NEW ZEALAND

Hot STI issues

- Providing long-term goals and clear governance of the innovation system.
- Developing and growing knowledge-intensive businesses.
- Further strengthening the internationalisation of the innovation system.
- Rebuilding Christchurch as a high-technology city.

General features of the STI system: In spite of a significant reform effort, New Zealand's long-run productivity performance has been disappointing. Its economic geography – a small market in a peripheral location – creates challenges. Its economic structure relies heavily on its primary industries and it lacks large firms. This limits the level and leverage effects of business R&D investments throughout the broader STI system. BERD intensity is low at just 0.54% of GDP in 2009 (Panel 1[(d)]). Yet the innovation system has some strengths. The comparatively high share of public research funded by industry indicates sound linkages (1[(o)]). The country's RTA in bio- and nano-technologies has recently risen strongly and it has remained rather stable in ICTs and environment-related technologies (Panel 3). Educational attainment and skill levels are strong. PISA scores in science for 15-year-olds are the second highest in the OECD (1[(t)]). Some 40% of the adult population are tertiary-qualified (1[(s)]), 30% persons employed are in S&T occupations (1[(v)]) and there are 12.4 researchers per thousand total employment. Researchers are reasonably well integrated into global networks: 50% of scientific articles and 20% of PCT patent applications were produced with international collaboration (1[(q)(r)]). ICT infrastructures are well developed. The number of fixed broadband and wireless subscribers is now a comparably high 26 and 54 per 100 inhabitants, respectively (1[(k)(l)]), and the e-government readiness index is above the OECD median (1[(n)]).

Recent changes in STI expenditures: GERD is relatively low at 1.30% of GDP but grew by 4.7% between 2005 and 2009. In 2009, industry funded 38% of GERD, government funded 54% and 5% was funded from abroad. Funding was made available for national science challenges to boost "fundamental" innovation solutions. The new Ministry of Science and Innovation (MSI) is promoting the redevelopment of Christchurch, which has a number of high-technology firms, as a high-technology city and has made significant investments in the Natural Hazards Platform.

Overall STI strategy: The MSI Statement of Intent 2011-14 reflects a shift in strategy. It highlights two high-level outcomes – growing the economy and building a healthier environment and society – and remains committed to innovation in traditional resource sectors. However, it intends to add new areas of capability in knowledge-intensive activities, such as high-technology manufacturing and the services sector. It identifies six priority areas: high-value manufacturing and services, biological sciences, energy and minerals, hazards and infrastructure, the environment, and health and society.

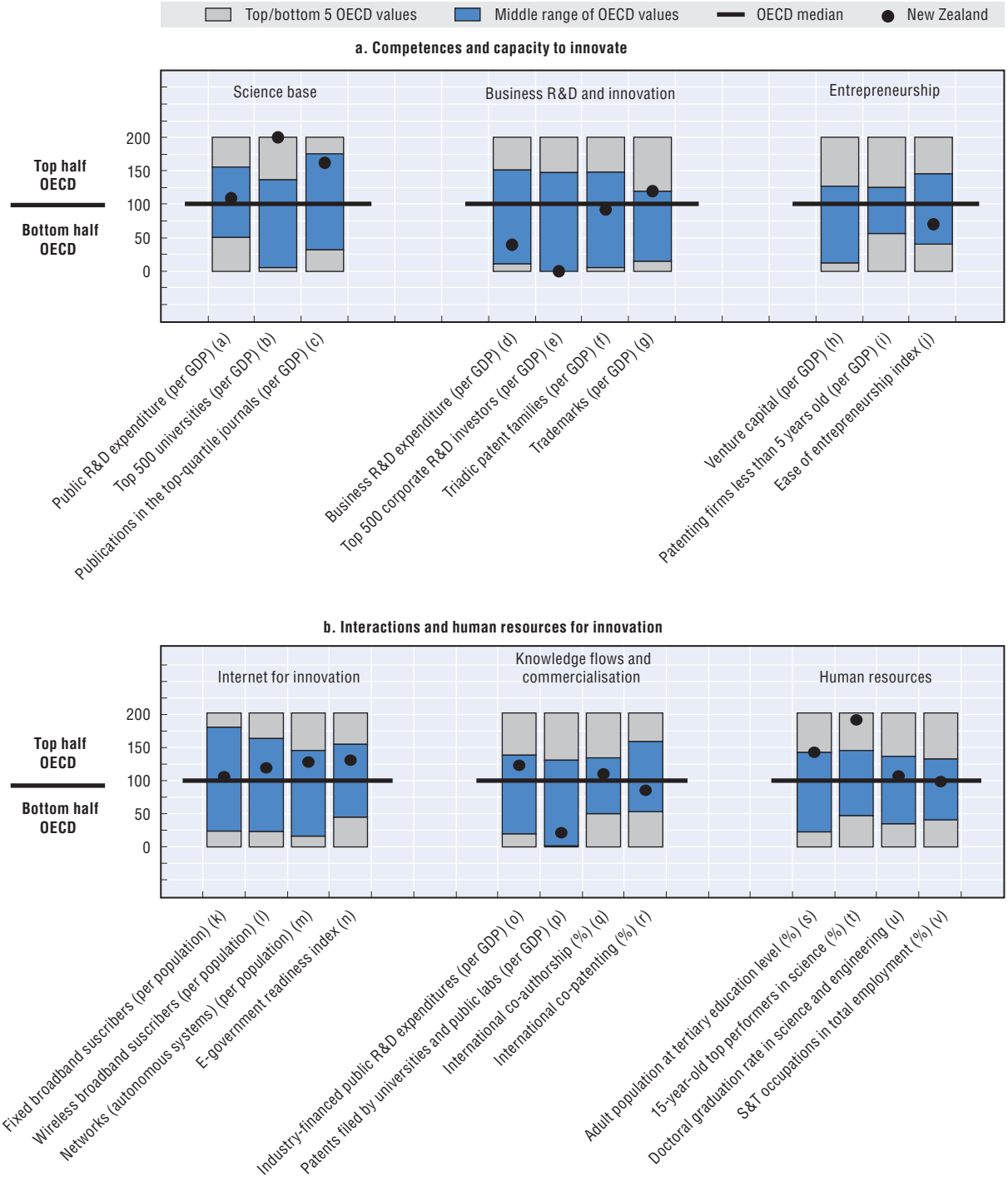
STI policy governance: MSI was created in 2010 and assumed responsibility for the Crown Research Institutes (CRIs) in close co-operation with the Royal Society of New Zealand. In line with the *OECD Review of Innovation Policy: New Zealand* (2007) and a review of

Key figures

Labour productivity, GDP per hour worked in USD, 2010	**34.0**	**GERD, as % of GDP, 2009**	**1.30**
(annual growth rate, 2005-10)	(+1.1)	(annual growth rate, 2005-09)	(+4.7)
Environmental productivity, GDP per unit of CO_2 emitted in USD, 2009	**4.08**	**GERD publicly financed, as % of GDP, 2009**	**0.70**
(annual growth rate, 2005-09)	(+3.2)	(annual growth rate, 2005-09)	(+5.5)

Figure 10.30. **Science and innovation in New Zealand**

Panel 1. Comparative performance of national science and innovation systems, 2011



Note: Normalised index of performance relative to the median values in the OECD area (Index median = 100).

the eight CRIs, reforms were introduced in 2011 to change their focus from profitability towards growth in the sectors they are linked with. This five-year funding agreement included shifting USD 155 million from contestable funding to core funding to increase the focus on research collaboration and technology transfer. Policy evaluation tends to be impact-oriented and will become "smaller and quicker" in the next decade, with a focus on pilot policy programmes.

***Science base*:** New Zealand has a dual science system based on universities and the CRIs. The system is strong, as reflected in public expenditure on R&D, highly ranked universities and its research publication record ($1^{(a)(b)(c)}$). Public R&D expenditure was 0.76% of GDP in 2009, but with the restructuring of CRIs, funding for health, state-owned and business-related research will increase.

Business R&D and innovation: Although BERD is comparatively low, New Zealand reversed its R&D tax credit in 2010. MSI currently offers four R&D support schemes: technology transfer vouchers, technology development grants, capability funding and funding from the New Zealand Venture Investment Fund (NZVIF).

Entrepreneurship: New Zealand's venture capital industry is relatively immature. The NZVIF has however made an impact, and invests USD 132 million through the Venture Capital Fund of Funds and the Seed Co-investment Fund. The Incubator Support programme facilitates the growth of early-stage businesses.

ICTs and scientific infrastructures: In view of New Zealand's geography, a high-performing ICT infrastructure is critical. To build on its current ICT capacity, the government will invest nearly USD 20 million over the next four years in the National e-Science Infrastructure (NeSI), a network of supercomputers, software and data services. NeSI will use the Kiwi Advanced Research and Education Network (Karen), which offers very high capacity broadband. MSI has also developed an Innovation Entrepreneurship Programme to support entrepreneurs in digital technologies. Ultra-fast Broadband in Schools (UFBiS) is a secondary school programme.

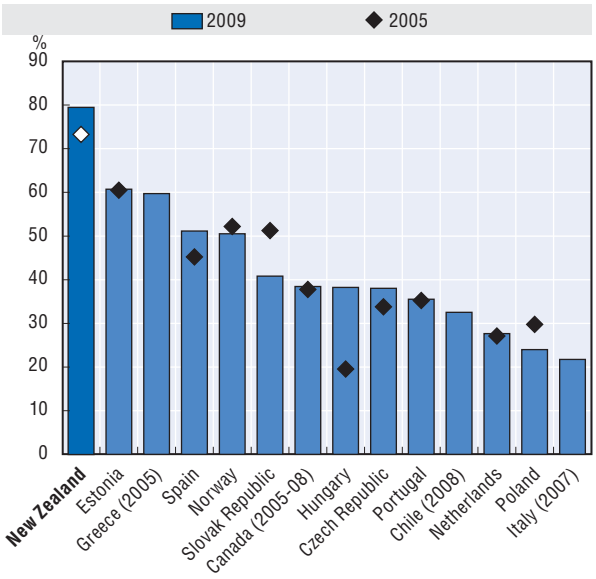
Knowledge flows and commercialisation: A National Network of Commercialisation Centres (NNCC) is to be in place in 2012, linking research organisations, entrepreneurs, incubators and regional development agencies. To ensure that the intellectual property regime remains in line with international standards, a new Patents Bill is currently under debate. Subject to commercial sensitivity, research findings are required to be published in journals and publicly available databases. This will increase the flow of publicly funded research to the general public, through platforms such as the Kiwi Research Information Service and *geodata.govt.nz*.

Globalisation: New Zealand has strong international networks, in spite of its remote location. Global Expert, a network of experts from universities, research institutions and global companies, assists firms to identify scientific, technological and market opportunities. New Zealand Trade and Enterprise (NZTE) and Beachheads Advisor Networks also link high-growth businesses with international investors. Allowing international PhD students to pay domestic tuition fees has increased interest from international students.

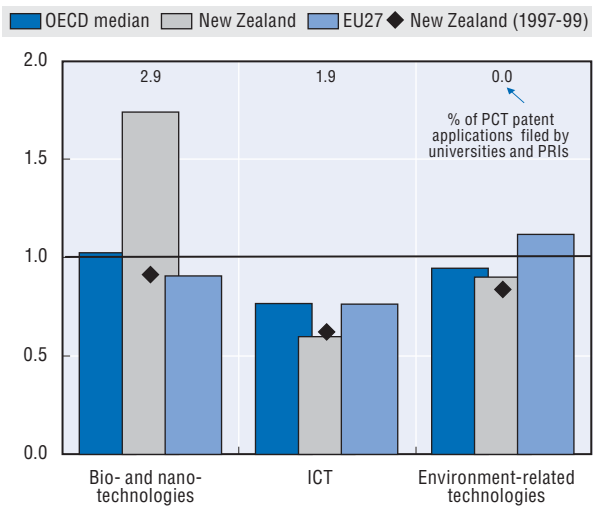
Human resources: To build on its already high level of human capital, a Science Programme was launched to raise student achievement in schools; the Tertiary Education Strategy 2010-15 outlines the vision for higher education. The Marsden Fund and Rutherford Discovery Fellowships fund exceptional research and support the career development of talented researchers. New programmes announced in 2011 include the Engaging New Zealanders with Research Science and Technology Fund, and Science and Biotechnology Learning Hubs.

Green innovation: The Green Growth Advisory Group, which represents the business and science sectors, has explored policy options for greener growth and presented a report to government in December 2011, *Greening New Zealand's Growth*. The report focuses policy advice on three topics: how to leverage an existing clean green brand, opportunities for the smarter use of technology and innovation, and options for SMEs to move to a lower carbon economy.

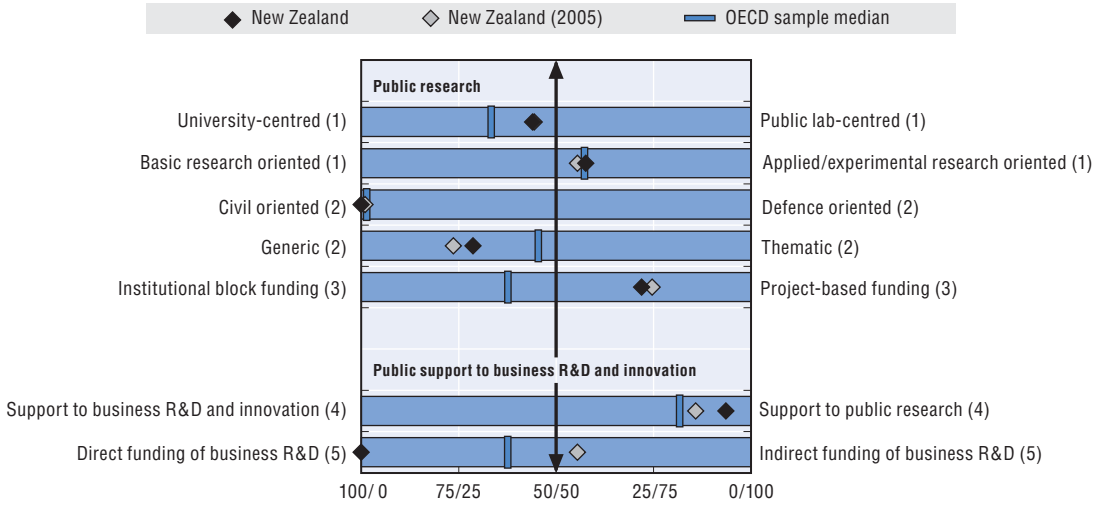
Panel 2. Share of BERD performed by SMEs, selected OECD countries (BERD < = 1% of GDP), 2005 and 2009
As a % of total GERD



Panel 3. Revealed technology advantage in selected fields, 2007-09
Index based on PCT patent applications



Panel 4. Overview of national innovation policy mix, 2010



1. Balance as a percentage of the sum of HERD and GOVERD.
2. Balance as a percentage of total GBAORD.
3. Balance as a percentage of total funding to national performers.
4. Balance as a percentage of the sum of HERD and GOVERD funded by government and higher education and components of (5).
5. Balance as a percentage of the sum of indirect funding of business R&D and innovation through R&D tax incentives and direct funding of BERD through grants, contracts and loans.

Source: See reader's guide and methodological annex.

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