

Physics and: the 2012 budget

An Institute of Physics briefing note



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With physics-based innovation of great importance in restoring the economic health of the nation, the Institute of Physics was pleased to see plans that will be beneficial to scientific

businesses in the Chancellor's Autumn Statement. We hope, too, that they'll remain there in the resulting Finance Bill.

Changing the application of tax credits to give businesses' local managers more responsibility will provide a big incentive to carry out research and development.

The introduction of a seed enterprise investment scheme will encourage venture capitalists to put their money into start-ups – the recent decline in such investment having particularly affected science-based businesses.

However a continued investment in the science on which innovation is founded will be required to build a sustained path from physics research to gains for business.

We're asking for MPs to look out for these innovation-supporting measures in the government's 2012 budget, and to welcome those that are present.

For with a little of the right kind of backing, physics-based innovation can play a big part in getting the UK economy back into shape – and making sure it stays that way.

Prof. Sir Peter Knight
President, Institute of Physics

“The Patent Box will encourage investment in patent-worthy ideas.”

Jonathan Flint,
Chief executive, Oxford Instruments

“Significant amounts of present-day research, resulting in major science-based innovation, are carried out on large-scale centralised facilities that require substantial capital investment.”

Prof. Mike Poole,
Science and Technology Facilities Council

Help physics spur growth

As the UK's economic recovery continues, supporting physics and physics-based businesses – major contributors to growth – is more important than ever. High-tech industries producing new products, or existing products more efficiently, increase exports and create jobs.

But how best to achieve this? It's crucial not only to agree in principle to promote science and engineering, but also to ensure that the action taken in practice is of the right kind. There are several measures to support research and innovation that members of the Institute of Physics would hope and expect to see in the Government's forthcoming budget.

The key to helping innovation R&D tax credits

Key to the contribution to the economy made by physics is the translation of research into viable

With changes to the system, tax credits become more of an incentive to do R&D

business. Despite the relative strength of our science base, this is an area in which the UK has recently lagged behind international competitors, and there is a risk of companies moving elsewhere to take advantage of preferential tax regimes.

In the past, research-and-development (R&D) tax credit schemes have been seen to benefit innovation. The Institute therefore welcomes plans to improve R&D tax relief.

One of these is to apply tax credits 'above the line', whereby they would be claimed directly by R&D departments rather than as a reduction to a company's overall tax charge. "This brings the effect of the tax credit closer to the local manager" says Jonathan Flint, chief executive of the leading high-tech manufacturing and research company Oxford Instruments. "He can see how his own business benefits directly from the tax-credit system. Previously, tax credits only affected corporate results, and were thus somewhat decoupled from day-to-day decisions on R&D management."

Tax credits would therefore become a more obvious incentive to carry out the R&D work >>>



US National Renewable Energy Lab

Hydrogen cars could become commonplace thanks to improvements in fuel technology

Rewards can be great both to investors and to the UK. But many start-ups fail through lack of financial backing

that leads to innovative processes and products – and directly to economic growth.

On proposed Patent Box legislation – a 10% rate of corporation tax on profits derived from certain intellectual property – Flint adds that this favourable taxation will also help the UK's physics-based industries. "It will encourage investment in patent-worthy ideas, and reduce the tax burden on companies that rely on intellectual property," he says. But this shouldn't be introduced at the expense of other aspects of R&D tax credits.

Seed enterprise investment scheme

The Institute also welcomes the planned introduction of a seed enterprise investment scheme, as a group of tax-exemption measures focused on smaller firms. It is hoped that its targeting of early-stage investments will begin to remedy the decline in venture-capital money going into start-up companies that has occurred over the past 10–15 years – which had been particularly felt by science-based companies, as innovation tends to require longer timescales, although it does generate impressive results.

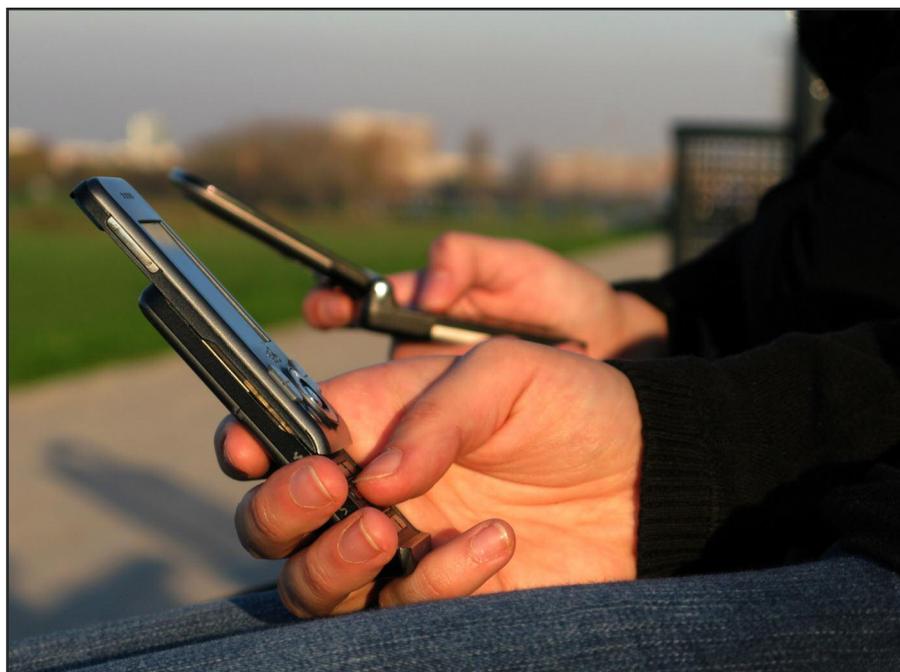
There are, however, still barriers for smaller and earlier-stage R&D-intensive physics-based businesses in terms of accessing growth capital. The Institute would like to see more done in this area to ensure that nascent firms can flourish.

Wherever successes do occur the rewards can be great – both to investors and to the country as a whole. But many start-ups fail to get off the ground due to a lack of financial backing. Norman Apsley, the Institute's vice-president for business and innovation and the chief executive of the Northern Ireland Science Park, says: "Investors in such companies now reap the rewards as they rise up the FTSE. For every soaring success, though, we've had a dozen failures to launch. Fixing that must be the aim of a new ecosystem in which investors must play their part, with government, business and academia, for the long term." He adds that while inventors and discoverers are lauded, there is often little recognition for innovators – those who spot the market opportunity for a particular invention.

Capital investment

Additional investment in knowledge transfer should not be at the expense of the science base. Continuing to invest in science can provide the research on which future innovation is founded and help to ensure sustained long-term growth.

The announcement last year of a £195 m fund for research into graphene and



Computers were predicted to be prohibitively expensive, but there's one in every pocket

supercomputing is therefore welcome and will reap its own rewards. But, given the contribution made by science to the economy, a renewed and sustained investment, as soon as the UK's economic and financial situation makes it viable, would be paid back many times over.

Experimental facilities such as the Diamond synchrotron or ISIS neutron source provide neat examples. "Significant amounts of present-day research, resulting in major science-based innovation, are carried out on large-scale centralised facilities that require substantial capital investment," says Prof. Mike Poole of Daresbury Laboratory.

"Each source attracts thousands of user scientists annually. Such modern facilities cost hundreds of millions of pounds." But they deliver. Expected breakthroughs as a result of work at ISIS, for example, range from novel ways to heal cleft palates to a new type of easily transportable hydrogen fuel.

These things don't necessarily happen quickly, however. "The one fact that hasn't changed since the dawn of the industrial revolution is that it takes over a generation to change the economic landscape," says Apsley. "The 1948 invention of the transistor didn't change the world at large, arguably, until the 1980s – even the 1990s." But the correct support for businesses can help to ensure the progression from laboratory bench to shop window – and economy-building success.

Backing support for innovation

The Institute would like to see MPs offering their backing to these examples, to welcome those that are present – and if any are missing, to ask some searching questions about why that is the case. The strength of physics-based innovation, and the UK's future prosperity, could depend on it.

What to look out for:

- Improvements to R&D tax credits
- Seed enterprise investment scheme
- Investment in science

FURTHER READING

IOP reports

- *Supporting Physics in Business*, 2011
- *Physics: an investment for the future – The Institute of Physics's manifesto for the 2010 general election*, 2010
- *Physics and the UK Economy*, 2007
- *Physics and the Irish Economy*, 2007
- *Physics and the Scottish Economy*, 2007

Responses to policy consultations

- *Response and further consultation: Research and Development Tax Credits*, 2011
- *Submission: Research and Development Tax Credits*, 2011
- *Submission: Technology Innovation Centres*, 2010
- *Submission: Financing a private-sector recovery*, 2010
- *Response: Regional Growth Fund*, 2010

Previous briefing notes

- *Physics and: economic growth*, 2011
- *Physics and: the UK economy*, 2010

Institute of Physics publications and policy documents are available online at www.iop.org.