



BRIEFING

Proposed approach to establish regional research institutes

Date:	1 May 2015	Priority:	High
Security classification:	In Confidence	Tracking number:	2649 14-15

Action sought		
Hon Steven Joyce Minister of Science and Innovation	Agree to the recommendations.	4 May 2015

Contact for telephone discussion (if required)				
Name	Position	Telephone		1st contact
Richard Walley	Manager, Science Policy	9(2)(a)	9(2)(a)	✓
Ron Clink	Principal Policy Advisor	9(2)(a)		

The following departments/agencies have been consulted					
<input type="checkbox"/> Treasury	<input type="checkbox"/> MoJ	<input type="checkbox"/> NZTE	<input type="checkbox"/> MSD	<input type="checkbox"/> TEC	<input type="checkbox"/> MoE
<input type="checkbox"/> MFAT	<input type="checkbox"/> MPI	<input type="checkbox"/> MfE	<input type="checkbox"/> DIA	<input type="checkbox"/> TPK	<input type="checkbox"/> MoH
<input type="checkbox"/> Other:			N/A		

Minister's office to complete:

- | | |
|-----------------------------------------------|----------------------------------------------|
| <input type="checkbox"/> Approved | <input type="checkbox"/> Declined |
| <input type="checkbox"/> Noted | <input type="checkbox"/> Needs change |
| <input type="checkbox"/> Seen | <input type="checkbox"/> Overtaken by Events |
| <input type="checkbox"/> See Minister's Notes | <input type="checkbox"/> Withdrawn |

Comments:



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Executive summary

This briefing sets out, and seeks your agreement to, MBIE's planned approach and criteria to establish new regional research institutes in New Zealand. This is in particular to inform announcements on Budget day, 21 May 2015.

The approach outlined for you is based on the Government setting aside \$10 million per annum over three years (\$30 million total) in contingency, beginning in Budget 2016/17, for the establishment of one or more of these institutes. The proposed high-level approach consists of three stages:

1. **Introductory workshops:** beginning June 2015, MBIE will conduct introductory workshops in the regions whereby interested investors and potential participants get a clear picture of the concept and high-level criteria for establishing a regional research institute
2. **Registration of Interest (ROI):** in September-October 2015, MBIE to conduct a ROI process that elicits early-stage commitments and proposals from the regions to proceed into business case development
3. **Business case development and recommendations:** From November 2015 to February 2016, MBIE to work more directly and in-depth with a few selected proposals that merit full business case development and for promotion to a final expert selection panel.

We propose the following high-level criteria for establishing institutes:

- new institutes should get established and maintain their presence in regions outside the main population centres of Auckland, Wellington and Christchurch, where we can induce business innovations and positive spillover benefits where they would not otherwise easily accrue.
- the research activity of any institute should be largely directed by, and highly complementary to, new efforts from New Zealand industry¹ to increase their R&D intensity
- new institutes must operate as private or private not-for-profit type entities in order to stimulate business innovation and economic growth in eligible regions and contribute directly to the Government's goal of raising BERD to 1.0% of GDP by 2018.

¹ Industry in this case can be non-government actors such as private firms, associations, communities, iwi and non-profit entities.

Recommended action

The Ministry of Business, Innovation and Employment recommends that you:

- a **Agree** to the following three-stage approach and conditions for establishing regional research institutes in New Zealand:

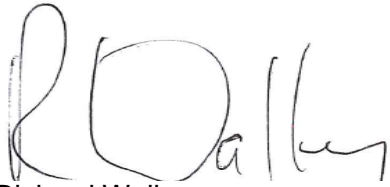
Process stage/condition	(circle one)
1. Introductory workshops beginning in June 2015 to provide clear picture of concept and high-level criteria to eligible regions	Agree/Disagree
2. Registration of Interest over September-October 2015	Agree/Disagree
3. Business Case Development using a an in-depth workshop process, over November 2015-February 2016, to take top tier proposals to their completion	Agree/Disagree
<ul style="list-style-type: none"> Acceptable to have more than one proposal from each eligible region 	Agree/Disagree
<ul style="list-style-type: none"> Two or more eligible regions may collaborate on proposals 	Agree/Disagree

- b **Agree** to our using the following high-level establishment criteria to progress the initiative in the regions (noting the process will likely contribute greater detail to final eligibility and selection criteria):

High-level Criteria	(circle one)
Eligible regions for hosting an institute are only those outside our main population centres of Auckland, Wellington, and Christchurch	Agree/Disagree
A range of ownership structures are acceptable, but institutes must be established and maintained as private or private not-for-profit organisations .	Agree/Disagree
Existing independent research organisations might seek to 'extend' their reach into new regions and thus qualify.	Agree/Disagree
Institutes must bring relevant science to support industry efforts that seek to increase R&D intensity	Agree/Disagree
Institutes should congregate and develop their own 'in-house' expertise, but are also expected to facilitate and integrate researchers from other NZ institutions, or from overseas , into their mix of activity	Agree/Disagree
Industry and other institute partners must be willing to co-invest with Government with a medium-term goal (ten years suggested) of government funding reducing to 20 per cent of total R&D expenditure, and eventually funding derived through contestable means	Agree/Disagree
Institutes would be expected to grow their capacity and capability to meet growing local industry demand, and then over time also seek to pursue relevant R&D opportunities across the country and internationally to benefit New Zealand	Agree/Disagree

c **Note** officials wish to discuss this briefing with you at our scheduled meeting on 4 May 2015

Note



Richard Walley
Manager, Science Policy
People, Science and Enterprise, MBIE

1 / 5 / 2015

Hon Steven Joyce
Minister of Science and Innovation

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Background

1. MBIE has previously briefed you on policy options and relevant processes for the establishment of regional research institutes in New Zealand. Our last briefing to you on 22 December 2014, which set out the main policy considerations for advancing this initiative, is attached as Annex 1 for your reference.
2. We understand you to have an interest in establishing the institutes in regions outside the main population centres of Auckland, Wellington, and Canterbury. Our advice to you is that establishing institutes outside our main population centres would work to induce new business innovations and positive spillover benefits where they would not otherwise easily accrue.

Proposed process for investigating the establishment of regional research institutes

A three-staged approach to initiate, develop, and consider best-case business proposals

3. We propose using a three-stage approach for establishing institutes. This phased approach will help MBIE to initiate and test the market for interest, encourage development of new partnering efforts between industry and 'external' researchers, and ultimately build strong business cases in the regions for final consideration and selection. The three proposed stages are:
 - a) Beginning June 2015, MBIE will conduct **Introductory Workshops** in the regions whereby interested participants get a clear picture of the concept and high-level criteria for establishing a regional research institute. These workshops would additionally seek to gain input from innovation actors in the regions to help shape our Registration of Interest process, to stimulate strong expressions of interest, and to secure effective participation in the development and delivery of proposals
 - b) In September-October 2015, MBIE will conduct a **Registration of Interest (ROI)** process that elicits early-stage commitments and proposals from the regions. At this stage MBIE will use a ROI selection panel to nominate and forward those few proposals with sufficient merit to proceed into full business case development
 - c) From November 2015 to February 2016, MBIE will work more directly and in-depth with the few selected proposals that merit full **Business Case Development** and for promotion to a final expert selection panel. Final recommendations, and related budget considerations, should be completed by April 2016.

Through the three-staged process, MBIE considers that two additional conditions should also apply. These are:

- it is acceptable to have more than one proposal from each eligible region
- two or more eligible regions may collaborate on proposals to build scale, but will only be considered when industry partners are committed to supporting and utilising the research activities from each region.

Proposals could be led by industry or existing researchers

4. We envisage the following types of scenarios developing from the process:
 - industry leaders will drive the proposal for developing a new institute, and the intended research focus of the institute will arise almost exclusively from industry initiative and R&D commitments which then direct relevant research expertise to get established and housed in an institute
 - researchers and research institutions in New Zealand, public and private, would take their existing research expertise and initiate collaborations with prospective industry partners

that manifest into proposals for a completely new and independent, private regional research institute

- existing private research institutions in New Zealand would extend their industry-focused activity into a new and different region.

5. What is important ultimately is that proposals get developed around new R&D collaborations that will accelerate and expand regional economic development opportunities in New Zealand and will incorporate commitments to regional spillover benefit.

We expect participation in the process to generate benefits to regions, whether successful or not

6. While we propose to use a competitive process, where only the strongest business cases get progressed through to final consideration and funding, we also wish to conduct our process in such a way that the regions themselves (businesses, scientists and others) generate new thinking and actions around effective R&D collaboration for economic wealth creation—collaborations which may materialise into new opportunities and innovations irrespective of receiving Government funding through this particular initiative.
7. MBIE has held preliminary discussions with Callaghan Innovation to ensure that our approach into the regions is complementary to its efforts to improve business R&D in New Zealand. We will continue to work alongside Callaghan, NZTE, regional business partners and others as appropriate.

Proposed advisory group and selection panel process

8. MBIE will locate and appoint an expert selection panel of scientists/researchers, industry leaders and systems integrators, sourced from within New Zealand and potentially from overseas, to assess tender applications at the ROI stage and at the final selection for funding stage.
9. MBIE will establish a five or six person, cross-departmental, advisory group to provide feedback throughout our introductory workshop and ROI stages, and on through the funding and early implementation stages of the institutes. The advisory group would also be available to contribute to the panels established to assess proposals at the ROI and business case development stages.

Overall high-level establishment criteria

Industry co-funding is a critical success criterion, but this does not need to be up-front

10. Government's initial role would be to catalyse the establishment of institutes in a way that incentivises them to generate, develop and exploit a steady pipeline of business and economic opportunities. We recommend that government funding of these institutes should taper off to a level similar to that for generally available Government support for BERD, for example the 20% available through growth grants, plus opportunities such as contestable funding. Government funding should reduce gradually in stages within ten years.
11. The level of financial commitment to co-funding from industry will therefore be a critical success criterion.

We recommend five core criteria in addition to financial commitment from industry

12. We recommend five core criteria in addition to financial commitment from industry. Further criteria are likely to be developed through the workshop phase of the process, which we may incorporate into the final ROI process, and we will seek your approval of these for the final ROI. The five high-level criteria we recommend to initiate discussions in the regions, in addition to industry financial commitment, are:

- Eligible regions for hosting an institute are only those outside our main population centres of Auckland, Wellington, and Christchurch
- A range of ownership structures are acceptable, but institutes must be established and maintained as private or private not-for-profit organisations. Existing Independent Research Organisations might seek to 'extend' their reach into new regions and thus qualify.
- Institutes must bring relevant science to support industry efforts that seek to increase R&D intensity
- Institutes should congregate and develop their own 'in-house' expertise, but are also expected to facilitate and integrate researchers from other NZ institutions, or from overseas, into their mix of activity
- Institutes would be expected to grow their capacity and capability to meet growing local industry demand, and then over time also seek to pursue relevant R&D opportunities across the country and internationally to benefit New Zealand.

Financial implications and funding approach

13. You are preparing to announce a contingency of \$10 million per annum over three years (\$30 million total) in contingency, beginning in Budget 2016/17, as part of Budget 15. MBIE officials will be available to work with your office to prepare for this announcement.
14. Given the parameters of this contingency funding announcement, MBIE will also work through the establishment process to determine:
 - how many institutes warrant funding initially
 - how and when development of individual business cases should determine what flow of funding is best suited for each institute over the initial three years of establishment
 - what the considerations might be for funding future years of each institute or for the establishment of any new additional institutes.
15. We also believe there is a strong likelihood that some proposals within this initiative will not progress to final funding stages for the 2016/17 process, but would have merit for future funding consideration, or alternatively may have merit for other Government support mechanisms. Should this occur, MBIE will report back to you on the merits of these proposals.

Risks

There could be a negative reaction to the Budget initiative from some parts of the science sector

16. Because this new budget initiative has a strong focus on the BERD goal, and is coupled with your other new Science and Innovation budget initiative that directly supports growing business expenditure on R&D, the science sector may express concerns about balance between business-focused initiatives and investment in the public science system.
17. MBIE sees these recent business-focused as being considered in balance to other recent initiatives in the Science and Innovation portfolio that extend funding for public institutions. These include the National Science Challenges, increasing the Performance Based Research Fund for tertiary institutions, increasing MBIE's contestable funds, and introducing new Centres of Research Excellence. In addition, we recommend that public science organisations be allowed to form partnerships with industry to develop proposals for new institutes.
18. MBIE will work with your office on Communications Plans around this initiative.

We may not receive proposals of sufficient quality

19. There is a risk that there may not be appetite or capability sufficient to develop worthwhile proposals for new institutes. We can mitigate this risk through a strong and well-communicated workshop phase, and investing MBIE resources to help develop sound business cases for the successful proposals.

Next Steps

20. Officials will discuss these recommendations with you at the scheduled 4 May 2015 meeting. Should you agree to our proposed approach, we will work with your office to develop a communications plan for the Budget announcement and additionally develop the schedule of workshops for introducing the initiative into the regions. We will keep you advised of our progress.

Annex 1: 1439 14-15 Investigating Regional Science Institutes

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BRIEFING

Investigating Regional Science Institutes

Date:	22 December 2014	Priority:	Medium
Security classification:	In Confidence	Tracking number:	1439 14-15

Action sought		
	Action sought	Deadline
Hon Steven Joyce Minister of Science and Innovation	Note the rationale for our recommended approach to establishing regional science institutes.].	N/A

Contact for telephone discussion (if required)				
Name	Position	Telephone		1st contact
Richard Walley	Manager, Science Policy	9(2)(a)	9(2)(a)	<input type="checkbox"/>
Ron Clink	Principal Policy Advisor	9(2)(a)		

The following departments/agencies have been consulted [double click box & click 'checked']					
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<input type="checkbox"/> Other:			N/A		

Minister's office to complete:

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| <input type="checkbox"/> Seen | <input type="checkbox"/> Overtaken by Events |
| <input type="checkbox"/> See Minister's Notes | <input type="checkbox"/> Withdrawn |

Comments:



BRIEFING

Investigating Regional Science Institutes

Date:	22 December	Priority:	Medium
Security classification:	In Confidence	Tracking number:	1439 14-15

Purpose

This briefing provides advice on (i) a proposed approach to determining if and where Regional Science Institutes might be established in New Zealand; (ii) what factors would drive the focus of the institutes' research; and (iii) the type of operating model that would be used.

Recommended action

The Ministry of Business, Innovation and Employment recommends that you:

- a **Note** the development of our proposed approach to establishing Regional Science Institutes in New Zealand has been based on our involvement in recent initiatives within New Zealand (such as the newly developing ICT graduate schools) and on a literature review of similar interventions in other jurisdictions

Note

ppRichard Walley
Manager, Science Policy
People, Science and Enterprise MBIE

Hon Steven Joyce
Minister of Science and Innovation

..... / /

22 / 12 / 2014

Background

1. The Government made an election manifesto commitment to investigate the establishment of Regional Science Institutes in New Zealand. 9(2)(f)iv

2. You have expressed interest in developing these science institutes with a strong mission orientation towards working closely with end users of research, particularly with business and industry. You also expressed an interest that these institutes themselves might:
 - begin life as private-public type entities, or perhaps as non-government research entities (eg the Cawthron Institute);
 - that the balance of their revenue streams, initially and ongoing, be derived more from client-centred services and knowledge exchange than from government funding; and
 - that this balance would shift strongly over time (ten years) towards the institutes becoming fully commercialised, client-centric research entities.

Underlying Policy Rationale for the Institutes

3. The rationale for considering the establishment of regional science institutes in New Zealand is effectively embedded in the objectives, related activity, and policy issues highlighted in the Government's Business Growth Agenda, in its draft National Statement of Science Investment, and to some degree also in the Tertiary Education Strategy.
4. Many of the policy interests contained in those three strategic documents focus on getting greater impact from our science investments, including driving stronger connectivity between researchers/science and firms/technology. While many policies are oriented towards national level interests, other activities are directed more specifically towards unique regional interests. With regards to the establishment of regional science institutes, interventions are likely to be oriented towards unique regional opportunities, but should also contribute to the high-level objectives of these three Government strategies.
5. As discussed with you previously and through expressions in this briefing, we consider that the initiative has potential to make a strong contribution to economic growth and innovation in New Zealand if it focuses on addressing regional growth opportunities, invests in local collaboration to overcome scale and information barriers, and leverages talent and investments towards turning science into important technologies for export and international attraction.

Growing BERD and Science Impact

6. At a national level, the BGA states that innovation and science need to play a bigger role in achieving stronger economic growth for New Zealand, and this necessarily includes a strong focus on stimulating technological and other forms of business innovation across the whole country. Government funding for business R&D, a critical factor for stimulating business innovation and growth, increased by almost 80 per cent from 2010 to 2012 to a total of \$146 million. Businesses themselves have also contributed more, increasing funding of their own R&D by 17 per cent between 2010 and 2012 and topping \$1 billion for the first time.
7. You have now set a goal of lifting business expenditure on R&D to 1.0% of GDP by 2018 from its current level at 0.54% of GDP, and this will require business R&D to grow by 15% per year [refer 0711 14-15]. You have already committed in your manifesto (and the Speech from the Throne) to a further \$20m per annum funding for business R&D grants.
8. As Government and firms continue to grow their levels of investment in business R&D, an important complement to those investments is the assurance of a growing and relevant

contribution from Government's other science investments, as stated in the draft National Statement of Science Investment. Improving the relevance of science to business and other end-user interests and enabling its effective transfer into new technologies, new firms, and new products and services, is essential to growing more productive firms and a more productive economy. The Tertiary Education Strategy further stipulates that the Government expects tertiary education organisations to work more closely with industry to improve the relevance of research and achieve greater transfer of knowledge, ideas and expertise to industry and wider society.

Improving Transfer and Connectivity

9. In regard to knowledge and technology transfer, New Zealand currently suffers from relatively poor connections between its public research and business where we rank 29th of 33 countries in the OECD for both large and small firm collaboration with public research institutions. And from this low base, another key indicator shows there is also a wide variation on rates of academic-corporate co-publications (one indicator of collaboration). This includes the critical subjects of Engineering, Computer Science and the Social Sciences which have a growing publication rate nationally, but which display zero or negative growth in academic-corporate co-publications.
10. Recent Government initiatives include the newly developing ICT graduate schools, additional Centres of Research Excellence, new technology-focused Incubators and actions to raise overall rates of engineering graduates. Each initiative represents new ways of fostering improved innovation outcomes through greater connectivity and transfer of knowledge between research-based institutions and industry. Regional science institutes would fit into a similar category of connectivity improvement efforts, specifically connections between science/researchers and technology/firms, and should be complementary to these other initiatives.

Regional specific factors

11. As stated above, many of New Zealand's science and innovation interests play out at a national or international scale and thus require a commensurate scale of Government focus and intervention. However, some issues can also be attributed to local or regional interests, and thus may require more localised intervention. Technological change and innovation are central to the quest for regional development. In the globally-connected knowledge-driven economy, the relevance of agglomeration forces that rely on proximity continues to increase, paradoxically despite declining real costs of information, communication and transportation.
12. The recently published Regional Economic Activity Reports for 2014 indicate that regional shares of national GDP in New Zealand show significant variation in the size of each regional economy. The most populous centres of Auckland, Wellington and Canterbury generate 62 per cent of New Zealand's GDP, while half of our regions make up only 16.1 per cent of the national economy.
13. As it relates to business R&D support, the main centres have also had the greatest percentage of firms receiving R&D grant assistance (Student, Project and Growth grants) and the greatest share of funding from Callaghan Innovation since February 2013. Auckland has had 428 grant recipient firms over that time (40% of total number of firms receiving grants); Canterbury has had 158 recipient firms (15% of total); and Wellington has had 144 recipient firms (13.5% of total). The next highest region is Bay of Plenty at 60 firms (5.5% of total). This is consistent with international evidence showing that technology policy often appears to reinforce regional inequalities as more public resources (both in absolute terms and as a proportion of regional GDP) flow to richer regions due to their greater absorptive capacity.
14. In addition to this predictable flow of Government research and development support to firms operating in main centres, the majority of New Zealand's research institutions, both public and private, are also more highly concentrated in these same regions. Regional science

institutes can play an important and complementary role to other Government initiatives seeking to accelerate growing rates of business R&D activity in New Zealand. They could also congregate and facilitate relevant research expertise towards any burgeoning business R&D developments in certain regions where access to research expertise remains limited or costly.

International Evidence

15. There are good examples internationally where other jurisdictions have recently established or are developing private-public research centres and networks. These research centres/networks see business and industry taking a lead role on identifying what strategic R&D pathways they will commit to advancing and will invest in. Industry assumes the mantle of leadership and governance of the research centre(s), and largely determines what complementary 'external science' expertise may be needed. Government works closely with industry in each of these cases to establish the centres over a period of time and ensure they have industry-related science and technology oriented missions.

Proposed Selection Process

16. Our proposed approach would effectively continue our investigation into whether and where regional science institutes should be established in New Zealand. It is based on the current ICT graduate school development process you have initiated here in New Zealand. The approach uses an Expression of Interest (EOI) and Request for Proposal (RFP) process to extract, utilise, and develop entrepreneurial knowledge from the regions and to drive connectivity between industry and tertiary actors in the design, build and implementation of the graduate schools.
17. As described above, this approach is very similar to initiatives in other countries that seek to drive greater investment and connectivity between business/technology and researchers/science. We highlight approaches in two countries, Finland and Australia, in Annex 1 for your information.
18. For the regional science institutes, we propose an industry-led approach that is intended to reveal:
 - a. where there may be business and industry commitments emerging in the regions which fit to the region's unique and comparative economic advantage and focus on developing new knowledge and potentially disruptive technologies;
 - b. where such commitments would both attract and benefit strongly from access to, and collaborations with, complementary 'external science' expertise embedded in an institute;
 - c. where such science and technology developments might lead to expanding export opportunities and/or attract international expertise and investment to New Zealand; and
 - d. where the Institutes could close key gaps in New Zealand's science-to-technology innovation system and contribute to key Government objectives including increasing rates of business expenditure on R&D, improving the relevance of science to end-users, and advancing specific regional economic interests.

Stages of the selection process

19. We propose that a process for establishing the Regional Science Institutes, with further detail to be provided in 2015, would be along the following lines:
 - *Initial workshops:* workshops would be conducted across the country with relevant industry stakeholders to socialise the initiative, scope potential opportunities and elicit interest from across the regions.

- *Screening phase:* the Government issues an initial Expression of Interest (EOI). A small number of proposals would move onto the next stage.
- *Full business case:* the Government issues a Request for Proposal (RFP) to those who met the initial criteria for success from the EOI process and conducts workshops to further define criteria for success and to answer specific queries from applicants.
- *Negotiation phase:* once proposals have been selected the Government will work with the successful applicants to further develop the project in preparation for implementation.
- *Implementation phase:* the region leads the implementation with oversight from Government.
- *Monitoring and evaluation phase:* the Government works with the regions to monitor and evaluate the performance and impact of the regional science institutes.

Decision making

20. We recommend an expert panel or board be established to screen the EOIs and make recommendations on which proposals would proceed to an RFP process. The panel/board would then also consider the RFPs and select the successful proposals. The panel/board could include experts from MBIE's science board, Callaghan Innovation's board and international experts involved in similar regional initiatives.

Preliminary funding criteria

21. Projects to be funded would be selected based on their business case showcasing their capability and capacity to invest in science and technology that would contribute to both regional and national economic transformation and lead to export growth and/or international investments and attraction of talent to the country (as outlined in paragraph 5). Specific criteria for determining the location of Regional Science Institutes, their research focus and the allocation of funding, including what level of industry co-funding would be required to establish an institute, will need to be determined before any EOI and RFP process commences. Subject to your agreement to the proposed selection process MBIE will develop this criteria.

Risks

22. There are many policy interventions that seek to improve the impact of science investments and simultaneously enable growing rates of business R&D and innovation. We believe this approach to investigating the establishment of regional science institutes is complementary to these other interventions. If it were to eventuate that no specific industry drivers exist to establish the institutes in New Zealand over the near term, then the proposed levels of funding can either be stopped or reallocation to other initiatives that seek similar outcomes.
23. There has also been some concern expressed through the consultation on the draft National Statement of Science investment that our science system is overly complex. While introducing institutes into the system might seem to add to this level of complexity, we advise that if they were to be established, their proposed mission is consistent with strong signals given in the NSSI which focus on greater connectivity, relevance and impact of science to key end users.

Next steps

24. Once we have received your feedback on our proposed process for investigating establishment of regional science institutes, we will come back to you with a more detailed plan early in 2015.

Annexes

Annex 1: International Examples of Research Centre Developments

1439 14-15

Annex one: International Examples of Research Centre Developments

1. MBIE has conducted a literature review of private-public models operating in several countries, including Finland, Denmark, Netherlands and the United Kingdom. We have also had discussions with policy officials in the Department of Industry in Canberra, Australia, where they too are implementing similar initiatives. Two countries, Finland and Australia, are highlighted below. We will work closely with Australian officials in the new year to better understand their approach to developing centres and what that would mean for efforts to establish regional science institutes here in New Zealand.

Finland's SHOKs

2. Finland's strategic centres for science, technology and innovation (SHOKs) represent a unique innovation apparatus in Finland, and perhaps internationally. They were created in 2007 by the Finnish Research and Innovation Council with high hopes of securing strong impacts from focused and intensive research efforts targeted at six selected areas: energy and environment; ICT/digital business; forest industry/Bio economy; metal and engineering; health and well-being; and real estate and construction. Seeking to combine relevant industry-driven and scientific expertise, the SHOK model is currently one of the principal innovation instruments of Finland's innovation policy.
3. The funding model for SHOKs is based on an average of 60% of funding coming from the main government funding body, Tekes, and an average of 40% being co-funded by the companies involved. Between 2008 and 2012, Tekes funded SHOK programmes at a total of over 343 million euros. The Centres are organised as limited companies around clusters of public-private partnerships, with the aim of creating new knowledge and expertise and accelerating innovation processes and industrial renewal through new types of cooperation, interaction and co-creation.
4. The SHOK model has emerged as a popular industry-driven instrument, and the Centres have successfully defined their strategic agendas. There are, however, some problems with the current SHOK model as evidenced in recent independent evaluations. Issues include multiple and often contradictory objectives, tensions between short-term interests of industry and longer-term perspectives required in generating cutting edge or 'breakthrough' research, and despite high expectations for international dimensions to SHOK activity, this has remained low. Further investigation of these issues and tensions in the model could help determine how to best initiate an industry-driven approach in New Zealand.

Australia's Programmes: NSW Knowledge Hubs and National Industry Growth Centres

5. In New South Wales, Australia, the state government has facilitated Knowledge Hubs which are built on existing agglomerations of industry and which develop platforms for businesses to improve collaboration with each other and with public researchers. These hubs are independent entities formed and driven by industry, which determines the firm-level R&D strategies and also helps to determine what 'external science' expertise would be beneficial to their efforts. The state mainly plays a facilitation role and does not fund the hubs.
6. The Knowledge Hubs are developing in five key sectors including Digital Creative, Medical Technology, Transport & Logistics, Energy Innovation and Financial Services, in response to the Economic Development Framework 2014 Priorities and Industry Action Plans. All five industry-led Knowledge Hubs have completed business strategies, with the Energy Innovation and Digital Creative Knowledge Hubs having recently been launched. The others are expected to launch and initiate projects soon.
7. To date, there is strong industry commitment to Knowledge Hubs which is evidenced by the broad range of stakeholder involvement, the high calibre of representation from major sector players, and significant funding commitments to Hub projects. This includes funding and in-

kind contributions (estimated at \$7.5 million) for 39 projects that are solely industry supported.

8. In addition to the New South Wales Knowledge Hubs, Australia is also developing Industry Growth Centres. This new initiative, announced as part of their Industry Innovation and Competitiveness Agenda on 14 October 2014, is the centrepiece of a key part of the Australian federal government's new industry policy direction to boost productivity and competitiveness.
9. These growth centres will initially be established in five sectors: Advanced Manufacturing; Medical Technology and Pharmaceuticals; Oil, Gas and Energy Resources; Mining Equipment, Technology and Services; and Food and Agribusiness. The centres represent a more holistic approach to supporting industry innovation and growth. They will focus on encouraging business-research collaboration, reducing excessive regulation, improving workforce skills, strengthening global supply chain linkages, and improving commercialisation outcomes. Science and innovation will be at the forefront of the initiative.
10. Each Growth Centre will be industry-led and will operate with a Board responsible for the operation of the Centre and for the development and implementation of activities. Growth Centres will be funded for a four-year period and are then expected to be self-sufficient. As the initiative is ongoing, the Government can establish new Growth Centres in different sectors in the future to respond to changes in domestic and global circumstances. Initially, each Growth Centre will receive up to \$3.5 million from the federal government.
11. Following public consultation across Australia, a facilitated expression of interest process will commence. Their approach will involve a facilitated process that brings together organisations to develop one proposal for each growth sector. This process will also help determine the workable and effective scope of each Growth Centre.