



## Voting for Science in Scotland - 2007

In advance of the 2007 election to the Scottish Parliament, CaSE asked the Party Leaders in Scotland three questions about their science policies:

### 1. Science education

Scientists in Scotland have reported to CaSE their concerns about the difficulty of recruiting science and mathematics teachers at secondary school level, and the effects this will have on the research base and the economy.

*How will your party ensure that children in Scotland continue to have access to qualified teachers in all of the core sciences?*

### 2. Science research

Scotland has an excellent track record of world-class research but competition from the rest of the world is becoming fiercer and the career structure for younger scientists remains precarious.

*What mechanisms will your party put in place to ensure that excellent researchers see Scottish universities and other research institutes as the first choice to base their work?*

### 3. Benefits of science to the economy

As a percentage of GDP, the private sector invests less in research and development than many other parts of Europe, including Denmark, Ireland, the South West of England, Belgium and France.

*What will your party do to ensure that science-based and engineering businesses find Scotland a more attractive place to do business?*

Responses from the Conservative, Labour, Liberal Democrat and Scottish Nationalist Parties:

## Conservative Leader Annabel Goldie MSP

### How will your party ensure that children in Scotland continue to have access to qualified teachers in all of the core sciences?

The Scottish Conservatives are committed to ensuring a sufficiency of teachers with the relevant specialist qualifications for the teaching of science. In the last education debate of this Parliament, we highlighted the risk of this becoming a major challenge and criticized other parties for not focusing on it enough.

Central to the Scottish Conservative education proposals is the introduction of a new Education Act. Under this, enhanced powers for head teachers will be complemented and counterbalanced by a strengthened statutory role for parents. The Act will

complete the picture by clearly defining and delimit the roles of the Executive and local authorities.

As you will know, last year, there were over seven and a half thousand fewer entries to science Highers than there were in 1997; in relative terms, the proportion of all highers that were in science subjects dropped by 15%. Encouraging pupils to do more science in the later years of school is essential. Making this a reality and ensuring that we have a strong base of excellently qualified science teachers are priorities that mutually reinforce on another. In the longer term, they will also be critical in our efforts to strengthen the university science base and to alleviate the difficulties which employers in the science sector often have in recruiting suitable graduates.

As part of their redefined roles under our Act, local authorities and head teachers will be required to get together, with the help of local further education institutions, and produce a strategy for teaching science and technology. A cohesive approach that has regard to not only to national but also local strengths, weaknesses and future projections is the best way forward.

**What mechanisms will your party put in place to ensure that excellent researchers see Scottish universities and other research institutes as the first place to base their work?**

We propose an independent commission to investigate the future funding of universities and colleges. A thorough, detailed review is needed, drawing on submissions from all concerned, including CaSE and other parts of the scientific community. We do not presume what changes - if any - would be required: that is why we want a review.

Our review will follow the precedent of the "Cubie Commission", which reported seven years ago. The challenge facing our universities has changed since then. In particular, the introduction of top-up fees will generate an estimated £1bn per year for universities in England. We must ensure that Scottish universities have sufficient funding to improve and maintain their teaching capacity and carry out the research which is essential to Scotland's economic and cultural well-being. We risk a "brain drain" of top academics and students otherwise. This would be a great betrayal of the rigour and inventiveness of our universities, not least in science, which had run like a golden thread through Scottish history since the Enlightenment.

**What will your party do to ensure that science-based and engineering businesses find Scotland a more attractive place to do business?**

My party have outlined a range of concrete proposals to reduce the overheads for companies seeking to do business in Scotland which will be of benefit to all firms, including those involved in science and engineering. Our policies include the abolition of business rates for the 116,000 smaller businesses, together with a tiered cut for 32,000 others. Businesses also require an improved transport infrastructure, and we will therefore invest an additional £30m a year to fast track key priorities such as the upgrading of roads like the A9, A75 and A96. We will also build a new Forth crossing. Further measures will include the simplification of public procurement so as to make it easier for companies to submit tenders and a raft of measures to reduce the amount of regulation on businesses.

## **Labour leader Jack McConnell MSP**

### **1. How Labour will ensure that children in Scotland continue to have access to qualified teachers in all of the core sciences:**

For centuries Scotland has led the world in scientific discoveries. Scottish Labour wants to build on this past and use our science base to compete in the global economy. We want to ensure that enough people study science to meet the future needs of Scotland and we are keen to promote the awareness, appreciation and understanding of science in children.

Scotland has an international reputation for the qualifications, performance and skill of its teachers. Under Scottish Labour, unprecedented investments have been made in teachers. We recognise that it is only through the highest quality teaching and leadership in our schools, that our ambitions for every pupil will be met. Scottish Labour will continue to invest in our schools' leaders and teachers to ensure that pupils have access to qualified teachers.

Scottish Labour intends to deliberately shift in the subjects that are taught from an early age – specifically introducing science to the youngest children and in primary schools, we will introduce specialist science teachers to work with the classroom teacher to. Through this measure, we will ensure that more primary pupils learn about science before they go to secondary school, catching youngsters while their minds are at their most inquisitive.

In addition, we will create six regional Science Centres of Excellence, specialist upper schools for local comprehensives, where young people from surrounding areas wishing to pursue an advanced level of science, will be entitled to attend. In secondary schools, we intend to work with universities, to open up their laboratories to secondary school students, in order to improve access to facilities and equipment, nurturing their awareness and interest in science.

And will ask Scottish scientists to sign up to a national science outreach programme, making them advocates and ambassadors, to inspire a whole new generation of young Scots in science.

### **2. What mechanisms will your party put in place to ensure that excellent researchers see Scottish Universities and other research institutes as the first choice to base their work?**

Scotland has a reputation for research excellence. Over 70 per cent of Scotland's higher education research was rated in the top three categories in the 2001 UK Research Assessment Exercise (RAE) and around half of our research was awarded 5 star ratings

Scotland also ranks first in terms of the number of citations per head of population and the number of academic papers published per \$million spent, in comparison to 11 of the world's major HE economies, including the USA. With just 0.1% of the world's population, we produce 1% of the world's published research

The international research and development environment is increasingly competitive. The last budget settlement for the HE sector in 2004 helped to facilitate an increase in the Scottish Funding Council's budget baseline for research (now nearly 40 per cent higher in real terms in 2007-8 compared to 2001-2). This goes a long way to make Scotland an attractive destination for top researchers.

In 2005 we asked the Scottish Funding Council (SFC), in partnership with Universities Scotland, the Scottish Science Advisory Committee, the Royal Society of Edinburgh and Scottish Enterprise, to commission a report into patterns of recruitment of researchers at Scottish universities. The report, the first of its kind undertaken, was published in October 2006 and looked at patterns of recruitment of researchers to Scotland's universities.

The report provides good baseline data and reveals that Scotland is highly attractive to researchers. More than 55 per cent of researchers are currently being recruited from outside Scotland, with around 40 per cent from the rest of the UK, 8 per cent from the EU and another 8 per cent from the rest of the world. Early indications are that the Scottish Funding Council's strategic investments in research pooling, together with initiatives such as the Royal Society of Edinburgh Research Fellowships, are having a positive effect and visible international impact.

This research provides a useful start in understanding the baseline position and there will be a need to continue to monitor the recruitment and retention of world class researchers to Scotland. The findings and recommendations of the report are being considered as part of SR2007 and the SFC's wider international engagement.

Research pooling aims to make Scotland a desirable destination for the world's best researchers. Since 2004, SFC have invested around £85m in pooling in physics, chemistry, engineering and mathematics, earth sciences, economics, life sciences, with further areas currently under consideration.

While it is too early to assess the success of SRDG, SFC has received overwhelmingly positive feedback from institutions on the caliber of appointments across the board under the SFC's research pooling initiatives, from the quality of applicants for prize studentships to the ability to recruit outstanding senior academics. There is also keen international interest in pooling as well as close scrutiny from the rest of the UK.

The benefits to Scotland in terms of reputation are increasing and, anecdotally, some successful applicants for posts in pooled research areas would not have considered coming to Scotland at all – not even to the larger institutions – were it not for the opportunity offered by pooling.

In late 2006, the Royal Society of Edinburgh Research Fellowships (RSE) Enderby review of the Personal and Support Research Fellowships sponsored by the Scottish Executive (three Personal and three Support at a total cost of £670k pa), confirmed the success of the Fellowships in retaining top academic research talent in Scotland.

Scottish Labour has a proven track record in ensuring that Scotland is an attractive place for scientists to live and work in. In a third term, we want to break down the myths of science and push the boundaries of science in stem cell research, ICT, genetic modification, renewable energy technologies and nuclear fusion. We will

attract and retain science students in post graduate research and development through increased incentives to stay. We will encourage investment in innovation and spin-off research from academia through a pipeline of support from Smart through proof of concept to the Scottish Venture fund. And we will continue to enhance Scotland's world-class reputation for science and engineering through the establishment of an Oil and Gas Academy in Aberdeen; a Scottish Institute for Life Sciences, based in Dundee; investing in Scotland's three Intermediate Technology Institutes; and supporting pre-competitive research in order to make it 'market-ready'.

### **3. What will your party do to ensure that science-based and engineering businesses find Scotland a more attractive place to do business?**

One of Scottish Development International's (SDI) objectives is to encourage inward investment into Scotland. It focuses on attracting high-skill, high-knowledge projects including those in the science and engineering sectors.

SDI provides a range of services including advice, access to specialist expertise, business mentoring and development, market information, financial assistance, business location information and investor aftercare.

SDI has developed a range of proposition documents for use in Scotland and abroad. These set out Scotland's strengths as a business location and cover - among other things - our industry strengths, our skilled and dedicated workforce, our world-class transport links, our encouraging government, the UK tax regime and the investment incentives available in Scotland, and our living environment. These proposition documents are regularly revised to make sure that they remain well targeted and compelling.

Once a company is established in Scotland, SDI continues to offer close support. Working with the Enterprise Networks, SDI executives work hard to ensure that the company continues to prosper and grow in Scotland.

The Intermediary Technology Institutes (ITIs) are good examples of Scotland leading the way in developing mechanisms which will encourage foremost global technology-based businesses to establish a base here. There have already been several examples of this including Stirling Medical, Cognia and Cellartis. The Scottish Centre for Regenerative Medicine will also act as focal point for commercial opportunities helping develop both indigenous businesses and attracting inward investment from global companies

The Executive has undertaken, and is currently implementing a comprehensive review of business support, specifically designed to provide greater clarity and reduced bureaucracy. This process has simplified the business support landscape and will further stimulate businesses to locate and grow in Scotland. For example, the new SMART: SCOTLAND brings together three existing schemes which support highly innovative research and development into one more straightforward programme offering an increased level of grants.

In a third term, we want to continue to create the right economic climate within which science and innovation can flourish. We are determined to up-skill Scotland, providing businesses with the talent they need to compete successfully. We are

committed to continuing to deliver economic stability, attracting investment and encouraging businesses to grow. And we believe that this investment in skills and hard-won economic stability would be put at risk if Scotland went down the route of independence.

## **Liberal Democrats leader Nicol Stephen MSP**

### **How will the Scottish Liberal Democrats ensure that children in Scotland continue to have access to qualified teachers in all of the core sciences?**

I want to make Scotland a science nation. That's why I want to increase the support for science in schools and build the links between further and higher education science departments and schools. We have to make science exciting, sparking a child's imagination with more practical science and increased investment in science facilities.

I want to see practical science lessons taking place in every primary school. And to encourage more young people to learn about science we will make entry to Scotland's science centres free for under 16s. For Scotland to compete internationally we must do more to support maths, science and engineering in schools.

I want 1,000 more teachers working in our schools, to cut class sizes and improve education.

It is also important that the best teachers are able to teach in those areas or subjects where there are shortages.

Whether it is a rural school struggling to find staff, a school that can't fill a long term vacancy in subjects like science, it is right to provide incentives for those individuals who step up to the challenge.

### **What mechanisms will your party put in place to ensure that excellent researchers see Scottish Universities and other research institutes as the first choice to base their work?**

We need to give the strongest possible support to Scotland's industries with world class potential. Our universities are a huge strength for Scotland, with an excellent reputation right around the globe. It is vital that we maintain high levels of investment in further and higher education.

That is why I am committed to continue the record investment in further and higher education to build on the last spending review which took investment to over £1.6 billion.

I want to see new investment in university buildings, making new funding available to improve facilities, and update and renew equipment. This funding should also be used to increase undergraduate and postgraduate places.

I want to see more done to retain and attract the best staff to Scotland with more discretionary funds for recruitment, greater use of research pooling among Scotland's universities, and a joint fund among government, universities and private benefactors for highly prestigious awards.

Scottish Liberal Democrats will support the call from Universities Scotland to increase investment in our universities by an extra £168 million by the end of the next term of the Scottish Parliament.

### **What will your party do to ensure that science-based and engineering businesses find Scotland a more attractive place to do business?**

My aim is a nation and an economy that every young person across the world will want to be part of; one that every enterprising person will look to first; and that gives those in Scotland the drive, ambition and dynamism to create world-class, world-beating ideas and turn them into a business reality.

I want to create a dynamic Scotland that benefits from sustainable economic growth. Scotland has companies of global scale that are expanding across the world. An example of that potential in Scotland is the science and technology industries, particularly energy.

Scotland can be the renewables powerhouse of Europe – I want 100% of Scotland's electricity coming from renewable energy by 2050, this not only makes sense on the environment but would give a huge market to an industry with the potential to generate massive investment and create thousands of jobs in Scotland.

We must also tackle Scotland's historically low investment in research, development and innovation. Industry in Scotland currently spends around £500 million a year on R&D – one half of the UK average and a miserable fifth of Sweden's. In Finland, R&D levels have risen steadily as a percentage of GDP for the past decade. We need to follow these examples by giving this issue a far higher profile.

In Scotland we are delivering among the best trained and educated young people. The challenge for business and government is to use this excellent resource and raise R&D levels here into the top OECD quartile within the next ten years.

I will set a new long term target for a threefold increase in business research and development in Scotland. And to make this ambition a reality and drive progress, I will establish an Investment and Innovation Agency in Scotland, bringing together current research and development, proof of concept, incubator, venture capital, and equity support from government. The Investment and Innovation Agency will follow best practice from around the world including the Finnish innovation agency TEKES.

## **SNP leader Alex Salmond MP**

Science and engineering can play a crucial part in creating a successful Scottish economy and meeting the challenge of climate change. The SNP wants to see a modern, sustainable economy based on knowledge, innovation and invention.

In schools, we will place greater emphasis on science and will introduce a Scottish Science Bacculaureate initially as a group award, recognising high attainment in a number of Highers and Advanced Highers.

Our universities compete on a global basis in research and development, and we need to provide more government support for them to continue to do so as a key driver in Scotland's economic and enterprise agenda. That is why we will allocate an additional £10 million to support cutting edge research in Scotland.

We will support the creation of a Scottish Life Sciences Institute. We believe such an Institute could play an important role in retaining and attracting the best scientists to Scotland and would act as a magnet for excellence in this important area of scientific research.

We will also deliver a series of measures to provide support for innovators seeking to take their product from concept to market place, including consulting on the introduction of Innovation Credits that would be available to support entrepreneurs from prototype to production.

The SNP is determined to maximise Scotland's renewable and low carbon energy capacity. We want Scotland to take the lead in offshore technologies. To help achieve this we will launch a Saltire prize to promote future innovation and technological endeavour. Our first £5 million prize will challenge Scottish and international scientists to design and develop the answers we need to take forward these vital technologies and deliver workable commercial scale generators around Scotland's shores. We will also give our full backing to cutting edge carbon capture and storage schemes so we can generate clean energy from hydrocarbon sources.

Improving energy efficiency is also central to our task of delivering a greener Scotland. We will institute a Scottish Energy Efficiency Design Awards to bring together our best designers, the construction and manufacturing industries so we can create the best energy efficiency solutions for Scotland. In total £1 million will be available in prize money and development incentives so we can turn our best energy saving ideas into workable energy efficient products.