Voting for Science and Engineering in Northern Ireland

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 Northern Ireland Executive 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 Northern Ireland Executive 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 Northern Ireland.**
- **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 its first Minister with responsibility for science, engineering, and innovation highlighted, 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.**
- **Northern Ireland Executive needs to appoint 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 Northern Ireland Executive should have a specified committee to scrutinise current and future policies affecting, and affected by, STEM.**

Education

Students in Northern Ireland do relatively well in STEM uptake and performance compared to the rest of the UK, but less well in international comparisons. There is an alarming discrepancy between the excellent access to STEM subjects and skilled teachers in selective schools and much poorer opportunities in non-selective schools. 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.

- **Northern Ireland 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, and mathematics), recruitment targets should be set for teacher training along with financial incentives for teachers.**
- **All teachers should be entitled to funded, subject-specific Continuing Professional Development.**
- **Northern Ireland needs to urgently revise its curriculum to require all**

students to study mathematics and science up until the age of 16.
- **All schools in Northern Ireland should give students the opportunity to study the three separate sciences at GCSE level and all post-16 schools should offer physics and mathematics A levels.**
- **Northern Ireland needs to develop its apprenticeships and offer more support for small businesses to participate in vocational training.**
- **All parties need to describe how they will fund higher education in a sustainable and internationally-competitive way. They need to ensure that enough STEM graduates and postgraduates are trained, go on to work in Northern Ireland, and that they match future skills needs.**
- **Northern Ireland should aim to recruit more international students - they can help keep under-subscribed courses open, bring a breadth of perspectives, build international networks, and give financial support.**

The Research Base

The strength of the base of public research in universities and institutes in Northern Ireland is growing in its quality and productivity. Unfortunately, it is far less successful than it should or could be at winning money from external sources (UK Research Councils, Charities, Industry, and Europe).

- **Public funding for Northern Ireland's research base must increase - as well as improving the research base directly, this investment should bring more success in winning competitive 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

Northern Ireland has recognised the need to move towards a more R&D intensive and knowledge-based economy – its rate of business investment in R&D is comparable with Scotland and Wales, but lower than England and the rest of the world. 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.

- **Northern Ireland 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.

- **Northern Ireland should develop a clear and funded strategy to improve diversity in STEM, increasing 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.**