

Voting for Science and Engineering in Scotland

All parties running for election should clearly articulate their intentions for science and engineering so that voters can make informed decisions about these critical areas for their future wellbeing and prosperity. This summary provides some core recommendations for all the parties – the rationale and analyses behind them are detailed in the accompanying background paper.

Government and Parliament

Scotland has a strong system for delivering advice on science, technology, engineering and mathematics (STEM) to policy-makers, but it needs to strengthen the position of science, engineering and innovation in Government, and scrutiny of relevant policy-making.

- The Scottish Government needs to produce strong and long-term policies, backed-up with the necessary funding, to give working and aspiring scientists and engineers, and investors, confidence to locate their careers and spending in Scotland.
- The over-arching vision for STEM needs to be set over decades, not years, as this is the time-frame in which research and innovation occur, external investment decisions are made, and careers pursued.
- The Government needs to appoint a Minister with specific responsibility for science, engineering, and innovation, and who is included in the relevant high-level decision-making committees.
- Departmental research and development (R&D) budgets need to be maintained to provide the evidence-base for policy development and enable the most cost-effective delivery of public services.
- Scotland must continue to have a Chief Scientific Adviser – he or she should also have explicit responsibility for engineering and direct access to the Science Minister and the First Minister. The system for scientific advice should be developed.
- The Scottish Parliament should create a dedicated Select Committee to scrutinise current and future policies affecting, and affected by, STEM.

Education

Scotland probably provides the strongest STEM education available in the UK, but there is no room for complacency. It is undergoing reform at all levels, and its performance in international comparisons is less impressive and has been worsening. Business groups such as the CBI have emphasised that the future STEM workforce will be vital to sustaining the economic recovery. The current review of higher education must deliver a strong and sustainable outcome.

- Scotland should develop a strategy to ensure that all primary schools have at least one teacher specialised in each of mathematics and science.

- All teachers should be entitled to funded, subject-specific Continuing Professional Development.
- Scotland needs to ensure that the reorganisation of its school curriculum and qualifications do not decrease the uptake of STEM
- Although Scotland has the highest proportion of students studying STEM at upper secondary level in the UK, it is still low in international comparisons and would benefit from more promotion of STEM and perhaps some compulsory study (e.g., of mathematics post-16).
- Each of the Scottish parties need to describe a mechanism for funding higher education in a sustainable and internationally-competitive way, without risking departmental or course closures in the strategically important STEM subjects.
- Scotland needs to ensure that enough STEM graduates and postgraduates are trained, and also improve numbers of people studying STEM from groups that are currently under-represented.
- The new Scottish Government should continue work to increase the number of international students who provide critical mass, a breadth of perspectives, and financial support.

The Research Base

Scotland stands out in the strength of its base of public research in universities and institutes – first among the UK nations and one of the best in the world - both in terms of the share of research produced and its quality. The strength of the research base means that funds from the Scottish public purse are successfully used to leverage money from external sources (UK Research Councils, Charities, Industry, and Europe).

The Scottish Funding Council must maintain its strong investment in research to continue its success in winning competitive funding as well as sustaining Scotland’s research strength. It should continue to cover the indirect costs of charitably funded research.

Innovation in Industry

Scotland’s relative weakness comes from its low rate of business investment in R&D, which is disappointing given the excellence of its research base.

- The Scottish Government needs to develop more strategies to encourage industry innovation, such as: more effective use of public-sector procurement; developing mechanisms for knowledge transfer from the research base; and looking at new collaborative models, especially for winning competitive funding for industry R&D (e.g., from Europe or the Technology Strategy Board).
- Scotland should continue to lead the way in supportive policy-making for medical research, as it has in streamlining approval times.

Diversity

The under-representation of distinct groups of people in some areas of STEM limits the skills available, restricts the range of perspectives that can contribute to innovation, and wastes investment.

- Scotland should develop a clear and funded strategy to improve diversity in STEM.

- Targets for increasing the study of STEM should be refined to enhance equality. Strategies to improve uptake may be most beneficial and cost-effective if they are targeted at under-represented groups.^a