



**STRENGTHENING INSTITUTIONAL CAPACITIES
FOR INNOVATION POLICY DESIGN AND
IMPLEMENTATION IN CHILE**

ASSESSMENT AND PROPOSALS

10 March 2010

BACKGROUND

This document has been elaborated by the OECD and the IADB with the support and collaboration of the CNIC. The document is part of an effort of the CNIC to support the dynamics of innovation policy making in Chile on the basis of international good practices and peer review mechanisms.¹ The document reviews and supports the process of strengthening institutional capacities for designing and implementing public policies for innovation in Chile.

The OECD and the IADB have been supporting the design and implementation of innovation policies in Chile in the last years, addressing issues of policy design, institutional governance and capacity building. The OECD and the IADB have accumulated extensive expertise in policy advice. The OECD is a forum for policy assessment and follow-up. The OECD multidisciplinary approach to policy analysis and dialogue through peer reviews and direct participation of senior policy makers in its work are recognised strengths. The IADB has extensive in-country presence and long experience in financing for development, capacity building and technical assistance. This document builds on the strengths of the two institutions and on the shared accumulated knowledge of the Chilean economy and the evolution of its policies.

The OECD is a unique forum for policy analysis and follow up where member countries work together to address the economic, social and environmental challenges of globalisation. The OECD offers a space for policy dialogue where member countries can share common problems and analyse common challenges. The OECD carries out policy oriented research in response to member countries requests and on key emerging challenges for global economies. The OECD mandate also allows the Organisation to work with non member Countries, responding to priorities established by its member countries. At the end of 2009, after the completion of the accession review process, Chile has been invited to become the 31st member Country of the OECD. The formalisation of Membership is currently ongoing, and the accession will be effective when all the required formalities will be finalised.

In the field of innovation policies the OECD has a long-standing experience on advising and supporting Governments in their efforts to support innovation for increasing productivity and well being of citizens. The OECD work on innovation policies includes: i) analyses of scientific, technological and industrial dynamics, ii) reviews and assessment of institutional frameworks, governance and policy instruments for supporting innovation and iii) empirical analyses based on aggregate and firm-level data assessing the determinants and impacts of innovation and its responsiveness to policies. The OECD accompanies its assessment process with follow-up of policy design and implementation, thus helping member countries to increase the effectiveness and impacts of their policies.

1. This document has been produced under the direction of Mario Pezzini, OECD and Flora Painter, IADB. Annalisa Primi co-ordinated the elaboration of the document, with the collaboration of Juan José Llisterri, Jean Guinet, Carlos Icaza Lara, Gabriel Casaburi and Mikael Larsson. The CNIC provided essential support for the elaboration of this document. The authors acknowledge the involvement by Eduardo Bitrán, Leonardo Mena, Daniel Ossandón and José Miguel Benavente, who provided valuable comments and facilitated the dialogue with the main stakeholders of the Chilean National and Regional Innovation System.

OECD has been following-up the process of policy design and implementation of innovation policies and territorial development in Chile since 2006. The Innovation Policy Review has been published in 2007 and the Territorial Review of Chile in 2009.² The two reviews contributed to the process of building institutions to support innovation and identified lines of action for public policy to support innovation and favour innovative behaviour in the public and private sector.

The IADB is the main source of multilateral financing and expertise for sustainable economic, social and institutional development in Latin America and the Caribbean. The IADB Group, composed of the Inter-American Development Bank (IADB), the Inter-American Investment Corporation (IIC), and the Multilateral Investment Fund (MIF), provides solutions to development challenges by partnering with governments, companies and civil society organisations, thus reaching its clients ranging from central governments to city authorities and businesses. In addition, the Bank also offers research, advice and technical assistance to support key areas like education, poverty reduction, agriculture, competitiveness and science and technology.

In the field of innovation, the IADB has acquired a wide-ranging experience in the analysis and implementation of policies and programs executed in Chile and in other countries of the region. With the creation of the Science and Technology Division (SCT) in 2007, the Bank's analytical and operative capacity has increased significantly, enabling it to appropriately accompany Chile and other countries in the region in the design, execution and evaluation of technological development and innovation programs.

In recent years, with innovation and productivity becoming emergent priorities for the Chilean Government, different divisions from the IADB and the MIF have been involved in a wide range of operations focused on the strengthening of the innovation and technological capacity of sub-national governments, as well as on the enhancement of the productive development and competitiveness of SMEs clusters at the regional level. Specifically, the Bank has been involved in key projects such as the creation of the Regional Development Agencies (ARDPs), the Strengthening of the Chile's Digital Information Strategy, the execution of the Development and Technological Innovation Program (PDIT), and other related programs developed conjunctly with SUBDERE. Likewise, in the analytical front, the Bank is currently finalising a series of studies performed in Chile to better understand the dynamics of Regional Innovation Systems (RIS), as well as a comprehensive study focusing on innovation investments and its impact on the productivity of Chilean firms.

The OECD and the IADB consider that one of the major challenges for improving the effectiveness of innovation policies in Chile is to strengthen and empower the institutions responsible for policy design and implementation and to better address the regional dynamics. Factoring in the regional dimension could help to overcome the current co-ordination failure, increase policy effectiveness, bridge the gap between design and implementation of policies, and better align national and regional initiatives to support R&D and innovation.

2. A follow-up of the Innovation Policy Review providing a more detailed assessment of the National Council for Innovation and Competitiveness (CNIC) was delivered early 2009.

TABLE OF CONTENTS

FORWARD NOTE: INNOVATION POLICIES IN A TIME OF CRISIS	5
EXECUTIVE SUMMARY	7
1. INTRODUCTION	11
2. INNOVATION POLICY IN CHILE: RECENT ADVANCES	13
2.1. Rising consensus for innovation as development-driver and policy paradigm shift.....	13
2.2. Increasing public support for innovation	14
2.3. Progress in institutional strengthening and policy learning	15
3. INCREASING POLICY EFFECTIVENESS: CURRENT CHALLENGES	17
3.1. Creating the conditions for long-term commitment to innovation.....	17
3.2. Defining effective mechanisms for resource allocation to innovation.....	18
3.3. Enhancing policy co-ordination	19
4. PROPOSALS TO INCREASE THE EFFECTIVENESS OF INNOVATION POLICY IN CHILE	21
4.1. Ensuring long term commitment to support innovation	21
4.1.1. Capitalising on recent efforts and strengthening institutional capacities: the role of CNIC and the ARDP.....	22
4.1.2. Increasing the participatory approach in strategy building and integrating regional bottom-up diagnosis	24
4.1.3. Mobilising private sector commitment towards innovation	25
4.2. Improving the mechanisms for the allocation of resources	26
4.2.1. Overcoming the bottleneck between the Treasury Department and the Ministry of Economy...26	
4.2.2. Improving the Regional Assignment mechanism in the FIC	27
4.2.3. Assuring the assignment of the 10% for production development of national public agencies to regional initiatives	27
4.2.4. Enabling the matching of different funds for innovation	28
4.2.5. Ensuring trust and transparency	29
4.4. Addressing the co-ordination failure and improving the governance structure	29
4.4.1. Strengthening institutions for strategic planning and budgeting: the role of the CMI	30
4.4.2. Empowering regional actors in designing and implementing innovation policies.....	31
4.3.3. Creating the appropriate incentives to align national and regional actions	34
4.3.4. Tackling “economic regions” beyond “administrative regions”	36
4.3.5. Support policy learning and experience sharing.....	36
ANNEX	38
ACRONYMS	43

Tables

Table 2.1. Chilean- Budget for Science, Technology, Innovation, including support to human capital development for innovation.....	14
Table 3.1. Advances and challenges to improve policy effectiveness in Chile.....	17
Table A.1. Distribution of the total innovation budget by category of investment (%).....	38
Table A.2. The regional scientific and technological centres	39
Table A.3. Chile's territorial units, governance and main functions at sub-national level	40
Table A.4. Size and funding in OECD regional development agencies, selected examples.....	41

Figures

Figure A.1. Public Investment in Innovation.....	38
--	----

Boxes

Box 2.1. Main advances in the institutional strengthening of regions	15
Box 4.1. The relevance of laws and regulations in institutional strengthening	22
Box 4.2. Experimenting the participatory approach in strategy building in regions	25
Box 4.3. The evolution of Luxinnovation as a one-stop-shop mechanism.....	29
Box 4.4. Strengthening institutions for improving policy effectiveness: NSTC and OSTI in Korea ...	30
Box 4.5. Empowering regional actors: different trajectories in Finland, Italy and Korea	31
Box 4.6. New Zealand: an experience of networking local development agencies.....	34
Box A.1. Horizontal co-ordination of STI policy	41
Box A.2. The European Consortium of Innovative Universities	42

FORWARD NOTE: INNOVATION POLICIES IN A TIME OF CRISIS

OECD countries increasingly recognise that long-term growth and productivity challenges are tightly related with the capacity to innovate and to introduce new products, processes, services and organisational routines in the economic system.

The 2008 financial crisis urged OECD countries to rethink the economic, social and environmental sustainability of current growth models and induced countries to embrace a collective reflection on finding new sources of growth for supporting a transition towards stronger, cleaner and fairer economies. Most OECD countries identify knowledge and innovation as the new engines of growth. However, innovation and knowledge-centred growth agendas require policies to support technical change and innovation, particularly to offer solutions for pressing social and environmental challenges, such as job creation and energy sustainability of production.

Most OECD countries increased their support to innovation in the aftermath of the crisis to preserve learning trajectories in R&D and to avoid the cumulative negative effects of a shrinking in current R&D investments on future streams of innovations. However, “more of the same” is not always the best option, and countries are thinking about which sets of policies to implement, with which intensity and towards which direction. The process of strategy building, priority setting and budgetary allocation is crucial. And it requires strong and empowered institutions.

With innovation rising both in the priorities of governments and in their budgetary allocations, the strategic relevance of innovation policy choices also augments. The institutional infrastructure for innovation policy shapes the processes of priority setting and budgetary allocation and influences policy-making capacity for effective design and implementation. Hence, considering that innovation policy emerged high on the political agenda in Chile over the last few years, it seems extremely relevant to capitalise on that experience and identify ways for strengthening its institutionality.

At the time of the delivery of this Note to the Government of Chile, the country has been devastated by an unprecedented earthquake. The consequences of this natural disaster in terms of human losses and infrastructure are immense. Reconstruction and post-disaster recovery will certainly mark public policy investment and interventions in the next legislation. The newly elected President already expressed that the new Government program will be adjusted to serve four main priorities in the next three years: revamping production and productivity, domestic security and supply of basic facilities and services (such as water, energy and transport), reconstruction investments and developing a sustainable financing plan for supporting those initiatives.

The aftermath of a natural disaster is always challenging for policy making. Countries need to put in place quick responses to address immediate emergencies, and at the same time they need to plan reconstruction investments with a mid and long-term view. Inter-ministerial committees and commissions, including the national Innovation Council and the inter-ministerial Committee for Innovation, at national and regional levels can play a crucial role in orienting those strategic decisions.

The agenda for innovation remains a pillar in the country's growth and development strategy and considering the cumulative and long term implications for productivity, employment and growth, it is important to preserve innovation investments. The effects of reconstruction and production investments on productivity will not be immediate. There will be a time-lag, and during this time, the economy is likely to experience a slowdown in productivity growth. Clearly, the time for re-adaptation depends on many factors, and besides the opportunities for reconstructing "more and better", there is some degree of stickiness production systems which influence the direction and pace of the reconstruction process. To support this process, the innovation policy would require a "smart policy mix" to match measures to support rapid recovery with new incentives for R&D and innovation, adoption of new technologies, and development of new solutions tailored to the reality of the country and its regions. And for better facing this challenge, strong and trustworthy institutions are required.

EXECUTIVE SUMMARY

Since mid of the 2000, Chile is in the process of building a national consensus for innovation as one of the pillars of the country's development strategy.

Chile advanced in the design and implementation of innovation policy. Those advances can be summarised in three major points: i) Rising consensus for innovation as a development driver and a policy paradigm shift; ii) Increasing public support and financial resources for innovation; and iii) progress in institutional strengthening and policy learning. While it is too early for a complete evaluation of the impact of the Chilean National Innovation Strategy, an analysis of its major implementation challenges is a timely exercise. Preserving the dynamic consistency of policies and ensuring capitalisation of efforts is a key challenge for building knowledge-based competitive advantages.

This document identifies some lines of actions to contribute to the process of institutional strengthening of innovation policy in Chile, with a special focus on the regional dimension, focusing on three key policy areas: i) Ensuring long term commitment to support innovation; ii) Improving the mechanisms for the allocation of resources; and iii) Addressing the co-ordination failure and improving the governance structure.

ENSURING LONG TERM COMMITMENT TO SUPPORT INNOVATION

Chile needs to strengthen the institutional capacity to manage innovation policy, capitalising on recent efforts and identifying steps to improve the current policy design and to support long term commitment for innovation.

The experience of OECD countries shows that it is necessary to ensure continuity to investments in support of innovation. Common institutional mechanisms put in place by OECD countries to ensure a long term commitment are: the creation of advisory bodies for strategy building with participation of politically-assigned responsible and of independent experts in the field at the national and regional level. Permanent policy dialogues in which different stakeholders discuss the design and implementation of the policy are usually created. In addition, OECD countries recognise the need of dynamic time consistency of policies and the fact that policies have a life cycle which requires adjustments and fine tuning when the economy and the society evolve and express new demands and needs. Chile should avoid “stop-and-go” interventions in supporting innovation; continuity and a systemic approach are required given the cumulativeness and sunk costs associated with the generation of scientific technological and production capabilities. Support to training of skilled human resources, qualification of research institutions, R&D subsidies and fiscal incentives, as well as support to networks and partnership for innovation are complementary and necessary initiatives to support innovation.

The role of the CNIC (National Council for Innovation and Competitiveness) as an independent and qualified strategic body for strategy building should be strengthened.

Most OECD countries prioritise the empowerment of advisory bodies for innovation strategy building. The governance of science, technology and innovation (STI) is generally organised around a multi-layered matrix of ministerial bodies, government agencies, advisory structures and a range of actors, concerned

with the design and steering of policy and its implementation. Most OECD countries have an institutional body which is responsible for overseeing the policy process at the Ministerial level. Beyond the differences in the institutional architecture for innovation policy, all OECD countries empower the institutions in charge of innovation policy. It would be recommendable to establish by law the role of the CNIC. This is a fundamental step in the legitimisation of innovation policy as a policy of the State, and not as a Government preference. The composition of the Council is determinant for endowing it with strategy building capacity. Clarifying the relationship of the CNIC with regional authorities is a desirable step to increase policy accountability and to ensure a more bottom-up policy strategy building and the commitment towards policy implementation.

The country could empower regional actors in designing and implementing innovation policies. There is a need to clarify institutional responsibilities at the regional level in the area of innovation and to differentiate between strategy building and executive functions, and to clarify the relationship between the Regional Development Agencies (ARDP) and the Regional Government.

The ARDP have been initiated recently (in 2006-2007), hence they are in plain process of institution building. In strengthening the role of ARDP as agencies responsible for strategic planning, it would be important to identify mechanisms for fostering dialogue and identification of common or synergic priorities between regions. The ARDP represented the first effort to build capacities in the regions to support production development and innovation, with a strong support from central administrations which was supposed to be gradually reduced with time. The ARDP have recently been modified and transformed into corporations to increase their autonomy. The new structure of the corporations transforms them in institutions rooted in the regional government.. Their installed capacity helps them to qualify as well endowed agencies for being the institutional referent for innovation policy in the region.

Co-ordination among governmental bodies is crucial for ensuring policy sustainability and implementation. Increasing the participatory approach in strategy building, integrating regional bottom-up diagnosis and mobilising private sector commitment towards innovation are necessary steps for improving policy effectiveness.

Chile has already made significant progress in the process of strategy building. However, improving the participation of different stakeholders could help in strengthening the consensus for innovation. Factoring in the regional dimension usually couples the delegation of financial resources with targeted effort to strengthen the institutions at the regional level and to clarify the responsibilities in strategy planning and policy implementation. Rising public commitment towards innovation needs to be coupled with a rising private investment in innovation. Involving representatives from firms and private sector associations in strategy planning exercises, a common practice in OECD countries, could help in designing instruments which better respond to the private sector needs and to identify which are the co-ordination failures between different initiatives in order to better fine tune policies.

IMPROVING THE MECHANISMS FOR THE ALLOCATION OF RESOURCES

The creation of the FIC (Fondo de Innovación para la Competitividad) represented an important step towards establishing a mechanism for medium and long term financing for innovation. It is necessary to improve resource allocation mechanisms and the Regional Assignment mechanism in the FIC.

There is widespread recognition that in Chile the process of resource allocation to innovation is too bureaucratic and that it needs to be improved to become more effective. Currently the mechanisms for the assignment of resources to innovation are decided on a year-by-year basis during the approval process of the national budget. This limits the margin of manoeuvre of innovation related agencies and confers an excessive power to the Ministry of Treasury on the allocation of resources to innovation. Moving to multi-annual innovation budgets could help to overcome this imbalance. However, the current proposal of law which establishes the CNIC, the FIC and the mechanisms for management of the current cluster policy, does not address this issue. To ensure that the fund responds to its primary function of representing a continuous source of financing for innovation, it is necessary to build strong and trustful institutions for resource allocation. This requires the consolidation of the institutional infrastructure at the national level and the development and the strengthening of the institutionality for innovation policy management at the regional level, as well as a feasible co-ordination mechanism between the two.

The identification of mechanisms to favour the matching of different funds is much needed since it could significantly improve the reach and effectiveness of policies.

The planning agreements (Acuerdos de Programación) could be used as an institutional framework to promote the matching of different funds for innovation and also for multiregional initiatives. Resources of the FIC could be complemented with regional resources of the FNDR (Fondo Nacional de Desarrollo Regional) and/or with resources of private actors.

When gradually transferring capabilities and autonomy to regions, Chile needs to ensure transparency and accountability.

Given its longstanding tradition in policy execution for supporting production development, CORFO can play a determinant role in ensuring transparency and in fostering policy learning in regions. The experience of the ARDP could serve as a good starting point for increasing autonomy in targeting and prioritising. Subdere is also a key actor to ensure transparency and to support capacity building.

ADDRESSING THE CO-ORDINATION FAILURE AND IMPROVING THE GOVERNANCE STRUCTURE.

One of the major drawbacks of is the lack of clear administrative procedures and strong institutional infrastructure for policy management. A major challenge for Chile is to ensure an effective implementation of policies by addressing the co-ordination failure and improving the governance structure.

In principle, the existence of similar programmes administered by different ministries and agencies is not a drawback of policies. Problems arise when scale benefits are unnecessarily compromised as a consequence of bureaucratic competition. Most OECD countries opted for creating inter-ministerial committees or co-

ordinating councils, which often operate at the top or highest levels of government, to improve the coherence and co-ordination of their innovation policies.

The Committee of Ministers for Innovation (CMI) has been created as the main body for assuring co-ordination between different initiatives and for orienting the process of strategy planning. It would be recommendable to strengthen the role of such type of co-ordination in strategic planning and budgeting and to establish in a clearer way its responsibilities and co-ordinating functions.

OECD countries recognise that a prerequisite for effective innovation policies is the political commitment at the highest executive levels of government regarding adequate budgetary allocations in support of STI activities. This commitment needs to be coupled with an adequate governance structure for priority setting and budget allocation. In fact, to be effective an inter-ministerial council should not only be formally entrusted with defining national priorities and ensuring interdepartmental co-ordination of S&T policy orientation and national support programmes: it should exert effectively these responsibilities and be involved in the preparation of the S&T budget. The CMI could represent the strategic space for allowing co-ordination and information exchange at the horizontal (different sectoral responsibilities) and vertical level (regional and national actions).

Chile needs to create the appropriate incentives to align national and regional actions and to identify specific mechanisms for tackling economic and functional regions beyond “administrative regions”.

In OECD economies, the co-ordination is designed following different institutional models and the effectiveness of the effort varies considerably across countries. Science and innovation policy councils like the CNIC have become a key element in these co-ordination efforts. Countries and regions in OECD increasingly recognise that innovation takes place in networks which have local but also national and international components. There are specific instruments to address these issues according to the characteristics of the region in question. Regions are investing in attracting human and financial capital from other locations. Regions can apply specific conditionalities to support instruments to favour local, national or international collaborations according to the needs and the regional development strategy. Agencies in charge of strategy planning might consider the possibility of carrying out joint national and regional road-mapping exercises in order to set the basis for eventual cross-border (inter-regional and international) collaborations to orient medium and long term public research and innovation programs. Institutions responsible for strategy setting could include in their functions joint road mapping exercises to stimulate information exchange and the creation of shared multi-regional programs.

Support policy learning and experience sharing matters. Increased policy responsibilities at the level of planning, implementation and financing require managerial capabilities and trustworthy institutions. Increased assignation of responsibilities should be coupled with mechanisms to facilitate policy learning in regions.

Capacity building for policy management and institutional strengthening is a long term process. It is important to establish procedures for policy dialogue between the different levels of governments in order to favour trust building, the generation of common routines and working practices, and to favour policy learning. In the case of Chile, there is a chronic lack of capacities to manage public policies in regions. The experience of the ARDP is relevant, but it is recent and it requires monitoring and follow up. The clusters-experience of Innova-Chile and the programs to support clusters represented a significant advancement in policy design and implementation. Capitalising on the experience of regional clusters could create opportunities for policy learning.

1. INTRODUCTION

1. Since mid decade of 2000 Chile is in the process of building a national consensus for innovation as one of the pillars of the country's development strategy. While it is too early for a complete evaluation of the impact of the Chilean National Innovation Strategy, an analysis of its major implementation challenges is a timely exercise. It is important to monitor the implementation of the new policy and the functioning of the newly created institutions in the early implementation phase in order to address the major operational challenges and to identify mechanisms for addressing the bottlenecks before implementation problems undermine the legitimacy of the policy and the capacity of the strategy to reach its long-term goal.

2. The 2007 OECD Innovation Review and the 2009 Territorial Review of Chile identified some advancements and challenges in innovation policy and pointed to some areas for improving policy effectiveness:

1. Chile lags behind in terms of innovation. R&D expenditure in Chile is approximately 0.7% of GDP, while European countries spend 1.8% and the OECD average is 2.2%. The number of firms involved in innovation is also relatively low, 1% of formal firms, while their links with research institutions are scant. Similarly, private investment in R&D is low, with only 30% of total expenditure financed by the business sector, while in OECD countries the private sector accounts for around 65% of total R&D expenditure.
2. The country suffers of a shortage of qualified human resources for innovation.
3. The business sector lacks an entrepreneurial culture that prioritises innovation in business strategy; this reflects the lack of diversification of the economy and the prevailing specialisation oriented towards natural resource based commodities.

3. On the policy side, public efforts to support innovation are incipient and they lack co-ordination between different initiatives with consequent duplication of efforts and reduced capacity of reaching the necessary critical mass. There are bottlenecks in the mechanisms for allocation of resources, and there is a need to improve the capacity of timely resource allocation to support innovation. This diagnostic of innovation dynamics and policy challenges is also shared by ECLAC recent assessments³.

4. One of the major challenges for Chile is to diversify the economy and support the transition towards higher value added activities. While many key industries are located in different regions, research and development (R&D) spending is concentrated in Santiago⁴. The relatively concentrated pattern of publicly funded R&D is an important limit on the ability of regions to focus on innovation, hence inhibiting diversification and jeopardising efforts to increase aggregate productivity. Some examples of the latest efforts to support innovation are:

3. See, among others, ECLAC (2008) *Structural Change and Productivity Growth 20 years later: old problems new opportunities*.

4. Close to 40% of total R&D expenditure is carried out by universities, mainly located in Santiago: the two largest Santiago universities (the University of Chile and the Catholic University of Chile) account for a large share of university-performed R&D. Most private investment is also carried out in Santiago.

1. The creation of the National Council for Innovation and Competitiveness (CNIC) in 2005 as an independent advisory body responsible for developing a mid and long-term oriented innovation strategy;
2. The elaboration of the National Strategy for Innovation and Competitiveness 2006-2020 by the CNIC;
3. The creation of a Fund for Innovation and Competitiveness (FIC) which channels financial resources coming from the royalties in the mining sector towards innovation and which includes a specific instrument to assign resources to regions;
4. The investment in strengthening institutional capacities for innovation policy in regions, such as the creation of regional development agencies (ARDP) in 2006-2007 to develop regional programs in support of competitiveness based on public private partnerships for innovation.

5. In august 2009, after four years since its first presentation to the Congress, a revised version of the law which establishes the institutional framework for innovation has been submitted to the Congress. (*“Proyecto de ley que crea el Fondo de Innovación para la Competitividad”*, hereby referred as ‘the proposal of law’). The proposal establishes the CNIC, the FIC and clarifies the institutional infrastructure for innovation policy at both the national and regional level. The proposal represents a step forward in the process of institution building, since it creates by law the CNIC and the FIC, thus helping to give a State-policy level to a governmental initiative. However, the institutional solutions envisaged in the proposal to address the regional dimension in innovation policy present several drawbacks. The proposal increases the institutional complexity of the articulation of responsibilities at the regional level and between the regional and the national levels and it seems to fail to recognise current advances in institutional strengthening (especially the creation and functioning of the ARDP).

6. With a view to contribute to the process of strengthening the institutionality for innovation policy in Chile, the following pages contain a brief overview of major advances in the Chilean innovation policy (what has been done and what has been achieved), an identification of the major implementation challenges (what are the elements that need to be better targeted and which need improved policy responses), and some proposals to address the challenges with a special focus on how to strengthen institutional capacities at the regional level, as well as on how to improve the interaction between national and regional entities for innovation. The Annex includes empirical and qualitative information on specific policy issues.

2. INNOVATION POLICY IN CHILE: RECENT ADVANCES

7. In recent years, Chile advanced in the design and implementation of innovation policy. Those advances can be summarised in three major points:

- A) Rising consensus for innovation as a development driver and a policy paradigm shift;
- B) Increasing public support and financial resources for innovation; and
- C) Progress in institutional strengthening and policy learning.

2.1. Rising consensus for innovation as development-driver and policy paradigm shift

8. The last five years marked a transition in the area of public policies for innovation in Chile. Innovation became a legitimised space for public intervention. The National Council for Innovation and Competitiveness (CNIC) has been created in 2005. The CNIC contributed to start a public policy reflection on innovation with a medium and long-term view⁵ and it elaborated the national strategy for innovation 2006-20. The strategy takes a broad approach to innovation and identifies three main areas for action: human capital development, mission-oriented science and business innovation.

9. The strategy represented an incipient effort to move towards a more selective approach, as compared to the prevailing horizontal approach of the preceding decade. The strategy emphasises the need to design incentives to address the co-ordination failure of different public actions in sectors with higher potential impacts and spillovers and in which innovative clusters could be developed as a mechanism for diversifying the natural resource based economy⁶.

10. The Strategy offered the opportunity for starting a process of consensus building for innovation in the country. To support the strengthening of consensus for innovation, the mechanisms for strategy building need to evolve. The experience of OECD countries shows that countries increase the participation of different actors over time, thus advancing the process of consensus building for innovation. Identifying mechanisms for a better and more effective participation of regional entities is a key challenge for the future evolution of innovation policies in Chile.

11. The rising importance of innovation in the national development agenda has been accompanied by an important shift in the policy paradigm. The community of policy makers supported the shift from a pure price-based and efficiency enhancing approach towards a knowledge-centred approach. The policy design now embeds the recognition that innovation is a non-linear process which results from the interaction and collaboration of public and private agents and which requires a policy mix supporting the various factors which enable it (*i.e.*, policies supporting human capital and capabilities for innovation,

5. The main objectives of the strategy are: the reduction of the education gap, with a special focus on improving not only the coverage of the educational system, but especially the quality of education; the increase in R&D investment from 0.68% to 2.5% by 2020, and the diversification of the specialisation pattern and the production matrix. The high concentration of the specialisation of the economy is seen as a drawback for its competitiveness and dynamisms. Currently 25 products account for 76% of total exports. The strategy sets the target of reducing this share to 50%.

6. The CNIC in 2007 carried out a mapping exercise to identify the most promising productive sectors for the next decade and to match those global trends with national potential strengths. As a result of the process, the CNIC prioritised eight production clusters. The majority of those clusters belong, however, to mature sectors linked to natural resources, such as mining in the north and agriculture and fishing in the south. Financial services and offshore have also been identified as priority activities.

research and development, infrastructure, provision of public goods, but also policies targeted to create and strengthen innovative actors, firms, networks of firms/clusters and private investment in innovation).

12. The current policy framework recognises that market incentives are not enough, and that interaction between market and non-market mechanisms is required to enable innovation. The country has also started to combine the prevalent horizontal policy model with a more selective approach to innovation. In this process, Chile chose an approach of “backing winners”, rather than “picking winners”, starting from identification of areas in which there is room for increasing co-ordination of actions to support productivity growth.

2.2. Increasing public support for innovation

13. Chile increased the amount of financial resources to support innovation (see Table 2.1 below). From 2005 to 2008, Chile registered a cumulative increase of 74% in the innovation budget, in real terms.⁷ Nevertheless, the budget for investment in innovation in Chile is still far from OECD standards.⁸

Table 2.1. Chilean- Budget for Science, Technology, Innovation, including support to human capital development for innovation

Current direct expenditures, millions of Chilean pesos, 2009

Areas of Investment	2005	2006	2007	2008	2009	2010
Advanced Human Capital	11,324	12,008	18,947	25,889	49,333	85,330
Annual variation (%)		6.04	57.79	36.64	90.55	72.97
Basic Science	45,928	66,099	80,062	79,393	79,244	88,954
Annual variation (%)		43.92	21.12	-0.04	-0.19	12.25
Precompetitive research	29,579	29,302	36,437	41,334	50,081	47,964
Annual variation (%)		-0.94	24.35	13.44	21.16	
Public goods for innovation	42,537	43,305	48,641	48,767	61,757	64,890
Annual variation (%)		1.8	12.32	0.26	26.64	
FIC, regional assignment				21,481	25,555	28,626
Annual variation (%)					18.97	
Human Capital	101,699	137,788	159,147	185,976	218,564	252,859
Annual variation (%)		35.49	15.5	16.86	17.52	
AFD-AFI	171,857	173,934	174,795	171,151	173,079	175,675
Annual variation (%)		1.21	0.5	-2.08	1.13	
Business Innovation	38,688	47,647	52,064	58,313	56,562	74,237
Annual variation (%)		23.16	9.27	12	-3	31.25
Innovative Entrepreneurship	2,759	5,350	6,749	5,534	5,256	8,738
Annual variation (%)		93.92	26.14	-17.99	-5.02	66..24
Other	1,329	2,134	4,692	2,795	2,232	2,266
Annual variation (%)		60.62	119.88	-40.44	-20.12	2
Indirect Costs	12,818	21,091	27,450	37,044	33,909	34,006
Annual variation (%)		64.55	30.15	34.95	-8.46	22
Public Investment in science, technology and innovation + human capital	458,517	538,657	608,983	677,677	755,573	863,454
Annual variation (%)		17.48	13.06	11.28	11.49	14.29

Source: CNIC, 2010.

7. Gonzalo Rivas, *Innovación para el Chile del Bicentenario: ocho propuestas*. July 2009.

8. For example, in the OECD area between 2000 and 2006, government R&D budgets grew on average by 3.8% a year (in real terms). (OECD, *Science, Technology and Industry Scoreboard*, 2009).

14. In 2005, as a result of a complex and long negotiation process, Chile approved the law number 20.026 on the royalty on mining production. The law channels resources to the Innovation for Competitiveness Fund (FIC). The FIC was established in 2006 as one of the instruments to finance the implementation of the innovation policy. The budget law (*Ley de Presupuesto*) in 2006 assigned approximately USD 84 million to the FIC, USD 154.5 million in 2008, and 240 million USD in 2009 (see Figure A.1 in Annex).

15. The FIC has a dedicated funding stream specifically to support innovation in regions. The Regional Assignment (the 25% of the FIC which since 2008 goes to regions) represents a mechanism for increasing innovation capacities in regions. Different constituencies in the country recognise that mechanism for the allocation of resources to regions is in its early stages and requires improvements. (Table A.3 in annex shows the distribution of the total budget for innovation by category of investment).

2.3. Progress in institutional strengthening and policy learning

16. The elaboration of the innovation strategy and the creation of the FIC induced a process of policy learning and contributed to strengthening institutional capacities in the country.

17. In this respect, the creation of the CNIC and of the Committee of Ministers for Innovation (CMI) represented an advance in the process of institutional strengthening. The implementation of the cluster programs and the creation of committees for cluster management also allowed for internal policy learning. However, the creation of the FIC, and the increase in the amount of financial resources for innovation, challenged the implementation capacity of executive agencies (such as CORFO and CONICYT) and showed the need to strengthen institutional capacities for innovation policy management at national and regional levels.

18. At the regional level, Chile implemented some reforms in recent years, to strengthen regional capacities in policy management. Some efforts have been: the strengthening of the Planning Divisions in regional governments and the creation of regional development agencies (ARDP) s well as some incipient activities carried out by CONICYT in the regions. Some of those activities have been more successful than others; however they represent an important phase in policy learning at the regional level (see Box 2.1).

Box 2.1. Main advances in the institutional strengthening of regions

Planning Divisions in Regional Governments

As of January 2007, the Under-Secretary for Regional Development (SUBDERE) invested more than USD 10 million in the creation and development of planning divisions in regional governments. Regional planning responsibilities were gradually transferred from the regional offices of Mideplan (Serplac) to the new planning division of the regional government. In addition, Subdere, with support from the IADB, carried out different programs to improve the skills and management capacity of regional governments. On 16 October 2009, President Bachelet approved a constitutional reform on regional government and administration (Law 20.390) that includes the direct election of the regional council (Core) , creating a democratically elected body for managing regional development. The reform includes the election of a President of the Core. The new figure of President of the Core (formerly the President was the Intendente) has for the moment only a symbolic role, since the Intendant retains all previous functions (for instance, presenting to the regional council the project portfolio for presenting to the National Investment System). However, it is stated that a new constitutional law will regulate the functions and attributions of the president of the council, giving space for a potential expanded role of this figure. Finally, this reform includes the institutionalisation of the Programming Agreements (*acuerdos de programación*) as binding contracts between one or more regions, ministries, municipalities, or private institutions. These agreements allow shared responsibilities for project formulation and finance between national and regional actors.

Regional Development Agencies (ARDP)

One of the main roles of the ARDP is to develop bottom-up regional agendas for productive development and innovation based on regional assets, strengths and opportunities. Based on these Agendas, each ARDP has selected at least three priority clusters in the first phase. Once selected, a participatory strategic planning process took place, involving sectoral business leaders and individual firms, foreign experts, local research and innovation agencies, ARDP's staff, and the local representatives of national promotion agencies, such as CORFO, INDAP or SENATUR. The result of this exercise is a Enhancing Competitiveness Program (PMC, its acronym in Spanish), with a detailed action plan aimed at overcoming co-ordination failures among private sector actors and public support agencies, and above all, aimed at increasing public-private co-operation to increase innovation and develop markets for the cluster's firms. The PMC also identifies key cluster-specific public goods necessary to productivity growth and/or increase market access. Each PMC is then discussed and approved by the ARDP's Strategic Council. One of the most ambitious goals of the creation of the ARDP was to make public spending on innovation promotion and business support services more focused on the actual demands of the regions. This is why the creation of the ARDP was accompanied by a requirement that, starting in fiscal year 2008, at least 10% of the budget of national public agencies supporting productive development should be allocated to meet the needs identified in the PMC defined by each ARDP.

It has been agreed that during 2010, the ARDP will be transformed into regional development corporations to progressively reduce their dependency from CORFO and increase their relationship with the Regional Council. Under this new setting, each Regional Council will have some margin to decide the composition of the governance structure of its corporation. This is a complex process that needs careful attention to make sure that it strikes the right balance between increasing the ARDP's autonomy and links with the regional governments, but at the same time maintaining co-ordination with the central government and the other ARDP to consolidate the current process of cross-fertilisation among the Agencies and their access to national and global sources of knowledge and institutional support.

CONICYT Regional Centres and programs

Chile registered an increase in the amount of grants to support PhD training and resources to support the creation of centres of excellence for scientific research. In 2000, CONICYT launched a regional programme on science and technology. CONICYT supported the establishment of 11 scientific and technological centres in 11 regions (see Table A.4 in annex). The objective of this initiative is to stimulate the development of centres of excellence in disciplines or specific areas of research that are consistent with regional assets and advantages. The initiative is managed by CONICYT in conjunction with regional governments, universities and the private sector. However, few projects have been undertaken so far, and they represent a modest share of CONICYT's total budget (2.9% for 2008). The initiative responds to the need of creating local research capacities and of reducing the concentration of research around the metropolitan area. However, this approach experienced several drawbacks during its implementation. Resources are allocated on a demand base and it is not possible to re-channel the destination of resources in case of underutilisation, and unsolicited demand is not allowed. Establishing a CONICYT research centre in each region undermines the possibility of reaching critical mass in given priority sectors and might engender emulation and competition between regions instead of favouring creative and constructive partnerships. In addition, the presence, experience and regional vocation of CONICYT are significantly less extensive than that of CORFO.

3. INCREASING POLICY EFFECTIVENESS: CURRENT CHALLENGES

19. Innovation policies are well known for producing cumulative results which require a mid and long-term horizon to become visible. Preserving the dynamic consistency of policies and ensuring capitalisation of efforts is a key challenge for building knowledge-based competitive advantages. The implementation of the new innovation policy has not been easy, reinforcing the view that funding availability is only one dimension for the success of the innovation strategy. Chile needs to strengthen the institutional capacity to manage innovation policy, capitalising on recent efforts and identifying steps to improve the current policy design. There is a need to clarify strategic and executive responsibilities at national and regional levels, and improve the mechanisms for dialogue and collaboration between agencies at the different governmental levels. Factoring in the regional dimension is a key issue in order to increase policy effectiveness.

20. For each of the three areas of advances (increasing consensus and policy paradigm shift; increasing public support for innovation-related activities and institutional strengthening policy learning) it is possible to identify the key challenges to improve policy effectiveness (Table 3.1).

Table 3.1. Advances and challenges to improve policy effectiveness in Chile

Recent advances in innovation policy		Major implementation challenges
Rising consensus for innovation as a development driver and policy paradigm shift	=>	Ensuring long-term commitment to innovation
Increasing public support to innovation	=>	Improving the mechanisms of allocation of resources
Institutional strengthening and policy learning	=>	Addressing the co-ordination failure and improving the governance structure

3.1. Creating the conditions for long-term commitment to innovation

21. Chile needs to anchor the innovation strategy into State policy. Policies to support innovation are mid-to-long-term oriented, and their implementation goes beyond the time frame of the governmental political cycle. The series of efforts implemented in recent years represent a shift in policy; it is necessary to put in place mechanisms for capitalising and building on previous experiences.

22. Ensuring long-term commitment to innovation requires actions both on the institutional side (better institutions, endowed with capacities to deal with strategy building and implementation) and the financial aspect (sustained availability of financial resources for innovation, coupled with rising private commitment to invest in innovation). In this respect, a key priority is to strengthen policy capacities both at the national and regional level, and improving the spaces for policy dialogue between the different levels of government.

23. The creation of the National Council for Innovation and Competitiveness (CNIC) represented an important step in the strengthening of the institutional structure for innovation management in the country. However, the Council has been created by presidential decree and lacks recognition by law. The proposal of law establishes the CNIC as a permanent feature of the Chilean innovation policy institutional landscape. The proposal represents an important step forward in the institution building process; however there is much room for improvement regarding the proposed solution. The proposal of law still makes CNIC board members too dependent on government cycles, failing to create the incentives for making innovation policy a State policy and not only a Government policy. The law proposal also envisages too narrow responsibilities for the CNIC and it does not include in its functions the responsibility for monitoring the implementation of the innovation strategy. In addition, the proposal falls short in addressing

properly the issue of regional institutions for innovation policy. The proposal of law has been drafted without benefiting fully from an open discussion process with all stakeholders, following basically a top-down approach, and it lacks endorsement from regional authorities and existing institutions (especially the ARDP). A law addressing the institutionalisation of innovation policy at national and regional levels in Chile would certainly benefit from a consultation process with all the relevant actors at both levels, including existing and recently created institutions such as the ARDP.

3.2. Defining effective mechanisms for resource allocation to innovation

24. The FIC responded to the willingness of increasing the amount of resources in support of innovation and to the need of ensuring a long-term financial commitment to innovation. As usual for most new policy measures, several implementation bottlenecks emerged in the operationalisation of the fund.

25. There is a conflict in terms of allocation criteria. The Ministry of Treasury tends to assign resources using an *ad-hoc* approach on the basis of path-dependent and static efficiency criteria, while the committee of Ministries (CMI) headed by the Ministry of Economy, the CNIC and the ARDP, should be functioning and establishing the guidelines for strategy planning on the basis of a systemic approach searching for dynamic efficiency gains resulting from the allocation of public resources to innovation. Clarification is needed to ensure that innovation-related spending is assigned according to dynamic efficiency gains.

26. There is a need to improve the mechanisms of resource allocation to regions. Currently, the FIC has a Regional Assignment. Mining regions receive 60%, while the rest (40%) goes to non-mining regions.⁹ The Regional Government (GORE) then transfers the resources of the Regional Assignment to CORFO, CONICYT, and universities and/or technological scientific centres of excellence. The amount of resources transferred to universities or research centres should not be superior to 20% of the total budget. There is widespread recognition that the process is too bureaucratic and that it needs to be improved and become more effective.

27. There is a need to create and improve mechanisms for establishing synergies between different sources of financing to support innovation. Incentives schemes to match private and public resources for innovation, as well as identification of mechanisms to match different public sources to support major innovation goals at the national and regional level, are required. For example, regions dispose of a Regional Development Fund, which could be matched with the Regional Assignment of the FIC to increase the critical mass of resources for innovation. Currently there is a lack of institutional mechanisms and incentives to favour the matching of those resources, thus hampering the possibility of implementing more ambitious innovation programs. This drawback is compounded by low levels of investment in innovation by the private sector, and a lack of specific policy instruments which incentivise private sector commitment to invest in innovation.

9. The Undersecretariat for Regional Development (SUBDERE) is the agency responsible for assigning the FIC to regions.

3.3. Enhancing policy co-ordination

28. The multiplicity of initiatives and the lack of mechanisms to align different governmental actions hamper policy effectiveness and generate co-ordination failures. There is a need to establish a dialogue with the different governmental levels and to identify and clarify institutional tasks and responsibilities. This requires increasing institutional support to regional governments to support legitimacy and the development of planning, enforcement and co-ordination capacities. There is high fragmentation and superposition of initiatives, misalignment between different actions, and administrative complexity. In addition, there is a lack of clear definition of institutional responsibilities for strategy building, policy design and policy implementation.

29. Currently the Committee of Ministers for Innovation (CMI) has the responsibility of orienting the strategy-building process and co-ordinating its implementation. However, the effective performance of the CMI has been quite reduced with respect to its potential, and its role could be strengthened. Actually, the CMI only orients the allocation of the FIC resources, without having clear responsibilities in overseeing the whole process of resource allocation to innovation. Correcting this problem could help in increasing policy effectiveness.

30. At the regional level, recent decentralisation efforts started to assign planning responsibilities to regional governments. However, regional governments require investment in strengthening their capacities to manage the newly assigned tasks and responsibilities. Even though there have been some important advances during the last years, regions still lack effective capacities both at the level of strategy building and in policy execution. The regional governments - GORE (created in 1993) - do not have an independent budget for carrying out regional investment.¹⁰ Additionally, until recently, the regional development strategies were designed by the regional branches of the ministry of Planning (Serplac). Development programs are mainly carried out either by sectoral ministers or by different national public agencies such as CORFO, the Chilean Export Development Agency (ProChile), the Technical Co-operation Service (Sercotec) or the Agricultural Development Institute (Indap) either from their national headquarters or through their regional offices, with low participation of regional entities.

31. The challenge is to design institutional mechanisms favouring information flows between national and regional agencies. Currently regional governments sometimes are informed about projects to be carried out by a national public agency in their region only when the projects have already been planned and are about to be implemented. This jeopardises the capacity to provide a coherent framework for formulating regional policies and creates a disincentive for regional planning. For example, the identification of production clusters in the National Innovation Strategy has been carried out with little bottom-up input from regions. Regional bottom-up diagnosis could help to find untapped regional resources for diversifying the economy and to better fine tune selective sectoral support, and taking into account territorial spillovers.

32. The ARDP were developed as an initiative to strengthen regional capacities to support competitiveness, investment and innovation at the regional level. Each ARDP has a Strategic Council made of regional private and public actors, as well as representatives from national institutions. The ARDP are small agencies (their staff consists of a Director and two managers, one in charge of innovation and the other in charge of business development, as well as two support staff).¹¹ In the initial phase, the

10. Investment going to the regions follows two main channels: sectoral investments by the line ministries and regionally defined investments (IDR), with regional governments intervening in the distribution process.

11. The agencies' Strategic Councils have, at a minimum, nine representatives: four from deconcentrated national public bodies (the intendant and representatives of CORFO, Sercotec, and the regional

institutional design assigned an important role to the Intendant, who is appointed by the central government, and who was identified as the head of the Strategic Council of the ARDP. This creates a tension between the ARDP as expressions of regional autonomy and as institutions reporting to the central government.

33. The process of evolution and consolidation of the ARDP followed diverse patterns in different regions; however, in general, they all favoured the development of a participatory process for defining agendas for local production development. The strategic agendas of the ARDP led to a prioritisation of cluster development in sectors in which the regions already had some accumulated capacities, such as mining, agriculture, fishing and agri-food sectors. In the future, the ARDP could explore new mechanisms for fostering the identification not only of already established regional clusters which require support, but for identifying newer, more knowledge-intensive activities and clusters which could boost productivity in each region and support diversification.¹² Actually, one of the main values of the ARDP could be to support the transition towards more value-added activities, identifying regional vocations and opportunities in the manufacturing, services and agricultural sectors, and in identifying co-ordination failures in the implementation of different programs and projects which impair the exploitation of these opportunities.

34. As part of the process of institution building, it has been established that the ARDP will be transformed into corporations to gradually shift them in the domain of the Regional Council and to reduce their dependency from CORFO. Under the new Regional Governments legislation, the ARDP will become non-profit, private corporations. This new legal framework will increase the degree of freedom of corporations with respect to the ARDP, since it will allow autonomy in deciding the composition of the Executive Board. To ensure a smooth transition, the corporations will follow a homogeneous format supervised by CORFO. Co-ordination mechanisms between the regional corporations and the national public agencies will be crucial for integrating the diverse and so far fragmented regional development initiatives in a common and coherent framework.

35. Currently there is a lack of clarification of responsibilities and functions in certain areas between the GORE and the ARDP. However, the proposal of law under discussion in Congress fails to address the challenge in the appropriate way. It requires creating a new institution in each region: the Regional Innovation Council (CRI). This solution seems to increase the complexity of the governance arrangements, because CRIs' functions, as they are specified by the law today, overlap with the sphere of action of both the ARDP and the GORE.

36. Co-ordinating innovation policy across different levels of government and between different sectors is a common challenge for governments in OECD countries. A key issue is the mismatch between economic and administrative boundaries. A regional approach to innovation which only deals with administrative boundaries as main governance levels is a short-sighted approach. Chile would benefit from the identification of proper mechanisms to incentivise inter-regional collaboration in innovation policy. Another challenge is the heterogeneity in terms of institutional and production capacities across the different regions. Regions in Chile are extremely diverse in terms of factor endowments, historical trajectories and production specialisation, making the regional approach particularly relevant, but also challenging.

representative of the Ministry of Economy), three from the regional private sector, and two from the regional public sector.

12. However, even in established sectors is it possible to identify opportunities for spillovers and diversification. The role of ARDP in the mining sector for example, focused on identifying opportunities for co-ordination in support of the creation of clusters of suppliers for the industry.

4. PROPOSALS TO INCREASE THE EFFECTIVENESS OF INNOVATION POLICY IN CHILE

37. The institutional changes of the recent years and the increased amount of resources available for innovation can be registered as efforts to increase the innovative capacity of the country, to support diversification and to increase domestic value added generation. Results of those efforts will require time to translate into improved innovation outcomes. It is important to keep in mind that in the short term, it will be easier to measure efforts and inputs, rather than results. In addition, governments must recognise that innovation policies advance through trial and error. The lack of tangible results in the short term should not lead to the premature conclusion that the policy has been ineffective.

38. There is a necessary time-lapse for policy learning, adapting routines and mechanisms for decision making which needs to be taken into account in policy evaluation. However, while administrations need to recognise the dynamic consistency of policies, and the existing gap between policy efforts and policy results, the process of public policy support cannot be an act of pure faith. Accountability of policies and mechanisms for policy follow-up are needed from the beginning, in order to improve the capacity of policies to be adaptive to unforeseen changes and to build the basis for more long-term impact evaluation. Institutions increase their capabilities in a cumulative way and through trial and error processes. It is important to establish early a routine process for policy follow up and evaluation. Small countries and regions usually tend to develop a network of external evaluators for policy follow up and evaluation. Likewise, regional and international dialogue on innovation policy can support the internal process of institutional learning.¹³

39. The following paragraphs identify some lines of action to contribute to the process of institutional strengthening of innovation policy in Chile, with a special focus on the regional dimension, addressing key policy issues in three main areas:

1. Ensuring long-term commitment to support innovation;
2. Improving the mechanisms for the allocation of resources; and
3. Addressing the co-ordination failure and improving the governance structure.

4.1. Ensuring long term commitment to support innovation

40. Designing innovation policy in order to support the allocation of resources in the most effective way is a shared objective for OECD countries. OECD countries recognise the need of dynamic time consistency of policies and the fact that policies have a life cycle which requires adjustments and fine tuning when the economy and the society evolve and express new demands and needs.

41. The experience of OECD countries shows that it is necessary to ensure continuity to investments in support of innovation. Changing plans and strategy following political cycles undermines the capacity of policies to effectively deliver results. Common institutional mechanisms put in place by OECD countries to ensure a long-term commitment towards innovation include: the creation of advisory bodies for strategy building with participation of politically-assigned responsible and of independent experts in the field at the

13. For example, as a follow up initiative of the OECD Regional Innovation Review, Piedmont will launch in 2010 an initiative in collaboration with the OECD to create a policy dialogue for regional innovation in order to support capacity building for policy making in the region and in order to increase the national and international linkages of the region.

national and regional level; the creation of permanent policy dialogues in which different stakeholders discuss the design and implementation of the policy. OECD countries also face the challenge of designing innovation policies which have a long-term horizon and which need, at the same time, to allow for experimentation in order to tackle changing challenges. Participation to international networks and policy forums also help to support continuity and capacity of adapting the policy to changing scenarios.

4.1.1. Capitalising on recent efforts and strengthening institutional capacities: the role of CNIC and the ARDP

42. Most OECD countries prioritise the empowerment of advisory bodies for innovation strategy building. The governance of science, technology and innovation (STI) is generally organised around a multi-layered matrix of ministerial bodies, government agencies, advisory structures and a range of actors, concerned with the design and steering of policy and its implementation. Most OECD countries have an institutional body which is responsible for overseeing the policy process at the Ministerial level. However, institution building requires time, and there are no blue prints. For example, the creation of a Ministry for STI is a long term process. In the case of Mexico, according to the OECD Review of Innovation Policy, the creation of a Ministry for STI is an issue which deserves consideration, but which is not likely to happen in the near future. Beyond the differences in the institutional architecture for innovation policy, all OECD countries empower the institutions in charge of innovation policy. Political visibility and connection with other governmental bodies are crucial for ensuring policy sustainability and efficient implementation.

43. Following international good practices, Chile needs to ensure a long-term commitment to support innovation. The country needs to capitalise on recent efforts and support the process of institutional strengthening and foster the cumulative process of policy learning.

44. Chile must avoid “stop-and-go” interventions in supporting innovation; continuity and a systemic approach are required given the cumulateness and sunk costs associated with the generation of scientific, technological and production capabilities. Support to training of skilled human resources, qualification of research institutions, R&D subsidies and fiscal incentives, as well as support to networks and partnership for innovation are complementary and necessary initiatives to support innovation. A minimalist approach to innovation policy will not be enough.

Box 4.1. The relevance of laws and regulations in institutional strengthening

The promulgation of laws and national plans is an important mechanism for directing and co-ordinating science, technology and innovation in OECD countries.

In Korea, the Science and Technology Framework Law of 2001 aimed to promote S&T more systematically. It includes provisions for the formulation of mid and long-term policies and implementation plans, and is the legal basis for inter-ministerial co-ordination of S&T policies and R&D programmes. It also provides the overall support mechanism for R&D activities and S&T agencies, and the legal basis for fostering an innovation-driven culture. The Framework Law also constituted the basis for the two last five-year Basic Plans of Science and Technology (2003-07 and 2008-12). Luxembourg, a small economy with a rather low level of financial resources for R&D and a lack of specialised institutions, succeeded in building a wide range of specialised institutions for innovation in the last couple of decades. The country approved laws and regulations (such as the framework law on public sector research (1987); framework law on private sector research (1989); framework law on higher education (1996); law on the creation of the FNR- National Research Fund (1999); law on the establishment of the University of Luxembourg (2003)). At the same time, Luxembourg invested in the creation and strengthening of institutions specialised in innovation such as Luxinnovation, the CRPs, the National Research Fund, the Ministry of Culture, Higher Education and Research, and the University of Luxembourg, among others.

Source: OECD Reviews of Innovation Policies, Korea 2009 and Luxembourg 2007.

45. Chile needs to strengthen the role of the CNIC as an independent and qualified strategic body for strategy building. The law proposal gives the CNIC a legal status. This is a fundamental step in the legitimisation of innovation policy as a policy of the State, and not as a Government preference. The composition of the Council is determinant for endowing it with strategy building capacity. The CNIC should include experts on innovation and on human resources for innovation, representatives from the private sector, and the academy. Regional entities in charge of innovation policies should participate in the definition of the national strategy and not only in the identification of the “territorial component” of the innovation policy.

46. Clarifying the relationship of the CNIC with regional authorities is a desirable step to increase policy accountability and to ensure a more bottom-up policy strategy building and the commitment towards policy implementation. It could be possible to establish specific mechanisms for ensuring that some members of the board of CNIC are nominated for a period which is not synchronised with political elections. Responsibilities of Board Members and of the Presidency should be clarified and their remuneration should be specified accordingly. Members of the CNIC could be more involved in committees’ co-ordination to ensure information flow between different bodies. Allowing re-election of members of the CNIC on the basis of performance evaluation would also be recommendable. Considering that the CNIC and the ARDP share the responsibility at the strategic level of the definition of the innovation strategy, it is recommendable to set mechanisms fostering the dialogue between the two bodies in order to integrate the national and the regional perspectives in the definition of innovation strategies both at the national and at the regional levels.

47. Innovation policy needs to take into account the spatial distribution of firms, the characteristics of the environment and the necessary synergies that are needed in order to create the conditions for innovation to occur. Advanced countries address the regional/local dimension of innovation policies in different ways adapted to their specific contexts. Chile needs to identify its own way to factor in the regional dimension in its innovation policy, with a view also to help the country to better fine tune FDI policies to match local needs. Regions might represent the appropriate institutional level for identifying conditionalities to make FDI work in support of regional development and of strengthening endogenous capabilities. Factoring in the regional dimension usually couples the delegation of financial resources with targeted effort to strengthen the institutions at the regional level and to clarify the responsibilities in strategy planning and policy implementation.

48. Institutional capacity building requires learning by doing. In centralised countries like Chile, constraining the political mandate of sub-national units can stifle local possibilities and motivation to acquire new skills. Observations from OECD countries reveal that apart from mechanisms to strengthen performance and improve local officials’ skills, building capacity clearly benefits from the progressive involvement of sub-national governments in public affairs. Most countries have implemented this learning-by-doing framework gradually. The use of performance indicators is a useful way to be aware of institutional capacities and requirements and to monitor the process (OECD, 2008; 2009).¹⁴

49. The central government can adopt different approaches for transferring responsibilities in areas for which sub-national units have limited management capacity. Either it can transfer policy domains immediately to the sub-national authority and co-operate (on the basis of a contract) to train and co-manage the policy. Or, before delegating wide policy areas to a weak sub-national government, it can narrow the scope of delegation on the basis of a relatively detailed contract, the performance of which can be the basis

14. OECD (2008), “Summary of the Global Forum on Governance”, Rio de Janeiro, Brazil, 22-23 October, 2007, *Modernising government: strategies and tools for change*, OECD, Paris; OECD (2009), *Governing Regional Development Policy: The Use of Performance Indicators*.

of further delegation (OECD, 2007).¹⁵ Proper incentives can go a long way in this regard. The recent experience in hiring highly-skilled staff for the ARDP through a competitive process has shown that when salaries are attractive and the jobs challenging, there is a sufficient stock of qualified people in the region (or even moving from another region) willing to take the chance.

4.1.2. Increasing the participatory approach in strategy building and integrating regional bottom-up diagnosis

50. Chile has already made significant progress in the process of strategy building. However, improving the participation of different stakeholders could help in strengthening the consensus for innovation. The implementation of participatory approaches in policy making is an emerging topic in most OECD countries, only some countries have already a long tradition in implementing really open and participatory policy processes. There is no “one size fits all” solution, and each society needs to identify the appropriate degree of stakeholder participation in policy making and in strategy building. In practice there are various mechanisms to support a participatory approach in policy making.

51. In the UK, for example, the “Regional Foresight” initiative supports the dissemination in regions of national foresight activities to identify possible complementarities and spillovers. There is also the possibility of establishing bottom-up dialogues in cases in which regional actions inspire national policies, this is the case for most successful science parks and research consortia which usually are created in response to local needs but then inspire initiative at the national level. For example, in Finland the support of science parks and private-public partnership in Oulu, Tampere and Turku constituted the basis for many national policies. Countries may also adopt schemes of cross-collaborations in which similar strategies carried out in a given location influence the strategies developed elsewhere, such as cluster supporting programs implemented in various European countries in the 1990s and the more recent public-private partnerships for innovation in the 2000s, which, generally, include institutional mechanisms for experience sharing and information exchange between the different initiatives.

52. Chile needs to develop appropriate solutions to encourage broad participation in strategy building, and foster an innovation culture throughout the government, the economy and the society. The definition of a national innovation strategy is a complex and multifaceted process, mediated by the Government vision at the various levels and the different stakeholders’ pressures. The strategy needs to be the result of a collective process. There are different institutional mechanisms which can favour the development of the strategy in a way in which it reflects territorial specificities and vocations. The creation of platforms for discussion and the institutionalisation of mechanism for face-to-face interaction of actors which are located in different regions of the country could support the creation of a more widespread consensus for innovation in the country and could increment the capacity of formulating more accurate and implementable policy strategies.

53. It could be useful to identify specific mechanisms supporting the formulation of an innovation strategy which takes into account both national and regional perspectives. The Committee of Ministers for Innovation (CMI) could be empowered and could serve as a key orienting body for ensuring vertical and horizontal co-ordination. The participation in national discussions, and the identification of participation mechanisms, should be listed as primary functions of the political body designated as responsible for innovation policy at the regional level. For example, the strategy for the development of innovative clusters have been carried out with little consultation and participation of regional entities. Regional authorities might be relevant actors for identifying untapped resources and potential in support of production

15. OECD (2007), *Linking Regions and Central Governments: Contracts for Regional Development*, OECD Publishing, Paris.

diversification. Increasing the dialogue with regional entities, however, requires a clarification of the governance structure at the regional level, and a parallel strengthening of strategy and implementation capacities in the regions.

54. Regions can represent interesting laboratories for experimenting different types of policies to mobilise actors which are best placed to identify solutions to address local challenges. However, a participatory approach in strategy building cannot be pursued to the detriment of policy effectiveness and delivery capacity. It is important to address the trade-off between inclusiveness and effectiveness. The country needs to develop tailored mechanisms to engage relevant stakeholders while avoiding an adverse selection problem. As for strategy building at the regional level, it is important to recognise that the identification of priorities and lines of action is influenced by the composition of the regional authority in charge of policy planning.

Box 4.2. Experimenting the participatory approach in strategy building in regions

The case of Piedmont

Recently the region of Piedmont, Italy, improved the process for bottom-up diagnosis in the identification of policy priorities, thus contributing to foster mutual learning between different stakeholders in the region and supporting a strengthening of the regional consensus for innovation. Several mechanisms contributed to this goal, including the investment of resources and the commitment of innovation leaders in the region to create a common vision by establishing a dialogue between different actors. A regional law establishes that the Regional Committee, which is the local authority responsible for policy design, must include the Chairman of the Regional Executive Council, and representatives from the *Compagnia di San Paolo* (The San Paolo Company); the CRT Foundation; *Confindustria Piemonte* (Piedmont Manufacturer's Association); *Federapi Piemonte* (Piedmont Association for small and medium enterprises); the Artisan Unions; *Unioncamere Piemonte* (Piedmont Union for Commerce, Industry and Agriculture); the Association of the Foundations of the *Casse di Risparmio Piemontesi* (Piedmont Savings Banks). Each regional university can also propose one member for this committee. Additional members come from environmentalist groups, science parks, research organisations, cultural foundations, labour unions, higher education, trade and farming. The composition of the Committee reflects the different interests of the key agents of the innovation systems and supported the identification of a strategy which is the expression of shared and concerted vision.

Source: OECD Reviews of Regional Innovation, Piedmont, 2009.

4.1.3. Mobilising private sector commitment towards innovation

55. Rising public commitment towards innovation needs to be coupled with a rising private investment in innovation. An important step towards ensuring long-term commitment to innovation in Chile is to promote private sector commitment to innovation. Chile follows the same pattern of Latin American countries in which the economies scantily invest in innovation and the majority of those resources come from the public sector. OECD countries show opposite patterns, they invest more in innovation, and the majority of that investment comes from the private sector. This is explained by the asymmetry between production structures between Chile and the OECD countries which are more specialised in technology and knowledge-intensive activities, thus expressing a higher demand for innovation.

56. Besides specific policy instruments supporting private investment in innovation (such as conditionalities for access to public funds targeted to specific sectors/groups of firms which require matching private and public financing) and activities directed to create a culture of innovation through the

country, there are some institutional mechanisms which can act as levers for increasing the commitment of the private sector towards innovation.

57. Participation of members of confederations and/or industry associations in boards, executive committees or in consultative groups of bodies with strategic planning functions is a common practice in OECD countries. Involving representatives from firms and private sector associations in strategy planning exercises could help in designing instruments which better respond to the private sector needs and to identify which are the co-ordination failures between different initiatives in order to better fine tune policies.

58. Institutions for strategy planning usually benefit from matching voices from the supply side and the demand side of innovation. Establishing platforms for policy dialogue where private and public entities confront their views and monitor policy implementation could help in increasing the commitment of the private sector towards innovation. In the case of Chile, improving the participation and commitment of the private sector both requires and facilitates parallel efforts in supporting the diversification of current specialisation patterns.

4.2. Improving the mechanisms for the allocation of resources

There is widespread recognition that in Chile the process of resource allocation for innovation is too bureaucratic and that it needs to be improved to become more effective. The following paragraphs identify five areas of action for improving the mechanisms for resource allocation.

4.2.1. Overcoming the bottleneck between the Treasury Department and the Ministry of Economy

59. Currently the mechanisms for the assignment of resources to innovation are decided on a year-by-year basis during the approval process of the national budget. This limits the margin of manoeuvre of innovation-related agencies and confers an excessive power to the Ministry of Treasury on the allocation of resources to innovation. Moving to multi-annual innovation budgets could help to overcome this imbalance. However, the current proposal of law, which establishes the CNIC, the FIC and the mechanisms for management of the current cluster policy, does not address this issue.

60. One of the major problems in fund allocations is the conflict between the “path dependent and fragmented view” based on static efficiency criteria which guide the decisions of the Treasury Department and the dynamic allocation criteria that should guide the Innovation Council of Ministries headed by the Ministry of Economy and the CNIC and the ARDP. Giving more power to the Ministry of Economy and entities at the regional level to decide on budget allocation on the basis of innovation and production development priorities could represent a way to overcome this situation.

61. In addition, there is a need to increase the availability of better metrics for innovation in the country in order to better monitor policy implementation. The Ministry of Economy is responsible for carrying out the national innovation survey which provides information on innovation activity at the firm level.¹⁶ Reinforcing the role of the Ministry of Economy and the CNIC in carrying out and analyzing innovation surveys could help in better endowing the Ministry in supporting innovation. Simultaneously, the ARDP could carry out efforts to monitor and analyze innovation in their territories.

16. Results of recent surveys are not optimistic in terms of innovation dynamics. The percentage of innovative firms is low with respect to advanced economies, registering a slight decline between 2003-2004 (38%) and 2005-2006 (33%).

4.2.2. Improving the Regional Assignment mechanism in the FIC

62. The creation of the FIC represented an important step towards establishing a mechanism for medium and long-term financing for innovation. To ensure that the fund responds to its primary function of representing a continuous source of financing for innovation, it is necessary to build strong and trustful institutions for resource allocation. This requires the consolidation of the institutional infrastructure at the national level and the development and the strengthening of the institutionality for innovation policy management at the regional level, as well as a feasible co-ordination mechanism between the two.

63. The mechanisms for the Regional Assignment of the FIC can be improved. Currently, regions can assign a maximum of 20% of the received amount to universities and research centres, the rest has to be re-channelled towards the main national public agencies supporting innovation (such as CORFO and CONICYT). The regional government (GORE) defines the use of those resources taking into consideration the national innovation strategy, the regional development strategy, and the plans for improving competitiveness of the regional development agencies.¹⁷ Some regions consider that the Regional Assignment is only a virtual devolution, because they need to re-channel the resources through the central agency. Central agencies, and especially CORFO, have a long experience in supporting production development and innovation, and it is thus normal that they play a key role in resource allocation, especially during the transition phase in which the country is creating institutional capabilities at the regional level.

64. Regional actors could gradually gain a larger role in managing the resources of the regional assignment of FIC. Regional entities claim that the current mechanism reduces the capacity of the region to selectively support local agents. Financing authorities consider that the allocation of resources on a competitive basis better responds to the need of supporting innovation dynamics. There is much room for improving the Regional Assignment, for example by adding conditionalities to support schemes and developing performance-based operational contracts. However, caution is required in the design and tailoring of those conditionalities, since a generalised call for “local and regional collaboration” might not be in all cases the best solution.

4.2.3. Assuring the assignment of the 10% for production development of national public agencies to regional initiatives

65. The 2008/2009 and 2010 Chilean budgetary law indicated that at least 10% of the resources of national public agencies involved in productive development (CORFO, Sercotec, SAG, Indap, Fosis, Conadi, Sence and ProChile) should be directed to finance initiatives from the PMCs (Enhancing Competitiveness Program) of the ARDP. This mechanism incentivises the co-ordination in strategy building between national and regional agencies. The fulfilment of this mandate, however, has been somehow uneven in the different regions, ranging from mostly formal attempts to comply with the law to actual co-ordination and co-operation for allocating resources to support the implementation of PMC. Differences in regional performances were mainly explained by the characteristics of each ARDP and by commitment of the local representative of national agencies. Some ARDP stated that they didn't have a clear role in resource allocation. It would be important to consolidate the targeting of regional initiatives in national production development programs and to empower the ARDP (*i.e.*, the new corporations) to define their strategy taking into account also this source of financing. Many OECD countries recognise the need to separate strategy building functions from resource allocation and financing functions. Usually there is a feedback and information exchange between the bodies responsible of the different functions, but

17. The financed projects have to focus on science, applied research, innovative entrepreneurship, specialised human resources formation and development, or technology transfer.

division of labour in strategy and financing is a feature that public administrations usually search for in order to improve policy effectiveness and reduce the risk of conflicts of interest.

4.2.4. Enabling the matching of different funds for innovation

66. Creating incentives to favour the matching of public and private funds for innovation is a common challenge for OECD countries. In Chile, the identification of mechanisms to favour this match of different funds is much needed since it could significantly improve the reach and effectiveness of policies. The planning agreements (*Acuerdos de Programación*) could be used as an institutional framework to promote the matching of different funds for innovation and also for multiregional initiatives. A main opportunity is that the investment initiatives coming from planning agreements allow multi-annual budgeting. To date, the use of programming agreements has been mainly restricted to large infrastructure initiatives, however they could also be used for multiregional initiatives on innovation, or for vertical co-ordination between national ministries/agencies and regional governments.

67. Resources of the FIC could be complemented with regional resources of the FNDR (*Fondo Nacional de Desarrollo Regional*) and/or with resources of private actors. This would be an incentive/opportunity for multilevel planning and financing of innovation initiatives. However, planning agreements are hard to enforce and it is necessary to put in place mechanisms for ensuring effective resource allocation and management.

68. The agencies responsible for the execution of innovation policy received an increasing amount of resources; this engendered a need for improving the internal procedures for project and program evaluation, as well as improving internal and external platforms for supporting the dialogue with different stakeholders. The agencies need to converge towards a model which combines both mechanisms oriented towards targeting specific objectives in line with the national and regional priorities and mechanisms supporting open demand (*ventanilla abierta*).

69. Beyond the support to specific clusters and production activities, the country needs to strengthen its capacity to address major innovative challenges and to comply with the critical mass imperative in any form of public intervention. Key strategic areas such as innovation in energy and water demand and supply would require co-ordination of different actions to improve the effectiveness of public support. A twofold strategy could be developed: implementing mechanisms for resource allocation which mobilise different funds at the national and regional levels to address major challenges; and developing channels to support innovation to address specific social and local needs at the regional level.

Box 4.3. The evolution of Luxinnovation as a one-stop-shop mechanism

Luxinnovation is the National Agency for Innovation and Research, founded in 1984. In 1998, it became an Economic Interest Group (EIG) under the supervision of the Ministry of the Economy and Foreign Trade, the Ministry of Culture, Higher Education and Research, the Ministry of the Middle Class, Tourism and Housing, FEDIL, the Chamber of Commerce, and the Chamber of Skilled Crafts. Luxinnovation acts as a first-stop shop and offers business enterprises and organisations free services, including information and assistance on all aspects of innovation, research, technology transfer and business start-ups; identification of the needs of each party before launching a project; advice on the choice of instruments and partners. Luxinnovation also devises and manages a number of pilot projects, including the cluster programmes, the Luxembourg Innovation Observatory and the Luxembourg Portal for Innovation and Research. Luxinnovation helps to promote innovative entrepreneurship in Luxembourg. It provides tailor-made assistance to entrepreneurs wishing to locate in Luxembourg: partnering; information and advice on financing, administrative formalities, accommodation, partner search; assistance in drawing up a business plan. Luxinnovation responds to a broad set of Ministries, and its main referent is the Ministry of the Economy and Foreign Trade which chairs the Management Council. During the evolution of the role of Luxinnovation, the Agency became a reference in priority setting, this conflicting with its primary role of innovation and production development agency. In 2008 Luxinnovation and its partner institutions signed a performance contract. On the basis of preliminary activities such as foresight exercises, evaluations or strategic audits, performance contracts help to identify work programs on a multi-annual basis.

Source : OECD Reviews of Innovation Policies, Luxembourg 2007.

4.2.5. Ensuring trust and transparency

70. Ensuring trust and transparency in resource allocation is crucial. There is a gap between the formal recognition of autonomy and the effective capacity of regional entities to design and implement their innovation strategy in response to local needs. When gradually transferring capabilities and autonomy to regions, Chile needs to ensure transparency and accountability. Institutions with a certain tradition and experience in policy administration and financial resource management will continue to play a key role in ensuring transparency and trust.

71. The strengthening of existing institutions is also usually coupled with renewed leadership committed to make the process of policy implementation more effective and able to respond to the demands arising from the national innovation system. For example, in the recent efforts of re-launching the commitment of the Region of Piedmont to support innovation, the strengthening of the regional development agency, Finpiemonte, and the identification of a key leadership committed to innovation helped to ensure trust, to improve transparency in policy implementation and to increase the capacity of the policy to respond quickly to innovative agents' needs.

72. Given its longstanding tradition in policy execution for supporting production development, CORFO can play a determinant role in ensuring transparency and in fostering policy learning in regions. The experience of the ARDP could serve as a good starting point for increasing autonomy in targeting and prioritising. SUBDERE is also a key actor to ensure transparency and to support capacity building.

4.4. Addressing the co-ordination failure and improving the governance structure

73. A major challenge for Chile is to ensure an effective implementation of policies. One of the major drawbacks of the current situation is the lack of clear administrative procedures and strong institutional infrastructure for policy management. Institutional multiplicity and lack of definition of mechanism for assigning responsibilities hamper the required co-ordination efforts. In addition, the disparities between capacities in the national administration and the institutional capabilities in the rest of

the country jeopardise the ability of the policy to profit from the potential synergies across different regions in the country.

74. In principle, the existence of similar programmes administered by different ministries and agencies is not a drawback of policies. Problems arise when scale benefits are unnecessarily compromised as a consequence of bureaucratic competition. Most OECD countries opted for creating inter-ministerial committees or co-ordinating councils, which often operate at the top or highest levels of government, to improve the coherence and co-ordination of their innovation policies. For example, Japan has created a Headquarters for Innovation Promotion, chaired by the prime minister, to promote measures outlined in its national strategy, and Finland has had a long-standing S&T Council with a co-ordinating role. In a similar vein, Korea created the National Science and Technology Council in 1999.

4.4.1. Strengthening institutions for strategic planning and budgeting: the role of the CMI

75. Priority setting is one of the most critical issues on the agenda of governments. According to the stage and evolution of the innovation system, it could be appropriate to set thematic priorities with a certain degree of selectivity in terms of scientific disciplines, technology fields or (societal or economic) problems; in other phases it may be more advisable to exert governance fostering the implementation of processes, principles or values. In certain contexts, it is possible to set directions through “shared visions”. Experience of OECD countries shows that, besides each country’s specificities, inter-ministerial committees for innovation might be useful instruments for improving co-ordination and effectiveness of policies and for ensuring a strategic and shared planning of public action for innovation.

76. OECD countries recognise that a prerequisite for effective innovation policies is the political commitment at the highest executive levels of government regarding adequate budgetary allocations in support of STI activities. This commitment needs to be coupled with an adequate governance structure for priority setting and budget allocation. In fact, to be effective, an inter-ministerial council should not only be formally entrusted with defining national priorities and ensuring interdepartmental co-ordination of S&T policy orientation and national support programmes: it should exert effectively these responsibilities and be involved in the preparation of the S&T budget.

Box 4.4. Strengthening institutions for improving policy effectiveness: NSTC and OSTI in Korea

Korea created the National Science and Technology Council (NSTC) in 1999. After five years of operation, the Korean Government felt that achievements were inferior to their expectations. In 2004 the Government announced its commitment towards a reform of the governance of the Korean system of policies supporting STI. The reform package supported the strengthening, rather than the abolition, of the NSTC. Korea created an Office for Science, Technology and Innovation (OSTI) in the Ministry for Science and Technology (MoST) in order to facilitate inter-ministerial co-ordination. OSTI staff came 40% from the MoST, 40% from other ministries and 20% from the S&T community and the private sector. The mixed composition of the OSTI allowed for cross-learning between different ministries and information exchange between different constituencies. In addition, the collaboration between the NSTC and the OSTI strengthened the advocacy power of the innovation agenda in Government budget allocation, giving more visibility to it and increasing its capacity of influencing public policy decision in high spheres. In addition, the expertise accumulated by the inter-ministerial OSTI staff allowed developing more informed strategic lines for allocation of resources with respect to the decisions that could have been achieved by the Ministry of Planning and Budget (MPB) alone. Actually, the innovation community complained that in previous phases the MPB allocated funds on the basis of rational choices influenced by various lobby interests, without taking into account potential dynamic gains deriving from the allocation of resources to innovation. The co-ordination between NSTC and OSTI allowed for reducing this type of behaviour and for setting priorities more in line with the needs of the innovation community.

Source: OECD Reviews of Innovation Policies, Korea 2009.

77. In Chile, the Committee of Ministers for Innovation (CMI) has been created as the main body for assuring co-ordination between different initiatives and for orienting the process of strategy planning. It would be appropriate to strengthen its role and to establish in a clearer way its responsibilities and co-ordinating functions. The CMI played a relevant role in defining the allocation of resources coming from the FIC; however, those resources represent only around 20% of the total resources for supporting the Chilean National Innovation System. Hence, the majority of resources for innovation are still subject to the traditional budgetary logic, contributing to the fragmentation in the management of resources for innovation and in a lack of coherence at the systemic level. A major advancement could be empowering the CMI to have a say on the allocation of the overall innovation budget (FIC and non-FIC resources).

78. Co-ordination and coherence in the allocation of resources is difficult to achieve and it is a common challenge for OECD countries. Some countries opted for creating a body which has the responsibility of overseeing the allocation of resources to innovation from a multi-sectoral perspective and encompassing all the major sources of financing for innovation. The CMI could play this role of overseeing general strategic resource allocation and it could provide a space for multi-sectoral dialogue on innovation and competitiveness. The CMI could represent the strategic space for allowing co-ordination and information exchange at the horizontal (different sectoral responsibilities) and vertical levels (regional and national actions).

4.4.2. Empowering regional actors in designing and implementing innovation policies.

79. Chile is a country with a legacy of centralised decision making. In the last decades the country has undergone a process of progressive decentralisation that has increased progressively the administrative and executive power of sub-national bodies. However, much remains to be done in order to increase planning and implementation capacities. The critical mass of financial and human resources needed and the disparity in capacities between the regions represent major challenges in the devolution process.

Box 4.5. Empowering regional actors: different trajectories in Finland, Italy and Korea

Empowering regional actors in the design and implementation of innovation policy is a gradual process. OECD countries follow different approaches in terms of devolution of autonomy in innovation policy to sub-national entities. In European countries, the process has been strongly supported and shaped by the European Union and by the Structural Funds which offer financial support to regional development. In 2008, Finland carried out an evaluation exercise of its national innovation system and its innovation policy. The panel of international experts recognised that innovation policy in Finland has a long tradition of centralised intervention and it is only recently that the country is exploring the regional and local dimensions of innovation policy. Most of the regions in Finland lack strong research environments, but they have considerable capacity in non-scientific based innovation. At present, Finland is facing the trade-off between the balanced development approach and the minimum level for efficient concentration of economic activities necessary to achieve world-leadership in key technological fields.

In Italy, a country with a strong regional vocation, it was only in 2001 that a Constitutional change supported the devolution of planning and resource administration to regions. Italy followed a case-by-case approach in the establishment of mechanisms to align national and regional actors. Therefore, the devolution process in the field of innovation policy has affected the Italian regions in different ways. At the regional level, in Italy, the local authority responsible for innovation policy strategy is or an ad hoc created body (Assessorato) in charge of research and innovation policies (such as in Piedmont), or the authority for economic development or education which are formally entitled to be responsible for regional innovation policy. Campania, for example, introduced a Regional Law on Research Policy in 2002, and started a process of development of three-year research planning. Emilia-Romagna, with a long tradition of pragmatic co-operative industrial policy, used the European structural fund programs to support innovation in the region. Lazio created a regional development agency which supports business development in hi-tech sectors and which offers traditional instruments such as investment promotion and technological services.

In Piedmont, a regional law approved in 2006 set the framework for a series of reforms to strengthen institutional capacities for innovation policy management at the regional level. The Law establishes the creation of a Regional Committee for Research and Innovation with strategy-setting functions. Then a Restricted Committee is composed of 8 to 14 members of the Regional Committee and it is in charge of policy implementation. A Scientific Commission is created with consultative functions to support international and intra-regional collaboration. Regions might choose different institutional solutions; however, the separation of the design, implementation and advice functions is crucial. In Piedmont an element of success of the gradual strengthening of innovation capacities has been the reinforcement and the amplification of tasks of Finpiemonte, the financial institution responsible for financing innovation and production programs in the region.

Korea invested in the creation of specialised intermediary organisations to support innovation in regions. Among them, there are the techno-parks, which are jointly established by local governments and the MoCIE (Ministry of Commerce, Industry and Energy) since 1997 as a means of building up technology infrastructure and facilitating production networks. The objective of the techno-parks programme is to support the formation of innovative clusters by fostering collaboration industry, academia, research institutes and government; promoting the establishment of high-technology business and prioritising the cultivation of local strategic and specific industries; and creating and fostering competitive industries. Each province has at least one techno-park. Each techno-park receives around KRW 5 billion annually to assist in infrastructure building and equipment purchase. MoST extended its Centres of Excellence programme to incorporate a new category of research centre (in addition to SRCs, ERCs, etc.), the Regional Research Centres (RRCs). In contrast to the other types of research centres, RRCs emphasised co-operative research between regional universities and industries. In 2004, this programme was taken over by MoCIE, which combined it with its own Technology Innovation Centres (TICs) programme. While RRCs had focused on supporting research work, TICs had focused on sharing expensive experimental facilities among local universities and SMEs. The new programme, known as Regional Innovation Centres (RICs), led to the creation of 80 centres. The Korean Authorities recognise that planning and implementation of these activities should be led by regional authorities, with accompanying accountability safeguards to ensure quality standards and to enable inter-regional learning.

80. As already mentioned above, in Chile there is a need to clarify institutional responsibilities at the regional level in the area of innovation and to differentiate between strategy building and executive functions, and to clarify the relationship between the ARDP and the regional government.¹⁸ As a preliminary step, it is important to identify the regional actors which should participate in the policy process and with which functions. In Piedmont, for example, there is a Direction for Science, Technology and Innovation in the regional government which is responsible for strategy setting, and Finpiemonte, an agency responsible of channelling resources to support innovation. In Chile, the ARDP (the new corporations for Productive Development) could be the repositories of the strategy building function. The Strategic Council of the ARDP could be entitled as the body responsible for identifying strategic lines of action and for proposing them to the Regional Government (GORE). The ARDP could play a determinant role in identifying the co-ordination failure between different activities and in identifying the potentialities of production transformation in each region. In strengthening the role of ARDP as agencies responsible for strategic planning, it would be important to identify mechanisms for fostering dialogue and identification of common or synergic priorities between regions.

81. The political decision is a responsibility of the Regional Government (GORE), which requires participation and support of the regional entities in charge of planning such as the SEREMIs (Regional Ministerial Secretariats), which are members of the Intendant advisory body (*Gabinete del Intendente*). The Planning division in the GORE could supervise the entire process and ensure co-ordination. Likewise, there is a need to clarify institutional responsibilities at the execution level. Some countries deliver

18. As of January 2007, responsibility for regional planning was transferred from the regional offices of the Ministry of Planning (Mideplan) to the regional government, establishing the division of planning of the regional government.

execution responsibilities to regional institutions; others maintain the control at the national level. In the case of Chile, it is necessary to strengthen institutional capacities at the regional level gradually and selectively. Public agencies responsible for policy execution, such as CORFO, CONICYT and FIA, need to be strengthened and require mechanisms for favouring regional participation and for fostering learning and development of managerial capacities at the regional level. Increasing the freedom to respond to demands coming from the regions could represent a good step in developing a culture of policy execution in regions. In this process of institutional strengthening, it is crucial not only to think about the institutional design and clarification of responsibilities, but also to implement specific programs for training officials responsible for policy execution and for fostering the diffusion of a culture of public policies for innovation and competitiveness at the national and regional level. Regions need to strengthen institutional capacities both at the technical and at the implementation level, together with organisational capacities for institutional management.

82. The proposal of law addresses the issue of strengthening institutional capacities at the regional level, but it is far from providing an implementable solution. Regarding the regional dimension, the main draw-back of the proposal is that it has been drafted without consultation of regional authorities: hence the indications for the creation of the institutional infrastructure for innovation policy in the regions lack the recognition of regional actors. On the operational side, the institutional configuration which would emerge if the law is approved would open opportunities for an institutional conflict between the proposed Regional Innovation Council (CRI) and the existing ARDP. The law creates Regional Councils for Innovation and Competitiveness in each region as advisory bodies of the Regional Government with the primary function of elaborating the regional innovation strategy and of supporting the CNIC in the elaboration of the territorial component of the national innovation strategy. The proposal of law also states that the CRI would elaborate the proposal of regional strategy for innovation. In this context the role of the recently established Corporations for Productive Development (CRDP) would appear as delegitimised by the newly funded CRI. Introducing new actors in the already weak and complex institutional arena seems inefficient.

83. The ARDP have been initiated recently (in 2006-07), hence they are in the process of institution building. The ARDP represented the first effort to build capacities in the regions to support production development and innovation, with a strong support from central administrations which was supposed to be gradually reduced with time. The ARDP have recently been modified and transformed into corporations to increase their autonomy. The new structure of the corporations transforms them in an institution rooted in the regional government instead of in a national agency. Their new capacity helps them to qualify as well-endowed agencies to serve as the institutional locus for innovation policy in the region. Strengthening the role of the corporations and identifying the requirements for empowering them to manage the innovation strategy in Chile at the regional level and to support the dialogue with the national administration is a necessary next step.

84. The new corporations should maintain the ARDP's sub-committee for innovation, which should be able to deal with the main tasks of co-ordinating innovation issues in the region in addition to the activities that the former sub-committee of innovation was already doing. At the same time, due to the important role that national public agencies play in productive development and innovation, fluent and institutionalised interactions between them and the CRDP will be crucial, beyond those that take place in the Executive Board.

85. If the new corporations are to efficiently assume responsibilities on productive development and innovation, a qualified presence of the main public/ private actors should be assured. It is important that the new governing body of the CRDP includes a fair representation not only of local actors (academia and private sector included) but also of national agencies. As of now, the ARDP were mainly dependent on the commitment of the region's Intendant (who also acts as the head of the ARDP). Most of the representatives were either from national institutions or private actors. The latter were appointed at the discretion of the

Intendant. An enlarged team of qualified professionals working for the new corporations will be required. The reduced team of technical staff of the ARDP (five people per agency including an executive director) contrast with the much higher figures observed in the ARDP of OECD countries with similar ambitions (see Table 6 in Annex). An enlarged team of professionals with the capacity to make an in-depth analysis of the different regional vocations and opportunities will be necessary in the future in order to comply in an efficient manner with the different objectives of the CRDP.

86. In OECD countries even in publicly funded agencies, emphasis is often placed on their private-sector attributes (such as a private-sector style of management and approach, self-financing via user fees, joint ventures and public-private partnerships). This shows that the agencies are not simply offshoots of line ministries and that their functioning and approach are more akin to that of the private sector. As such, the governance structure of ARDP generally involves significant representation of the private sector and other non-governmental actors. In general, ARDP are expected to play a key role in improving relations between enterprises of all sizes and the public sector.

87. The new corporations could play a key role to strengthen the competitiveness of Micro, Small and Medium Enterprises (MSMEs) at the regional level by involving them in regional productive planning. Taking regional vocations into account and offering MSMEs better access to skills, innovation and technology will add value to currently developed economic sectors in the regions and help to diversify the productive base. In this regard, attention should be paid to ensure representation of MSMEs in the ARDP.

4.3.3. Creating the appropriate incentives to align national and regional actions

88. There are several co-ordination failures hampering policy effectiveness and implementation. OECD countries undertake various efforts to co-ordinate innovation policy between and across levels of government; however effective co-ordination is seldom achieved. The co-ordination is designed following different institutional models and the effectiveness of the effort varies considerably across countries. Science and innovation policy councils like the CNIC have become a key element in these co-ordination efforts (see Box 8 in annex).

89. OECD countries recognise the need to better align national and regional actions. They attempt to foster this co-ordination and/or collaboration in different ways; actually, the governance of policies and programs at the different levels and in different fields is a key factor, but most countries struggle in designing and implementing effective mechanisms to support it.

Box 4.6. New Zealand: an experience of networking local development agencies

New Zealand has created a platform for collaboration of local and regional initiatives through EDANZ (Economic Development Agencies New Zealand), which is a network of Economic Development Agencies (EDAs). EDANZ has a 13-member board composed of the 13 Regional Agencies and around 50 other local EDA participating in the network. The network plays a key role in conveying local and regional voices into the national political debate. EDANZ carries out co-ordination, advocacy and support functions at the national level for local EDAs. EDANZ acts as a bridge between the central government and the local territorial authorities. The network ensures the effectiveness of information flow between the regions and the central government, it provides information to EDAs regarding possible opportunities for their development plan, it ensures co-ordination at the national level in case of special events/issues, and it facilitates inter-regional collaboration.

Source: OECD Reviews of Innovation Policies, New Zealand, 2007.

90. In response to the rising relevance of innovation both in national and in regional agendas, Italy opted for creating a space for dialogue between the national government and the regions in the field of innovation. Italy instituted a State-Regions Conference (*Conferenza Unificata Stato-Regioni*) as a formal mechanism through which Italian regions interact with the national state. This mechanism allows information sharing and hence interaction between national and regional actions. Representatives meet regularly to discuss aspects of the EU policy which concern regional development. The State-Regions Conference evolved in time and expanded its functions. It was created in 1983; in 1997 a reform increased its domain of action, and after the constitutional reform in 2001 it has been formally recognised as the body in charge of co-ordination between national and regional actions.

91. In Chile there are two major instances for strategic co-ordination in innovation at the national level: the Committee of Ministers for Innovation and the CNIC. At the regional level there are: the Strategic Councils for Clusters and the ARDP. CORFO, CONICYT, FIA are some of the executive agencies of the policy. It is important to maintain this distinction between the strategy building and the executive function. However much has to be improved in what concerns sectoral and regional instances. The key point is the identification of the agencies responsible for strategy building and for implementation in the regions.

92. A typical instrument used to favour the alignment of national and regional actions are well designed evaluation schemes. Empowering the CMI could help in addressing the co-ordination failure between different sectoral and national/regional programs. The CMI could play a determinant role in ensuring better coherence in strategy and resource allocation.

93. Developing a system of program-based evaluation, rather than a project-based evaluation scheme, could also represent an incentive to increase policy effectiveness, however those schemes are usually difficult to manage and excessive co-ordination requirements might slow down policy decision making. Program-based evaluations help to create synergies among different initiatives and increase the effectiveness of policies while ensuring critical mass.

94. Some countries developed a system of negotiated programming between the central government and the regions, especially in key areas such as capacity building infrastructure for innovation and support to technological development in key areas. The experience on multi-annual commitments is mixed: they are effective because they help in supporting long term initiatives which is particularly relevant in innovation; ensuring fund availability for innovation on a continuum basis is a necessary requisite for innovation policy, whose effectiveness is undermined by “stop and go” interventions. However, establishing the mechanisms for multi-annual planning also requires creating the appropriate incentives for enforcement: which otherwise can be extremely weak. If Chile decides to introduce multi-annual negotiated planning between regions and the national government, investment in the strengthening of institutional capabilities at the regional level is crucial. Currently the dialogue between the national and the regional government is biased, due to scant administrative capacities at the regional level.

95. It is important to avoid the creation of adverse incentives which foster competition between regions, instead of collaboration. Performance based indicators at the regional level might be useful for monitoring, but might induce competitive behaviour between regions, this limiting the effectiveness of the overall policy.

96. Chile invested in strengthening monitoring and evaluation capacities at the different administrative levels; however this process has not been structured and there is lack of clarification of responsibilities and domains of action. In summary, there is a need to: clarify institutional responsibilities (political functions and executive mechanisms); develop an institutional infrastructure which avoids the overlap of different instruments/mechanisms; support mechanisms for co-ordination/dialogue between

regional actors (council or agency for innovation) and implementing agencies to support the transition towards a “one-stop shop” to simplify the mechanisms of policy delivery.

4.3.4. Tackling “economic regions” beyond “administrative regions”

97. OECD countries face the challenge of designing and implementing policies which are nested in given administrative frameworks, but which deal with cross-borders phenomena, such as production and innovation. Countries and regions in OECD increasingly recognise that innovation takes place in networks which have local but also national and international components. There are specific instruments to address these issues according to the characteristics of the region in question. Regions are investing in attracting human and financial capital from other locations. Regions can apply specific conditionalities to support instruments to favour local, national or international collaborations according to the needs and the regional development strategy.¹⁹

98. Agencies in charge of strategy planning might consider the possibility of carrying out joint national and regional road-mapping exercises in order to set the basis for eventual cross-border (inter-regional and international) collaborations to orient medium and long-term public research and innovation programs. Institutions responsible for strategy setting could include in their functions joint road mapping exercises to stimulate information exchange and the creation of shared multi-regional programs. Road maps have been extensively used by Korea as guidelines for mid-term public research programs. Norway developed a certain capacity in carrying out foresight exercises to form a basis for consensus building among various stakeholders on new priority areas involving cross-regional collaboration. In New Zealand, the network of Economic Development Agencies EDANZ (Economic Development Agencies New Zealand) facilitates not only the alignment of national and regional action, but also aims to strengthen inter-regional collaboration.

99. For example, the regional approach chosen by Piedmont recognises that innovation does not take place only within regions, but also within wider production networks. Piedmont choose an innovation policy focus which, on the one hand, favours the linkages and connections within the region, while at the same time supporting the connection within centres of excellence located outside the regional administrative borders. And this issue is relevant especially in the case of Chile considering its geography and the challenge of reaching critical mass in terms of financial and human resources for innovation. Tackling economic regions requires a regional dialogue at the strategy level and at the execution level. For strategy building, the establishment of mechanisms for policy dialogue between the various ARDP could help to identify areas of synergies and complementarities between different regions. At the execution level, the national agencies responsible for resource allocation such as CORFO, CONICYT and FIA could also play a role in designing instruments which favour the allocation of resources to multi-regional programs. For example, the cluster policy could be designed in order to respond to regional challenges but also in taking into account complementarities between different regions in terms of human resource requirements, infrastructure for innovation and networks of firms.

4.3.5. Support policy learning and experience sharing

100. Increased policy responsibilities at the level of planning, implementation and financing require managerial capabilities and trustworthy institutions. Mechanisms to facilitate policy learning in regions could be coupled with increased assignation of responsibilities. Training courses, within the country and in collaboration with other countries are required in order to facilitate learning and experience sharing among policy makers.

19. See Box 9 in annex for a brief description of the experience of the European Consortium of Innovative Universities.

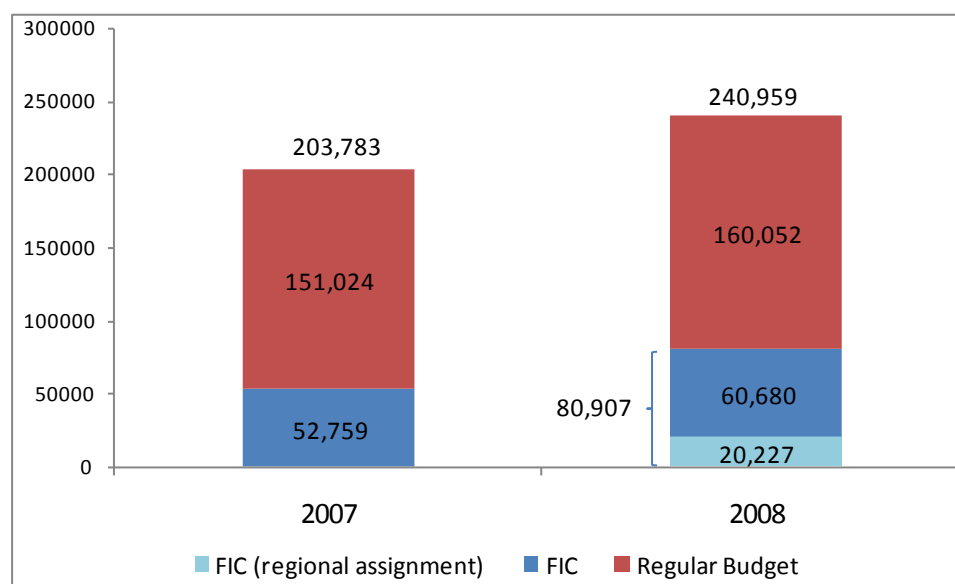
101. Capacity building for policy management and institutional strengthening is a long term process. It is important to establish procedures for policy dialogue between the different levels of government in order to favour trust building, the generation of common routines and working practices, and to favour policy learning. In the case of Chile, there is a chronic lack of capacities to manage public policies in regions. The experience of the ARDP is relevant, but it is recent and it requires monitoring and follow up.

102. The cluster experience of Innova-Chile and the programs to support clusters represented a significant advancement in policy design and implementation. Establishing a dialogue between those responsible of the management of different programs in the different regions could facilitate the exchange of good and problem solving practices in policy making. A framework for dialogue between the regional authorities and agencies for the management of the cluster programs could also help in identifying challenges and opportunities for cross-regional collaboration helping to address the challenge of decentralised support to cross-regional innovation activities. Capitalising on the experience of regional clusters could create opportunities for policy learning. Therefore, a network of observatories of the different clusters localised in the various regions could facilitate the exchange of best practices and problem solving in policy management.

ANNEX

Figure A.1. Public Investment in Innovation

(Millions of Current Chilean Pesos)



Source: Ministry of Economy of Chile

Table A.1. Distribution of the total innovation budget by category of investment (%)

Areas of Investment	2005	2006	2007	2008	2009	2010
Advanced Human Capital	2.47	2.23	3.11	3.82	6.53	9.88
Basic Science	10.02	12.27	13.15	11.72	10.49	10.30
Precompetitive research	6.45	5.44	5.98	6.10	6.63	5.55
Public goods for innovation	9.28	8.04	7.99	7.20	8.17	7.52
FIC, regional assignment	--	--	--	3.17	3.38	3.32
Human Capital	22.18	25.58	26.13	27.44	28.93	29.28
AFD-AFI	37.48	32.29	28.70	25.26	22.91	20.35
Business Innovation	8.44	8.85	8.55	8.60	7.49	8.60
Innovative Entrepreneurship	0.60	0.99	1.11	0.82	0.70	1.01
Other	0.29	0.40	0.77	0.41	0.30	0.26
Indirect Costs	2.80	3.92	4.51	5.47	4.49	3.94
Public Investment in science, technology and innovation + human capital	100	100	100	100	100	100

Source: OECD, on the basis of CNIC data.

Table A.2. The regional scientific and technological centres

Name	Location	Partners	Focus
Centro de Investigaciones del Hombre en el Desierto (CIHDE) (Man in the Desert Research Centre)	Arica Parinacota	CONICYT, Arica and Parinacota Regional Government, Tarapacá University	Archaeology and anthropology
Centro de Investigación Científico para la Minería (CICITEM) (Scientific Research for Mining Centre)	Antofagasta	CONICYT, Antofagasta Regional Government, Catholic University of the North, and Antofagasta University	Mining and biodiversity of the arid, semi-arid and hyper-arid area of the Atacama Desert
Centro Regional de Investigación y Desarrollo Sustentable de Atacama (CRIDESAT) Regional Centre of Sustainable Research and Development	Atacama	CONICYT, Atacama Regional Government, Atacama University, Corporation for the Development of the Atacama Region and the miners' trade union of Copiapó	Sustainable competitiveness in the Atacama Region
Centro De Estudios Avanzados en Zonas Aridas (CEAZA) (Centre for Advanced Research in Arid Zones)	Coquimbo	CONICYT, Coquimbo Regional Government, La Serena University, Catholic University of the North, Institute of Agricultural Research, INIA, Intihuasi.	Climate change, hydrology, biology
Centro Regional de Estudios en Alimentos Saludables (CREAS) Regional Centre of Healthful Food	Valparaiso	CONICYT, Valparaiso Regional Government, Catholic University of Valparaiso, Federico Santa María Technological University of Valparaiso, institute of Agricultural Research, INIA La Cruz.	Research on healthful food
Centro de Investigación de Polímeros Avanzados (CIPA) (Centre for Advanced Polymer Research)	Bío Bío	CONICYT, Bío Bío Regional Government, Concepción University, and Bío Bío University	Polymer science
Centro de Genómica Nutricional Agroacuícola (CGNA) (Agro-aquaculture Nutritional Genomic Centre)	Araucanía	CONICYT, Araucanía Regional Government, Institute of Agricultural Research, INIA Carrillanca, Catholic University of Temuco, and La Frontera University	Agro-aquaculture
Centro de Ingeniería de la Innovación – CIN (Centre for Innovation Engineering)	Los Ríos	CONICYT, Los Ríos Regional Government, Centre of Scientific Studies (CECS)	Technology transfer and innovation
Consortio de Investigación en Nutrición, Tecnología de los Alimentos y Sustentabilidad del Proceso Alimentario en la Acuicultura (CIEN AUSTRAL) (Group for Research in Nutrition, Food Technology, and the Feeding Process in Aquaculture)	Los Lagos	CONICYT, Los Lagos Regional Government, Austral University, and Santiago University	Development of aquaculture food and its nutritional effects in fish, molluscs or crustaceans
Centro de Investigación en Ecosistemas de la Patagonia (CIEP) (Patagonia Ecosystems Research Centre)	Aysén	Aysén Regional Government, Austral University of Chile, Concepción University, INIA, Salmon Technological Institute, Ice Fields Institute, SHOA, Fishery Industry Trade Federation, Salmon Industry Association, Coyhaique Tourism Association, University of Montana in the U.S., and University of Siena, Italy	Research on aquatic ecosystems and sustainable development of productive activities in aquatic environments.
Centro de Estudios del Cuaternario de Fuego-Patagonia y Antártica (CEQUA) (Centre for Quaternary Period Research in Tierra del Fuego, Patagonia, and Antarctica)	Magallanes	Magallanes and Chilean Antarctic Regional Government, Magallanes University, Chilean Antarctic Institute, and Institute of Fishing Development, IFOP.	Multidisciplinary scientific research on the evolution of the natural environment

Source: CONICYT.

Table A.3. Chile's territorial units, governance and main functions at sub-national level

Regions (15)	<p>a) The government of the region – national government line</p> <p>Intendant (<i>intendente</i>): The direct representative of the president of the Republic in each of the regions. The intendant is named by the president of the Republic and is maintained in the office at the discretion of the president. The intendant directs the government of the region according to the guidelines given directly by the president.</p> <p>b) The regional government (GORE) – territorially decentralised line</p> <ul style="list-style-type: none"> - Intendant (<i>intendente</i>): Acts as the executive head of the regional government and presides the Regional Council. - Regional Council (CORE): Supervises the intendant's duties. A reform is under way to elect regional councillors directly through a democratic election. <p>Main functions of the regional government:</p> <ul style="list-style-type: none"> - Design programmes and policies for regional development and productivity. - Approve the regional development plan. - Define and take investment decisions regarding use of resources from regionally defined public investments, especially from the National Fund for Regional Development (FNDR). - Advise municipalities. - Build and administer the paving of sidewalks and roads in rural areas. - Carry out various tasks related to land management, human settlements and infrastructure equipment. <p>c) Other organs of the public administration in the region</p> <ul style="list-style-type: none"> - Ministerial regional secretaries (SEREMIS): National ministries' regional representatives who co-ordinate the public services under their responsibility. The Regional Planning Secretariat (SERPLAC) is a key institution in the investment process.
Provinces (52)	<ul style="list-style-type: none"> - Governor (<i>Gobernador</i>): Appointed by the President. He is the territorial deconcentrated authority of the intendant in the territory of the province. - Provincial Economic Council: Headed by the governor, acts as an advisory institution to the provincial governor. <p>Main functions: Supervise public services provided in the province. Maintain public order and citizens' safety.</p>
<p>Municipalities (345)</p> <p>Public corporations, with both legal personality and private assets, whose end is to satisfy the needs of the local community</p>	<ul style="list-style-type: none"> - Mayor (<i>Alcalde</i>): Highest authority in a municipality; chair of the municipal council. - Municipal council: advises, regulates and supervises the mayor's performance. It is in charge of ensuring the effective participation of the local community. - Economic and social council: It is an entity of the municipality composed of representatives of civil organisations of the comuna, aimed at ensuring their participation. Both the mayor and the council are chosen through popular elections every four years. <p>Main functions:</p> <p>Exclusive functions: To develop, approve and modify the communal zoning plan (Plan Regulador Comunal); to promote local development; to enforce all measures regarding transport; to implement provisions regarding construction and the planning and urban regulation of the commune.</p> <p>Shared faculties (implemented either directly or in conjunction with other levels of government): public health, primary and secondary education, culture, work training and economic development, tourism, traffic regulations, social housing development and sanitary infrastructure, citizen safety.</p> <p>Special attributions to carry out its functions: Collect fees for municipal services, concessions or licences; enforce taxes on activities or goods with a clear local identity to be used for communal development; award grants to public or private non-profit organisations; acquire or transfer moveable properties or real estate.</p>

Source: SUBDERE.

Box A.1. Horizontal co-ordination of STI policy

All countries undertake efforts to co-ordinate science and innovation policy. This co-ordination is implemented and institutionalised in different forms, and the stringency of this effort varies considerably across countries. Science and innovation policy councils have become a key element in these co-ordination efforts:

- Korea has made persistent efforts to better co-ordinate its science, technology and innovation policies. It has established a National Science and Technology Council, which has been progressively strengthened to play a pivotal role in policy co-ordination. Among other functions, it is responsible for improving coherence between different ministries' programmes.
- The advisory Swiss Science and Technology Council is rather centred on science and higher education. Unlike comparable councils in other countries, it is comprised exclusively of members from academia.
- Norway lacks a strong institutionalised co-ordination "arena", but it is held that this is partly compensated for by a relatively strong informal co-operation between the ministries involved in science, technology and innovation policy.
- Hungary has a Science and Technology Policy Council chaired by the Prime Minister. In recent years it has stopped convening, and thus has not played a decisive role in important strategic policy decisions.
- Chile has established an advisory National Innovation Council for Competitiveness. It has been successful in developing a national strategy and deploying a cluster initiative. The Council has triggered changes in the governance system, including the creation of an Inter-ministerial Committee for Innovation, the advisory Council's counterpart in the executive branch. There has been some initial uncertainty concerning its actual role in allocating resources from the Innovation for Competitiveness Fund (which was established along with a levy on mining revenues).
- China's State Council Steering Group for Science, Technology and Education headed by the Prime Minister is a top-level co-ordinating mechanism on strategic matters. There is a lack of a co-ordination covering the design and implementation of science, technology and innovation policy, and co-ordination between the central and provincial levels, and among regions, remains weak.

Source : : Based on country reviews of innovation policy, current status and interim synthesis report, OECD DSTI/STP(2009)4.

Table A.4. Size and funding in OECD regional development agencies, selected examples

	Number of Employees	Annual budget, EUR millions
One Northeast (United Kingdom)	250	400
SPRI –Basque Country (Spain)	92	53
Midi-Pyrénées Expansion (France)	27	3.1
ASNM Nordmilano (Milan)	30	9
NOM (The Netherlands)	50	13
Barcelona ACTIVA (Spain)	80	16

Source: OECD Territorial Review of Chile, 2009

Box A.2. The European Consortium of Innovative Universities

The European Consortium of Innovative Universities (ECIU) was established in 1997 and registered as a Foundation under Dutch Law with 10 European members and three associate Partners (Mexico, Australia and Russia). The Consortium has an annual budget of EUR 2.5 billion. The ECIU governing body is the Executive Board with one representative per ECIU institution. The ECIU Board meets twice a year. The members of the consortium are universities with specific vocation of fostering collaboration between universities and business. The experience show that this consortium has contributed to the socio-economic development of the areas around member universities (Aalborg University in Denmark, Universitat Autònoma de Barcelona, Spain, Universidade de Aveiro (Portugal), Politecnico di Torino, University of Twente Netherlands, etc.).

ACRONYMS

ARDP	<i>Agencias Regionales para el Desarrollo Productivo</i>	Regional Development Agencies
CMI	<i>Comité de Ministros para la Innovación</i>	Committee of Ministers for Innovation
CNIC	<i>Consejo Nacional de Innovación para la Competitividad</i>	National Council for Innovation and Competitiveness
Conadi	<i>Corporación Nacional de Desarrollo Indígena</i>	National Corporation for Indigenous Development
CONICYT	<i>Consejo Nacional de Ciencia y Tecnología</i>	National Council for Scientific and Technological Research
Core	<i>Consejo Regional</i>	Regional Council
CORFO	<i>Corporación de Fomento de la Producción</i>	Economic Development Agency
CRDP	<i>Corporación para el Desarrollo Productivo</i>	Corporation for Production Development
CRI	<i>Consejo Regionales de Innovación</i>	Regional Innovation Council
EU	<i>Unión Europea</i>	European Union
FIA	<i>Fundación para la Innovación Agraria</i>	Agrarian Innovation Fund
FIC	<i>Fondo de Innovación para la Competitividad</i>	Innovation Fund for Competitiveness
FNDR	<i>Fondo Nacional de Desarrollo Regional</i>	National Fund for Regional Development
Fosis	<i>Fondo de Solidaridad e Inversión Social,</i>	Social and Solidarity Investment Fund
GORE	<i>Gobierno Regional</i>	Regional Government
INDAP	<i>Instituto de Desarrollo Agropecuario</i>	Agricultural Development Institute

AAA

MIDEPLAN	<i>Ministerio de Planificación</i>	Ministry of Planning
MSMEs	<i>Micro, pequeñas y medianas empresas</i>	Micro, Small and Medium Enterprises
PMC	<i>Programa de Mejoramiento para la Competitividad</i>	Enhancing Competitiveness Program
SAG	<i>Servicio Agrícola y Ganadero</i>	Agriculture and Livestock Service
SERNATUR	<i>Servicio Nacional de Turismo</i>	National Tourist Board
Sence	<i>Servicio Nacional de Capacitación y Empleo</i>	National Training and Employment Service
SERCOTEC	<i>Servicio de Cooperación Técnica</i>	Technical Co-operation Service
SEREMI	<i>Secretaría Regional Ministerial</i>	Ministerial Regional Secretariat
SERPLAC	<i>Secretaría Regional de Mideplan</i>	Regional Secretariat of Mideplan
STI	<i>Ciencia, Tecnología e Innovación</i>	Science, Technology and Innovation
SUBDERE	<i>Subsecretaría de Desarrollo Regional y Administrativo</i>	Sub-Secretariat for Regional and Administrative Development