

Budget Consultation
S1, New Building
Rathgael House
Balloo Road
Bangor
BT19 7NA

17 December 2014

Re: Consultation on the Northern Ireland draft budget, 2015-2016

To Whom It May Concern:

The Institute of Physics in Ireland welcomes the opportunity to submit a response to the Northern Ireland Executive on the draft budget for 2015-2016.

The Institute of Physics in Ireland is a scientific membership organisation devoted to increasing the understanding and application of physics in Northern Ireland and the Republic of Ireland. It has over 2000 members, and is part of the Institute of Physics.

The Institute of Physics has a world-wide membership of over 50,000 and is a leading communicator of physics-related science to all audiences, from specialists through to government and the general public. Its publishing company, IOP Publishing, is a world leader in scientific publishing and the electronic dissemination of physics.

This submission was prepared in consultation with the IOP in Ireland's governing committee, its Education Group and with input from members of the Institute working in education at all levels. The attached document highlights key issues of concern to the Institute.

If you require any further information or clarification, please do not hesitate to contact the Institute at the above address.

Yours sincerely

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Northern Ireland draft budget 2015-2016 consultation

Response from the Institute of Physics in Ireland

December 2014

The Institute of Physics views with concern plans to reduce the annual budgets of the Department of Employment and Learning by over 10% and the Department of Education by 5% in 2015-16. Given the limited nature of the resources available it is essential that priorities are identified. In particular, the Institute considers that strengthening the research, technological development and innovation base is key to the economy. Hence the Institute strongly proposes that measures to protect and enhance the teaching and learning of science and technology are implemented across all departments.

Importance of physics to the local economy

Policymakers and economists are generally in agreement that innovation is a major driver of growth and a critical aspect of innovation is physics. In the UK, physics-based businesses have long punched above their weight in the economy, accounting for as many jobs as the construction sectors and as much gross value added as finance, banking and insurance. (IOP Report¹ – Importance of Physics to the UK Economy 2012). Areas such as communications, medical technology, space industry and energy are all significant drivers in the UK economy. In addition these are highly productive jobs with a Gross Value Added (GVA) per employee at £69,000 - 70% higher than the UK average. Given Northern Ireland's current low GVA per employee, it is clear that it is growth in this type of employment which is essential for the region. Northern Ireland's economy is particularly weak in relation to high tech manufacturing. In the UK, physics-based manufacturing contributes over 50% of manufacturing GVA. However, in Northern Ireland, that number drops to under 25%. In terms of total employment: in the UK, physics-based manufacturing accounts for almost 48% of the manufacturing workforce; in NI that number is under 30%².

Securing the pipeline

A key area of concern is to ensure the pipeline of suitably qualified technicians, scientists and engineers. This requires action at all levels of education not just at postgraduate level. E.g. support at schools to ensure uptake of the physical sciences, plus support re careers information at all stages.

To facilitate this and to act as a driver for change, the IOP strongly recommends the full implementation of the Northern Ireland STEM Review³ proposals and in particular the rapid appointment of an independent chief science advisor. This is vital to ensure a strong, fully co-ordinated approach to the implementation of proposals in this area.

Support for science in schools

The Institute strongly calls for science to be considered a core subject of the curriculum up to the age of 16. Currently students in Northern Ireland are not required to study any science beyond the age 14. As noted by the Association for Science Education⁴ and other bodies this is in stark contrast with the rest of the UK and many other countries. At primary level, the lack of any curriculum for science has resulted in an insufficient emphasis on science teaching – especially within an enquiry based context. Coupled with this, over the past decade, there has been a steady reduction in the amount of support for the professional development of science teachers. Given the rapid pace of change in science and technology it is essential that teachers are fully equipped to both understand these developments and to bring them to their students. Access to new and exciting developments – both within the sciences and in the way that they are taught - is an important component in encouraging uptake of science at all levels. As noted in the 2009 Report of the STEM Review³, the quality of STEM teaching is fundamental to pupils' attainment. For example, it has been shown that the qualification of physics teachers was the second most powerful predictor of pupil achievement in GCSE and A-level physics after pupil ability (measured by prior attainment).

Support for science in further and higher education

Science and technology based careers have a wide range of entry points from apprenticeships to PhD studentships. All of these are essential to the provision of the skill set necessary for a well-balanced economy and it is vital that all of these are supported.

An essential element in increasing the numbers in STEM is to find ways to widen participation in higher education. Therefore it is necessary to promote the uptake of science education by women and by persons from low socio-economic backgrounds. The Department of Employment and Learning has noted this in its corporate business plan for 2013-15.⁵ Encouragement should be based on evidence that higher education leads to a wider range of employment opportunities coupled with higher salaries, particularly if subjects such as physics are studied at university. For example, a 2012 report from the IOP notes that graduates in the physical sciences are commanding salaries 14% above the average graduate.⁶

The Institute is particularly concerned that the Department of Employment and Learning keeps to its commitments to increase the numbers of places for STEM students – e.g. the promise to make available funding for an additional 233 higher education Science, Technology, Engineering and Mathematics (STEM) places in 2014-15.⁵ Likewise it is essential that DEL should remain committed to the implementation of the DEL Research Agenda for the period 2012-15 'Underpinning Success'.⁷

References:

1. IOP Report – Importance of Physics to the UK Economy 2012
http://www.iop.org/publications/iop/2012/page_58712.html
2. IOP Report – Importance of Physics to the Northern Ireland Economy, 2012
http://www.iop.org/publications/iop/2012/page_58982.html
3. Report of the STEM Review, Department of Employment and Learning, Department of Education, 2009. http://www.delni.gov.uk/report_of_the_stem_review.pdf
4. Association of Science Education 2013 <http://www.ase.org.uk/news/ase-news/ase-has-concerns-science-education-in-northern-ireland/>
5. Department for Employment and Learning, Corporate business plan, 2013-2015.
<http://www.delni.gov.uk/corporate-business-plan-14-15.pdf>
6. IOP Report - The career paths of physics graduates. 2012.
http://www.iop.org/publications/iop/2012/page_55925.html
7. Department for Employment and Learning, Underpinning Success, research agenda 2012-15. <http://www.delni.gov.uk/research-agenda-2012-2015.pdf>