From:	no-reply@mbie.govt.nz
To:	Mark Cleary; Research, Science and Innovation Strategy Secretariat
Subject:	Late submission on draft RSI strategy
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Attachments:	Online-submission-form-uploadsdraft-research-science-and-innovation-strategy-submissionsRSI-submission-MBIE1.docx

Are you making your submission as an individual, or on behalf of an organisation?
Organisation

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Which of the below areas do you feel represents your perspective as a submitter? (Please select all that apply)

If you selected other, please specify here:

Gender

Ethnicity

Name of organisation on whose behalf you are submitting, if different to the organisation named above

In which sector does your organisation operate: (Please select all that apply)
Industry

If you selected other, please specify here:

How large is your organisation (in number of full-time-equivalent employees)?
We represent all the major companies spending the most on R&D, as well as small to medium businesses.

Please indicate if you would like some or all of the information you provide in your submission kept in confidence, and if so which information.

Please upload your submission document here
RSI-submission-MBIE1.docx - Download File

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BusinessNZ
GROWING PROSPERITY AND POTENTIAL

7 November 2019

BusinessNZ Submission on MBIE's Draft Research Science and Innovation (RSI) Strategy

In addition to the information about BusinessNZ at the end of this submission, as part of our Major Company Group we have a Chief Technology Officers Group. This group consists of the CTO's of 20 of New Zealand's leading firms that invest the most in R&D in New Zealand.

Many thanks for the opportunity to submit. We will make some general comments and then address some of the questions in the document.

Summary – pg. 6

Vision

"By 2027, New Zealand will be a global innovation hub, a world class generator of new ideas for a productive, sustainable and inclusive future."

The proposed vision is very ambitious we wonder if it is a bit unrealistic given we are a country of not quite 5 million people from a geographically remote part of the world. We don't have big numbers of consumers on our doorstep like other small advanced economies and we are not logistically 'on the way' to anywhere. We don't have big military or pharmaceutical industries, which are usually big drivers of RSI spending internationally.

Maybe we could aim for something a bit more nuanced and tangible to strive for. For example, if we amended it to "New Zealand will be a globally **competitive** innovation hub, etc.

The word competitive denotes value for money and equally good ideas. The feedback we get from some of our biggest businesses that are investing the most in R&D and innovation is that they get better quality of research internationally for a better price than they can get from the innovation system in New Zealand. It would be a good goal to turn that around.

The Strategy focusses on the "frontier" – "solving problems no-one else has solved or is likely to investigate; capitalising on new ideas where nobody else has been successful so far; and making the most of opportunities that are unique to us."

While we realise this is a Government RSI strategy and not a business strategy – most businesses would be a bit alarmed at that kind of language. There is a saying that you can be at the 'leading edge' or the 'bleeding edge' and the latter is quite financially risky and could have poor outcomes for the taxpayer investment.

We support the idea that New Zealand should invest in areas of RSI where we have a particular problem to solve that no-one else is likely to solve – like methane emissions, but as a more

general approach to RSI we would urge officials not to discount the value of RSI that stands on the shoulders of known discoveries and ideas, but takes them to a new and innovative level. It is incredibly hard and expensive to commercialise RSI in new frontiers and it could be more fruitful for New Zealand to take a more "balanced portfolio" approach, akin to a fund manager, knowing that you need to do some high risk research, but there should be some safe and steady investments as well.

The other reservation we have about making distinctions between "at the frontier" or "behind the frontier" is that in policy, academic and political circles more emphasis tends to go on the new tech start-ups and there is less consideration given to the important RSI role that takes place in the big companies investing in R&D that benefits the wider system.

Big corporates can play a major role as incubators of the next frontier company – such as happened with Fisher and Paykel Appliances (FPA) being the starting point for Fisher and Paykel Healthcare. Facteon is one of the leading 'Industry 4.0' companies in New Zealand, and that company was a spin-out of FPA Production Machinery Ltd.

Members of the Major Companies Group that invest a lot in R&D are the canopy of the forest which nurtures the new spin-outs that can be hugely successful and very importantly they are also training the talent that goes on to start-up companies (e.g. Peter Beck started his journey at FPA), and grow the SME's into large successful companies. A lot of the leading managers of our big high-tech companies have learnt their skills in companies in the 'Major Companies Group' of companies. It would be good to see a RSI Strategy that gave some thought as to how this could be acknowledged and accelerated, either through more government support for capability building and or more affordable access to the CRI's.

In relation to NZ talent creation in the STEM subjects and subsequent career paths, New Zealand lacks a centralised co-ordinated approach to this. There is a major gap in supporting and promoting STEM subjects and subsequent career paths in primary and secondary education. This is having a significant on-going impact on diversity and inclusion in STEM careers in the workforce. Major companies have a role to play here but it needs clear ownership and governance. Who is taking the lead?

We agree that stronger connections within the system and beyond would be beneficial and that as a country with a small population – we should be better connected and better at collaboration than we currently are. We think there are some institutionalised barriers to the research and academic system connecting effectively with business, which we will cover in more detail below.

Questions asked in Discussion Paper – we will answer selected questions.

Q1. The transition to a clean, green, carbon neutral NZ. The focus for NZ should be on a solution to our methane emissions, which make up 50% of our emissions and for which there is currently no easy solution apart from de-stocking, despite around 20 years of research into this problem already. Given agricultural exports make up 70-80% of our goods exports, this is a problem we need a cost-effective solution for.

Other areas of climate change vulnerability for New Zealand are our tourism and foreign student markets – some of our top export earnings aside from agricultural exports.

International efforts are no doubt going into how to power aviation on low emission fuel, but New Zealand should take a close interest in this and add our efforts to the global efforts to solve the problem, given we have a lot of economic risk riding on it.

RSI investment into adaptation will continue to be important, as will renewable energy and battery technology to continue to decarbonise energy and transport.

More research should be going into understanding the carbon lifecycle, so that farmers have more options and information to become carbon neutral at the farm level and for this to be scientifically verifiable. They also need some innovative ways to measure, monitor and report on emissions that are cost effective.

Q4. Innovation at the frontier (creating new knowledge) or behind the frontier (building on existing knowledge).

As stated already – we need a mixture of both. Too much emphasis on the frontier seems a risky and expensive strategy for a small country. New Zealand has some areas of natural competitive advantage and it would seem obvious to put emphasis on those – which to a certain extent is what the industry strategy is attempting to do.

Where we do have areas of global leadership and excellence, we should have a strategy in place to continue to invest in that research where it is having an impact. An example is the world-renowned Dunedin Longitudinal health and development study. It seems inconceivable that such insightful and world leading research was scrambling for funding a couple of years ago. That is the opposite of taking a strategic approach.

Q10. They Key Challenge for the RSI system is stronger connections?

We agree this is a challenge when it comes to business and University or CRI interconnectedness. As stated earlier we think there are some barriers to University and Business connectedness and feedback we have had from industry suggest the following are barriers;

- PBRF. The funding model for Universities incentivises research and publication in academic journals. Academics are rewarded for publishing. Publishing can be at odds with the protection of intellectual property – which needs to be kept secret until properly protected.
- Figure 2: pg 21. Summary of Statistics on our research, science and innovation activity indicates that for all the publishing we are doing (far ahead of the other small advanced economies) the quality could be lacking. The patent citations per scholarly output is in negative territory, we are not ranking in the top 1% of highly cited researchers, or the top 10% of publications. The Business Expenditure on R&D (BERD) is more negative as a % of GDP compared to other small advanced economies, as is the Government Expenditure on R&D (GERD). For all the publications we are in, the positive impacts are negligible to negative on those measures mentioned above. Maybe there needs to be a new focus on quality over quantity.

- Other barriers to business working with academics is that their primary motivations are teaching and publishing, so working with industry cannot always be done in a timely manner.

- The bigger companies want a problem to be solved by a professor rather than a PHD student and they want it solved in a timely manner.

- A University Professor has no career advancement opportunities if they work with industry. It is not easy for academics to move between the business world and the academic world and stay on the academic career ladder. In Europe we understand it is career enhancing to have been working with industry and it is much easier to go between the two worlds. MBIE should investigate those kinds of models.

- Some businesses have given up trying to work with Universities, given these misalignments and take the view that what they want from the Universities is the pipeline of graduate talent they can employ and then build in-house R&D capability.

- With regard to the CRIs – feedback we have is that they have various capabilities, some are better than others (those with a strong sector focus are in the better camp). Challenges working with CRI's can be that they think their ideas are close to market/commercialisation, while the business knows they are a long way from the commercialisation stage.

- They (Universities and CRI's and Commercialisation Offices) want too much for their IP. Some of our members say if the value of the IP is $1.00, the cost to commercialise it is $100. The failure to recognise this means a lot of IP probably gets left on a shelf. There needs to be a more realistic approach to the value of the IP coming out of our RSI institutions.

- Another challenge with RSI that comes out of the Universities and/or CRI's – is that they have a great idea looking for a market/customer. In the business world the business works backwards from the customer problem/need and then looks for the solution.

- Small to medium size businesses find CRI's and Universities too expensive to engage with.

Guiding Policy

Q. 11 The definition of excellence, - "in reference to the frontier – the leading edge of what the world knows it can do."

We don't agree with that definition because as stated above, some the most lucrative research and innovation is built on the back of pre-existing knowledge. In addition, in a competitive global RSI world, there are countries and multi-nationals with much bigger budgets and deeper pockets than we have in New Zealand. If we can do leading-edge RSI then that is fantastic, but that should not be where all the emphasis is placed if we want to get a good return on our investment.

Q13 – Yes, we agree that excellence must be seen in a global context and we should be drawing from the best technology, people and ideas internationally. We also like the idea of New Zealand being a talent magnet – a place where talent wants to live and work. We think that for this to be successful – immigration settings need to support this approach.

With regard to career paths and talent attraction and retention, as discussed above it would be good to have a system where researchers and scientists are more able to move between academia and business in a career enhancing way.

Q15. We agree that the impact of research should be measured and look forward to MBIE's further work on how impact is measured.

Part 4 – Actions

On Start Up – Scale up

The ideas around helping start-ups probably need more specificity than is in the draft strategy for us to be able to comment.
One of the programmes which we have promoted to Government to take a closer look at is the power of procurement to help small companies grow. There is a scheme in the USA called Small Business Innovation Fund (SBIF) where a select group of Government agencies need to spend a small percentage of their procurement budget on innovative solutions to problems they want solved. This could be the development of new technology or a novel approach to solving a social policy problem. The Government agency funds the company to develop the solution and the company keeps the IP. This is a scheme that has been going for a number of years and has had a good success rate in growing tech companies. We attach a report on the scheme.

In terms of scaling up support – we are supportive of approaches that benefit a wide range of businesses if they want to take advantage of them, such as commercialisation facilities as has been done with the Food Bowl. In addition, we have had good feedback from industry on programmes where there has been support for projects such as the primary growth partnership working on sector wide challenges.

We do think it a mistake for government to try to focus RSI spending on particular, predefined areas. We think it would be better to leave that to individual companies or institutions that may be in a better position to make those decisions.

As already stated, we don't believe a global frontier approach is right and that it should be a mixture of frontier and building on existing knowledge to innovate.

Many thanks for the opportunity to comment and we would be happy to organise a meeting with our Chief Technology Officers Group to explore ideas further if that would be helpful.

Yours sincerely

Catherine Beard
Executive Director
ExportNZ & ManufacturingNZ, BusinessNZ

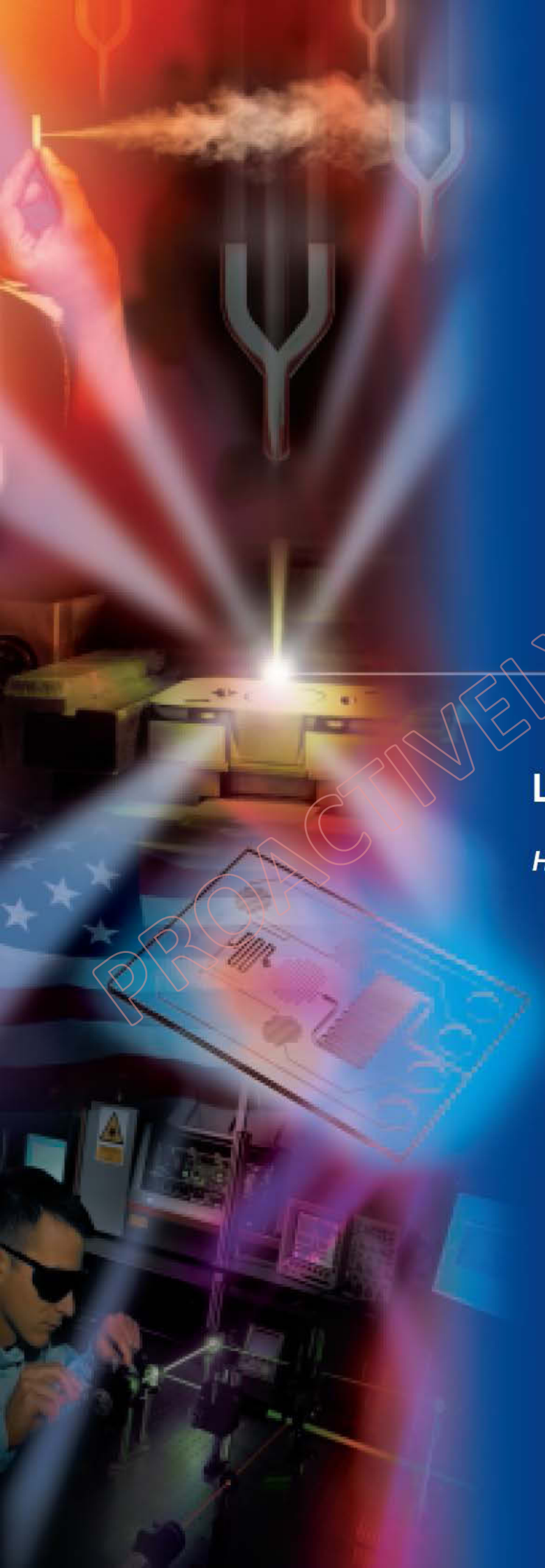
Background information on BusinessNZ

BusinessNZ is New Zealand's largest business advocacy body, representing:

- Regional business groups EMA, Business Central, Canterbury Employers' Chamber of Commerce, and Employers Otago Southland
- Major Companies Group of New Zealand's largest businesses
- Gold Group of medium sized businesses
- Affiliated Industries Group of national industry associations
- ExportNZ representing New Zealand exporting enterprises
- ManufacturingNZ representing New Zealand manufacturing enterprises
- Sustainable Business Council of enterprises leading sustainable business practice
- BusinessNZ Energy Council of enterprises leading sustainable energy production and use
- Buy NZ Made representing producers, retailers and consumers of New Zealand-made goods

BusinessNZ is able to tap into the views of over 70,000 employers and businesses, ranging from the smallest to the largest and reflecting the make-up of the New Zealand economy.

In addition to advocacy and services for enterprise, BusinessNZ contributes to Government, tripartite working parties and international bodies including the International Labour Organisation (ILO), the International Organisation of Employers (IOE) and the Business and Industry Advisory Council (BIAC) to the Organisation for Economic Cooperation and Development (OECD).



"SECRETS" OF THE WORLD'S LARGEST SEED CAPITAL FUND:

How the United States Government Uses its Small Business Innovation Research (SBIR) Programme and Procurement Budgets to Support Small Technology Firms

EXECUTIVE SUMMARY

By David Connell

Centre for Business Research,
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Images on cover and page 1 courtesy of TTP Group plc

ABOUT THE AUTHOR

David Connell joined the Centre for Business Research as a Senior Research Associate in June 2006. He was co-founder and Chief Executive of TTP Ventures - an early stage investor in science and technology based companies, which was established in 1999 with backing from Boeing, Siemens and financial institutions.

Before becoming a venture capitalist, he was Head of the Strategy Consulting arm of TTP Group plc and was earlier responsible for the Deloitte Haskins and Sells High Technology Group, based in the City of London.

Since 2004, David has been leading a campaign for the UK to adopt a US-style SBIR programme alongside Anne Campbell (then MP for Cambridge), Kitty Ussher, MP for Burnley, and members of the UK scientific, enterprise and venture capital communities.

David's first degree was in Physics from Bristol University. He also has Masters Degrees in Operational Research and Economics, both with Distinction, from the Universities of Lancaster and London respectively.

ABOUT THE CBR

The Centre for Business Research (CBR) is an independent research institution within the University of Cambridge.

It began originally as the Small Business Research Centre and to this day, the study of enterprise and innovation remain key areas of research, alongside work on corporate governance. **(www.cbr.cam.ac.uk)**

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"SECRETS" OF THE WORLD'S LARGEST SEED CAPITAL FUND:

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EXECUTIVE SUMMARY

In nearly a quarter of a century of existence, the SBIR programme has played a pivotal role in exploiting the US science base and supporting the growth of its small science and technology companies. The purpose of this report is to examine how it operates and to assess its economic impact. It also looks at the relationship with the broader small business procurement "set aside" policies in the US, and at the market pull-through effect they exert on small US firms. The final section of the report makes specific and detailed recommendations on action that could be taken to replicate the SBIR programme in the UK so that government departments can participate more effectively in building the innovation based economy we need to remain competitive as a nation.

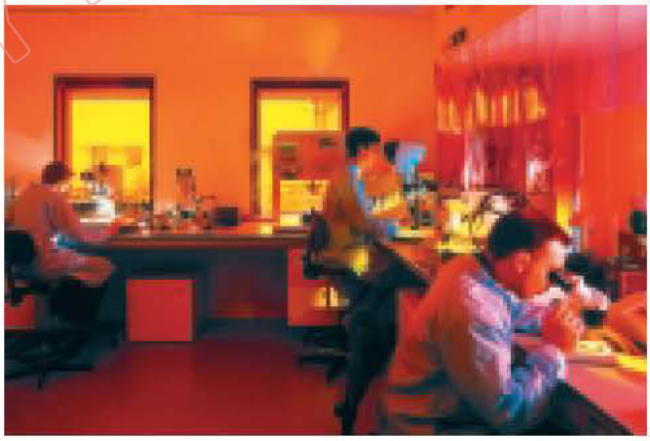
How Technology Firms Get Started

The popular perception of how successful high technology companies get started is based on what is sometimes referred to as the "Silicon Valley" model. An engineer or scientist has an idea for a new product based on his invention. He starts development in his laboratory or garage with a couple of colleagues, writes a business plan and uses that to raise money from venture capitalists and other investors. The money they put in, and subsequent investments, finances the development and marketing of the firm's products.

The reality is usually rather different. In practice it is often research and development contracts placed by customers that play the key role in early stage funding, not equity from investors. And in the United States federal government R&D contracts, placed through the Small Business Innovation Research (SBIR) programme have, for nearly a quarter of a century, played a pivotal role in this process. In essence it is the world's largest seed capital fund.

How Research and Development Contracts Help Small Businesses

A company whose funding comes mainly from R&D contracts is sometimes known as a "soft" company. Its business may be based around the founders' scientific or engineering expertise or around a piece of proprietary technology with applications in different markets. The name reflects the ability of "soft" companies to mould their strategies and R&D programmes to respond to a range of different customers' needs. "Hard" companies are focused on the development of **standard** products and conform more to the Silicon Valley model.



They usually offer much larger rewards, but they have less flexible strategies and entail much higher investment costs and risks.

Many of the UK's successful technology companies - possibly even most - owe their origins to the "soft" company model in one way or other. Cambridge Silicon Radio (CSR), probably the most successful UK technology start up of the 1990's, is a good example. Its founders had honed their CMOS wireless design expertise and management skills over 10 years within Cambridge Consultants by carrying out a wide range of development contracts for different customers.

When Bluetooth emerged as an important new wireless standard, they were perfectly positioned to spin out with venture capital funding and start a "hard", product business to exploit it.

By focusing technology development on real, well defined customer needs, paid R&D contracts provide the best market research a technology company can have. And they perform

a particularly important role during the "exploratory" phase of commercialising platform technologies – scientific or engineering breakthroughs with multiple potential applications. These represent some of the most significant spin off opportunities from within the academic science base, though because of the long timescales involved in searching out, proving and developing valuable applications, they are often hard for venture capitalists and private investors to back. Examples abound in sensors, imaging, materials and the life sciences, as well as in more advanced areas of mathematical computing.

"Soft" companies are relatively straightforward to manage, certainly much easier than "hard" companies which need a broader range of strategic, marketing and financial skills. For founders with a predominantly technical background, they therefore provide a useful stepping stone on the way towards a faster growth and more demanding, "hard" company model as opportunities emerge for 'standard' products.

Even Intel owes its success today to a customer funded development. In 1970, shortage of funds and engineering resources caused it to finance development of the world's first single chip microprocessor with a $60,000 contact from the Nippon Calculating Corporation. NCF's demanding technical requirements for calculator chips helped Intel's engineers come up with the design for the Intel 4004. Its business today is largely based on this product's successors. When NCF got into financial difficulties later, Intel was able to buy out NCF's rights. *"I think it gave Intel its future"*, said Chairman Andy Grove in an interview much later, *"... but for maybe the first ten years we looked at it as a sideshow"*.

Government Procurement and Innovation

The US government's role in nurturing the computer and semiconductor industries during the Cold War is well recognised, with the Department of Defense, NASA and National Security Agency all playing a key part. But public sector organisations also represent a substantial proportion of the UK economy. They are responsible for some 55% of all UK purchases of information technology products and services, for example. By placing R&D contracts with new technology companies, and by trialling and purchasing their products, they can play an important part in building a high technology economy.

However, there is powerful evidence today that UK government departments are failing to rise to this challenge. The problem appears to stem both from the perception across many government agencies that innovation is the responsibility of the private sector or the Department of Trade and Industry, and from the overwhelming predominance of value for money considerations and risk minimisation in public procurement procedures.

The US SBIR Programme

The Small Business Innovation Research (SBIR) programme was established in 1982. Each year it makes over 4,000 awards to US small businesses, totalling over $2 billion in value.[1]

SBIR awards take the form not of equity, loans or grants (in the sense used in the UK), but of contracts for the development of technologies that US federal government agencies believe they require as customers, specifiers or research organisations.[2] The aim is that this will lead on to mainstream development contracts, procurement by the agency of developed products or some other form of commercialisation.

SBIR awards are designed to provide 100% of the funding needed for a project, plus a small profit element for the business undertaking it. Whilst the 'norm' is $850k for each project, the size of awards can be substantially larger. Small businesses can win and run multiple projects in parallel. It is quite common for US companies to have received several million dollars, sometimes each year, from this source.

The US legislation underpinning the SBIR programme requires that 2.5% of all federal government agencies' external R&D budgets are distributed through this means. But the keys to the programme's success are its structure and the highly efficient process which each agency operates to advertise topics of interest and make awards. The majority of award winners are businesses with less than 25 employees, though US businesses with up to 500 staff are eligible.

KEY FEATURES OF US SBIR PROCESS

- ***Regular solicitations at fixed dates during the year;***
- ***Awards directed at the best submissions from across the US; no state or regional quotas;***
- ***Complete transparency in terms of topics, awards winners and amounts;***
- ***Standard contracts; companies own the intellectual property developed;***
- ***Clear linkage to agency R&D interests and priorities; strong focus on commercialisation;***
- ***Companies do not have to be established until awards have been won;***
- ***100% funding of all contract costs plus a profit element;***
- ***Flexible mechanisms to encourage involvement of academics and support academic spin-outs and technology transfer;***
- ***Phased awards to manage risk, typically with $100k for a Phase I feasibility study and 50% of Phase I award winners going on to win a $750k Phase II development award;***
- ***Phase III SBIR awards funded from mainstream (i.e. non SBIR budgets), and adding probably as much again to overall federal R&D expenditure on SBIR projects;***
- ***Phase III projects bring businesses the opportunity to win valuable sole supplier contracts with federal agencies;***
- ***Prime contractors are encouraged to take up SBIR developed products.***

1 The closely related Small Business Technology Transfer (STTR) programme, worth a further $230m a year, is specifically for projects involving collaboration with a university.

2 Some SBIR awards are defined as "grants", but they provide 100% funding for directed research projects and are therefore contracts in all but name.

The full report examines the detailed operation of the SBIR programme in four US agencies: the Department of Defense, the National Institutes of Health, the National Science Foundation and the United States Department of Agriculture. Case studies of successful award winners are provided for each agency.

Through the SBIR programme and other federal R&D contracts, early stage US technology companies have access to government R&D funding at a level which is very much larger per company – probably by an order of magnitude – than in the UK. As a source of early stage finance, the SBIR programme is probably at least as important in value terms as venture capital. However, unlike most venture capital investments, SBIR awards are available from right at the start of a business's life.

Other US Policies for Small Businesses: "Set Asides" and State Innovation Programmes

This report focuses on the SBIR programme. However, for many businesses it is just a way of getting on to the first rung of the procurement ladder and it cannot be considered in isolation from the United States' broader "set aside" legislation. This requires that each agency adopts annual "set aside" targets for the percentage of its **overall** procurement budget that it will spend with small US businesses. The statutory minimum target is 23%. There are also "set aside" targets for prime contractors' expenditure with US small businesses. For example, in 2005 the Department of Defense's goal was 43%. When taken together, this means that over two fifths of Department of Defense procurement expenditure is earmarked, directly and indirectly, for small US firms. Performance against these targets is carefully monitored and large US corporations have Small Business Offices to ensure they comply. There is therefore a natural pull through of products and technologies developed by small businesses under the SBIR programme and an implicit bias away from non US suppliers.

At national level, the overall percentage of R&D contracts going to small firms is also monitored. In 2003 it was 13%.

The SBIR programme is concerned with federal government agencies. Many individual US states also operate their own economic development programmes, and research undertaken for the State of Maine provides some useful insights. Per head of population its grants programme is more generous in all important aspects than the DTI's broadly equivalent Grants for R&D scheme. Its technology firms therefore receive better government financial support from the State **even before** the much more important federal SBIR programmes are taken into account. With other federal R&D programmes, they add a further $11 for each $1 of state support.

The Economic Impact of the US SBIR Programme

The SBIR programme is used by firms ranging from start-ups to companies with nearly 500 employees. It funds applications from defense electronics to healthcare. It is highly regarded across both government and industry, and has been the subject of repeated favourable reviews undertaken on behalf of Congress.

The full report examines the different kinds of benefit delivered by the SBIR programme and summarises the available evidence on its economic impact. Companies that have benefited range from major corporations like Qualcomm, Amgen and Genzyme, that won SBIR awards in their early days, to many specialised small and medium sized businesses that continue to make use of SBIR contracts to fund R&D into new areas.

One academic study has shown that over a 10 year period, SBIR funded companies generated five times as many new jobs as non-SBIR funded firms. Over 300 SBIR award winners now have public market listings.

Potential Benefits of a UK SBIR Programme

The existence of a 'funding gap' for early stage UK technology companies has been highlighted at depressingly regular intervals over past decades.[3] However the problem remains unsolved. And despite the successes of a very few specialist venture capital firms, the average financial returns generated by this part of the UK private equity industry have been unacceptably poor over many years. As a result very few institutional investors now have a serious appetite for the asset class.

The problems experienced by early stage venture capital firms are mirrored by individual 'angel' investors. Existing UK grant programmes do little to help as they fund only a proportion (typically 35%) of project costs. The same applies to R&D tax credits. Indeed, the very persistence of the problem suggests that we must look for other solutions if we are to address it successfully. R&D contracts, from both the private and public sector can play a major role.

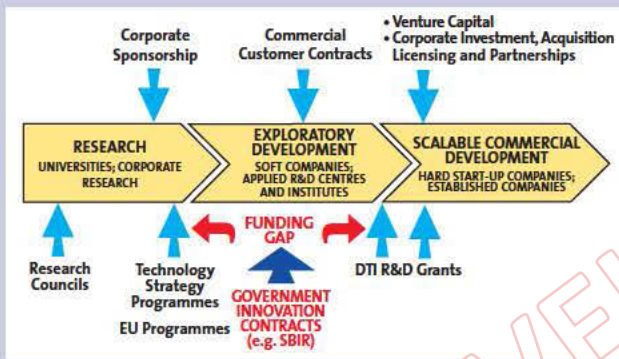
A UK initiative similar to the US SBIR programme would benefit the economy in many different ways:

- It would stimulate innovation in public sector services, and help address policy challenges in areas like healthcare, energy, transport and environment;
- It would provide a method of financing start-ups, which addresses key funding gaps, with major practical benefits to potential entrepreneurs;
- It would facilitate spin-outs and technology transfer from universities by providing a flexible approach for funding the transfer of people into the commercial world;

3 The gap in funding is frequently referred to as an 'equity gap', a term which incorporates an implicit, but unjustified assumption about the kind of funding needed at this stage in the development of new technology businesses.

- It would provide validation of new technologies, helping firms to win the support of further customers as well as partners and investors;
- It would reduce time to market by facilitating early development and trials with lead customers;
- It would make it easier for small companies to access **mainstream** government procurement budgets;
- It would increase the number of 'venture capital ready' companies throughout the UK, leading both to a stronger technology sector and to a healthy and growing venture capital industry to finance it.

STAGES IN THE COMMERCIAL EXPLOITATION OF NEW SCIENCE AND TECHNOLOGY PLATFORMS AND UK FUNDING MECHANISMS



What the UK Should Do

In an attempt to emulate the US SBIR programme, the UK government introduced a similarly named initiative in 2001. Called the 'Small Business Research Initiative (SBRI), it provided a web portal through which government departments could advertise R&D contracts. The objective was for 2.5% of external R&D to be spent with small and medium-sized enterprises (SMEs) through this mechanism. However, up to 2005, it only ever advertised contracts totalling around £2m per year, and virtually no departments participated.

In March 2005, Gordon Brown announced that the SBRI's 2.5% target was to become mandatory. Though, despite subsequent attempts by the Small Business Service to improve it, the SBRI still bears little or no resemblance to the US SBIR programme it purports to imitate.

To implement an effective US-style programme in the UK, it is necessary to address three important issues:

(i) It must encourage individual government departments to identify areas where they need innovative new technology to meet their objectives and to commission R&D contracts to develop and trial this technology;

(ii) It must enable officials to do this efficiently, without falling foul of value-for-money dominated Office of Government Commerce procurement rules designed for conventional products and services, and which inhibit risk taking;

(iii) It must not conflict with EU regulations on procurement and state aids which would make a simple transposition of US legislation impossible.

The final section of the report proposes an approach which addresses all of these issues. It would involve the provision of £100m a year for "Innovation Contracts" awarded by departments on a similar basis to the US SBIR programme.[4] The approach proposed does not demand a legislative approach, though it will undoubtedly need initially to be driven from the top of government if conflicts between departmental objectives, and the cultural barriers to innovation and risk taking within them, are to be overcome.

The major economic challenge for UK policy makers in the early part of the 21st century is to find a way of sustaining a high wage economy against competition from low cost, but increasingly technologically sophisticated, nations like China and India on the one hand, and from US based companies benefiting from its enormous R&D investments and the overwhelming dominance of its market for science and technology based products on the other. It is essential that the UK public sector plays it full role in the 21st century "innovation economy" we will need to create.

The US is the world's most successful economy at building science and technology based industries and its use of procurement, through the SBIR programme and other mechanisms, has played a key part in that success. We would do well to learn from its experience.

> *"I am a strong advocate of the US SBIR programme as I think there need to be channels other than traditional venture capital to seed new technology businesses. But they are also very helpful to the government on many levels, seeding businesses that are developing technologies useful to government agencies – and, often, to us all".*
>
> **Dr Eric Fossum, founder of Photobit Technology Corporation.**

> *"We would all have preferred to establish the company in Cambridge, rather than California, because Cambridge is where the research and development has taken place. But the funding gap for start-up biotech companies in the UK is such that we did not have a choice".*
>
> **Dr Helen Lee, Cambridge University academic, founder of Diagnostics for the Real World and serial SBIR award winner.**

4 Many of the details of the approach are based on work undertaken by the author with Anne Campbell and Kitty Ussher MP for their Private Members' Bills to introduce a US style SBIR programme in the UK.

FUTURE CBR RESEARCH

The research for this report has also highlighted much broader differences between the way that the UK and the US defines and manages its government R&D programmes and their interaction with private industry through the procurement process. The Centre for Business Research at Cambridge University is therefore starting a research programme from mid 2006 to examine these broader differences and to study their impact on the processes by which scientific developments are converted into commercial products and economic growth within a modern innovation economy.

The UK policy framework is partly defined by a precompetitive collaboration model established a quarter of a century ago and by European Union policies on state aids and procurement. The underpinning principles which determined this approach were primarily concerned with European integration and a desire to limit wasteful competition as regards national subsidy levels. The policies and programmes we have to support innovation and technology transfer in the UK are largely a result of a whole series of incremental changes and initiatives made against this background over the intervening years.

The purpose of this new research will be to stand back from the detail and from traditional UK policy frameworks in order to undertake a "zero based" review of UK policies, using the very different US approach and those of other countries as comparators. The aim is to help define the R&D and technology exploitation policies that will best sustain Britain's position as a medium sized, high income, innovation based economy capable of meeting the global challenges we will face as the 21st century unfolds.

This is the Executive Summary of a longer and more detailed report on this issue. Copies of the full version of this report can be obtained from:

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