and a wider review of National Qualifications to further enhance the way in which Curriculum for Excellence liberates teachers to be innovative and imaginative in their teaching, places individual pupils at the centre of their learning and skills development, and delivers future generations of Scottish scientists who are successful learners, confident individuals, effective contributors to society and responsible citizens. It is important that all our young people are equipped with skills for learning, skills for life and skills for work.

- The International Framework places Scotland as a responsible nation and partner on the world stage. It aligns public sector international activities to the Government's purpose of increasing sustainable economic growth by: creating the conditions for talented people to live, learn, visit, work and remain in Scotland - so that Scottish population growth matches EU average; bringing a sharp economic growth focus to the promotion of Scotland abroad - so that the Scottish GDP growth rate matches the UK's by 2011; and managing Scotland's reputation as a distinctive global identity, an independent minded and responsible nation at home and abroad and confident of its place in the world. Particularly relevant to the international dimension of science, engineering and technology is the commitment to continuing to position Scotland as a great place to live and work, with actions to attract highly skilled and talented people to Scotland...

  Also relevant is the International Lifelong Learning Strategy which aims to position Scotland as a world-leader in international post-school education, attracting talent and fostering international partnerships and strategic alliances

- *New Horizons*, the report of the Joint Future Thinking Taskforce on Universities, defines a new outcome-driven relationship between the Scottish Government, Scottish Funding Council (SFC) and Scotland's Universities, setting out ambitions for - and practical steps towards - a university sector and a science base which:
  - is nationally and internationally competitive
  - is an attractive and welcoming place for students outwith Scotland to come and study; which actively supports a changing learner demographic and assists learners to access university and progress through the education system, returning throughout their lives to upskill, re-skill or develop new skills for life and work
  - develops entrepreneurial capacity and makes a significant contribution to graduate employability
  - where learning, teaching *and* research continue to be the cornerstone of university activity and are increasingly carried out as collaborative activities
  - willingly engages with the micro, small and medium sized business base of Scotland, playing a key role in increasing demand side 'pull' for new knowledge created in universities and delivering knowledge into the Scottish economy which creates additional wealth
  - works actively with employers to ensure the skills of graduates can be utilised to best effect in the workplace and where employers are engaged in the development of the curriculum, influencing its content and participating in its delivery
  - is aligned with the Government's purpose of delivering sustainable economic growth for the benefit of all.

  New Horizons set out plans, of particular relevance to science, to reform University funding arrangements while maintaining the integrity of dual support, by establishing a formula-driven General Fund and an incentivised Horizon Fund;

- Public sector reform focused on efficiency, effectiveness, customer-focus and system alignment with the Purpose. A good example of this is the recent reforms to Scottish Enterprise and Highlands and Islands Enterprise. This has resulted in

a refocus of their activities towards working selectively and proactively with businesses of high growth potential, key industry sectors and on transformational projects of regional or national significance. Local authorities are now responsible for helping small businesses serving predominantly local markets through the Business Gateway service, which is to be rolled out across the Highlands and Islands area for the first time. Those changes are consistent with the Funding Council developing a new light-touch and enabling approach to the implementation of key strategic initiatives in partnership with universities and others.

23. In addition, in 2008, the Chief Scientific Advisor restructured the membership of the Scottish Science Advisory Council to better reflect the diversity of the Scottish science-base including an increase in the business and entrepreneurial representation.

Realising our potential

24. The strategic direction and ambition emerging from GES and the way existing policies and plans align and connect, help define how science should will underpin Scotland's success as a nation:

> Our vision is of a nation of world-class scientific achievement, a magnet for talent and for investment, a powerhouse of technology innovation and enterprise, increasing sustainable economic growth.

25. To make that vision a reality, we need to build on our strengths, exploit key opportunities and address a range of key challenges, all of which are well-understood and recognised having been the subject of detailed analysis and investigation. Some are distinctively Scottish challenges, but most feature in the science strategies prepared by governments across the globe. They include:

- international competition and the challenge of maintaining our national pre-eminence in science teaching and research and continuing to attract science-related inward investment
- The cost of science infrastructure and the case for selectivity in national investment;
- Encouraging more young people to study science subjects and build careers in science and engineering in Scotland
- Developing a science workforce which is aligned and responsive to the future needs of the science base and the economy as a whole
- Increasing business research and product development capacity and business demand for and utilisation of the science base in ways which support economic growth, including deriving more from intellectual property and growing companies of scale
- Improving the international marketing of Scotland's science and seeking broader and deeper international collaborations with new and existing partners.

26. This significant change will take time and a shared commitment. Government recognises the need to work in partnership with all of the individuals and organisations that make up the science base in Scotland, both in the public and the private sectors. This includes our leading science-based companies and small and medium-sized businesses, the financial investment sector, our universities, colleges and our local authorities and schools, the NHS and research institutes and charities. In common with *Skills for Scotland* and the proposed Innovation Framework, it will involve:

- nurturing a culture in which creative, enterprising people are empowered and rewarded within organisations and which attracts creative people from outside Scotland
- developing systems that support and facilitate interchange of existing ideas, concepts and intellectual property between and within organisations and people
- growing and supporting networks which facilitate co-creation of economically valuable knowledge and ideas through creative interaction within and between organisations and people.

27. As such, the strategic framework is focused on:

Developing individuals
- Developing, attracting and retaining skilled and talented people

Scientific Research
- Maintaining and growing capacity for world-class research

Economic and Business Demand
- Stimulating the co-creation and exploitation of knowledge for economic benefit
- Closing the R&D funding gap between the public and private sector, and building product development capacity

International
- Promoting the image of Scotland as a vibrant centre of scientific excellence, enterprise and endeavour - a great place to live and work

Connections in Scotland and in Government
- Working together, more effectively to achieve our shared goals.

Developing Individuals

28. The Government Economic Strategy states that "*our people are our greatest economic asset. A skilled and educated workforce is essential to building our comparative advantage and to the delivery of sustainable growth. Investment by all individuals and by the state in early years, school, further and higher education has a proven impact on the employability and productivity of individuals and, in turn, business growth*."

29. *Skills for Scotland* encouraged better utilisation of skills: **"***Through all levels of post-compulsory learning from the development of foundation-level skills to PhD study, learning to apply skills is as important as learning skills.*"

30. Government will promote the development of the science and engineering workforce of the future in ways which are adaptable and responsive to the aspirations of our young people and the changing needs of the science base and, in particular, business. Government will foster a workforce that uses and applies their science skills in the workplace. That is, of course, wholly consistent with the established wider goal of education in Scotland, which is to produce successful learners, confident individuals, effective contributors to society and responsible citizens.

31. Government will:

- **Encourage more young people to prepare for and pursue science careers**
  Uptake levels of science, engineering and technology courses in schools, colleges and universities vary by discipline and over time, contributing to periodic skills and staffing shortages in business sectors and in academia. Given that the projected growth of SET-based jobs exceeded all other

categories (prior to the economic downturn) we will actively promote a more positive and realistic image of modern science and the diversity and rewards of careers which are science-based. A 3-year *Do something creative. Do science* marketing campaign will be launched in 2009 to begin changing perceptions of science courses and careers. In parallel Skills Development Scotland will develop their successful "The Path is Green" model to launch a new, integrated and more relevant careers programme, "The Path is SET", which will provide improved advice and guidance in schools and colleges across Scotland. This will promote science subjects and give students, parents and teachers a much more informed capacity to make decisions about course choices and career paths.

- **Continue to work with all stakeholders to make science in schools and colleges challenging, relevant, interesting and exciting**
  Recent consultation on science and technology elements of Curriculum for Excellence (CfE) highlighted the capacity and commitment of groups of scientists and employers, and bodies such as the Royal Society of Edinburgh and the Scottish Science Advisory Council, to assist this process. As such, this goal will largely be delivered through the ongoing development and implementation of the detail CfE, and the related reform of science qualifications. The introduction of the Science Baccalaureate will support our brightest scientific talent in schools, and we will work with businesses and with Knowledge Transfer Partnerships to provide project opportunities which connect science and business innovation.

  Support for teaching and learning in schools will continue through (already) increased investment in continuous professional development of teachers in primary and secondary schools, support around identification and awareness of best practice by Learning and Teaching Scotland and HMIE, and collaboration and input from scientists in the network of Science Centres, colleges, universities, research institutes and business.

  Links between education institutions and employers will continue to be supported through Determined to Succeed and work with COSLA and Local Authorities to reform Excellence in Education through Business Links (EEBL), as part of CfE capacity-building.

  The Office of the Chief Scientific Adviser (OCSA) will continue to support the expansion of the Science Ambassador network which assists and matches schools, businesses and scientists through light-touch co-ordination arrangements. OCSA will also work with HMIE to develop a new self-assessment tool, to help benchmark the quality and relevance of the way in which scientists in colleges, universities, research institutes and business support the delivery of the new science curriculum in schools. This will help anyone taking science shows and experiences into schools to quality assure their work and improve the capacity of local authorities and teachers to make informed choices between a range of external offerings.

- **Work with colleges and universities to better match science course provision to demand**
  Scotland's colleges and universities are autonomous bodies. Apart from a small set of centrally funded and managed vocational courses, and some high-level conditions associated with Scottish Government funding distributed by the Scottish Funding Council, they make their own decisions about the range of courses they offer and the number of students on each course. Anecdotal evidence suggests that individual institutions already experience periodic mismatches between demand and supply. In the context of developing the science and engineering workforce of the future, in ways which are adaptable and responsive to the aspirations of our young people and the changing needs of the science base and business, such systemic barriers need to be addressed through appropriately flexible response mechanisms.

  Government will ask the Scottish Funding Council to work with colleges and universities to consider funding arrangements - within the overall resources available in any year – and how to optimise the capacity of colleges and universities to respond to future demand for science courses.

  Government will also encourage the Sector Skills Council for Science, Engineering and Manufacturing Technology (SEMTA) to progress plans for a science skills forum which brings all relevant stakeholders together to improve collaboration and responsiveness to changing cross-sectoral skills requirements.

32. The Scottish Government will also consider targeted and sustained growth in postgraduate number as one of the principles for future funding of Universities as proposed by New Horizons. The Scottish Government has already increased the numbers of its prestigious Royal Society of Edinburgh Research Fellowships to six a year, extending their total duration from 3 to 5 years.

Scientific Research

33. GES highlighted the importance of scientific research and the particular challenge for Scotland:

- "*increasing the level of research and development activity and knowledge transfer…..are key drivers of innovative activity, particularly in science and technology related sectors, helping to boost productivity and sustainable growth*"
- *While the rate of expenditure on R&D in Higher Education is in the top quartile of OECD economies and government R&D spend is above the average EU 25 and OECD rates, business expenditure on R&D in Scotland is less than half the UK rate.*

34. This section is focused largely on basic and applied research undertaken in universities and research institutions. The challenge of improving business R&D investment is covered under "Economic and Business Demand" below.

35. Both GES and *New Horizons* recognise that there is a compelling case for continued Scottish Government investment in basic research infrastructure in order

to sustain and enhance the excellence of Scotland's science research base - which of course extends beyond the University sector, to the NHS and Research Institutes. That investment attracts significant gearing in terms of project funding from the UK Research Councils, Research Charities and business. That excellence provides international profile and collaboration, attracts a significant proportion of inward investment and provides the potential for participation in future as yet unknown markets and industries. Many countries across the globe are investing heavily to develop the science research base which exists already in Scotland.

36. The most significant element of Science for Scotland for scientific research is to confirm that the **Scottish Government will continue to support science infrastructure which underpins existing and emerging world-class research** in order to sustain and enhance our international standing and competitiveness. This was previously signalled in the *New Horizons* report which:

- noted the general principle that "*the integrity of the dual support model…. should be maintained*" and that advice on the "*investment in learning and teaching, research and knowledge exchange activities" required to "maintain broad overall comparability with the rest of the UK*" would be offered through the new Tripartite Advisory Group
- Set out firm plans to refocus the Scottish Funding Council and arrangements for the funding of university science and research in order to better support the Government's Purpose and outcomes in excellence and relevance while sustaining the flexibility of the sector to adapt and to address emerging scientific challenges.

37. In addition, the Scottish Government will take forward a range of complementary actions designed to deliver an evolving, flourishing and internationally competitive science research base in Scotland. Government will:

- **Provide an integrated agenda linking strategic research through to science application in government-funded rural, environmental and marine scientific work**.
  Scottish Government's direct funding for R&D is dominated by rural, environment, marine programmes. A new strategy informed by policy priorities and setting the direction of future funding will be developed in 2009 to further improve alignment with the Purpose and the strategic framework.

  In addition Government will work with environmental and rural research organisations, notably the Macaulay and Scottish Crop Research Institutes, to encourage them to come together in a new Institute. The Moredun Research Institute, Fisheries Research Services, and the Scottish Agricultural College will also be involved to take the opportunity of developing better integration of research in support of the Government's rural, marine and environmental policies. More generally, Government will continue to develop the funding and organisational structures which enhance collaboration between all those public bodies in receipt of core, programme, grant-in-aid or infrastructural funding from Scottish Government for research, knowledge exchange and innovation.

- **Promote growth in medical and related research**
  A new strategy informed by policy priorities and setting the direction of future funding will be developed in 2009 to further improve alignment with the Purpose and the strategic framework.

  A Scotland-wide network of academic medical centres will also be established. This collaboration will help the NHS and medical research community in Scotland to operate as a large integrated research body, sustaining and growing the volume and economic value of research funding attracted to Scotland from UK bodies and international pharmaceutical companies.

  Commercial organisations planning to conduct pan-Scotland trials currently seek approvals from all Health Board separately, with duplication of negotiations about costs and contracts. Establishing a single Scotland–wide NHS R&D approval system will significantly reduce bureaucracy, negotiation and trial start-up times.

  Also, NHS Scotland has a wealth of data in its records which is suitable for research. Improved access and utilisation will both allow proper feasibility exercises for studies to be conducted to better plan trials, and allow long term electronic follow up of trials at minimal cost. This will improve the business environment.

- **Build on the success of research pooling to promote inter-disciplinarity**
  A distinctive feature of Scottish research in the past four years has been large scale collaborations or 'research pooling'. Pools have been created in Physics, Chemistry, Geoscience, Economics, Engineering, Biological Science and Brain Imaging with total SFC investment exceeding £100 million and total investment by all partners exceeding £300 million. The pools help attract and retain world class researchers, and the very positive impact on the quality of scientific research in Scotland is expected to be confirmed by the results of the 2008 Research Assessment Exercise. Recognising that inter-disciplinarity in research, is increasingly expected to be the optimum source of disruptive science-driven innovation, Government will ask the Funding Council to work with universities to further develop the pooling model with available resources, promoting collaborative working across pools and also with business to improve knowledge exchange.

- **Enhance links with the UK Government, Research Councils and the EU**
  The dual support system requires substantial Scottish Government investment in university infrastructure but brings benefits in the form a share of UK research grants which is greater than our population share and capable of further growth. Given the competitive nature of UK Research Council funding it is clear that the UK as a whole benefits from the strength of the science base in Scotland. Maintaining and enhancing that position is in all our interests. There are already many strong links between the science communities in Scotland and the rest of the UK. The Scottish Government will promote and enhance opportunities for Scotland to influence a shared

agenda for science and research, promoting and building productive links at every level.

The Funding Councils across the UK are working together develop new arrangements for the assessment of research. The Scottish Government will contribute as required, and consistent with the Purpose, promote systems which improve capacity to align research quality and increased sustainable economic growth.

In terms of the EU, there is great merit in contributing to the development of the EU's proposals for the creation of a European Research Area and promoting Scottish interests and priorities in European mechanisms for cross-border projects and infrastructures, such as the 8th Research Framework Programme and the European Institute of Innovation and Technology.

Economic and Business Demand

38. *Skills for Scotland* noted that "*simply adding more skills to the workforce will not secure the full benefit for our economy unless employers and individuals maximise the benefits that they can derive from these skills…. We need to move beyond a focus on meeting the current demand for skills and tackle the issues which underlie and drive demand. We need the skills to facilitate sustainable economic growth but we also need our firms to be ambitious and demanding users of skills*."

39. The same is true of science. Earlier sections address important challenges essentially through progression based on Scotland's recognised strengths, the quality of our people, education and scientific research. This section sets out how we will - over time – promote radical change in cultures and performance to overcome relative weakness, increasing business research and development, and business demand for and utilisation of the science base in ways which support economic growth. This is a key challenge for Scotland.

40. The Innovation Framework and the new delivery focus of SE and HIE will deliver a new approach to boosting innovation performance in Scotland – moving beyond science and technology to impact on areas such as services and business model innovation. It will address the key issue of how - over time - to work with businesses in Scotland to help them increase their absorptive capacity. In part that will involve developing management, marketing and product development (the D in R&D) skills and capacity in Scotland.

41. In that context, focusing on increasing business research and development – may appear counter-intuitive. However, "The Sources of Economic Growth in the OECD Countries" confirms that business R&D is the optimum driver of economic output, compared with government or higher education research. "The future of Science and Technology in Europe - setting the Lisbon agenda on track" describes the policies and progress of countries including Sweden, Denmark, Ireland, Switzerland, and Norway towards the EU goal of increasing research expenditure to 3% of GDP, and records limited progress largely due to the fact that business research and development expenditure depends on the structure of industry, which

evolves slowly. In Scotland, small companies are in the majority and most business research and development is undertaken by larger companies owned elsewhere.

42. Government will increase the flow of overseas investment into Scotland's scientific R&D base by: bringing a sharp economic growth focus to the promotion of Scotland abroad; and in particular **Scottish Development International will target and grow inward investment which links the requirements of international business with the research excellence of Scotland's academic researchers as identified by RAE 2008**.

43. Government will also, as set out in GES "*expand Scotland's areas of international comparative advantage by building critical mass of activity in established businesses in Scotland in key sectors*" which are: the creative industries, energy, financial and business services, food and drink, life sciences, tourism, education and healthcare, the university sector and the technologies that contribute to the development of these key sectors. The extent to which science engineering and technology can immediately underpin higher levels of research and product development will vary across the key industrial sectors. Therefore, a sectorally focused, business-led approach is necessary to identify and deliver those strategically important projects which have real business benefits and, as a key deliverable, the capacity to contribute to higher and sustainable economic growth. As such, a key element of Science for Scotland is to signal that:

- **Government will in future prioritise <u>both</u> research excellence <u>and</u> strategic knowledge exchange involving demanding businesses given the need for both to secure sustainable economic growth**; and
- **support for knowledge exchange will grow faster in order to support industry-led strategic projects which will help key business sectors deliver increased and sustainable economic growth.**

44. This strategic approach will:

- direct increasing support to key business sectors, allowing them to articulate and take forward strategic projects focused primarily on sustainable economic growth as an outcome, negotiating support from Government agencies
- foster sustained growth in business demand for and utilisation of:-
  - knowledge exchange (and also skills utilisation)
  - business research and product development
- progressively adjust the balance of current incentives in academia, promoting further growth in academic participation in knowledge exchange with business in Scotland
- require increased collaboration across agencies of Government, consistent with the ongoing evolution of SE, HIE, SDS and SFC and including closer engagement with SE's industry advisory boards to improve alignment with business need.

45. This is not about creating a new consolidated funding stream combining SFC, SE and HIE budgets. It is about those bodies collaborating much more closely in order to respond more proactively to business-led opportunities which support key sectors and deliver sustained economic growth. Such arrangements should be as responsive and as light touch as is possible, varying with the specifics of sectors and

proposals. For example, collaboration with large companies may secure government support only with matched funding, whereas it may not be reasonable to impose a similar condition where a number of small businesses in Scotland initiate a new collaboration.

46. In addition, the Scottish Government will take forward a range of complementary actions designed to encourage sustained improvement in knowledge exchange which supports sustainable economic growth. Government will:

- **Work with Universities Scotland and business , through SFC, SE and HIE, to enhance the way intellectual property from public sector research is managed in order to optimise economic benefits for Scotland**
  Government, the Funding Council and Scottish Enterprise have welcomed an outline proposal from Universities Scotland to: create a single forum for all available IP from Scottish Universities, improving visibility, access and scope for added-value through bundling; open up the assessment and valuation process by involving individuals and organisations in Scotland with wider relevant experience of markets and business; and build on that wider involvement and access to entrepreneurial expertise to help grow companies of scale in Scotland. A substantive proposal will be considered early in 2009.

- **Encourage research collaborations between business and academia that focus on growing businesses in Scotland**
  Scottish Enterprise and Highlands and Islands Enterprise will assist businesses to identify research collaboration opportunities where businesses can share knowledge, costs, risks and benefits of their R&D and innovation activities, for example through participation in European R&D programmes.

  European funding schemes promote collaboration and growth in business research and development by paying up to 50% of the costs of participating in joint research projects. This represents a supported route for Scottish businesses keen to undertake research and development perhaps for the first time. Scottish Government provides funding for administration cost through the Scottish Proposal Assistance Fund (SPAF) scheme, but Scottish business participation remains low. As such, Government will ask SE and HIE to integrate actions to deliver an increase in SPAF uptake and participation in EU research programmes with their mainstream work to engage with companies and promote innovation and economic growth.

- **Ensure Scotland is well positioned to take advantage of emerging science-based market opportunities**
  Scottish Enterprise and Highlands and Islands Enterprise will work with the Funding Council and use industry and university expertise to identify emerging market opportunities where Scotland has both the research capacity and commercial potential to exploit scientific advances.

- **Influence the creation of the most appropriate fiscal and taxation regime to stimulate innovation and R&D**
  International evidence confirms that in the right circumstances business taxation arrangements can incentivise research and product development in companies and support an increase in sustainable economic growth.

International

47. The International Framework recognised that "*Scotland's educational policies and institutions have an international footprint .. our worldwide reputation for educational excellence .. is a magnet for further and higher education students, and a strong factor in influencing potential migrants with school-age children to come here….Scottish research ,,,attracts investment from around the world, stimulating our economy. Promotion of Scotland's institutions and their innovative capabilities should therefore be a key facet of our overall brand promotion strategy abroad"*. Significantly it adopts a "*sharp economic growth focus to the promotion of Scotland abroad - so that the Scottish GDP growth rate matches the UK's by 2011*"

48. The key to science supporting our international profile and inward investment growth is to sustain the science base and the current prioritisation of research excellence. Research excellence acts as a magnet for inward investment. That is the basis of the earlier confirmation that Scottish Development International will target and grow inward investment which links international business with the research excellence of Scotland's academic researchers as identified by RAE 2008.

49. In addition, the Scottish Government will work with partners to:

- **Build on the international profile and wider benefits of the Saltire Prize**
  With the support of SDI, the Saltire Prize will encourage new international partnerships/collaborations between academia and industry to bring ground breaking new marine renewable technology to Scotland. The Prize will also be used as a platform to promote information exchange on international renewables technology development, including and beyond marine renewables, and seek to leverage this to Scotland's advantage.

- **Develop the International Lifelong Learning Strategy further**
  Funding of £500,000 a year over three years will promote collaborative working to: enhance Scotland's profile in key international markets; increase college and university engagement in international education; support post-graduate employment of international students; improve the quality of the international student experience; and increase opportunities for students and academics to gain overseas experience.

- **Strengthen Scotland's international reputation for science.**
  The Government's National Performance Framework includes an indicator to improve perceptions of Scotland's reputation. The main tool for measuring that is the Anholt Nation Brand Index. Science with be an integral part of wider activity to improve Scotland's standing in the Anholt Nation Brand Index and also in the international science and business communities (where there

is an established recognition of the quality ad impact of Scotland's world-class science).

For example, Government will explore opportunities to enhance the international profile of existing scholarship initiatives through consolidation and common marketing. This will also help attract and retain international science talent to Scotland.

SDI and the Office of the Chief Scientific Adviser will work together, with Global Scots, The Royal Society of Edinburgh and others, to develop core messages and utilisation by individuals representing Scotland anywhere in the world to capitalise on opportunities to enhance marketing of Scotland's science reputation. Government will also encourage greater partnership within the science base in Scotland to enable a stronger contribution to development and poverty reduction.

Government and its agencies will consider opportunities for international partnership and co-funding of research in key areas of research such as health, climate change and sustainable energy. We will also encourage greater partnership within the science base in Scotland to enable a stronger contribution to development and poverty reduction.

- **Promote increased science interchange with the EU**
  The EU's influence on science and research is expected to grow over time as the European Research Area and Council become established. Greater direct interaction with the EU is a priority for this Government's approach to its international activities. Science in Scotland will benefit by raising our profile in the EU and ensuring that more scientists in Scotland have relevant experience and are better able to influence policy. Government will encourage scientists to participate in existing *stagiaire* secondment opportunities in the EU.

  Government will also encourage Scottish universities, research institutes, companies and other organisations to make full use of EU opportunities for collaborative working and exchanges of best practice.

Connections in Scotland and in Government

50. **Government will increase activity, including themed conferences and smaller events, to promote improved connectivity in Scotland**. This will help disparate parts of the science base - in business and in academia - to come together to discuss progress and prospects focused on Scotland's needs, and to promote collaboration and linkages between these areas.

51. GES signalled the importance of building "on the new more focused structure of the Scottish Government by reducing duplication, bureaucracy and overlap across the public sector in pursuit of greater efficiency, effectiveness and speed of delivery". To build on earlier actions and improve arrangements for science in government, Government will:

- **initiate a cross-cutting review of Scottish Government science and research expenditure to inform the next Spending Review**

- **improve collaboration and identification of strategic opportunities for key science industry sectors to lead global markets**
  Government will review and redefine the role and membership of an existing inter-agency group in order to support proactive and improved joint assessment of strategic investment options. This will be a key factor in facilitating the improved collaboration between SFC, HIE, SE, SDS and the Office of the Chief Scientific Adviser to deliver substantive improvement in support for strategic support for knowledge exchange. The group will work very closely with business representatives on SE's industry advisory boards and others to integrate knowledge and foresight vested in a range of Scottish bodies and advise Ministers on emerging strategic opportunities to lead global markets through the capacity of the science and business base in Scotland.

- **Continue to develop effective funding and organisational structures**
  Recent public sector reform focused on efficiency, effectiveness, customer-focus and system alignment with the Purpose. Government will continue to look for opportunities to develop the funding and organisational structures which enhance collaboration between all those public bodies in receipt of funding for research, knowledge exchange and innovation,.

Implementation, Monitoring and Challenge

52. The Government Economic Strategy stated that:

"implementation …. will be driven across the public sector and supported by the new arrangements within the Scottish Government to provide a clear focus on the delivery of the Purpose. Financial and other resources will be aligned to ensure that policy development and spending programmes are sharply focused on the delivery of the Purpose"

"The Strategy will be used to:

- *direct the activities of key bodies such as Scottish Enterprise, Highlands and Islands Enterprise, Visit Scotland, Transport Scotland, Scottish Funding Council, Skills Development Scotland Ltd [47] and Scottish Water;*
- *direct the development of the outcome agreement approach with local authorities that will enable local government to contribute effectively to the country's sustainable economic growth; and*
- *direct our discussions with the UK Government and the EU in areas which will influence the achievement of sustainable economic growth in Scotland."*

"The Strategy must evolve as economic conditions and the responsibilities of the Scottish Government change. This evolution will be heavily influenced by the reviewing of progress from outside of government and by the development of evidence which is brought to bear. To secure this external review we:

- *have established the Council of Economic Advisers, which has been highly influential in shaping this Strategy, to advise on how best to achieve increasing sustainable economic growth; and*
- *are in the process of establishing the National Economic Forum, which will involve key players from across Scotland in building consensus around the collective contributions to achieving increasing sustainable growth.*

These bodies will hold the Government to account through assessing achievement of the measurable economic targets set out in this Strategy."

53. The Scotland Performs website follows the National Performance Framework and provides the latest information on how Scotland is performing relative to the Purpose and its associated targets, five Strategic Objectives, 15 National Outcomes and 45 National Indicators. The National Performance Framework includes objectives, outcomes and indicators and targets which relate directly to science and developing individuals, research, economic and business demand and knowledge transfer, and international profile.

54. Consistent with that approach, detailed implementation of Science *for Scotland* will be driven forward and monitored through:

- The National Performance Framework, and Scottish Government's corporate and business and delivery planning arrangements
- The corporate and delivery planning and reporting arrangements in place in respect of key bodies such as Scottish Enterprise, Highlands and Islands Enterprise, the Scottish Funding Council, NHS Scotland, Skills Development Scotland and Rural, Environmental and Marine Delivery partners.

55. Each individual body must determine whether and ensure their detailed performance metrics - relating to for example the scale, impact and outcomes of improved knowledge exchange – remain fit for purpose over time in terms of accountability and delivery.

56. Scottish Government will invite regular feedback from the Chief Scientific Adviser and the Scottish Science Advisory Council given their established role to provide external critical challenge and support in relation to science policy.

Annex 1 – What our partners need to do

The vision set out earlier is of a nation of world-class scientific achievement, a magnet for talent and for science investment, a powerhouse of technology innovation and enterprise, delivering increasing sustainable economic growth. To make that vision a reality, Government needs to work in partnership with all of the individuals and organisations that make up the science base in Scotland, both in the public and the private sectors. This includes our leading science-based companies and small and medium-sized businesses, the financial investment sector, our universities, colleges and our local authorities and schools, the NHS and research institutes and charities.

This Annex lists a number of shared challenges which build on those set out in *Skills for Scotland*. It is not exhaustive or prescriptive, but it is call to action which is designed to trigger a response.

Local Authorities and schools should.

- Take forward robust implementation of science elements of Curriculum for Excellence in primary and secondary schools, and work with colleges and universities to produce and sustain effective, articulated learning pathways for learners.
- Engage with science CPD programmes and Determined to Succeed links to the world of work
- Use *Do something creative, do science* and *The Path is SET* material to encourage young people to study science

Colleges should:

- Support implementation of the science elements of Curriculum for Excellence and the new Scottish Science Baccalaureate.
- Enhance the match of skills, competencies and qualifications to the needs of science industries through flexible learning opportunities, tailored courses, vocational qualifications, and a wide range of task orientated competency based learning.
- Increase their capacity further to work collaboratively with businesses to develop science skills and knowledge programmes which enhance personal effectiveness, technical ability, productivity and support sustainable business growth.
- Work with Universities to meet the needs of learners and employers through comprehensive integrated provision, science research and knowledge transfer, while promoting skills utilisation.
- Work collaboratively with universities to enable a stronger contribution to international development and poverty reduction through harnessing an enriched combined capacity making possible increased ‘research into results’ and the securing of external funding from Scottish business, UK and international sources.
- Enhance the range of work-based vocational learning, assessment and accreditation opportunities, working in partnership with employers and Skills Development Scotland.
- Promote increasing participation in science, engineering and technology.

Universities should:

- Support implementation of the Science Baccalaureate and science elements of Curriculum for Excellence in primary and secondary schools, and work with schools and colleges to produce and sustain effective, articulated learning pathways for learners.
- Aim to better match science course provision to student and employer or sector demands and work with the Scottish Funding Council to address systemic barriers
- Work collaboratively with local businesses to respond to their needs and develop their capacity to use science, research and product development to deliver innovation and sustainable growth
- Grow the volume and economic value of research funding they secure from UK, EU and international bodies and business
- Work towards the New Horizons shared ambition for the university sector
- Work together and with HIE, SE and SFC to develop proposals for enhancing the way available IP is managed to optimise economic benefits for Scotland
- work collaboratively with colleges to enable a stronger contribution to international development and poverty reduction through harnessing an enriched combined capacity making possible increased 'research into results' and the securing of external funding from Scottish business, UK and international sources.
- Encourage scientists to participate in EU secondment programmes

The Royal Society of Edinburgh should:

- Progress its plans to establish a business-led Forum to explore ways in which business demand for the exchange of scientific knowledge and its investment in R& D can be stimulated;
- Create an Education Committee to draw on the Society's fellowship and its partners to contribute authoritatively to the development of the science component of the Curriculum for Excellence, the Scottish Science Baccalaureate and the new qualifications framework
- Plan, with partners and the Scottish Government, a seminar designed to highlight the opportunities for the development of science provided by Curriculum for Excellence; and for opportunities for partnership with schools.

Scottish Qualifications Authority should:

- Ensure through a process of review that the content and assessment arrangements for science qualifications are both up-to-date and relevant.
- Take opportunities offered by the development and promotion of Scottish Science Baccalaureates to encourage greater uptake of science in the later stages of secondary and enhance both links and transition between school, college, university and employment.

The Scottish Funding Council should:

- Support research infrastructure which underpins existing and emerging world class science
- Prioritise both research excellence and strategic knowledge exchange

- Increase support for knowledge exchange in order to support - with SE and HIE - industry-led strategic projects which will help key business sectors deliver increased and sustainable economic growth.
- Work with colleges, universities and others to better match science course provision to student and business demand
- Work with universities to develop the research pooling model within available resources, by promoting inter-disciplinarity, knowledge exchange and the international profile of science in Scotland
- Support the development of research assessment arrangements which better recognise excellence in basic and applied research
- Work with Universities Scotland HIE and SE to develop the sector's proposals for enhancing the way available IP is managed to optimise economic benefits for Scotland
- Work with colleges and universities to develop an enriched combined capacity for 'research into results' aimed at international development and poverty reduction and facilitate external resourcing from Scottish business, UK and international sources.
- Support Curriculum for Excellence and the delivery of National Outcomes

Scottish Development International should:

- Target and grow inward investment which links the requirements of international businesses with the research excellence of Scotland's science base.
- Work with the Office of the Chief Scientific Adviser and others to enhance the international marketing of science in Scotland and mobilise Global Scots and scientists to exploit their capacity to promote Scotland when travelling and working internationally.

Scottish Enterprise and Highlands and Island Enterprise should:

- Encourage the commercial exploitation of scientific and technological breakthroughs that contribute to business growth in Scotland.
- Direct increasing support to key business sectors, using business demand to define strategic projects focused primarily on sustainable economic growth for Scotland. (Many of Scotland's key business sectors are dependent on science based innovation for their growth opportunities).
- Assist science based businesses to achieve accelerated growth by facilitating their access to investment and/or international calibre business management.
- Directly assist businesses with growth potential in Scotland to identify, and to implement, science based business innovation.
- Nurture opportunities for co-creation of new scientific knowledge, which is of value to businesses in Scotland, by stimulating new demand led business-academia collaborations.
- Work with key industries to identify emergent market opportunities where Scotland has world leading research capability and the potential to become a world player in its exploitation, and to work collaboratively with the business sector and agencies of Government to align public investment with these market opportunities.
- Work collaboratively with Government and its agencies to assist in balancing the priorities for research excellence and strategic knowledge exchange, recognising that the latter is critical in realising exploitation in Scotland.

- Work collaboratively with Government and its agencies to ensure that science and technology students are encouraged to develop entrepreneurial, business leadership and marketing skills.
- Work with Government to influence the creation of the most appropriate fiscal, regulatory and taxation regime to stimulate business investment in R&D and innovation.
- Work with Universities Scotland and SFC to develop the sector's proposals for enhancing the way IP is managed to help grow successful businesses and optimise the economic benefits for Scotland.

Skills Development Scotland should:
- Support improved science skills utilisation, workplace innovation and business demand for science as part of skills, training and development skills.
- Support and build on the *Do something creative, do science* marketing campaign by developing and sustaining as new, national "The path is SET" careers programme
- Work with businesses and learning and training providers to foster improved management, marketing and product development (the D in R&D) skills and capacity in Scotland.
- Work jointly with SE and HIE to gain better business intelligence on what businesses require in terms of science for shaping skills and training interventions.

SEMTA should:
- Establish a science skills forum to engage stakeholders and delivery partners and to improve collaboration and responsiveness to changing cross-sectoral skills requirements
- Develop an MA in Life Sciences to help support the growing need for technicians to support industry and monitor stimulation provision in other science areas.

Businesses in Scotland can and should:
- Deliver profitable business growth using science as a source of product and process innovation to build competitive advantage in existing and emergent markets.
- Articulate the science and innovation challenges which key business sectors face in delivering to upcoming customer and market needs - thereby setting key challenges to which the science base can be asked to respond.
- Be more ambitious and demanding consumers of Scotland's capabilities in science and research.
- Work with Scottish Enterprise, Highlands and Islands Enterprise, industry advisory boards, colleges, universities and others to build capacity to use science and innovation to deliver economic growth across Scotland's key business sectors.
- Engage in business-with-business and business-academia research collaborations, as appropriate, recognising that collaborative approaches can deliver increased benefits through sharing of knowledge, resources, costs and risks in delivery of the strategic research that underpins future product and process innovation.

- Develop and enhance the management, marketing and product development (emphasising the D in R&D) skills and capacity within Scotland's businesses.
- Support science education in schools by helping to develop Curriculum for Excellence, supporting teacher CPD or joining the Science Ambassador programme.
- Work with universities and colleges to ensure that Scotland's student population is aware of (and is inspired by) the challenges, opportunities and rewards of a career within a science based key industry.

Annex 2 - Strategic Connections

This Annex provides a high level assessment of the expected relevance of policy actions set out in the main body of the strategic framework to the Government's strategic objectives and the 7 themes from the 2006 consultation document which underpinned development.

As indicated earlier, a linked but separate Innovation Framework is proposed.

In parallel with Science for Scotland, the Office of the Chief Scientific Advisor will take forward substantive policy development and implementation relating to science and society and science in government.

Policy Actions		Strategic Objectives					2006 Consultation Themes						
		Wealthier & Fairer	Smarter	Healthier	Safer & Stronger	Greener	Science Base	International	Knowledge Exchange	Innovation	Science education	Science & society	Science in Government
Developing Individuals													
Encourage more young people to follow science careers	*Do something creative, do science*	4	4			4	4				4	4	
	The Path is SET careers advice	4	4	4		4	4		4		4	4	
Make science in schools and colleges challenging, relevant, interesting and exciting	Curriculum for Excellence implementation	4	4	4	4	4	4		4	4	4	4	
	Science Baccalaureate (including Knowledge Transfer Partnership projects)	4	4				4		4		4	4	
	Qualifications reform	4	4				4				4	4	
	Science Teachers CPD & industry links	4	4				4		4		4	4	
	Science Ambassador co-ordination		4				4				4	4	
	OCSA/HMIE quality-assessment tool		4				4				4	4	
Work with colleges & universities to match course provision to demand		4	4				4	4	4		4		
Encourage science skills forum		4	4				4		4	4			
New Horizons and implementation		4	4				4	4	4		4	4	

Policy Actions		Strategic Objectives					2006 Consultation Themes						
		Wealthier & Fairer	Smarter	Healthier	Safer & Stronger	Greener	Science Base	International	Knowledge Exchange	Innovation	Science education	Science & society	Science in Government
Scientific Research													
Support world class research in universities	New Horizons and implementation	4	4	4	4	4	4	4	4	4	4	4	4
	Maintain dual support	4	4	4		4	4	4	4				
Rural, environmental and marine	Publish funding strategy	4	4			4	4	4					4
	Support new research institute formation	4	4			4	4	4	4				4
Medical research	Publish funding strategy	4	4	4			4	4	4				4
	Network of academic medical centres and single R&D approval system	4	4	4			4	4	4				
Build on research pooling to promote inter-disciplinarity		4	4				4	4	4	4			
Enhance links with UK Government, research Councils and EU		4	4	4		4	4	4	4	4			4
Development of research assessment		4	4	4		4	4	4	4				
Economic & Business Demand													
SDI grow FDI linked to RAE 2008 research excellence		4	4				4	4	4	4			
Prioritise research excellence and knowledge exchange		4	4	4		4	4	4	4	4			
Progressive increase over time in KE funding focused on industry-led strategic projects		4	4				4	4	4	4			
Optimise economic utilisation of public sector research IPR		4	4				4	4	4	4			
Encourage business research collaboration		4	4					4	4	4			
Position Scotland to take advantage of science-based market opportunities		4	4				4	4	4	4			
Influence improved tax regime to promote R&D		4	4				4	4	4	4			
International													
Build on international profile of the Saltire Prize		4	4			4	4	4	4	4			
Develop the International Lifelong Learning Strategy		4	4				4	4			4		
Enhance international profile of existing scholarship initiatives			4				4	4			4		

Develop core messages and utilisation to market science better	4	4				4	4					
Promote increased science interchange with the EU		4				4	4					

Policy Actions	Strategic Objectives					2006 Consultation Themes						
	Wealthier & Fairer	Smarter	Healthier	Safer & Stronger	Greener	Science Base	International	Knowledge Exchange	Innovation	Science education	Science & society	Science in Government
Connections in Scotland and in Government												
Increase activity to improve connectivity in Scotland	4	4	4	4	4	4		4		4	4	4
Cross-cutting review of science expenditure	4	4	4		4	4		4	4	4	4	4
Improve collaboration and identification of strategic global opportunities linking the capacity of the science and business base in Scotland	4	4				4	4	4				4
Continue to develop effective funding and organisational structures	4	4	4		4	4		4				4

Annex 3 - Statement on Equality

The production of this strategic framework for science in Scotland provided the opportunity to out our ambitions for science, in the context of lifelong learning, research and economic and business development. In keeping with voluntary and statutory commitments, Science for Scotland has the promotion of equality of opportunity and the elimination of discrimination at its core.

The strategic framework shows how all of the constituent parts of Scotland's education and learning, research, and economic development systems can contribute to science and to the nation's success through: developing knowledge exchange between academia and business; increasing the flow of overseas investment into Scotland's R&D base; and developing the science base. As well as aiming to promote equal access to and participation in science skills and learning for all, the Scottish Government will aim to recognise people's different needs, situations and goals and remove the barriers that limit what people can do and can be. We will expect our partner organisations to do the same.

In order to consider fully the equalities implications of each policy area on its relevant audience, the Scottish Government will ensure that each programme underpinning the strategic framework will be equality impact assessed across six strands (race, disability, gender, sexual orientation, age and religion/faith) and monitored thereafter to make sure that they are appropriate, to mitigate against any potential negative impact and to ensure that our policies are as robust and effective as they can be for as many people as possible.

The Scottish Government will engage actively with partners, stakeholders, target groups and individuals in order to evaluate the needs and experiences of the communities that they serve. This process will facilitate the development of constructive and informative links with a range of equality constituencies and improve knowledge and understanding of equality issues. Monitoring the impact of these policies will allow further developments which meet the specific needs of target audiences thus ensuring that each individual has the opportunity to reach their potential.

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