



Voting for Science and Engineering in Wales

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, and more information will be regularly updated on our website: www.sciencecampaign.org.uk.

Government and Parliament

The Welsh Assembly Government is developing strategies to build up science, technology, engineering and mathematics (STEM) skills and utilise them for economic growth, but they need high-level political support and full scrutiny.

- **The Welsh Assembly Government needs to produce strong and long-term policies, backed-up with the necessary funding, to give working and aspiring scientists, engineers, and investors confidence to locate their careers and spending in Wales.**
- **The over-arching vision for STEM needs to be of the order of decades not years, as this is the time-scale in which research and innovation occur, external investment decisions are made, and careers pursued.**
- **The Government needs to appoint a Minister with 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.**
- **Wales must continue to have a Chief Scientific Adviser – he or she should also have explicit responsibility for engineering and direct access to a Science Minister and the First Minister. The system for scientific advice should be developed.**
- **The Welsh Assembly should have a specified committee to scrutinise current and future policies affecting, and affected by, STEM.**

Education

The incoming Welsh Assembly Government needs to quickly commit to recently developed strategies to improve the number and performance of students studying STEM - Wales does not fare well in international or UK comparisons. The future STEM workforce will be vital to sustaining the economic recovery and the current review of higher education must deliver a strong and sustainable outcome.

- **Wales should ensure that all primary schools have at least one teacher specialised in each of mathematics and science.**
- **For subjects in which there is a shortage of specialist teachers (physics, chemistry, mathematics), recruitment targets should be set for teacher training and financial incentives for teachers should be maintained.**
- **All teachers should be entitled to funded, subject-specific, Continuing Professional Development.**
- **Research should be commissioned to determine the impact of requirements to teach science and mathematics in the Welsh medium.**

- **All schools in Wales should give students the opportunity to study the three separate sciences at GCSE level and all of those teaching post-16 should offer physics and mathematics A levels.**
- **Wales needs to develop its apprenticeships and offer more support for small businesses to participate in vocational training schemes.**
- **Each of the Welsh parties need to describe a mechanism for funding higher education in a sustainable and internationally-competitive way, eliminating the shortfall of investment compared with other areas of the UK. They need to ensure that enough STEM graduates and postgraduates are trained and that they match future skills needs.**
- **Wales needs to recruit more international students - they can help keep courses open and bring different perspectives and financial support.**

The Research Base

The strength of the base of public research in universities and institutes in Wales is growing in its quality and productivity. It secures less public funding than it should (by share of UK population) and that, combined with its small size, probably explains why it is less successful than it should or could be at winning money from external sources (UK Research Councils, Charities, Industry, and Europe).

- **The Higher Education Funding Council for Wales must increase its investment in research - as well as improving the research base directly, this investment should bring more success in winning competitive, UK-wide funding. The indirect costs of charitably funded research should continue to be covered.**
- **Policies should continue to build up the critical mass of research through collaboration, including with overseas researchers or businesses.**

Innovation in Industry

Wales has recognised the need to move towards a more R&D intensive and knowledge-based economy - it currently has the lowest rate of business investment in R&D in the UK (by share of population). Political commitment, a stronger skills base, and more investment in the research base, all need to be complimented by supportive policies and investments to encourage business innovation.

- **Wales 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; streamlining research regulation (e.g., approval times with the NHS); and looking at new collaborative models, especially for winning competitive funding for industry R&D (e.g., from Europe or the Technology Strategy Board).**

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 be used to drive innovation, and wastes investment.

- **Wales should develop a clear and funded strategy to improve diversity in STEM - this will increase cost-effectiveness as well as equality.**
- **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.**