



Mid Term Review 2011

OECD Environmental Performance Review, Chile 2005

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EXECUTIVE SUMMARY

As a result of the first environmental performance review of Chile, carried out voluntarily as part of the accession process to the OECD (2005), 52 recommendations were made by a team of experts from OECD countries (France, United States, Canada and Mexico), the OECD Secretariat, and the UN ECLAC. The objective of the recommendations was to highlight a series of issues related to promotion of sustainable development and environmental management.

In relation to these recommendations, this mid-term review provide a panorama of both the level of progress in achieving national objectives and international commitments that the country has signed as well as the tasks and challenges that remain for the next process of evaluation.

The most significant advances in Chile during this period are in six areas: environmental institutions, energy efficiency and development of non-conventional renewable energies (NCRE), air quality management, aquaculture regulations, *in situ* biodiversity conservation policies and native forest sustainable management, and climate change.

In 2010, Chile's environmental institutions were redesigned with the creation of the Ministry of the Environment, the Ministerial Council for Sustainability, the Environmental Assessment Service, and the Superintendency for the Environment. This redesign will be complemented by the creation of the Environmental Courts and the Biodiversity and Protected Areas Service, which are now being considered by the Congress. The new environmental institutions respond at two of the country's priorities: to increase the importance of environmental matters in the national government and to clearly define responsibilities in the various fields that involve sustainable development.

In matters of energy efficiency and NCRE development, in 2006 the National Energy Efficiency Programme (now known as the Chilean Energy Efficiency Agency) was created to lead national policy development in this area. Today, this Agency is part of the Ministry of Energy, which was created in 2010.

Regarding NCRE, in order to create a legal basis for and provide appropriate economic incentives for these sources of energy, in 2008 Law 20,057 was passed to promote and develop NCRE, and in 2009 the Center for Renewable Energies was created.

In terms of air quality management, progress can be verified in three levels: strengthening and updating regulations, developing and implementing prevention and decontamination plans, and creating an air quality programme.

Notable advances in strengthening regulations include the establishment of the Air Quality Standard for Fine Particulate Matter - PM2.5 , which will go into force in 2012, and the Emissions Standard for Power Plants, which is now in the last phase of approval. In accordance with the declaration of saturated zones, updates and reformulations were carried out of the Prevention and Decontamination Plan of the Metropolitan Region (2009), the Decontamination Plan for the Municipalities of Temuco and Padre Las Casas (2009), and the Decontamination Plan for the Municipality of Tocopilla (2010), while six other plans are in progress. Complementing these plans and standards, in 2010 the Ministry of Environment created the National Clean Air Programme, which is designed to address cross-cutting aspects that affect air quality on a national level, particularly in cities with high pollution levels.

The following progress has been made in aquaculture: in April 2010, Law 20,434 which modifies the General Law of Fishing and Aquaculture in terms of conditions for large-scale aquaculture, was published. This law adopted measures for improving sustainability, preventing impacts, containing disease and pests and reinforcing compliance mechanisms. The sanitation measures emphasise the territorial reorganization of the industry through the creation of concessions neighbourhoods.

Also, environmental quality monitoring activities in the areas surrounding and underneath aquaculture farming centres are now carried out by the government, rather than the private sector. Complementary to this , the law created the National Aquaculture Unit within the National Fishing Service, as a way to strengthen its enforcement function.

Another important initiative during this period was the promulgation in 2007 of Law 20,283 on Recovery of Native Forest and Forest Development. This law is the most significant in terms of protection, sustainable management and reforestation of native forest. Together with diverse measures aimed at guaranteeing proper management and conservation of these resources, the law includes a fund for recovery, conservation and management of native forest.

In regard to *in situ* conservation, the most important action taken during this period was the submission to Congress of the bill to create the Biodiversity and Protected Areas Service. This new agency will replace the National Forestry Corporation as part of an effort to better define the role of the government in nature conservation.

Since 2006, the country has had a National Strategy for Climate Change, which was followed in 2008 by the National Action Plan on Climate Change (2008-2012), giving political viability to the commitments that the country has made in this area. Along the same lines, another notable action was the creation of the National Climate Change Office within the Ministry of Environment. This Office is responsible for formulating and articulating climate change policies within government.

Although progress in environmental management has been substantial during this period, there are still issues which have advanced slowly and which will be priorities for the government in environmental matters over the coming years. These topics include development of environmental statistics and indicators, compliance with the goals of the National Biodiversity Strategy and strengthening the scientific knowledge to support it, and the definition and implementation of an appropriate National Policy on Water Resources.

Regarding the development of environmental statistics and indicators, since 2005 there has been a process to strengthen the National Environmental Information System (SINIA). This initiative is primarily aimed at centralising environmental information in the country into a single data center. In this context, the National Statistics Institute is now including environmental data on air and water quality in its annual reports and the National Action Plan on Climate Change includes the development of environmental indicators.

Although the country was not able to meet its goal of protecting 10% of all significant ecosystems by 2010 (which was part of the National Biodiversity Strategy), the National Policy on Protected Areas (2005) was created and there has been a 5.1% increase protected land area in the country since 2005 (17 new units). During this period, moreover, the country's Marine Protected Areas increased by 54% (6 new marine areas).

While scientific knowledge to support public policies aimed at conservation and sustainable use of biodiversity have not shown substantial progress, this situation is expected to be reversed with the creation of the Biodiversity and Protected Areas Service. That bill of law includes a special fund for research, in addition to other initiatives that include biodiversity as one of their priority issues, such as the National Action Plan on Climate Change.

In April 2008, the National Strategy for Integrated Watershed Management was officially launched. Although this effort has not met with much success, some elements driven by this Strategy have been adopted, including the creation in 2011 of the User Organisations and Water Efficiency Unit within the General Water Directorate. Among the main functions of this new area will be to guide, direct, control and strengthen water user organisations and continue to implement the "National Water Efficiency Initiative," which promotes water efficiency actions among the different

productive and non-productive activities in the country. Additionally, this year the Ministry of Environment is working on the design of an environmental policy on water, mainly aimed at setting environmental objectives and long-term goals. It should be noted also that during this period, the General Directorate of Water began to administer a monitoring system of glaciers, a step forward on a matter of high public priority for the country.

Overall, despite remarkable progress in environmental management in Chile observed during the last 6 years, the country still faces important challenges which are to be addressed as part of the priority commitments of the government's environmental agenda in the coming years.

1. ENVIRONMENTAL MANAGEMENT

i. Implementing environmental policies

RECOMMENDATION 1**DEVELOP AND STRENGTHEN THE ENVIRONMENTAL INSTITUTIONS AT NATIONAL AND REGIONAL LEVELS.**

On 26 January 2010, Law No. 20,417 was published in the Official Gazette (Diario Oficial). This law modified Chile's institutional framework for environment matters, completely transforming it by creating the Ministry of the Environment, the Ministerial Council for Sustainability, the Environmental Assessment Service and the Superintendency for the Environment, which specialises in enforcement and sanctions. This redesign will be complemented by the creation of the Environment Courts and the Biodiversity and Protected Areas Service, which are included in bills now being considered in Congress.

a. Ministry of the Environment

The Ministry of the Environment is responsible for developing and applying policies and programs and serves as the nerve centre of the reform, increasing the importance of environmental issues. Its main areas of competence are:

- Development and application of policies, plans and programs in environmental matters;
- Protection and conservation of biological diversity and renewable and natural and water resources;
- Promotion of sustainable development;
- Ensuring the integrity of environmental policy and regulations.

With this reform, protection of nature and biodiversity becomes the exclusive competency of the Ministry of the Environment. This includes the obligation to develop a database of Chilean biodiversity and formulate policies and regulations regarding Protected Areas, among other tasks¹.

The Ministry of the Environment is the sole administrative, technical and scientific counterpart to international conventions and is responsible for ensuring compliance with them, regardless of the natural areas of authority of the Ministry of Foreign Affairs. Among other things, the Environment Ministry is responsible for proposing policies and formulating plans, programs and actions in the area of climate change. In the exercise of this competency, the Ministry must collaborate with different government organisms at the national, regional and local levels to determine the effects of climate change and establish the necessary adaptation and mitigation measures.

¹ Although the political and legal responsibility for protecting biodiversity belongs to the Environment Ministry, the Ministry of Agriculture and the Ministry of Economy maintain some authority in this area, and these must be coordinated through the Ministerial Council for Sustainability.

In the area of environmental risks, its competency extends to chemical products, genetically modified organisms and substances which in general can affect the environment.

On the other hand, the Ministry has the regulatory power and competency and general and mandatory administrative power to interpret environmental quality and emissions standards and prevention and decontamination plans. In addition, it has the authority to require prior notification from other ministries regarding administrative acts they dictate for their implementation.

The Ministry is also responsible for establishing a public information system on compliance and application of general environmental standards in effect, including a comprehensive and updated survey of such standards, which must be freely available to the public through electronic means. Likewise, the Ministry must manage all information on air, water and soil quality monitoring programs provided by the competent organisms, as applicable.

The Ministry develops studies and collects all available information to determine the baseline for the country, prepare environmental accounts, including environmental assets and liabilities, and define the carrying capacity of environmental basins in the country.

b. Ministerial Council for Sustainability

The Ministerial Council for Sustainability is a public policy deliberation organism which brings together the different ministries. This organism guarantees regulatory integrity, to the extent that all sectors must always obtain the ruling of this Council regarding regulations in environmental matters. Its agreements or decisions are binding and mandatory for government organisms. Among the Council's other functions is to propose to the President of the Republic the creation of protected areas; policies for management, use and sustainable exploitation of renewable natural resources; and sustainability criteria to be included in government policies and plans.

c. Environmental Assessment Service

The Environmental Assessment Service is the technical agency in charge of administering the Environmental Impact Assessment System (Sistema de Evaluación de Impacto Ambiental, or SEIA). This Service is a decentralized organism overseen by the President of the Republic through the Ministry of the Environment. It is also responsible for managing a system with information on environmental permits and authorizations and an information system on project baselines. Among its other functions are unifying environmental criteria, requirements, conditions and procedures as well as proposing ways to simplify procedures.

Among the modifications contemplated for the Environmental Impact Assessment System are:

- A facultative citizen participation process in relation to Environmental Impact Declarations;

- Voluntary evaluation and certification process for projects and activities which are required to submit an Environmental Impact Declaration;
- The right to environmental information, establishing for this purpose a national public records system;
- Criteria for expiration, publication, revision and adaptation of Environmental Qualification Resolutions (Resoluciones de Calificación Ambiental, or RCAs);
- References to 15 new regulatory matters and 8 modifications of the SEIA Regulation.

d. Superintendency of the Environment

The Superintendency of the Environment is an autonomous organism overseen by the President of the Republic through the Ministry of the Environment. The Superintendent is named by the President of the Republic through the Senior Public Management System.

The Superintendency manages an integrated system of environmental enforcement designed to execute, organise, and coordinate the monitoring and enforcement of Environmental Qualification Resolutions, measures contained in Prevention and/or Decontamination Plans, the content of Environmental Quality and Emissions Standards, Management Plans as applicable, and all other environmental instruments established by the law.

The system includes direct enforcement by the Superintendency through enforcement programmes as well as indirect enforcement through subprogrammes implemented by the various public agencies. Support is also to be provided by suitable and duly certified third parties which provide data collection services for the Superintendency.

The enforcement system includes incentive mechanisms such as Citizen Reports, through which an identified individual may report and demand resolution, as well as a Self-reporting scheme, through which an offender may immediately report a violation and reduce his or her sanction by up to 100%. Likewise, it will maintain a registry of sanctions with information about the sanctioned parties and their representatives.

The Superintendency of the Environment will not have its full powers, particularly regarding enforcement and sanctions, until the first Environmental Court begins functioning, so that in the short term it will focus on defining priorities and generating information necessary for efficient operations. The legislative proposal for the creation of the Environmental Courts is currently in discussion in Congress.

Fundamentally, what the legislation proposes is that the Environmental Court be an organism with a special and independent jurisdiction, subject to the executive, correctional and economic oversight of the Supreme Court, and whose function shall be to solve disputes of an environmental nature in matters within its competency. The project contemplates three courts distributed in macrozones

(northern, central and southern Chile). Each of these courts will be staffed by three judges, 2 lawyers and 1 scientific professional.

Finally, the new Law also introduces modifications which involve other state organisms in the following sense:

- It modifies the General Fishing and Aquaculture Law, giving authority to the Environment Ministry, for example, to create marine parks and reserves via decree.
- It modifies Article 31 of Law 17,288 on National Monuments, among other things, granting custody of nature sanctuaries to the Environment Ministry.
- It modifies Law-Decree N° 1,939 of the Ministry of Land and Colonisation of 1977 on Acquisition, Administration and Disposal of State Property, requiring prior notification from the Ministry of Environment to impose environmental protection requirements in purchase and sale contracts of rural, state-owned land and in decrees or resolutions regarding rental, acts of entitlement or titles of dominion, as applicable, by the Ministry of National Property.
- It modifies the Organic Law of Municipalities, changing the Department of Sanitation and Landscaping of each municipality to the Department of the Environment, Sanitation and Landscaping, with new functions as a result.
- It modifies Decree with Force of Law N° 294 of 1960 of the Treasury Ministry on the Functions and Structure of the Agriculture Ministry, in order to reconcile the attributions of the latter ministry with those of the Ministry of Environment, leaving to the Agriculture Ministry powers only relating to protection, conservation and enhancements of renewable natural resources in the area of forestry, farming and livestock.
- It modifies Article 129 bis 1 of the Water Code, giving authority to the Ministry of the Environment to set regulatory criteria in order to establish the minimum ecological flow, and to deliver a report prior to the establishment of minimum ecological flows through Presidential decree.
- It modifies Law N° 18,902 which creates the Superintendency of Sanitary Services, limiting its oversight function of liquid industrial waste (LIW) to those LIW which are related to services provided by sanitation companies.

This process of institutional change has significantly increased the resources of the Ministry: in 2006 CONAMA's total budget was US\$22.5 millions, which grew in subsequent years at a rate much higher than public spending on average. By 2011, the budget was US\$61,8 millions. These resources have provided financing for the new organisms and have allowed the ministry to increase staff as well as raise salaries in accordance with the new skills and functions.

RECOMMENDATION 2

FURTHER DEVELOP AND STRENGTHEN REGULATORY FRAMEWORKS (E.G. STANDARDS) TO IMPROVE ENVIRONMENTAL HEALTH AND TO ACHIEVE CHILE'S INTERNATIONAL COMMITMENTS; REVIEW WAYS TO STRENGTHEN COMPLIANCE AND ENFORCEMENT CAPACITY, INCLUDING THROUGH INSTITUTIONAL REFORMS, FOR INSTANCE THE ESTABLISHMENT OF AN ENVIRONMENTAL INSPECTORATE.

With respect to regulation, the enactment of Law 20,417 that modifies the institutional framework (see Recommendation 1) introduced regulatory changes related to environmental standards and prevention or decontamination plans. With regard to emissions standards, language was added concerning the use of criteria from the best available techniques to determine which values or parameters should be included in the regulation. On the other hand, in relation to the declaration process for saturated zones, a procedure was established to render without effect a Saturated or Latent Zone declaration when the conditions upon which it was based do not exist. This situation had not been contemplated in the previous legislation.

Another law enacted in this period is the Ozone Law (Law 20,096, published 23 march 2006), which authorises the establishment of controls on imports, production and use of substances subject to the Montreal Protocol.

In the area of environmental standards, since 2005 the following supreme decrees establishing environmental and emissions standards aimed at improving human health and natural resources have gone into effect (Table 1):

TABLE 1
ENVIRONMENTAL STANDARDS ISSUED DURING 2005-2011 PERIOD

Component	Environmental Standards Issued 2005-2011	Decree N°/year	Scope
Water	Primary Quality Standard for continental surface waters suitable for recreational activities with direct contact ²	SD N° 143/09, Ministry Secretary General of the Presidency (MINSEGPRES)	National
Water	Primary Quality Standard for protection of marine and estuarine waters suitable for	SD N° 144/09, MINSEGPRES	National

² Establishes levels of environmental quality for the country's continental surface waters suitable for recreational activities with direct contact in order to safeguard public health.

	recreational activities with direct contact ³		
Water	Secondary Environmental Quality Standard for protection of continental surface waters in the Serrano River basin (Torres del Paine National Park). ⁴	SD N° 75/10, MINSEGPRES	Territorial
Water	Secondary Environmental Quality Standard for protection of the waters of Lake Llanquihue ⁵	SD N° 122/10, MINSEGPRES	Territorial
Water	Emissions Standard for Molybdenum and Sulphates in Effluents Discharged into Carén Creek ⁶	SD N° 80/05, MINSEGPRES	Territorial
Air	Emissions Standard for Incineration and Co-incineration cement furnaces, rotating limestone furnaces and forestry installations using treated forest biomass ⁷	SD N° 45/07, MINSEGPRES	National
Air	Emissions Standard for NO, HC and CO spark ignition vehicles ⁸	SD N° 149/06, MINSEGPRES	Territorial
Air	Primary Environmental Quality Standard for Fine Particulate Matter PM2.5	SD N°12/11, MMA	National

Since 2005 the following standards revision processes⁹ have been finalized (Table 2):

³ Establishes levels of environmental quality for the country's marine and estuarine waters suitable for recreational activities with direct contact in order to safeguard public health.

⁴ This is the first secondary water quality standard in effect in Chile for fresh water bodies and is aimed at preventing environmental deterioration, protecting and preserving aquatic biodiversity and maintaining resource quality. Specifically, the regulated flows are the Paine, Serrano, Grey, Las Chinas, Baguales, Vizcachas, Don Guillermo and Tres Pasos rivers. The overall objective of this standard is to protect and maintain water bodies or flows of exceptional quality in the Serrano River basin, ensuring it remains a site of environmental, scenic and touristic value. The regulated parameters are aluminium, cadmium, chloride, copper, fecal coliform, chromium, iron, manganese, mercury, conductivity, molybdenum, nickel, pH, dissolved oxygen, lead, SAR (sodium adsorption ratio), selenium, sulphate and zinc. The standard establishes quality levels for each parameter and for each of the 8 areas of oversight defined within it.

⁵ The general objective of this standard is to maintain the current quality of the waters of Lake Llanquihue and prevent anthropomorphic eutrophication. The regulated parameters are conductivity, pH, dissolved oxygen, turbidity, silicon, chemical oxygen demand (COD), transparency, total nitrogen, total phosphorous and chlorophyll a. The standard establishes quality levels for each parameter and for each of the 4 areas of oversight defined within it.

⁶ Establishes emissions standards for molybdenum and sulphates in effluents discharged from tailings dams into Carén Creek, specifically regulating the liquid industrial waste of CODELCO's El Teniente Division, in a different way than that governing the rest of the industrial sector.

⁷ This is aimed at preventing the negative effects on public health and natural resources caused by the toxic emissions from these processes. More information about the characteristics of this regulation are presented in Recommendation 8.

⁸ Establishes NO, HC and CO emissions standards for the control of NOx in spark ignition (Otto cycle) vehicles in use, which meet the emissions standards established in Supreme Decrees N° 211 of 1991 and 54 of 1994, both of the Transport and Telecommunications Ministry, in order to reduce nitrous oxide emissions.

⁹ In accordance with current environmental legislation, standards must be revised at least every five years based in terms of the effectiveness and efficiency of their application.

TABLE 2
ENVIRONMENTAL STANDARDS REVISED DURING 2005-2011 PERIOD

Component	Environmental Standards Revised 2005-2011	Decree N°/year	Scope
Air	Revision of Secondary Air Quality Standard for sulphurous anhydride (SO ₂) ¹⁰	SD N° 22/09, MINSEGPRES	Territorial
Air	Revision of Emissions Standard for regulation of arsenic released into the air ¹¹	SD N° 75/08, MINSEGPRES	Territorial
Air	Revision of Emissions Standards for Light, Medium and Heavy Motorised Vehicles ¹²	SD N° 95/05, MINSEGPRES	National
Noise	Revision of Noise Emissions Standard for urban and rural public transport buses ¹³	SD N° 38/07, MINSEGPRES	National

The Public Table¹⁴ published in February 2011 provides information on 24 enactment processes of environmental standards begun in 2005 and currently in development. Nine of these correspond to standard revision processes. The standards are presented below, divided into quality standards (Table 3) and emissions standards (Table 4):

TABLE 3
ENVIRONMENTAL STANDARDS IN THE PROCESS OF ENACTMENT OR REVISION, DURING 2005-2011 PERIOD

Component	Environmental Quality Standards in the Process of Enactment or Revision, 2005-2011	Scope
Water	Secondary Environmental Quality Standards for protection of marine and estuarine waters in the Aysén Region	Territorial
Water	Secondary Environmental Quality Standards for marine sediments in the Aysén Region	Territorial
Water	Secondary Environmental Quality Standards for protection of waters in the Mataquito River basin	Territorial
Water	Secondary Environmental Quality Standards for protection of waters in the Valdivia River basin	Territorial
Water	Secondary Environmental Quality Standards for protection of waters in the Baker River basin	Territorial

¹⁰ This improves the standard currently in effect, through the introduction of the percentile as the criterion of excellence for the current daily and hourly standard. It also updates monitoring methods and the obligation to submit information to the authorities and describes appropriate monitoring stations for evaluating the secondary standard.

¹¹ The main modifications are related to the measurement and control methodology of the standard.

¹² Contained in Supreme Decrees N° 211 of 1991 and 54 and 55 of 1994, of the Transport and Telecommunications Ministry.

¹³ In this revision, the dynamic testing methodology was modified.

¹⁴ In accordance with regulations in effect, the Public Table must provide information about the matters addressed and status of the various standards processes, as well as their timeframes and pending procedures.

Water	Secondary Environmental Quality Standards for protection of waters in the Huasco River basin	Territorial
Water	Secondary Environmental Quality Standards for protection of continental surface waters of the Tinguiririca River basin	Territorial
Water	Secondary Environmental Quality Standards for protection of continental surface waters of the Itata River basin	Territorial
Water	Secondary Environmental Quality Standards for protection of continental surface waters of the Villarrica Lake basin	Territorial
Water	Secondary Environmental Quality Standards for protection of continental surface waters in the Limarí River basin	Territorial
Air	Revision of primary quality standard for PM10	National
Air	Revision of primary air quality standards for SO ₂ , CO, O ₃ and NO ₂	National

TABLE 4

EMISSIONS STANDARDS IN THE PROCESS OF ENACTMENT OR REVISION, DURING 2005-2011 PERIOD

Component	Emissions Standards in the Process of Enactment or Revision, 2005-2011	Scope
Air	Emissions standards for domestic appliances that burn firewood or other biomass fuels	National
Air	Particulate matter and gas emissions standards for generators in the Metropolitan Region	Territorial
Air	Emissions standards for thermoelectric plants ¹⁵	National
Noise	Noise emissions standard for light and medium vehicles and motorcycles	National
Water	Emissions standard for liquid waste discharge from the potable water treatment system	National
Air	Revision of NO, HC and CO emissions standards for control of NO _x in spark ignition (Otto cycle) vehicles in use	National
Air	Revision of emissions standards for odors from the manufacture of sulphate pulp (TRS gases);	National
Air	Revision of emissions standard for incineration and co-incineration	National
Water	Revision of emissions standard for regulation of contaminants associated with liquid waste discharge into marine and continental surface waters	National
Water	Revision of the emissions standard for liquid waste discharge into groundwater	National
Noise	Revision of emissions standard for noises generated by fixed sources	National

¹⁵ Details on this emissions standard are presented in Recommendation 8.

Light	Revision of the emissions standard for regulation of light pollution	Territorial
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As June 2011, The Emissions Standard for Thermoelectric Plants has been approved by the President of the Republic and is now in the final stage of review by the General Comptroller of the Republic. Thus, it is expected that the decree will be published in the Official Gazette (Diario Oficial) in the next few months¹⁶.

In accordance with current regulations, the 2007-2009 Strategic Standards Program was published in the Official Gazette in April 2010, and defines the following priority standards (Table 5):

TABLE 5
PRIORITY ENVIRONMENTAL STANDARDS (APRIL 2010)

Component	Priority Environmental Standards	Scope
Air	Emissions standards for furnaces	National
Air	Emissions standard for generators	National
Air	Emissions standards for smelters	National
Water	Secondary Environmental Quality Standard for protection of water in the Imperial River basin	Territorial
Water	Secondary Environmental Quality Standard for protection of the waters of Ranco Lake	Territorial
Soil	Primary Quality Standard for Soil	National

Regarding Prevention and Decontamination Plans, the following decrees that establish Decontamination Plans (presented in greater detail in Recommendation 7) have been published and initiated:

- Decontamination Plan for the city of Tocopilla¹⁷, in the Antofagasta Region (Supreme Decree 70/10, MINSEGPRES)
- Decontamination Plan for Temuco and Padre las Casas¹⁸, Araucanía Region (Supreme Decree 78/09, MINSEGPRES)
- Likewise, the Prevention and Decontamination Plan for the Metropolitan Region¹⁹ has been published, revised, reformulated and updated twice, most recently in 2009.

¹⁶ For more information about the characteristics of these standard see Recommendations 7 and 8.

¹⁷ Recommendation 7 contains more information on this Plan.

¹⁸ Recommendation 7 contains more information on this Plan.

¹⁹ Recommendation 12 contains more information on this Plan.

According to the Public Table of Prevention and Decontamination Plans of January 2011, since 2005 six Prevention and Decontamination Plan preparation processes have begun and are in development. One of these is a revision process. These are:

- Decontamination Plan for the Central Valley of the O'Higgins Region;
- Decontamination Plan for the City of Calama and surrounding area;
- Decontamination Plan for the town of Andacollo and nearby areas;
- Atmospheric Prevention Plan for the municipalities of Metropolitan Concepción;
- Prevention Plan (SO₂) for the Chuquicamata Smelter, Codelco North Division;
- Revision of PM10 Decontamination Plan for the Chuquicamata Smelter, Codelco North Division.

In other areas, during this time a series of environmental standards in different sectors have been approved. Among these are:

- Regulation on handling waste from healthcare establishments, Health Ministry (MINSAL): Establishes the sanitary and basic safety standards for handling waste generated in healthcare establishments. (Supreme Decree 6/09, MINSAL)
- Regulation on sanitary and basic safety conditions in sanitary landfills, Health Ministry. (Supreme Decree 189/08, MINSAL)
- Regulation for handling sludge generated by sewage treatment plants, Health Ministry: Establishes the sanitary classification of sludge and the minimum sanitary requirements for its handling, as well as restrictions, requirements and technical conditions for the application of sludge to specific soils. (Supreme Decree 4/09, MINSAL)
- Decree which establishes the obligation to declare emissions indicated by the Health Ministry: Establishes the obligation to provide the necessary background information to estimate emissions of atmospheric contaminants from different business sectors, activities or source types. This law ensures compliance with the international commitments Chile has signed regarding reduction of the use of ozone-depleting substances (Supreme Decree 138/05, modified by Supreme Decree 90/10, MINSAL).
- Decree which approves the Stockholm Convention on Persistent Organic Pollutants, of the Foreign Affairs Ministry (MINREL). (Supreme Decree 377/09, MINREL)

On the other hand, in January 2011 a draft version of the General Waste Law was submitted for consideration to the National Advisory Board (Consejo Consultivo Nacional). The legislative proposal seeks to regulate sustainable waste management, preventing its generation and promoting its valuation in order to protect the environment. One of the main issues included in the legislative proposal refers to Extended Producer Responsibility (EPR) as a mechanism for improving large-scale waste management by applying it to specific priority products.

The proposal is to define a strategy for promoting the use of a hierarchy in solid waste management in which the first alternative is to prevent its generation; the second is reuse; the third is recycling of waste or of one or more of its components; the fourth is to take advantage of the energy waste produces (either totally or partially); and disposal is the last alternative. With regard to municipal solid waste, what is proposed is to establish a subsidy for municipal solid waste management services focused on low-income families and to include requirements for regional management plans. Other issues in the proposal are related to waste management, export and import, information records and insurance policies for sanitary landfills and incineration. The proposal is expected to be submitted to Congress in mid-2011.

With regard to enforcement, as indicated previously (see Recommendation 1), the most substantial advance has been the creation of the Superintendency of the Environment as the enforcement organism (Law 20,417). It establishes, among other matters, that the Superintendency will carry out enforcement of compliance with quality and emissions standards, conditions for approval of Environmental Impact Declarations and Studies, measures and instruments set by the Prevention and Decontamination Plans, as well as management plans.

RECOMMENDATION 3

REVIEW THE SCOPE FOR INTRODUCING NEW ECONOMIC INSTRUMENTS (E.G. PRODUCT CHARGES ON HAZARDOUS WASTE, AIR EMISSION CHARGES, WATER POLLUTION CHARGES) AND IMPROVE TRADING MECHANISMS.

During this period, three economic incentives were introduced to promote energy efficiency and reduce the environmental impacts of energy use.

Law 20,365 of 2009 establishes a tax exemption for installation of solar thermal systems, allowing construction companies to deduct the cost of purchasing and installing solar water heating systems from their income taxes. This credit applies to new residential construction (it does not include office buildings, retail stores, industries, etc.). The benefit amount depends on the value of the home in which the solar heater is installed.

Regarding energy in the transport sector, since 2009 the National Energy Efficiency Programme (Programa País de Eficiencia Energética, or PPEE) has been operating a truck replacement programme (known as the "Replace your Truck" project). This initiative consists of providing a financial incentive according the size of the truck of 8.500, 17.000 o 25.500 US dollars to owners of trucks that are more than 25 years old and still circulating. The funds can be used to co-finance the purchase of a new truck. The first stage of this project took place in 2009, and incentives totaling US\$3.8 million were provided to replace 196 trucks.

On the other hand, through Law 20,259 (2008) a tax incentive for the purchase of hybrid vehicles was introduced. This incentive establishes an annual tax credit equivalent to 100% of the value of the annual vehicle registration permit for owners of hybrid vehicles which are registered in the Motor Vehicle Registry between March 1, 2008 and March 31, 2010. The benefit is valid for a period of two to four years, depending on the price of the vehicle.

Currently awaiting approval as part the draft of the General Waste Law (described in Recommendation 2) is the establishment of Extended Producer Responsibility (EPR) as a mechanism for improving large-scale waste management. This would introduce a change in the property rights of certain products to require that producers be responsible for waste derived from their products through the end of their useful life.

For this purpose, studies have been conducted which demonstrate the economic, environmental and social feasibility of EPR and a series of public and private initiatives have been carried out²⁰ to make

²⁰ More than 20 initiatives have been identified in this period, notably: The signing of a Clean Production Agreement with tire manufacturers; Copec's used oil disposal network, through "Via Limpia", with 11 offices around the country; and a public-private initiative of the Environment Ministry, importers, distributors, recovery entities, recyclers and NGOs to improve handling of electronic waste.

progress on the following products once they are no longer in use: Tires, batteries, oils and lubricants and electronic waste, particularly computers and cellular phones.

The proposed legislation would also establish deposit-reimbursement systems which will be enacted through an expedited supreme decree of the Ministry of the Environment. In addition to the instruments mentioned, the legislation proposes one or more laws to establish charges for waste disposal and credits, subsidies or other incentive instruments for applying valuation techniques.

Also contained in the legislation is a provision that every waste generator must present to the Environment Ministry an insurance policy that ensures and guarantees that it has sufficient financial resources to address any contingency and pay for damage to the environment and to third parties which may occur during waste handling, and/or sufficient resources to finance supervision after closure of the waste management facility. For such purposes, the Superintendency of the Environment will be the beneficiary and insured party and the quantity and sum insured will be considered part of its assets for the purposes established in Article 14 of the Second Article of Law 20,417, which creates the Superintendency of the Environment and establishes its organic law. The proposal would require a regulation to determine the requirements, form, conditions, amount and periods of time of the respective insurance policy or guarantee.

RECOMMENDATION 4

FURTHER APPLY THE POLLUTER PAYS AND USER PAYS PRINCIPLES THROUGH APPROPRIATE CHARGES (E.G. ON WASTE MANAGEMENT, FOR ACCESS TO PROTECTED AREAS, FOR NATURAL RESOURCES), WITH DUE REGARD TO SOCIAL CONSTRAINTS.

On this topic, the country made progress in three areas related to payment for use of natural resources: the “license for non-use of water rights”, the “specific mining tax” and the “aquaculture concessions license.”

In June 2005, Law 20,017 which “Modifies the Water Code” established fees for a “license for non-use of water” (Title IX, articles 129 bis and subsequent). This fee applies to permanent consumptive and non-consumptive rights and possible usage rights of the whole or the fraction for which collection and restitution works have not been built, if applicable.

The fees are annual and calculated on the basis of the geographic location, the unused flow, and in the case of non-consumptive rights, the difference in altitude between the collection and authorized restoration points. The fee for permanent rights will double in 2011 and double again in 2016.

There are exclusions for non-consumptive rights with an average flow below 100 l/second in the Metropolitan Region and all regions to the north, and below 500 l/second for the rest of the country. For consumptive rights, the exclusion operates for average flows below 10 and 50 l/second, respectively.

The rights subject to this payment are published annually, and if the fees are not paid by the deadline established by Law, the rights are auctioned.

These fees went into effect in 2007 and according to the General Water Directorate (Dirección General de Aguas, or DGA), US\$22.4 million in fees were collected in 2009 while US\$32.3²¹ million were collected in 2010. The Law establishes that 75% of the amount collected shall be distributed to the regions and municipalities where the rights subject to the fee are located.

Also enacted in 2005 was Law 20,026 which establishes a “Specific Mining Activity Tax” (also known as the mining royalty), which went into effect on January 1, 2006. This tax applies to mining companies with sales equal to or greater than the equivalent value of 12,000 metric tons of fine copper (this value is calculated using the London Metal Exchange price of grade A copper and is published in Chilean currency at the beginning of each year). The rate applied ranges from 0.5% (annual sales equivalent to 12 to 15 tons) to 5% (annual sales of more than 50,000 tons) of the taxable operating income derived directly from the sale of mining products.

²¹ Temporary figure.

Although the law did not establish a use for the royalties collected, an agreement signed between the Executive and Congress when the law was approved established that the funds collected shall be used to increase the productivity and competitiveness of the entire economy through the creation of an Innovation Fund for Competitiveness (Fondo de Innovación para la Competitividad, or FIC). This fund was established as an additional budgeted programme in the 2006 Budget Law, the total of which is equal to the structural or long-term income collected by the specific tax. In other words, the amount was based on what would have been collected through this tax if the price of copper had been the "long-term equilibrium," thus ensuring a stable flow of long-term financing without annual fluctuations.

TABLE 6
FIC BUDGET DURING 2006-2009

	2006	2007	2008	2009p
Specific tax collected (millions of US\$)	1,006.4	950.8	680.6	480.0
FIC budget (millions of US\$)	82	106.2	127.1	201.6

Source: Consejo Minero AG

FIC funding has been used to finance the “National Innovation Policy for Competitiveness”, primarily the strengthening of scientific and technological research of excellence (Fondecyt Iniciación programme, Conicyt’s Basal Financing for Science and Technology programme and the Attraction of International Centres of Excellence programme of Innova Chile, among others), the formation of advanced human capital (Conicyt Graduate Fellowships programme) and business entrepreneurship and innovation (at Innova Chile).

On the other hand, Law 20,434 of January 2010 which “Modifies the General Law on Fishing and Aquaculture in Aquaculture Matters” increased the fee for Aquaculture Concession Licences for exotic fish in bodies of water, from US\$161 to US\$808 per hectare annually. This increase will be implemented gradually through the year 2013.

The following initiatives are currently in development:

1. As part of the Global Environmental Facility (GEF)/Environment Ministry/UNDP project, the creation of a “National System of Protected Areas: Financing and Operations Structure” (hereafter GEF-SNAP), includes a pilot project starting in 2011 for tourism fees and concessions in areas protected by the State. The aim of this GEF project is to design the financial and operational structure of the new Biodiversity and Protected Areas Service, which is currently being discussed in Congress. This legal initiative recognizes as part of the Service’s assets the “income it obtains for fees charged for access to state-protected

- wilderness areas and for the concessions or permits granted in those areas” (Article 8, letter e).
2. This same initiative includes a pilot project in 2011 for the start of an Ecosystem Services Payment system related to water provision.
 3. One of the main aspects of the GEF/Environment Ministry/UNDP Regional Protected Areas System Project (hereafter GEF-SIRAP), which is designed to contribute to the conservation and sustainable use of the biodiversity of the temperate forest in the Los Lagos and Los Ríos regions, is the creation of institutional and financial mechanisms to support the Regional Protected Areas System in the long term.
 4. The cited proposal of the Waste Law proposes to modify the current Municipal Revenue Law, which exempts the 75% lowest-income households from paying collection and disposal fees. Instead, it would substitute this exemption with a demand subsidy for the poorest households, which implies that these households will make payments to the service provider.

RECOMMENDATION 5

FURTHER DEVELOP AND STRENGTHEN LAND USE PLANS: MUNICIPAL AND INTERMUNICIPAL PLANS, REGIONAL URBAN DEVELOPMENT PLANS AND COASTLINE AND WATERSHED MANAGEMENT PLANS; SURVEY WETLANDS AND ASURE THEIR PROTECTION THROUGH REGULATIONS AND INCENTIVES.

There has been progress in two areas within this topic: First, a set of legal initiatives which strengthen land use planning instruments, and second, the application of such instruments in territories.

The most significant laws enacted in the period are:

- Law 20,017 published on 16 June 2005, which introduced changes to the Water Code, among them the obligation of the General Water Directorate (Dirección General de Aguas) to establish a minimum ecological flow (articles 129 bis 1 and 314).
- Law 20,256 on Recreational Fishing, published on 12 April 2008, establishes several provisions for protection of ecosystems in which this activity is practiced. These include the establishment of the minimum fishing flow and the development of management plans for preferred recreational fishing areas (articles 16, 17 and 18) and regulations on recreational fishing in protected areas (articles 36 to 39)

Article 17 of Law 20,283 on Native Forest Recovery and Forestry Development, published on 30 July 2008, contains regulations aimed at protecting glaciers, soils, natural bodies and courses of water, and wetlands which have been declared priority conservation sites or Ramsar sites. The corresponding regulation (Supreme Decree 82 of 2010, Agriculture Ministry) was published on 11 February 2011.

Law 20,417 cited above introduced changes regarding the various land use planning instruments in Chilean legislation, as well as wetlands protection. Among others, it is worth mentioning:

- Regional land zoning plans, inter-municipal zoning plans, municipal zoning plans, district plans, regional urban development plans, zoning of the coastline, maritime territory and integrated basin management, or territorial zoning plans which replace or sistematise them, must be submitted to a strategic environmental evaluation (Article 7). Thus, these instruments are excluded from the domain of project environmental assessments, and are instead subject to an assessment mechanism which is more coherent with their planning nature;
- In the same sense, investment projects submitted to the Environmental Impact Assessment System (Sistema de Evaluación de Impacto Ambiental, or SEIA) must now also obtain a

territorial compatibility report issued by the regional government, the respective municipality or the competent maritime authority, as applicable (Article 8, third section);

- In all cases, urban or tourism development projects located in areas not included in a land use planning instrument must be submitted to the SEIA (Article 10, letter g);
- Regarding wetlands²², Environmental Impact Studies are now required when the project is located in or near –among others—protected wetlands and glaciers which could be affected (Article 11, letter d).

As part of the development of Regional Biodiversity Strategies, by 2005 more than 300 priority sites for biodiversity conservation had been identified in the country. Since 2005 the Ministry has been improving information about these sites, selecting 64 of them as areas under official protection for the purposes of the Environmental Impact Assessment System (SEIA). A study is currently underway on the “Systematisation and Proposal of National Conservation Objectives and Criteria of Representativity, Prioritisation, Qualification and Management of Priority Conservation Sites”. The results of the study will provide information to be used to transform these sites into some category of protected area in the framework of the future law creating the Biodiversity and Protected Areas Service.

In another area, the National Coastline Use Policy (Política Nacional de Uso del Borde Costero, Supreme Decree 475 of 1994, Defense Ministry) established the National Commission on the Use of the Coastline (Comisión Nacional de Uso del Borde Costero) and the respective regional commissions (Comisiones Regionales de Uso del Borde Costero). In 2005, an internal regulation was prepared for the functioning of these regional commissions, establishing minimum shared guidelines for these organisms throughout the country. Also, that same year the Maritime Concession Regulation was modified by Supreme Decree 2 of 2005, bringing up to date the version which had existed since 1998.

Within the framework of this policy, in 2004-2005 an agreement was signed to begin the process of macro-zoning coastline use; this was finalised in 2010. The zoning includes Preferred Use Zones for Conservation or Preservation, the locations of priority sites identified in the Regional Biodiversity Strategies, as well as Multiple Use Marine and Coastal Protected Areas and Marine Parks and Reserves.

Progress has been made on the National Wetlands Inventory (Inventario Nacional de Humedales), an initiative for spatial identification of wetlands. Also, there have been advances in the implementation of an environmental monitoring and early alert system for these ecosystems.

On 11 February 2001, the Soils, Water and Wetlands Regulation (Reglamento de Suelos, Agua y Humedales) was enacted, establishing technical criteria and standards applicable to activities which may damage soils, water courses, wetlands which have been declared Ramsar sites and priority sites

²² In addition to wetlands, this article also refers to populations, resources and protected areas, priority conservation sites and glaciers.

for biodiversity conservation declared as such by the Environment Ministry. It also sets protection requirements for the species which inhabit them.

With regard to application of the instruments, progress has been made in the zoning processes of the coastline of the Aysén and Coquimbo regions, and the conservation and preservation areas identified in those processes were included and are validated as “areas under official protection” for the purposes of the SEIA (Article 10, letter p).

Regarding land use, as of January 2010 there were:

- 210 Municipal Zoning Plans (Planes Reguladores Comunales, or PRC) in different states of progress: 21 being implemented, 49 finished, 101 approved and 39 published in the Official Gazette (Diario Oficial).
- 37 Inter-municipal Zoning Plans (Planes Reguladores Intercomunales, or PRI) in different stages of preparation: 12 being implemented, 2 finished, 15 approved and 3 published in the Official Gazette.
- 15 Regional Urban Development Plans (Planes Regionales de Desarrollo Urbano, or PRDU): 2 being implemented, 2 finished, 9 approved and 2 published in the Official Gazette.

RECOMMENDATION 6**DEVELOP A NATIONAL SET OF INDICATORS TO MEASURE ENVIRONMENTAL PERFORMANCE WITH RESPECT TO DOMESTIC OBJECTIVES AND INTERNATIONAL COMMITMENTS**

During this period, the country has made progress in three areas related to creation of a national set of environmental performance indicators.

Improvements and expansions have been made to the Annual Environmental Reports (Informes Anuales de Medio Ambiente) published by the National Statistics Institute (Instituto Nacional de Estadísticas, or INE). Since 2006 version, the report includes new statistics regarding:

- Production and trade of industrial wood.
- Expanded coverage of emissions from pollution sources.
- Sewage, organic load received by treatment plants and sewage generation with details on treated and untreated volumes.
- Liquid industrial waste discharge volumes with details at the regional level.
- New air quality monitoring stations in the Metropolitan Region.

Pollutant Release and Transfer Register (PRTR). This Register dates to 2002 and consists of a database with information on emissions and transfer of pollutants into the environment (air, water, soil and waste), identifying their nature and quantity. These data are broken down by region.

The PRTR periodically generates reports to the community for the purposes of guaranteeing adequate public access to the environmental authority's information on pollutant emissions and transfers for the period. To date, four reports have been prepared; the fourth one corresponds to the 2005-2008 period. With this document, the Environment Ministry and the National PRTR Coordination Group (Grupo Nacional Coordinador del RETC) fulfill the commitments made in the National Proposal for Implementation of the Pollutant Release and Transfer Register of Chile and its Action Plan. It includes a report on compliance with environmental regulations.

Finally, the creation of the National Air Quality Information System (Sistema de Información Nacional de Calidad del Aire, or SINCA). For more details see Recommendation 7.

ii. Air management

RECOMMENDATION 7

MAKE FURTHER PROGRESS WITH THE IMPLEMENTATION OF AIR QUALITY PROGRAMMES, INCLUDING THOSE CONCERNING THE MINING SECTOR AND THOSE FOCUSING ON PM2.5, PM10, AND OZONE; MONITOR PROGRESS AND THE PROGRAMMES' IMPACT ON HEALTH THROUGH APPROPRIATE INDICATORS

Regarding air quality management in Chile, progress can be verified on three levels:

- environmental regulations and monitoring
- prevention and decontamination plans
- Clean Air Programme

Environmental regulations and monitoring

The enactment of environmental regulations on emissions and primary or secondary quality standards occurs within a prioritised programme, which is prepared after consulting the competent State organisms.

Based on the priority programmes, the environmental regulations related to air resources enacted and published since 2005 correspond to emissions standards. These are presented in Recommendation 2, in the table on enacted environmental standards.

Recommendation 2 also lists the environmental standards for air which have been revised since 2005 (see table on revised environmental standards).

The Public Table published in February 2011 on the processes of enacting environmental regulations provides information on 8 enactment processes begun in 2005 and currently underway, of which 5 correspond to standards revision processes. These have been presented in Recommendation 2 in tables 3 and 4.

Notable among them are the enactment process of the Emissions Standard for Thermoelectric Plants²³. This one is in the last stage of the procedure, and the corresponding decree has already been submitted to the Comptroller General of the Republic and is expected to be published in the next few months in the Official Gazette (Diario Oficial).

The primary quality standard for PM2.5 is designed to protect human health and establishes annual quality levels (20 ug/m³) and daily quality levels (50 ug/m³) for fine particulate matter in the air. This standard will go into effect on 1 January 2012, 10 years earlier than initially proposed in the draft legislation for this standard.

²³ More details on this standard are presented in Recommendation 8.

In regard to the most recent Regulation Priority Programme, in April 2010 the 2007-2009 Strategic Regulation Programme, which sets priority standards related to air quality, was published in the Official Gazette²⁴. It is worth noting that for the air component, national emissions standards have been prioritised.

Of particular importance is the smelter emissions standard for the country's copper smelter emissions, which historically have been regulated by decontamination and prevention plans. This standard is designed to achieve additional reductions in SO₂ and particulate matter emissions. On 15 March 2011 the process of developing this standard began.

As a result of monitoring compliance with environmental quality standards, the following latent zones (between 80% and 100% of the standard) or saturated zones (above the standard) have been declared in recent years (Table 7):

TABLE 7
SATURATED AND LATENT ZONES CREATE DURING 2005-2010

Zone	Region	Type	Associated pollutants	Decree N°/year
Metropolitan Concepción (10 municipalities)	Bío Bío Region	Latent	24-hour PM10 concentration	SUPREME DECREE N° 41/06, MINISTRY SECRETARY GENERAL OF THE PRESIDENCY (MINSEGPRES)
Chuquicamata Copper Smelter	Antofagasta Region	Latent	24-hour SO ₂ concentration ²⁵	SUPREME DECREE N° 55/05, MINSEGPRES
City of Tocopilla	Antofagasta Region	Saturated	Annual PM10	SUPREME DECREE N° 74/08, MINSEGPRES
City of Calama	Antofagasta Region	Saturated	Annual PM10	SUPREME DECREE N° 57/09, MINSEGPRES
City of Andacollo	Coquimbo Region	Saturated	24-hour and annual PM10 concentration	SUPREME DECREE N° 08/09, MINSEGPRES
Central Valley of the O'Higgins Region (17 municipalities)	O'Higgins Region	Saturated	24-hour and annual PM10 concentration	SUPREME DECREE N° 07/09, MINSEGPRES
Municipalities of Temuco and Padre	Araucanía	Saturated	24-hour PM10	SUPREME DECREE N°

²⁴ See the table on priority environmental standards in Recommendation 2.

²⁵ This Supreme Decree annuls the declaration of a zone saturated by sulphurous anhydride (SO₂) for a 24 hour concentration and an annual concentration, established by Supreme Decree N° 185 of 1991 (Mining Ministry).

Las Casas	Region	concentration	35/05, MINSEGPRES
Municipalities of Talca and Maule	Maule Region	Saturated 24-hour and annual PM10 concentration	SUPREME DECREE N° 12/10, MINSEGPRES

Prevention and decontamination plans

According to the declaration of saturated zones, the following decrees establishing Decontamination Plans have been published:

- Decontamination Plan for the city of Tocopilla and surrounding area (Antofagasta Region) aimed at achieving compliance with the primary quality standard for PM10 within seven years. This plan identifies the main emissions sources of particulate material in the area in terms of share of emissions and contribution to air quality and establishes requirements for reducing contaminating emissions, differentiated by type of company. (SUPREME DECREE N° 70/10, MINSEGPRES)
- Decontamination Plan for the municipalities of Temuco and Padre las Casas: The plan includes a set of measures to be implemented immediately, within 6 to 12 months, and within three years from publication in the Official Gazette. It establishes a ban on the use of open chimneys in homes in the area and also requires the registration of all firewood-burning devices owned by residents. The use of firewood which does not comply with the technical moisture requirements contained in Official Chilean Standard N° 2907/2005²⁶ is strictly prohibited. Existing group and point sources and group heating furnaces will be required to comply with certain maximum emissions values for particulate matter. The implementation of this plan implies changing people's behavior, which is often rooted in cultural practices. For this reason, environmental and air quality content is being included in curricula at all levels of the educational system. (SUPREME DECREE N° 78/09, MINSEGPRES)
- Air Prevention Decontamination Plan for the Santiago Metropolitan Region²⁷. This plan was created in 1998 and since then has been reformulated and updated through a study and consensus-building process begun in 2005 with the Second International Audit of the Plan, the results of which were published in April 2006.

At the same time, as shown in the January 2011 Public Table on the status of the Prevention and Decontamination Plan preparation processes, and according to the zones declared latent and saturated, since 2005, six plan preparation processes have begun, one of which is a revision process. These are:

- Decontamination Plan for the Central Valley of the O'Higgins Region;

²⁶ This standard defines "dry firewood" as having a moisture content of 25% or lower (dry basis).

²⁷ More information about the Metropolitan Region Plan is provided in Recommendation 12.

- Decontamination Plan of the City of Calama and surrounding area;
- Decontamination Plan of the town of Andacollo and nearby areas;
- Atmospheric Prevention Plan for the municipalities of Metropolitan Concepción;
- Prevention Plan (SO₂) for the Chuquicamata Smelter, Codelco North Division;
- Revision of PM10 Decontamination Plan for the Chuquicamata Smelter, Codelco North Division.

Clean Air Programme

The Clean Air Programme began in 2010. This initiative of the Environment Ministry is aimed at improving air quality in the country's largest cities and includes various strategies to control emissions from firewood, industries and transport, as well as improving air quality monitoring.

With regard to firewood, the Programme includes a Country Strategy for Control of Firewood Combustion (Estrategia País para el Control de la Combustión de Leña), which is focused on the southern-central section of the country. This strategy is designed to reduce the public health impact of firewood heating and at the same time achieve greater energy efficiency and improve quality of life.

The Strategy has four major pillars:

- a. Promote better quality firewood
- b. Accelerate the technological replacement of current firewood stoves
- c. Improve insulation in homes
- d. Educate the general public

Regarding the acceleration of technological change, firewood stove replacement programmes are underway in southern-central Chile. The objective of these programmes is to replace old stoves that generate high emissions and are not very efficient with others of high quality which not produce fewer emissions but also save fuel, provide greater comfort and represent a lower fire risk.

Likewise, as part of the Clean Aire Programme a special programme has been developed to control industrial air emissions between 2010 and 2014. The first priority of the Plan is to reduce particulate matter, SO₂, and NO_x emissions in order to limit concentrations of PM_{2.5} in the atmosphere. The second priority is to reduce emissions of heavy metals into the air. The priority industrial sectors are: Thermoelectric plants, copper smelters, furnaces and combustion processes and generators. The programme components are:

- Enactment of emissions standards for the industrial sector
- Development and standardisation of criteria for ongoing emissions monitoring
- Development of a protocol for emissions compensation
- Development and monitoring of decontamination plans

- Progress in improving the quality of fuels used in industry

The Clean Air Programme also includes the implementation of a PM_{2.5} monitoring network in cities with more than 100,000 inhabitants starting in 2011 and the development of studies to better understand the health impacts of this pollutant.

In regard to transport, a strategy will be implemented which takes advantage of the quality of fuels available in Chile and existing infrastructure for control of vehicle emissions to ensure that the increase of vehicular activity does not translate into higher emissions.

The main guidelines of this strategy are:

- Develop stricter entry standards for new vehicles and incentives for zero-emission and low-emission vehicles.
- Implement seals for pollutant and GHG emissions to inform buyers so they can choose clean, efficient vehicles.
- Promote financial incentives for the adoption of less contaminating technologies, such as tradeable allowances and taxes on emissions.
- Develop and implement innovative mechanisms to speed up the replacement of older vehicles, particularly the most polluting ones.

Monitoring progress and health effects

In terms of monitoring the progress of these programmes and the health effects, this is done at the regional level in the Metropolitan Region as well as at the national level.

Diverse monitoring mechanisms are used to track the Prevention and Decontamination Plan of the Metropolitan Region, both in terms of the plan itself and air quality. These are:

- a) Evolution of air quality (PM₁₀, PM_{2.5} and gases) through the Metropolitan Regional Automatic Air Quality Monitoring network (Monitoreo Automático de Calidad del Aire de la Región Metropolitana, or MACAM).
- b) Characterisation of Particulate Matter. The impact of the Prevention and Decontamination Plan was studied by analysing the chemical elements in approximately 770 samples of PM_{2.5} taken from 1998 to 2007 at the Parque O'Higgins station of the MACAM network. A significant reduction in sulphur was detected at the beginning of the decade, but the trend reversed in 2005, probably because of the progressive substitution of natural gas with heavy oil in industry. For the period studied, it was concluded that the groups of sources with the greatest impact are transport and contaminated street dust (36%), followed by metallurgy (20%) and industrial fuels (15%).
- c) Analysis of air pollution trends. A retrospective analysis is done of the air quality parameters, normalising the data by controlling for the effects of the inter-annual meteorological variable. Among the results obtained are that the annual PM variability was falling until 2004 and has increased in subsequent years. Concentrations of CO have

declined on an annual basis, possibly due to the technology change toward new vehicles. It is difficult to interpret the trend of ozone, a secondary pollutant.

- d) Indicators of the impact on health associated to mortality, morbidity and toxicity analysis. The Regional Ministerial Secretariat of the Environment has built databases on mortality, meteorological factors and air quality indices, in particular for PM, NO₂, SO₂, CO and O₃. Short-term indicators have also been developed by analysing the health risks associated with air quality, in order to establish an environmental health prevention system for the population of the Metropolitan Region. Long-term indicators have also been created through time series which provide an estimate of the impact of atmospheric concentrations on public health, controlling for meteorological and other important factors. Together with Health Canada, the government developed a model described by M.A. Rubio and S. Cakmak based on health and air quality information and known as the Air Quality Index (AQI). This is defined as the percentage of daily mortality attributable to exposure to a specific air pollutant. This index is used to evaluate progress in managing air quality and its health impact for the population of the Metropolitan Region. The results of the model (to 2007) show that in 1997, 11% of non-accidental daily mortality in the seven municipalities included was associated with pollution by PM₁₀. By 2006, the AQI had fallen to 6.84%, a drop of 38% in premature mortality. This was attributable to progress in air quality management.

Nationally, progress has been observed in four areas:

The development of the National Air Quality Information System (Sistema de Información Nacional de Calidad del Aire, or SINCA), a project of the Ministry of the Environment which is based on Airviro software. This system handles large volumes of information from all networks in the country and connects with other systems and monitoring networks.

Through the SINCA, the Ministry of the Environment has promoted the standardisation of procedures related to monitoring and information reporting, as well as the centralisation of air quality information from around the country in regard to the following:

- Air quality measurements online
- Historical tracking of air quality measurements
- Background information on monitoring stations

The Health Ministry operates an Air Quality Surveillance System, administering monitoring networks in Temuco, Rancagua, Viña del Mar, San Fernando, Rengo, Los Andes, San Pedro, Osorno, Valdivia, Chillán, Coyhaique and Andacollo. The Health Ministry also operates the Automatic Air Quality Monitoring network in the Metropolitan Region (MACAM). As part of the institutional reform, these air quality networks will be managed by the Environment Ministry starting in 2011.

With respect to the Air theme, the Pollutants Release and Transfer Registry (PRTR; described in Recommendation 6) has an inventory of fixed air sources containing more than 7,000 establishments. This inventory is updated annually. An inventory of mobile sources in the transport sector is also generated each year, including more than 2 million vehicles in the country's largest cities which are home to 80% of the country's population.

Finally, and to complement the PRTR, the Health Ministry enacted a decree establishing an emissions declaration obligation (Supreme Decree N° 138/05, MINSAL) for fixed sources which correspond to the following facilities: Steam and/or hot water boilers; cellulose production; primary and secondary smelters; thermoelectric plants; production of cement, lime and plaster; glass production; ceramic production; iron and steel production; petrochemicals; asphalts and generators.

RECOMMENDATION 8**DEVELOP NATIONWIDE EMISSION STANDARDS (E.G. FOR A RANGE OF INDUSTRIAL SOURCES AND FOR TOXIC AIR POLLUTANTS)**

Since 2005, three supreme decrees have been published that establish emissions standards. Two of these apply to air and one applies to water, and all are designed to protect public health and natural resources²⁸. It is worth noting that only one of these standards –the emissions standard for incineration and co-incineration (Supreme Decree 45/07, MINSEGPRES)– is national and applies to a set of industrial sources. This standard establishes emissions limits for incineration and co-incineration facilities located anywhere in the country. These include cement ovens, rotating lime kilns and forestry installations which use treated forest biomass. The goal is to prevent negative effects on public health and natural resources caused by toxic emissions from these processes. The decree establishes the maximum quantities of particulates and gases allowed and how frequently they must be measured. It also sets operating standards for incineration and co-incineration facilities and defines the measurement methodologies and conditions for particulates and gases and for ongoing emissions monitoring systems.

During this time, national emissions standard revision processes have also been finalised, as mentioned in Recommendation 2²⁹.

The Public Table published in February 2011 provides information on 10 environmental standard enactment processes begun in 2005 and which are currently underway. Six of these correspond to revision processes. These are listed in Recommendation 2³⁰.

Of particular note is the Thermoelectric Plant Emissions Standard, which is in the final stage of the process and is now being reviewed by the General Comptroller of the Republic (Contraloría General de la República). It is expected to be published in the Official Gazette (Diario Oficial) in the next few months.

This national standard is designed to reduce the risk of adverse effects on public health and ecosystems associated with these installations, establishing maximum limits based on European emissions standards for three air pollutants: particulate matter (PM), sulphur dioxide (SO₂) and nitrogen oxide (NO_x). Although the requirements are differentiated, they apply to all thermoelectric plants, whether new or existing.

²⁸ See the table on enacted environmental standards in Recommendation 2.

²⁹ See the table on revised environmental standards in Recommendation 2.

³⁰ See table of emissions standards in the process of enactment or revision in Recommendation 2.

This standard is expected to achieve significant emissions reductions, improving air quality in several areas of the country which have one or more installations of this type, such as Coronel, Talcahuano, Puchuncaví-Ventanas, Huasco, Tocopilla and Mejillones.

As mentioned in previous recommendations³¹, in April 2010 the 2007-2009 Strategic Standards Program (Programa Estratégico de Normas) was published in the Official Gazette. This defines the priority standards for air quality. In this regard, it is worth noting that for the air component, only national emissions standards have been prioritised.

³¹ Recommendation 2, table on priority environmental standards, and Recommendation 7.

RECOMMENDATION 9**DEVELOP AIR MONITORING IN ALL MAJOR CITIES AND AN INTEGRATED AIR DATA MANAGEMENT SYSTEM**

The geographic distribution of air quality monitoring stations in Chile is largely determined by investment projects submitted to the Environmental Impact Assessment System (Sistema de Evaluación de Impacto Ambiental, SEIA) which have a significant impact on air quality in the local area.

There are two public air quality monitoring networks: The Air Quality Oversight System network (Sistema de Vigilancia de Calidad del Aire, or SIVICA), in central-southern Chile and the Automatic Air Quality Monitoring Network of the Metropolitan Region (Monitoreo Automático de Calidad del Aire de la RM, or MACAM).

The Health Ministry operates the SIVICA, with monitoring networks in Coyhaique, Osorno, Valdivia, Temuco, San Pedro, Chillán, San Fernando, Rengo, Rancagua, Viña del Mar, Los Andes and Andacollo. Information about this network is available on the SIVICA web site (www.sivica.cl) and the web page of CONAMA's National Air Quality Information System (Sistema de Información Nacional de Calidad del Aire, or SINCA, at <http://sinca.conama.cl>).

The MACAM monitoring network is managed by the Regional Ministerial Secretariat of Health in the Metropolitan Region. It has 11 stations located at strategic points in Greater Santiago. Air quality information from this network is available on the web page of the Sanitary Authority of the Metropolitan Region (<http://www.asrm.cl>).

However, under the new environmental regulations, the Ministry of the Environment will take over management of both networks.

The National Air Quality Information System (SINCA), which was developed by the Ministry of the Environment handles large volumes of information from all networks in the country and connects with other systems and monitoring networks. It serves as a comprehensive management system for air quality information.

Through the SINCA, the Ministry of the Environment has promoted the standardisation of procedures related to monitoring and information reporting, as well as the centralisation of air quality information from around the country in regard to the following:

- Air quality measurements online
- Historical tracking of air quality measurements
- Background information on monitoring stations
- Documentation on air quality and monitoring

- Links to related web sites, both national and regional

The SINCA information is split into two categories:

- Raw data automatically received online from the monitoring stations (currently from the MACAM 3 network stations in the Metropolitan Region and the SIVICA network of the Health Ministry).
- Data which is validated operationally. These are monitoring data which have undergone a validation process by the station operator or the measuring network, but have not been ratified by the competent environmental authority.

SINCA currently provides a database of 183 air quality monitoring stations, distributed by region as shown in the table 8:

TABLE 8
AIR QUALITY MONITORING STATIONS BY REGION

Region	No. of stations
Arica and Parinacota	0
Tarapacá	12
Antofagasta	26
Atacama	21
Coquimbo	16
Valparaíso	29
Santiago Metropolitan	11
Libertador General Bernardo O'Higgins	14
Maule	7
Biobío	38
Araucanía	2
Los Ríos	5
Los Lagos	1
General Carlos Ibañez del Campo	1
Magallanes and Chilean Antarctica	0

The SINCA has gradually included aspects of air pollution modeling within its strategic guidelines, with high-resolution photochemical modeling studies for the country's central macro-zone (5th, 6th and Metropolitan regions) using WRF/Chem. The first phase of this model began in 2007 and has been expanded to breathable particulate matter and their precursors of interest.

RECOMMENDATION 10**DEVELOP ENERGY EFFICIENCY MEASURES FOR ALL ASPECTS OF ENERGY CONSUMPTION**

The National Energy Efficiency Program (Programa País de Eficiencia Energética, or PPEE) was created in 2005 to solidify efficient energy use and thus contribute to sustainable energy development in Chile. In 2008, the institutional framework for energy was redesigned. The Ministry of Energy was created in February 2010 along with the Chilean Energy Efficiency Agency (Agencia Chilena de Eficiencia Energética), which absorbed the PPEE.

The Agency's mission is to promote efficient use as an energy source, contributing to sustainable energy development in Chile. Its specific objectives include establishing the regulatory framework for energy efficiency, providing incentives and support tools and developing useful information for public and private decision-making.

Among the actions it has taken are providing incentives for efficient technology substitution both in households and industrial processes.

Since the creation of the PPEE, it has implemented these notable actions:

- i. Subsidy for thermal retrofitting of homes for people living in social housing or who belong to the lowest-income sectors in the O'Higgins, Maule, Araucanía, Los Ríos, Los Lagos and Aysén regions. An initial goal of 10,000 was set and by 2010, 8,900 households had benefited from this program.
- ii. Pilot projects on thermal improvement for 400 new social housing units in different climate zones of the country.
- iii. Labeling of Electronic Appliances. During this time, labeling of lightbulbs and refrigerators has gone into effect.
- iv. A pilot program in four municipalities to replace public lighting, in order to study financing models based on the savings generated.
- v. Truck replacement pilot project: a subsidy ranging from CLP 4 to 12 million to replace old trucks with new, more efficient and less polluting ones, and scrapping of the old trucks. A total of 196 trucks have been replaced.
- vi. Implementation of actions and educational activities on energy efficiency directed at the general public, schools and industries.
- vii. Replacement of traditional lightbulbs in the 40% lowest-income households. In 2009, two CFLs were given to 195,000 households and in 2010, this was repeated for the 40,000 households affected by the earthquake.

- viii. Incentive for the introduction of efficient electric motors in industry: A total of 2,050 subsidies were provided in 2009 and 2010 for the purchase of high-efficiency motors from 1 to 10 HP.
- ix. Subsidy for preinvestment studies for energy efficiency in small and medium size enterprises (SMEs), financed by CORFO. These subsidies cover up to 70% of the cost of a company energy audit, design of an implementation plan and financial studies when significant investment is required.
- x. Voluntary Industry Agreements: Large mining, retail, small and medium mining, metallurgy (Chilean Association of Metalmechanic and Metallurgy Companies, or ASIMET), agrifood, paper and cellulose (8th Region), printing (Printing Industry of Chile, ASIMPRES), wineries and chemical industry.

RECOMMENDATION 11

REVIEW THE FUTURE ENERGY SUPPLY MIX (INCLUDING CONTINGENCY PLANS), TAKING INTO ACCOUNT ENVIRONMENTAL CONCERNS (SUCH AS EMISSIONS OF AIR POLLUTANTS AND GREENHOUSE GASES)

A set of regulations and incentives have been established to create better conditions for incorporating renewable energy into the energy matrix.

Law 20,257 of April 2008 defines non-conventional renewable energy (NCRE) sources as small hydroelectric plants (maximum power below 20 MW) and projects which use biomass, geothermal, solar, wind, tide and other energy sources. This law requires electricity generation companies with installed capacity above 200 MW to obtain 5% (in 2010) to 10% (in 2024) of their energy from non-conventional renewable sources or from hydroelectric plants of less than 40,000 KW. These sources may be owned or contracted as of 1 January 2010, and this provision applies to supply contracts signed after 1 January 2007.

Generation companies that fail to comply with this obligation will be charged US\$32³² for each megawatt-hour (MWh) of non-accredited NCRE. This fee will increase to US\$48 for companies which are repeatedly out of compliance.

Law 19,940 of 2004, the regulation of which was published in Supreme Decree N° 244 of January 2006, establishes the conditions for interconnection of small-scale generation systems in trunk transmission networks and distribution networks. This law ensures that such small-scale generation sources will be paid the spot or node price of power for energy and exempts non-conventional modes of generation from paying the cost (toll) of use of the respective trunk transmission installations, with a limit of 5% of NCRE of total installed capacity.

Non-conventional renewable energy's share of the country's electricity generation reached 2.6% of installed capacity in July 2007 and 3.9% by November 2010. These figures include the two largest electricity systems, the Norte Grande Interconnected System (Sistema Interconectado Norte Grande, or SING) and the Central Interconnected System (Sistema Interconectado Central, or SIC). Between 2005 and 2010, came into operation 36 new generation projects base on NCRE (22 small hydro, 7 wind and 7 biomass) with a total of 403.5 MW.

At the same time, in addition to the abovementioned laws, at least three instruments have been implemented to promote NCRE. The three, described below, are operated by CORFO:

³² Approximately US\$25 to 30 per MWh not supplied.

- i. Subsidies for pre-investment studies. A subsidy of up to 50% of the total cost of studies and/or consultancies with a limit of up to 2% of the estimated investment and US\$60,000 for NCRE projects. The studies are aimed primarily at determining the amount of available resources and the technical and financial prefeasibility.
- ii. Subsidies for engineering studies in advanced stages, up to 50% of the cost of the studies with a limit of 5% of the estimated investment and up to US\$160,000 for basic engineering, specific engineering studies, electrical connection, etc.
- iii. CORFO NCRE Loan. Line of credit channeled through banks for investments in NCRE generation and transmission (wind, biomass or small hydro) in co-operation with German Government through KfW. The maximum credit amount is US\$18,5 millions³³ per company, at an interest rate fixed in UF and in US\$, with payment terms up to 15 years and a grace period of up to 36 months. Up to 30% may be used for working capital needed to put the project into operation. The beneficiary company's own resources must comprise at least 15% of the total investment amount required. This credit line was recently renewed.

Also in this period, was created the Renewable Energy Centre (Centro de Energías Renovables, or CER) in August 2009, aimed to accelerate the NCRE technology transfer process through cooperation agreements with international institutions, and promote the NCRE industry in Chile.

Finally, the recent signing by the President of the Republic of a decree which establishes emissions standards for thermoelectric plants³⁴ will ensure progress in internalising environmental costs of this form of generation, making renewable energy sources more competitive.

³³ Approximately US\$17.5 million.

³⁴ More details on this standard are presented in Recommendation 8.

RECOMMENDATION 12**IMPLEMENT AIR, TRAFFIC, AND TRANSPORT MANAGEMENT PLANS IN THE METROPOLITAN REGION; DEVELOP AND IMPLEMENT IMPROVED PLANS TO REDUCE EMISSIONS FROM TRANSPORT IN ALL CITIES**

Supreme Decree N° 66/09 reformulated and updated the Prevention and Decontamination Plan of the Metropolitan Region (Plan de Prevención y Descontaminación de la Región Metropolitana, or PPDA). This reformulation and update began after the publication of the Second International Audit of the Plan in April 2006, which was followed by a study and debate process with stakeholders to develop the measures for this new stage.

This Plan went into effect in 1998 and was first updated in 2002. The information available as of 2006 indicated that with the measures then in effect, the air quality goals committed for 2011 would not be reached, particularly those for PM10 and ozone. The emphasis of the 2009 update is to reinforce control of direct emissions of PM10 and precursors of particulate matter and ozone (NO₂, SO₂, NH₃ and volatile organic compounds, or VOCs).

By 2010, the air quality information indicated that the region is no longer in a condition of saturation for NO₂ and CO, but continues to be so for PM10 and O₃.

Ozone is the only pollutant which did not show a clear declining trend until 2007. Although the 8-hour standard has been exceeded (as of 2008 it was exceeded by 22%), the new trend shows that regulation of the precursors to ozone formation, such as NO_x, is having an impact with the measures implemented in the PPDA.

It should be emphasised that the greatest reduction in particulate matter was achieved for fine particulate matter (PM_{2.5}) by the measures established in the Decontamination Plan, through which PM_{2.5} has been reduced by 41.4 µg/m³ since records have been kept (1989). Important progress has also been made in the number of days above the daily standard for PM10, as 2010 had the fewest number of days ever reported.

In regard to transport and fuel, the emphasis is on reduction of emissions from diesel vehicles (cars, buses and trucks) through technological improvements and use of post-combustion devices. In addition, stricter standards have been introduced for light vehicles and motorcycles, as well as incentives for low and zero-emission vehicles. The expected impact of the measures, compared to the emissions inventory of 2005, are reductions in public transport emissions of 42% in PM10 and 6% for NO_x; in heavy vehicles, a 50% reduction in PM10 and 20% for NO_x; and in light and medium-size vehicles, 60% in NO_x and 50% for VOCs.

The measures aimed at new vehicles sold in the Region require that these meet particularly strict emissions standards, based on an entry calendar (Table 9), along with the standard applied to sulphur in fuels.

TABLE 9
EMISSION STANDARDS FOR NEW VEHICLES IN METROPOLITAN REGION

Category	Regulation in Effect	2010	2011	2012
Light Gasoline Vehicles	Euro III	Euro IV	Euro V	
Light Diesel Vehicles	Euro IV			Euro V
Medium Gasoline Vehicles	Euro III	Euro IV		
Medium Diesel Vehicles	Euro III	Euro IV		Euro V
Public Transport Buses	Euro III Advanced	Euro III + Filter		Euro IV + Filter
Trucks	Euro III			Euro IV
Motorcycles	EPA 80	Euro III		
Diesel (sulphur)		50 ppm	15 ppm	
Gasoline (sulphur)		15 ppm		
Kerosene (sulphur)		300 ppm		100 ppm

Related measures in the Plan are the following:

- Establishment of a low emissions zone for heavy cargo vehicles to improve maintenance and accelerate the incorporation of clean technologies in heavy transport vehicles;
- Develop a voluntary truck scrapping program and an incentive program for the use of non-motorised vehicles that stimulates and facilitates the reduction of local contaminants;
- Establishment of a procedure for retiring vehicles which do not have a green seal (non-catalytic);
- Establishment of an incentive program for zero- and ultra low-emission vehicles.
- Implementation of the second phase of the ASM standard for gases in catalytic vehicles which has stricter levels, to be controlled at technical revision plants.

In the industrial sector, adjustments have been introduced to the existing regulation and emissions compensation instruments are now included. The priority for emissions control was placed on direct emissions of particulate matter and the precursors of secondary aerosols. The 50% emissions reduction goals established for PM and NO_x have been maintained and in order to ensure the

reliability of the system, it is now required that PM, NO_x and SO₂ emissions be monitored continuously.

In the residential sector, a regulation has been added to address growing emissions from use of firewood for heating, starting with voluntary equipment certification through the Environment Ministry. A PM emissions standard has been established for new combustion devices and starting in 2013 the use of non-certified heaters will be prohibited.

Standards have been established for control of evaporative emissions related to the distribution chain of fuel used in vehicles, industry and commerce.

The PPDA also establishes the following Strategic Programs, most of which are under development as stipulated by the Plan:

- Intramural pollution control program
- VOC control program
- Control of gas leaks in industrial, commercial and residential facilities.
- Clean production agreements
- Agricultural burning emissions control program
- Ammonia (NH₃) emissions control program
- Off-road machinery emissions control program
- Dust control and green space creation program

In addition to the PPDA and in regard to transport, in February 2007 the Santiago Transport Modernization Plan (Plan de Modernización del Transporte en Santiago), known as Transantiago, was implemented in order to improve public transport coverage in the city by decreasing the number of transfers, reducing wait times and increasing the number of routes. Transantiago is a megaproject implemented by the government and involves bus and Metro services, an integrated frequency management system and a single financial administrator. After a difficult start-up in February 2007, Law 20,206 of 2007 created a financial stability fund for Santiago's public transport system, providing funds for Transantiago as well as other regions of the country as a form of compensation.

In January 2011 the law modifying the Legal Structure of Public Transport Concessions was approved to address the Transantiago implementation problems that had been identified. This created a new legal regime which will be applicable to all transport systems in the country. As a result of this law, other regions of the country will receive almost US\$3 billion for transport and connectivity projects between 2010 and 2016.

ii. Water management

RECOMMENDATION 13**CONTINUE TO INVEST IN SEWERAGE, WASTE WATER TREATMENT AND OTHER SANITATION INFRASTRUCTURE IN URBAN AND RURAL AREAS**

In this area, as of 2005 the country had high rates of coverage for drinking water, sewer and wastewater treatment. The country has continued to make progress, with the majority of investment focused on expanding access to sewer and wastewater treatment services and rainwater capture systems in the Metropolitan Region.

In quantitative terms, in 2005, 99.8% of the estimated urban population of 13.3 million had access to potable water while sewage service coverage was 94.9%. By 2009, the potable water coverage was 99.8% for an estimated urban population of 14.8 million while sewage service coverage was 95.6%.

Nationally (including both urban and rural), wastewater treatment coverage increased from 73.3% in 2005 to 83.3% in 2009.

The investment made in the sanitation sector from 2005 to 2009 was stable in terms of annual figures, varying from US\$278 million to US\$427 million for drinking water, sewer and wastewater treatment. These works were carried out primarily by large sanitation companies.

The official project for total investment over the next 11 years, based on figures provided by these companies, is US\$1.145 billion, which includes sanitation works and other investments.

RECOMMENDATION 14**INCREASE THE EFFECTIVE TREATMENT OF INDUSTRIAL EFFLUENTS, AND STRENGTHEN WATER INSPECTION AND ENFORCEMENT CAPACITIES**

Discharge of industrial effluent into bodies of water is governed by three regulations: One which regulates discharges of liquid waste into marine and continental surface waters (Supreme Decree 90/00, Ministry Secretary General of the Presidency, or MINSEGPRES); a regulation governing liquid waste emissions into groundwater (Supreme Decree 46/02, MINSEGPRES), and one which regulates liquid industrial waste discharged into sewage systems (Supreme Decree 609/98, MINSEGPRES).

Since 2006 there has been a systematic decline in the number of regulatory violations (from 2006 to the present, incompliance rates have been below 15%), particularly infractions of regulations governing direct discharges to natural surface and underground bodies of water.

Compliance with these regulations is based on self-reporting, which is the main tool used for verification, complemented by inspections carried out directly by the authorities³⁵. Sampling procedures and analytical methods are set by official technical standards³⁶. To ensure that criteria are correctly applied and standardised in the application and enforcement of the regulation, the “Operating Manual for the NCh 411/10- 2005 Wastewater Sampling Regulation” was developed.

A regulatory revision process was begun in 2006, and in February 2010 the changes proposed by different public organisms were published. The changes currently moving through the enactment process address, in the case of Supreme Decree 90, inclusion of new parameters (trihalomethanes and free chlorine residual), modification of maximum limits (cadmium, manganese, mercury, nickel, lead and zinc), changes in the scope of the “coastal protection zone,” inclusion of estuaries in the regulation and modification of monitoring and inspection procedures. In regard to Supreme Decree 46, the changes include an exception for the case of reinjection of geothermal water, modification of maximum limits (copper, chloride, sulphate and cadmium), inclusion of new parameters (temperature, BOD5/TSS); inclusion of a new table for the high vulnerability condition and modifications to monitoring procedures.

Finally, with the institutional changes, among the functions and attributions established for the Superintendency for the Environment by Law 20,417 is enforcement of compliance with the laws,

³⁵ In this case, inspections are carried out by the Superintendency of Sanitation Services (Superintendencia de Servicios Sanitarios, or SISS) and the General Directorate for Maritime Territory and the Merchant Marine (Dirección General del Territorio Marítimo y Marina Mercante, DIRECTEMAR) which oversees discharges into the ocean.

³⁶ Sampling is governed by Chilean standard NCh 411/10-2005: “Wastewater sampling. Sample collection and handling;” and for testing, by a series of analytical standards in Chilean standard NCh 2313: “Wastewater Analysis Methods.”

regulations and other standards related to the discharge of liquid industrial waste. Government organisms with environmental enforcement functions will maintain their competencies and enforcement authority, in all matters and instruments which are not part of the Superintendency's area of authority. They must also adopt and respect all criteria established by the Superintendency regarding the way in which enforcement activities are to be carried out, and they may request a ruling from the Superintendency for this purpose.

RECOMMENDATION 15**REDUCE DE EFFECTS OF AGRICULTURE (E.G. THOSE RELATED TO IRRIGATION, NUTRIENTS, PESTICIDES AND SALINISATION) ON WATER QUALITY AND QUANTITY**

During this period, a series of initiatives were developed to improve efficiency in water use and reduce the environmental effects of agriculture on this resource.

Regarding irrigation, in 2005 the Ministerial Council of the National Irrigation Commission (Comisión Nacional de Riego, or CNR) approved the National Irrigation and Drainage Policy. In general, the policy is aimed at promoting economic growth in the agriculture sector within a framework of social, gender and ethnic equality, environmental sustainability and watershed management. Among other things, the Policy proposes the following specific objectives:

- Develop irrigation in the context of the watershed, focusing actions on those considered priorities based on current agriculture policy, and seeking to balance agricultural development with environmental protection;
- Increase efficiency of water use in the agricultural sector, including more promotion of technology, development of infrastructure and research and technology transfer;
- Promote efficient and modern management of irrigation systems and drainage among farmers.

In 2009, Law 18,450 on Promotion of Private Investment in Irrigation and Drainage Works was updated and extended for 12 years. The changes and adaptations have been made to increase the efficiency of applying regulations and deepen their influence on agriculture modernisation processes, taking into consideration environmental factors. The new regulations introduce environmental objectives, so that the projects funded through the law do not contribute to degradation of soils or biodiversity or cause any kind of environmental damage.

The government has also promoted the construction of hydroelectric plants associated with existing irrigation systems, as these are opportunities for electricity generation with a low environmental impact and also provides additional resources to farmers. In 2007 the CNR carried out a survey together with the National Energy Commission (Comisión Nacional de Energía, or CNE) in eight regions of the country. The survey found that there is potential to develop 290 hydroelectricity plants of between 2 and 20 MW associated with irrigation works, for a total potential of 860 MW. These initiatives are supported by the changes in the abovementioned Investment Promotion Law, which includes subsidies for electricity generation used in automated irrigation systems. So far, four plants related to irrigation works with a total capacity of 30.3 MW are operating and another five are under construction with a total estimated capacity of more than 50 MW. In addition, and with support from

the European Union, the CNR carried out technical and economic prefeasibility studies for 15 irrigation canals. The results of these studies will be available in June 2011.

A central theme of the development strategy for the agriculture sector has been the application of Best Practices in Agriculture (BPA) oriented toward clean and sustainable production. Thus, in 2008 the Technical Guide to Best Practices for Natural Resources, Water, Soil, Air and Biodiversity (Guía Técnica de Buenas Prácticas Recursos Naturales, Agua, Suelo, Aire y Biodiversidad) was published by the National Commission on Best Practices, which is part of the Subsecretariat of Agriculture. This publication on best practices in natural resources management and protection provides elements to guide production decisions, aimed at resulting in property systems that are more efficient and sustainable over time. The Commission developed 18 Technical Specifications for Best Practices in Agriculture between 2003 and 2009.

In this same area, the Agriculture Ministry has defined general BPA guidelines for the following crops and activities: rice, corn, wheat, potatoes, beef cattle, dairy cattle, eggs, poultry, pork, fruit, sheep and goats, packing and produce grown in the open and in greenhouses.

Regarding organic agriculture, in 2006 Law 20,089 was enacted to regulate the production, preparation, labeling and sale of organic products in Chile. The regulation for this law is Supreme Decree 36/06 (Agriculture Ministry, or MINAGRI) and its technical standards are contained in Supreme Decree 17/07 (MINAGRI). The law creates a national certification system for organic agricultural products, an instrument which supports the implementation of domestic organic production. Chile's Agriculture and Livestock Service (Servicio Agrícola y Ganadero, or SAG) is charged with administering and overseeing the system as well as supporting and guaranteeing the reliability of Chilean organic production for export markets. This facilitates efficient and sustainable development and the adoption of practices and techniques which are environmentally friendly and also beneficial in terms of public health.

Chile's total organic production area in 2009-2010 was 151,097 hectares. The largest proportion of this is 119,087 hectares used for collection of wild plants. This area has increased by 29% compared to the previous season, and the main product is rosehip. The largest portion of organic hectares is located in the Bío-Bío Region (109,636 hectares). Collection of wild plants occupies the majority of that area, or 103,448 hectares. The second most important crop by area is natural pastures, which represent 11% of the domestic organic area.

The agriculture sector has also participated in Clean Production Agreements (CPAs). During this period, the following agreements were signed:

- Coquimbo Agriculture CPA (2009): The objective of this Agreement for the agriculture sector of the Coquimbo Region is to incorporate clean production measures and technologies in order to increase production efficiency and prevent and reduce pollution

generated by agricultural activities. This is currently in the implementation and final audit stage.

- Wineries CPA, Stage II (2009): This agreement seeks to install in the country's wineries and cellars aspects of environmental production management, with a focus on increasing production efficiency and preventing and reducing environmental impacts generated by the activity. This is currently in the implementation and final audit stage.

Also as part of the clean production agreement with the wine industry, the Agriculture and Livestock Service (SAG) prepared a technical document entitled "Basic conditions for using winery LIWs in irrigation." This document provides recommendations for practices related to irrigation and crop restrictions in order to minimise the risk of environmental contamination.

RECOMMENDATION 16**DEVELOP AN INTEGRATED WATERSHED APPROACH TO IMPROVE WATER AND FOREST RESOURCE MANAGEMENT AND TO PROVIDE ENVIRONMENT-RELATED SERVICES MORE EFFICIENTLY**

The country has advanced little in this area.

In April 2008 the National Strategy for Integrated Watershed Management (Estrategia Nacional de Manejo Integrado de Cuencas Hidrográficas) was officially launched. This strategy is aimed at coordinating the use of water and related resources by promoting a national institutional framework that would push forward initiatives to create local watershed organisms.

This effort was not successful because of problems with the Strategy design, and because the benefits of making significant institutional changes in water management was not clear enough.

However, some of the elements of the Watershed Strategy have been adopted as part of the environmental management of water resources. Notable in this area is the creation in 2011 of the User Organisations and Water Efficiency Unit (Unidad de Organizaciones de Usuarios y Eficiencia Hídrica). Among the main functions of this new area will be to guide, direct, control and strengthen water user organisations and continue to implement the "National Water Efficiency Initiative," which promotes water efficiency actions among the different productive and non-productive activities in the country. In addition, an environmental policy regarding water is currently under development. This policy is particularly oriented toward setting long-term environmental goals and objectives in line with the European Union Water Framework Directive, developing water quality monitoring based on bioindicators and improving information systems and indicators related to this resource.

RECOMMENDATION 17

GIVE GREATER WEIGHT IN WATER MANAGEMENT TO PROTECTION OF ACUATIC ECOSYSTEM IMPROVE THE INTEGRATION OF NATURE CONCERNS IN WATER MANAGEMENT BY SETTING UP A ROBUST REGIMEN FOR MINIMUN ECOLOGICAL FLOWS AND BIOLOGICAL WATER QUALITY STANDARDS

In 2005 the reform of the 1981 Water Code was approved (Law 20,017) to address social equity and environmental protection issues. Among the most important aspects of the reform are the following: 1) granting authority to the President to exclude water resources from the market when necessary to protect the public interest; 2) the obligation of the General Water Directorate (Dirección General de Aguas, or DGA) to consider environmental aspects in the process of establishing new water rights, especially when identifying ecological water flows and protecting sustainable aquifer management; 3) charging permit fees for unused water rights and limiting applications for water rights to the original needs in order to prevent hoarding and speculation.

In 2008, through an exempt resolution of the DGA, the new text of the "Standards and Procedures Manual for Water Resources Management" (Manual de Normas y Procedimientos para la Administración de Recursos Hídricos) was approved. This manual establishes technical criteria and procedures for defining minimum ecological flows for constituting new water use rights. Thus, in all new water rights granted, the DGA is required to establish an associated "minimum ecological flow" which must be maintained for the natural source. Finally, in December 2009 a DGA resolution was published in the Official Gazette (Diario Oficial) which "Sets Criteria for Calculating the Ecological Flow when Granting Water Use Rights."

On the other hand, the reform of the institutional framework for environmental matters (Law 20,417) of 2010 includes among the functions of the Environment Ministry to develop policies and formulate plans, programmes and actions that establish the basic criteria and preventive measures to promote recovery and conservation of water resources.

The combining of water regulation and current environmental regulations is reflected in the requirements related to the minimum ecological flow³⁷. Law 20,417 modifies Article 129 bis 1 of the Water Code, adding a provision which establishes that the criteria for establishing the minimum ecological flow will be established through a regulation signed by the ministries of the Environment and Public Works. The two ministries are currently working together to prepare this regulation.

Likewise, Law 20,417 includes the Environment Ministry as an institution which, along with the public agency responsible for regulating the use and exploitation of natural resources in a specific

³⁷ According to Article 129 bis 1 of the Water Code, the minimum ecological flow is that which enables the preservation of nature and environmental protection.

area, shall require, when applicable, the presentation of and compliance with management plans for conservation. Such plans must include considerations related to the maintenance of water flows. This matter will be addressed in the regulation alluded to in the preceding paragraph.

On the other hand, by virtue of the reformed Water Code, a series of decrees have been signed to reserve flows in watersheds which currently have conservation status within the National Protected Wilderness Areas System (parks, reserves, etc.) as well as nature sanctuaries and tourism zones (Zonas de Interés Turístico, or ZOIT). This is aimed at restricting requests for water rights by private parties and ensures the environmental conservation of such watersheds in order to preserve the environmental and landscape value as well as their value in terms of tourism.

In regard to environmental regulations, so far two Secondary Standards for Environmental Quality for the protection of surface continental waters have been published: one for the protection of water in the Serrano River basin, near Torres del Paine National Park (Supreme Decree 75/10, MINSEGPRES), and another for protection of the water of Lake Llanquihue (Supreme Decree 122/10, MINSEGPRES)³⁸. These standards establish quality levels for each parameter and for each oversight area defined within them. Biological monitoring has been included in the oversight programmes of these laws. These programmes must be approved by the DGA and will become public information. According to this regulation, these oversight programmes may include monitoring of additional parameters beyond those included in the regulation, as well as new water quality monitoring stations. Both bioindicators and bioassays may also be included as complementary tools for evaluating the effects of water quality on aquatic communities.

According to the Public Table published in January 2011, secondary quality standards are now being developed for the following river basins: Maipo-Mapocho, Aysén, Cachapoal, Bío Bío, Aconcagua, Elqui and Loa. These rivers are the main water courses in the country and are home to the largest urban centres, including the country's capital.

The secondary water quality standards which have been prioritised for development in coming years are those for the Imperial River basin and Lake Ranco.

Finally, in 2011 the Environment Ministry will finalise the four guides that address deficiencies related to the lack of uniform criteria for biological sampling of water and analysis of the results.

³⁸ For more details, see the footnotes in Recommendation 2.

RECOMMENDATION 18

IMPROVE THE INFORMATION AND KNOWLEDGE BASE FOR WATER MANAGEMENT (E.G. MONITORING OF AMBIENT WATER QUALITY, REGISTRY OF WATER RIGHTS, DATA ON EXPENDITURE AND FINANCING)

The General Water Directorate (DGA) is the governing organism in Chile in matters related to management, planning, research and characterisation of continental water resources. To carry out its work, the DGA has developed a technology platform which integrates different systems:

- Public Water Survey (Catastro Público de Aguas), which includes information about requests for and grants of water rights and user surveys, among other data; the National Water Banking System (Sistema Banco Nacional de Aguas), which contains all of the information from the hydrometeorological network and on water quality;
- Geographic Information System;
- An automated documentation system, which contains all the information from the DGA document centre.

Some of these systems use client-server technology while others are based on a web platform. This platform has been maintained over time, with improvements in data quality and adaptation to current regulations.

For example, in 2008 the supreme decree which contains the Regulation on the Public Water Survey was modified and the DGA was charged with carrying out a “Public Inventory of Glaciers,” the content of which was defined in a specific rule from the same year (DGA Exempt Resolution 1,043). Within the DGA the Glaciology and Snow Unit (Unidad de Glaciología y Nieves, or UGN) was created in order to establish the National Glaciological Programme. This programme is responsible for carrying out the country's glacier inventory and implementing a glacier monitoring network in different geographic areas. This network has already been implemented. These efforts are aimed at making progress in terms of quantifying the hydrological contribution of the glaciers to the different watersheds, as well as to determine the response of the glaciers to global warming.

Among the activities of this unit are the Glaciological Programme in the Northern Ice Fields (Campo de Hielo Norte), which has collected extremely precise information from the surface of the Colonia glacier to the San Rafael glacier using airborne laser altimetry. Since 2009 three glaciological campaigns have been carried out in the accumulation zone of San Rafael glacier. Also, two hydrometeorological stations which use satellite transmission are in operation in the Southern Ice Fields (Campo de Hielo Sur), specifically on the Témpano and O'Higgins glaciers.

On the other hand, in 2007 the first list of usage rights subject to payment of non-use permits was created. This gave the market greater transparency, releasing water resources for new productive

projects and reducing hoarding for speculative purposes. As already pointed out, this was done as part of the modification of the Sanitation Code through Law 20,017, which inserted a new title regarding payment of permits for non-use of water rights.

The General Water Directorate's electronic application system, which facilitates submittal and questions about applications for water use rights, began operating in 2007. This system provides public access to an Internet-based technological tool for applying to the DGA for water rights.

In addition, to ensure compliance with secondary water quality standards, the agency is considering the use of oversight programmes. These must be approved by the DGA and be available to the public. These oversight programmes could include monitoring of parameters in addition to those included in the regulation, such as bioindicators and bioassays, as well as new monitoring stations in order to generate information about the level of compliance and improve the existing regulation.

The DGA plans to develop a public information system on the use of water in the country as a key element of policymaking in the coming year. The measure is designed to address non-regulated use of water and guarantee that the authorities are informed of changes and transfers of existing rights.

The DGA also plans to restrict authorisation of new water rights and eliminate illegal water extraction by imposing more drastic sanctions and enforcing the use of extraction control systems in order to ensure that rivers maintain sustainable flow levels.

In the future, the government plans to continue to generate information about glaciers and glacier melting and the flows they contribute to different watersheds. This process of monitoring and evaluation will provide information about the evolution of bodies of ice over time and their impact on water resources.

iv. Nature and biodiversity

RECOMMENDATION 19**COMPLETE, FIRMLY IMPLEMENT AND DEVOTE ADEQUATE RESOURCES TO THE NATIONAL AND REGIONAL BIODIVERSITY STRATEGIES AND ACTIONS PLANS**

Since the creation of the National Biodiversity Strategy (Estrategia Nacional de Biodiversidad) in 2003, three specific public policies have been developed within its framework: the National Threatened Species Policy (Política Nacional de Especies Amenazadas), the National Protected Areas Policy (Política Nacional de Áreas Protegidas) and the National Wetlands Strategy (Estrategia Nacional de Humedales), all of which were created in 2005. Of all the actions planned through 2010 for these four instruments (which together contain a total of 275 actions), only 25 (9%) show no progress. The reasons for delays in advancing them are related to lack of financing and institutional adjustments which had to be made during the implementation period of the Action Plans.

Of the actions carried out, 32% have been completed and 58% are still being implemented.

The country currently has 14 Regional Biodiversity Strategies for its 15 regions (official approval of the strategy for the Los Ríos Region is still pending). The Regional Biodiversity Strategies prepared in 2003-2004 proposed lists of priority sites for biodiversity conservation, identifying a total of 328 sites. Other regions in the country have developed baselines for defining new priority sites. This process has culminated in the transfer of 21 sites to an official conservation category, which largely explains the 24 new protected areas created by the country between 2005 and 2011³⁹.

Although an evaluation has not yet been carried out to determine the resources necessary to fully implement the National Biodiversity Strategy, the creation of the Environment Ministry will bring greater dynamism and attributions to the management of natural resources and biodiversity. In this line of work, proposed legislation to create the Biodiversity and Protected Areas Service (Servicio de Biodiversidad y Áreas Protegidas) is currently in discussion in Congress. In this scenario, it has become evident that the country needs to develop a policy exclusively for natural resources and biodiversity. This will take place in 2011.

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³⁹ In the context of the institutional framework for the environment, the structure, role and functions of the Regional Biodiversity Operating Committees (Comités Operativos Regionales de Biodiversidad), which are responsible for preparing the Regional Strategies, are currently undergoing a review process. This process is part of the update of the National Biodiversity Strategy, based on the objectives defined in the 2020 Strategic Plan for Biodiversity which includes the agreements established in the Nagoya Convention on Biodiversity.

RECOMMENDATION 20**REVIEW INSTITUTIONAL AND LEGISLATIVE ARRANGEMENTS FOR THE MANAGERMENTS OF NATURE AND BIODIVERSITY**

Subsequent to the approval of the National Biodiversity Strategy (2003) and the public policy instruments which arose from it, since 2005 various agreements and legal changes have been undertaken to make biodiversity a priority by including it in decision-making and in the objectives of all national government institutions. While efforts in this area have been important, the creation of the Environment Ministry and the submittal to Congress of proposed legislation to create the Biodiversity and Protected Areas Service and the National Protected Areas System⁴⁰, have been the most significant.

In addition, the creation in 2005 of three policy instruments based on the National Biodiversity Strategy⁴¹, is further evidence of the country's recognition of the important role of biodiversity.

Among the public policies and laws which have not directly resulted from the National Biodiversity Strategy, but which nevertheless fall within the agreements the country has signed on biodiversity and sustainable development, are the enactment of Law 20,283 on Native Forest Recovery and Forest Development (Recuperación del Bosque Nativo y Fomento Forestal) in 2008 and the National Tourism Policy (Política Nacional de Turismo) in 2005.

Law 20,283 on Native Forest Recovery and Forest Development is aimed at protecting, recovering and improving native forests in order to ensure forest sustainability. This law defines native forest and management plans and establishes environmental protection regulations. It also establishes a fund for native forest conservation, recovery and sustainability. Through public competitions, beneficiaries can obtain government resources from this fund for appropriate forest management practices. The law also includes a Native Forest Research Fund to promote and increase knowledge of native forest ecosystems as well as their organisation, preservation, protection, expansion and recovery.

During this period the country has signed and ratified a series of international agreements on biodiversity conservation and promotion and has developed policy instruments related to those agreements: regarding marine birds, in 2005 Chile ratified the Agreement on the Conservation of Albatrosses and Petrels, and in 2007 it ratified the National Action Plan for Reducing Incidental Bird Captures in Long-Line Fishing; in terms of hydrobiological resource conservation, developments include the National Action Plan on Illegal Fishing in 2006, the National Strategy on Comprehensive Hydrographic Basin Management in 2007, the National Action Plan for Shark Conservation, also in

⁴⁰ Proposed legislation submitted to Congress on 26 January 2011.

⁴¹ Details are provided in the previous recommendation..

2007, and in 2008, the approval of a set of recreational fishing regulations (Law 20,256), as well as other regulations related to bans on capturing cetaceans in national waters (Supreme Decree N° 179, Ministry of Economy) and the establishment of regulations for the General Fishing and Aquaculture Law regarding protection of cetaceans. In 2010, changes were made to this law in the area of aquaculture and benthonic resource management and production areas. Also, that same year Chile ratified the Inter-American Sea Turtle Convention. Regarding land use management, in 2010 the Incentives System for Agro-environmental Sustainability of Agricultural Land was created⁴² as well as the Regulation on Soils, Water and Wetlands.

Proposed legislation on Real Conservation Law, an initiative conceived of as a limitation on property domain created voluntarily for the purpose of environmental conservation and community benefit, is currently being discussed by Congress. The proposed law determines that the exercise and protection of property is granted to a specific legal entity as owner and by virtue of which certain duties are imposed on the affected real estate.

The GEF/Environment Ministry/UNDP Project to create a National System of Protected Areas for Chile (now in the implementation phase) should provide a set of inputs and recommendations to support discussion of the proposed creation of the Biodiversity and Protected Areas Service. Additionally, the GEF Project should also provide technical considerations regarding operational aspects of the National Protected Areas System, several of which will contribute to the regulations of the future law creating the Protected Areas Service.

⁴² This programme updates a similar one which was implemented 20 years ago in Chile. This update puts a greater emphasis on sustainability than the earlier one.

RECOMMENDATION 21**DEVELOP A STRATEGIC VISION OF THE COMPLEMENTARY ROLES OF STATE AND PRIVATE PROTECTED AREAS IN ORDER TO ACHIEVE A COHERENT NETWORK OF CORE PROTECTED AREAS, BUFFER ZONES AND ECOLOGICAL CORRIDORS**

The National Biodiversity Strategy (2003) includes public-private cooperation as an essential strategy for achieving in situ conservation. In this area, one of the central objectives of the formulation of the National Protected Areas Policy in 2005 is the creation and implementation of a Comprehensive National System of Public and Private Protected Areas, both terrestrial and aquatic. While these policies express the country's emphasis on the strategic role of public and private collaboration for in situ conservation, the most important coordinating action is related to the creation of the Biodiversity and Protected Areas Service, as set out in Law 20,417 now under discussion. Although the proposed law may undergo modifications in the course of the approval process, as currently written it states that the Service's functions will include "administering the National Protected Wilderness Areas System, as well as state-protected wilderness areas." To provide functional connections between national protected areas, the proposed law promotes linkages on land as well as in continental, marine and coastal waters.

The proposed law creating the Biodiversity and Protected Areas Service indicates that the state-protected wilderness areas may only be created in those geographic areas which have been declared priority sites. This, according to the same legislation, may only occur on state-owned land. In the event that sites which have a high biodiversity value are in private hands, if the private owner so desires, he or she may request their inclusion in one of the categories of the National Protected Areas System, under the conditions stipulated by the law. In this sense, the addition of private protected areas should contribute to improving both the ecosystemic representation of the country's protected areas as well as their connectivity⁴³.

⁴³ In the framework of coordinations and feedback from the GEF Project, what is being proposed is to develop the definition of a buffer zone concept and promote ecological corridors, as part of public-private strategic alliances. The country currently has 337 private conservation initiatives, which together represent a surface area of about 1.5 million hectares. More than 50% of these are located in the 10th and 14th regions.

RECOMMENDATION 22**STEP UP FINANCIAL EFFORTS TO MEET THE TARGET OF PROTECTING 10% OF ALL SIGNIFICANT ECOSYSTEMS IN CHILE (INCLUDING COASTAL AND MARINE AREAS) AND BOOST NATURE-RELATED ENFORCEMENT ACTIVITIES**

The National Protected Areas Policy (2005) explicitly proposes in its fifth specific objective that the necessary public resources must be guaranteed for the efficient functioning of the National Protected Areas System, through assessment and prioritization of the financing and structural requirements for assigning these resources.

In 2006, as part of the GEF/Environment Ministry/UNDP Project⁴⁴, the UNDP Financial Sustainability Scorecard was applied in order to determine current financing and identify gaps for optimal management. According to the scorecard, the total annual CONAF budget for protected areas management was US\$5.7 million in 2007. In 2010, the Budget Law allocated US\$17 million, and this year the amount was increased to US\$19.8 million⁴⁵.

Starting in 2008, the Protected Areas Unit of CONAMA's Department of Natural Resources began to administer its own budget, which has evolved as follows: in 2008, it reached US\$65.500 (only at the central level); in 2009 it was US\$145.500; it was increased to US\$266.000 in 2010 and in 2011, as part of the Environment Ministry, it received US\$328.000.

In terms of protection efforts within the objectives of the National Biodiversity Strategy, in this same period, 17 new land-based protected areas have been created representing 692,690 hectares, while six new marine areas have been created representing 15,010,903 hectares (Table 10). This represents growth of 5.1% of the protected land-based area in comparison to 2004. The new marine areas represent a 54% increase over the quantity in 2004 and 1,500 times the area, due almost exclusively to the creation of the Motu Motiro Hiva Marine Park which consists of 15 million hectares in the exclusive economic zone of the Sala y Gómez Islands.

TABLE 10**PUBLIC PROTECTED AREAS BY YEAR**

Years	1907-1989	1990-2004	2005-2011	Total
Protected Coastal Marine Areas	0	4	2	6
Natural Monuments	11	4	1	16
Marine Parks	0	1	1	2

⁴⁴ See Recommendation 22.

⁴⁵ These figures are from the Budget Law for 2010 and 2011 for the CONAF Protected Areas Program, and their amounts in Chilean pesos are \$8,176,799,000 and \$9,479,653,000, respectively.

National Parks	28	3	4	35
National Reserves	34	14	2	50
Marine Reserves	0	3	2	5
Nature Sanctuaries	12	10	10	32
Ocean Nature Sanctuaries	5	3	2	10
Overall Total	90	44	24	158

This shows that there has been significant progress toward achieving the goal of protecting 10% of all significant ecosystems in Chile. The Table 11 shows progress toward this goal by type of land-based vegetation formation present in the country and for the zoogeographic zones of the Chilean coast.

TABLE 11
PROGRESS TOWARD THE GOAL BY TYPE OF LAND-BASED VEGETATION FORMATION

WWF Land Ecoregion	Area of Protected Areas (ha)	Total area (ha)	Representation (%)
Atacama Desert	143,309.19	10,484,502.22	1.4
Dry grassland of the Central Andes	989,606.04	8,273,942.68	12.0
Grassland of the Central Andes		94,131.00	0
Chilean scrubland	139,976.16	14,817,888.11	0.9
Temperate forests of the Juan Fernández Islands	10,413.48	10,413.48	100
Magellanic subpolar forests	7,626,974.97	13,835,889.68	55.1
Patagonian steppe	353,591.17	2,801,833.98	12.6
Subtropical broadleaf forests of Rapa Nui	18,216.75	18,216.75	100
Ice and rock	1,701,841.81	1,731,051.97	98.3
Temperate forests of the San Félix-San Ambrosio islands		606.85	0.0
Sechura Desert	4,686.16	141,355.58	3.3
Southern Andean steppe	92,299.99	2,986,315.45	3.1
Valdivian temperate forests	4,017,500.31	20,345,445.38	19.7

TABLE 12

ZOOGEOGRAPHIC ZONES OF THE CHILEAN COAST

Coastal Zoographic Area	Area of Protected Area (ha)	Area of coastal sea (ha)	Representation (%)
1	339.96	743,794.30	0.05
2	0	137,962.90	0
3	9,753.22	456,459.30	2.14
4	0	291,932.50	0
5	278.87	1,781,023.00	0.02
6	4,199.96	1,416,207.10	0.30
7	17,037.85	7,441,358.50	0.23
8	66,830.94	6,989,432.60	0.96
9	0	5,354,634.30	0

The proposed law to create the Biodiversity and Protected Wilderness Areas Service would establish the bases for providing the Service with sufficient resources to function, effectively protect the areas which are part of the National Protected Wilderness Areas System and to include new areas, both public and private, which would contribute to ensuring that all of the country's ecosystems are properly represented in the system. Thus, the proposed law states that the Service's resources would include (Article 8, fourth paragraph): a) the funds assigned to it annually in the National Budget or by other general or special laws; b) fixed and movable property, tangible and intangible, transferred to or acquired by the Service; c) bequests and legacies the Service accepts, which must occur under benefit of inventory. Such bequests shall be exempt from all taxes or payments; d) contributions from international donor organisations which the Service receives for carrying out its activities; e) income from entrance fees to state protected wilderness areas and from concessions or permits granted in those areas; and f) other income contemplated in the law.

It is important to remember that the creation of private protected areas is one of the key elements for ensuring complete protection of the country's ecosystems and biodiversity, because much of the biodiversity which is not represented in state-protected areas are present on privately held land⁴⁶. Thus, to promote private participation, the proposed law also includes the creation of the National Biodiversity and Protected Wilderness Areas Fund. This fund will be administered by the Service for full or partial funding of projects, programmes, development activities or measures, research, dissemination, education, implementation and conservation of biodiversity and protected wilderness areas.

In addition, it is worth noting that one of the priority objectives of the GEF/Environment Ministry/UNDP Project is to design the financial and operating structure for the National Protected Areas System, consistent with the model included in the proposed legislation.

⁴⁶ There are currently 337 private conservation initiatives totaling 1,541,688 hectares. Most of these are located in the 10th and 14th regions (65% of the total).

Public financing has been complemented by international funds from the GEF, through major biodiversity conservation initiatives. A total of US\$15 million has been raised for this fund from 2005 to 2013⁴⁷ distributed in four projects.

⁴⁷ The GEF/Environment Ministry/UNDP Project for Creation of a National Protected Areas System has received US\$ 5,312,000 for a five-year project (ending in 2013). The GEF/Environment Ministry/UNDP Project for Conservation of Globally Significant Biodiversity along the Chilean coast, which began in 2005 and ended in 2010, involved resources totaling US\$ 3,872,432. The GEF/Environment Ministry/UNDP Project for Conservation of Altos de Cantillana, which concluded in 2010, received a GEF grant of US\$ 981,485. The GEF/Environment Ministry/UNDP Project for Creation of a National Protected Areas System, which is now being implemented, has received US\$ 5 million from GEF for a five-year project (2008-2012).

RECOMMENDATION 23

MOUNT A CO-ORDINATED EFFORT BY STATE AGENCIES AND ACADEMIA TO BUILD THE SCIENTIFIC KNOWLEDGE BASE (INCLUDING CATALOGUING OF LIVING SPECIES) REQUIRED FOR NATURE MANAGEMENT

During this period, no significant progress was made in establishing a coordinated initiative between the government and academic institutions. Nevertheless, there are some notable examples of coordination between the government and academia, including the publication in 2006 (with an updated editing in 2008) of the book “Biodiversidad de Chile: patrimonio y desafíos” (Biodiversity in Chile: Heritage and Challenges), which is the official government document on this subject. This publication includes an assessment of academic research on biodiversity and the possibilities of developing such research to support national policy. The document states that the lack of specific government incentives for research is one of the main reasons for the lack of development in this area in Chile. The proposed legislation that would create the Biodiversity and Protected Areas Service includes a fund for this purpose.

Another important initiative is the National Species Inventory (Inventario Nacional de Especies) which is currently under development. The purpose of the inventory is to serve as a national repository of knowledge about native and exotic species in the country. The National Species Inventory has been designed to interact with different government institutions with competencies and knowledge in these matters and to facilitate the participation of civil society and academia in its preparation. In addition to the data already mentioned, the system will generate specific reports on the status of species included in it, the threats to them and possible measures to be taken for their recovery and permanence.

RECOMMENDATION 24

SPEED UP PROGRESS TOWARDS ESTABLISHING AN EFFECTIVE LAND USE PLANNING SYSTEM CAPABLE OF TAKING BIODIVERSITY VALUES INTO ACCOUNT.

In addition to the laws and regulations mentioned in Recommendation 5, the legislation that will create the Biodiversity and Protected Areas Service and the National System of Protected Areas will contribute to land-use planning once the categories of protected public and private wilderness areas, whether land-based, freshwater or marine, are defined. It will also define the mechanisms for adding and removing protected areas and the conservation targets contained within them. In this regard, the act of declaring a protected area will be essential for determining clearly and precisely the objectives of protection and general zoning of the area, in order to provide certainty about the activities permitted within it. This action will also provide the criteria for environmental assessment of projects located near the protected area. All of the areas are to have a management plan, which will likewise be an essential instrument for identifying the protection zones and possible areas which can be used for purposes compatible with the protection category.

Moreover, including a strategic environmental assessment in the different zoning instruments used in Chile will promote the inclusion of the biodiversity variable in land use planning.

Another aspect which should be noted is the promulgation in early 2011 of the Regulation on Soils, Water and Wetlands (Reglamento de Suelos, Agua y Humedales) which protects wetlands that have been declared Ramsar sites and Biodiversity Conservation Priority Sites, as declared so by the Ministry of the Environment.

RECOMMENDATION 25**IDENTIFY AND USE FURTHER MECHANISMS, INCLUDING ECONOMIC INSTRUMENTS, FOR CREATING WIN-WIN OPPORTUNITIES IN TOURISM AND NATURE POLICIES**

The proposed legislation to create the Biodiversity and Protected Wilderness Areas Service gives the Service or the Environment Ministry and the Ministry of National Property, together, the authority to grant concessions (gratuitous or paid) and use permits within state-protected wilderness areas. Tourism services are among those that may be granted as concessions, which is also in accordance with the recently passed Law 20,423 on the Institutional System for Tourism Development. This law has a chapter devoted to tourism development in state-protected areas⁴⁸. Income from these concessions or permits will be part of the Service's budget. This legislative initiative shows that the country clearly intends to generate positive interaction between the opportunities offered by tourism and protection of nature, within the limits set by the management plan for each protected area and in accordance with the category and protection purpose of the area in which each concession is granted.

In accordance with the legal framework now being discussed, the GEF/Environment Ministry/UNDP Project proposes to develop pilot projects that would test new instruments as part of its annual operating plan for 2011. In relation to tourism, it proposes the start-up and implementation of a pilot project on “a system for entrance fees and tourism service provision fees in a network of protected areas” in northern Chile, in order to test mechanisms for generating income to cover the financing gap of the National Protected Areas System.

Law 20,417, which modified the Law on General Environmental Bases (*Ley de Bases Generales del Medio Ambiente*), expressly included the Protected Marine and Coastal Areas for Multiple Uses (*Áreas Marinas y Costeras Protegidas de Múltiples Usos*) as a conservation category under the supervision of the Environment Ministry. This use of this category was also included in the proposed legislation to create the Biodiversity and Protected Areas Service. These two acts validate the internal legal organisation of a category which seeks to reconcile nature conservation with productive development based on mechanisms such as zoning, assignment of uses based on load capacity and development of compatible uses and at levels appropriate to the conservation objectives of each area.

In addition to the processes started this year, since 2008, an effort has been underway to change the management of priority sites to organise and rationalise their administration. One proposal has been the formulation of the Priority Site Management Model (*Modelo de Gestión de Sitios Prioritarios*) to organise their management and expand the concept of site management beyond simply the idea of “official protection” (protected area). As part of this effort, a study was carried out in 2010 known as

⁴⁸ The regulation of this law is currently moving through the approval process.

the “Prospective Study of Instruments for Production Development, Enterprise and Innovation and their Functionality for Conservation and Sustainable Use of Biodiversity in Priority Sites.” This study has generated proposals for changes to existing instruments (Native Forest Law, Law-Decree 701) and has also led to proposals for new instruments, such as a "conservation bank" for compensations required by the Environmental Impact Assessment System. Studies of the latter instrument will be carried out in 2011.

2. TOWARDS SUSTAINABLE DEVELOPMENT

i. Integration of environmental concerns in economic decisions

RECOMMENDATION 26

DEVELOP ECONOMIC ANALYSES OF ENVIRONMENTAL RELATED POLICIES, EXPANDING BOTH ECONOMIC INFORMATION ON THE ENVIRONMENT (E.G. ON ENVIRONMENTAL EXPENDITURE, ENVIRONMENT-RELATED TAXES, HEALTH RISK ASSESMENT, WATER AND ENERGY PRICES) AND COST-BENEFIT ANALYSIS OF PROJECTS AND LEGISLATION RELATING TO THE ENVIRONMENT

The country's progress in terms of economic evaluation of environmental policy instruments are restricted to specific areas of environmental policy, particularly processes of enacting environmental standards and decontamination plans, where the law requires the preparation of cost-benefit studies known as General Analyses of Economic and Social Impact (Análisis General del Impacto Económico y Social, or AGIES). In this area, it is worth mentioning the background information analysis for scenario evaluation in the preparation of the Primary Quality Standard for PM2.5, which was commissioned by CONAMA (now the Ministry of the Environment) to define, based on a cost-benefit analysis, the advantage of introducing requirements at different levels and at different points in time. It should be noted that this type of analysis has improved gradually since it was first used in 1997, which is important for its future application in other areas of policy. Thus, the Ministry of the Environment's Research Division (División de Estudios) has made progress in strengthening its capacity to evaluate risks associated with soil contamination, ecological impacts and impact on human health. On the other hand, the Ministry is working toward standardising the cost-benefit methodology for health impacts related to air pollution to make it easier to apply it to different contexts and areas of the country.

In another area, Chile is planning to implement Extended Producer Responsibility (EPR) through a General Waste Law and specific regulations for selected priority products. Before implementing EPR in Chile, the decision was made to evaluate the potential impacts associated with selected priority products. CONAMA commissioned an economic, environmental and social study of EPR implementation in Chile, which was carried out from May 2009 to June 2010.

RECOMMENDATION 27**REVIEW WAYS AND MEANS OF INTEGRATING ENVIRONMENTAL CONCERNS IN FISCAL INSTRUMENTS AND POLICIES**

With regard to public spending, the government has an online platform for public procurement known as Mercado Público (www.mercadopublico.cl). In 2010 a working group was created to introduce environmental criteria into public procurement, starting the process with a study to assess the market availability of products which meet environmental standards.

In terms of taxes, the ministries of Energy, Finance and the Environment are in the process of formulating the terms of reference for an evaluation of taxes on fuels in order to determine any possible distortions in relative prices and the feasibility of introducing a carbon tax.

Finally, the government is in the process of developing a Green Growth Strategy (Estrategia de Crecimiento Verde) which will include fiscal policy mechanisms among its potential instruments.

RECOMMENDATION 28

UNDERTAKE STRATEGIC ENVIRONMENTAL ASSESMENTS CONCERNING: I) CHILE'S ENERGY POLICY FRAMEWORK AND II) LONG TERM TRANSPORT PLANS FOR THE SANTIAGO METROPOLITAN REGION, FOR OTHER URBAN AREAS AND AT NATIONAL LEVEL

By law, the Strategic Environmental Assessment (Evaluación Ambiental Estratégica, or EAE) is "the procedure carried out by the respective ministry to ensure that the environmental considerations of sustainable development are included in the formulation process of policies and plans of a general regulatory nature, which have an impact on the environment or on sustainability, so that they can be incorporated into the promulgation of the respective policy or plan and its major modifications."

Therefore, the EAE is an administrative instrument which represents a new requirement for integration and coordination of the processes of preparing and adopting public instructions and guidelines, unlike the historically sectoral nature of policy and plan development.

According to the law, the instruments that are subject to the EAE are regional land use plans, inter-municipal zoning plans, municipal zoning plans and district plans, regional urban development plans, coastal and maritime territory zoning, and integrated management of watersheds or the land-use instruments which replace or systematise them. It also stipulates that policies and plans issued by the President of the Republic, as recommended by the Ministerial Council for Sustainability (Consejo de Ministros para la Sustentabilidad), are subject to this procedure.

Finally, it should be mentioned that the EAE encourages other public agencies, private institutions and citizens to participate in the process.

In parallel, a project co-financed by the European Union and the Government of Chile entitled "Support for Strategic Environmental Assessment in Chile" (Apoyo a la Evaluación Ambiental Estratégica en Chile) which began in 2009 seeks to support the implementation of the regulation by providing methodological recommendations, training and human resource development, as well as communication and dissemination activities.

This management instrument is now beginning to be implemented. A regulation is now being prepared based on the draft text proposed by the Ministry of the Environment, and which was submitted to all government ministries for comments. These observations are being consolidated into a final version which will be presented to the Ministerial Council for Sustainability, which in turn will propose it to the President of the Republic.

The EAE team is already advising municipalities in the evaluation of land-use planning instruments and some pilot projects are being carried out in various regions.

RECOMMENDATION 29

BASED ON ANALYSIS OF THE SOCIAL COST AND BENEFITS OF ENERGY EFFICIENCY AND NON-CONVENTIONAL RENEWABLES, CONSIDER PROVIDING A POSITIVE FINANCIAL INCENTIVE TO ENCOURAGE FASTER UPTAKE

As indicated in Recommendation 11, Law 19,940 of 2004 and its regulation published in Supreme Decree 244 of January 2006 set the conditions for interconnection of small-scale generation systems both in trunk transmission networks and distribution networks. This law exempts non-conventional modes of generation from paying the cost (or toll) for use of transmission facilities.

Later, Law 20,257 was enacted, introducing changes to the General Electricity Services Law regarding generation of electrical energy by non-conventional renewable energy sources. This law states that every electricity company which withdraws energy from electricity systems with installed capacity above 200 MW must show that 10% of its withdrawals each year come from non-conventional renewable generation sources, either their own or through contracts⁴⁹. This creates the conditions for the electricity sector and new investors to develop NCRE infrastructure and encourages companies participating in the system to work together to meet this requirement.

In addition, since 2005 the country has developed a series of subsidies for the development of NCRE and energy efficiency (EE)⁵⁰. These incentives cover different aspects, including support for research (exploration of new forms of energy and technologies) and financing for studies to develop NCRE and EE projects in various stages. In term of positive financial incentives, CORFO and German KfW set a program to provide credit with reduced interest rate and extended payments terms and grace periods. This fund was fully in place for 2010, and negotiations are currently in place between Chilean and German governments to replenish the credit line.

⁴⁹ The obligation referred to in the first paragraph is 5% for the years 2010 to 2014, increasing by 0.5 percentage points annually starting in 2015. This gradual increase will be applied such that withdrawals subject to this requirement in 2015 must show 5.5% of generation from non-conventional renewable sources, in 2016 it increases to 6% and so on, until reaching 10% in 2024 as stated in Article 150 bis.

⁵⁰ To date, the government has provided a total of 24 different subsidies for NCRE and EE.

RECOMMENDATION 30

ENSURE THAT SUCCESSORS TO THE CLEAN PRODUCTION AGREEMENTS IN THE AGRICULTURE SECTOR INCLUDE DATED TARGETS FOR PESTICIDE AND NUTRIENTS MANAGEMENT, EXPRESSED AS INTENSITY OF USE, AND ANNUAL AUDITED PROGRESS REPORTS

In May 2007, through Supreme Decree 56/07, the Ministry of Economy established the National Clean Production Policy (Política Nacional de Producción Limpia). This policy defines guidelines for strengthening clean production in both public and private management for 2007-2010 in order to raise the environmental standards and competitiveness of Chilean companies. This policy defines a set of standards aimed at establishing a compliance evaluation mechanism to be applied to the companies which sign such agreements. Among these regulations are those aimed at ensuring the agreements are objective and governing the mechanisms for auditing compliance. These are formalised, respectively, by Chilean standards NCh 2807 Of2009 and NCh2825 Of2009⁵¹.

Within this framework, in 2009 two clean production agreements were signed in the agriculture sector: “Clean Production Agreement: Competitiveness and Responsibility in the Winemaking Industry” and the “Clean Production Agreement for the Agriculture Sector of the Coquimbo Region.”

The Clean Production Agreement: Competition and Responsibility in the Winemaking Industry was signed in 2003 by the Chilean Wine Corporation (Corporación Chilena del Vino, or CCV)⁵². One of the specific objectives is to deepen prevention and self-control regarding sustainable use of agrochemicals (through training and a registry system). In this area, the CCV has committed to establishing a management system within 24 months which would lead to a reduction of at least 10% in the total volume of pesticides applied by the group of companies that have signed the CPA. It also proposes deadlines for facilities to produce a monthly record of the volumes and types of pesticides applied, to formulate a phytosanitary programme, to develop records of all tasks associated with the application of agrochemicals by production unit, to create records on maximum waste limits established by both the domestic market and the destination markets, and the justification of pesticide application through registration and monitoring of pests and diseases present in vineyards.

⁵¹ NCh 2807 Of2009 establishes regulations for monitoring and control, evaluation of compliance and certification; NCh2825 Of2009 specifies the requirements which must be met by the registered auditor who performs the compliance evaluation audit and describes the process for granting the compliance certificate and maintaining it.

⁵² This agreement included an analysis of its results, which showed that in terms of company size, of a total of 494 small and medium-sized companies which signed the agreement, 32% achieved certification. This is in contrast with the 38 large companies which earned certification, equivalent to 86% of the total companies of that size. Thus, the second Clean Production Agreement will support small and medium-sized enterprises in the winemaking industry, through a public-private partnership.

Monitoring and control of each facility's progress in implementing the agreement will be carried out through audits performed by their own personnel or personnel hired for this purpose, who will report on the state of progress toward goals and actions established in the CPA. The facilities must produce periodic audit reports on monitoring and control.

As part of the Clean Production Agreement for the Agriculture Sector of the Coquimbo Region, the companies represented by Sociedad Agrícola del Norte A.G have committed to the following actions in relation to pesticides:

- Enable more producers to comply with the requirements of destination markets.
- Safe storage of phytosanitary products.
- Safe and efficient application of phytosanitary products.

Performance indicators and deadlines were defined for each action associated with the points listed. Monitoring and control of implementation progress at each facility will be done through audits performed by their own personnel or personnel hired for this purpose, who will report on the state of progress toward goals and actions established in the CPA.

RECOMMENDATION 31**FORMALISE INSTITUTIONAL INTEGRATION MECHANISMS RELATING TO SUSTAINABLE DEVELOPMENT**

Law 20,417 was published in the Official Gazette (Diario Oficial) on 26 January 2010, and introduced changes to Chilean environmental law, including a complete redesign of the country's institutional framework through the creation of the following new organisms: The Ministry of the Environment, the Ministerial Council for Sustainability (Consejo de Ministros para la Sustentabilidad), the Environmental Evaluation Service and the Superintendency of the Environment, which has enforcement and penalty functions. This redesign will be complemented by the creation of the Environmental Courts, which are currently being discussed in Congress⁵³.

The Ministry of the Environment, as part of its overarching role among government institutions, is responsible for administrative interpretation of environmental quality and emissions standards and prevention and/or decontamination plans, once the organism(s) with competence in the specific area and the Superintendency of the Environment have issued their reports. The Ministry may also standardise the application criteria and clarify the meaning and scope of environmental quality and emissions standards, when it finds discrepancies or errors of interpretation (Law 19,300, Article 70, letter o).

In another aspect, the Superintendency of the Environment is responsible for coordinating enforcement and can sign agreements with other government organisms for this purpose, such as the one signed with the municipalities related to the reception of citizen reports of non-compliance with regulations. The Superintendency of the Environment is required to follow up on these reports and inform all municipalities about progress in relation to the report (Law 19,300, Article 75).

The Ministerial Council for Sustainability is a policy-making organism which is made up of the different ministries. It is presided over by the Minister of the Environment and its members are the ministers of Agriculture; Health; Economy, Development and Reconstruction; Energy; Public Works; Housing and Urban Development; Transport and Telecommunications; Mining; and Planning.

Because all ministries must always request a decision from the Council in regard to environmental regulations, and its agreements or decisions are binding and obligatory for all state organisms, it guarantees regulatory integrity in matters of sustainability.

The functions and attributions of this Council are as follows:

⁵³ More details on the courts are provided in Recommendation 2.

- a) Propose policies for sustainable management, use and exploitation of renewable natural resources to the President of the Republic.
- b) Propose sustainability criteria to be included in the policymaking and planning processes of the ministries, as well as their subordinate services and related organisms, to the President of the Republic.
- c) Propose to the President of the Republic the creation of state-protected areas, including parks and marine reserves, as well as nature sanctuaries and coastal marine areas protected from multiple uses.
- d) Propose to the President of the Republic the sectoral policies which should be subject to a strategic environmental assessment.
- e) Rule on the criteria and mechanisms for citizen participation in environmental impact declarations.
- f) Issue decisions on legislative proposals and administrative acts proposed to the President of the Republic and which contain environmental regulations, regardless of the ministry of origin.

The Council is undoubtedly the integration mechanism *par excellence*, ensuring sustainability in the country.

ii.Sectorial integration: mining, forestry, aquaculture

RECOMMENDATION 32**FURTHER REDUCE THE ENVIRONMENTAL IMPACT OF THE MINING SECTOR (E.G. AIR POLLUTION BY SO₂ AND ARSENIC, WATER POLLUTION, ABANDONED SITES AND TAILING DAMS)**

Since 2005 the following standards revision processes related to environmental regulations for the mining sector have been finalised:

- Revision of Secondary Air Quality Standard for Sulphurous Anhydride (SO₂): This improves the standard currently in effect, through the introduction of the percentile as the criterion for exceeding the current daily and hourly standard; updates monitoring methods and the obligation of submitting information to the authorities; and describes appropriate monitoring stations for evaluating the secondary standard (Supreme Decree 22/09, Ministry Secretary General of the Presidency, MINSEGPRES).
- Revision of emissions standard for regulation of arsenic emitted into the atmosphere: The main modifications are related to the measurement and control methodology of the standard (Supreme Decree 75/08, MINSEGPRES).
- Revision of the emissions standard for regulation of contaminants associated with discharge of liquid waste to marine and continental surface waters (Supreme Decree 90/00).
- Revision of the emissions standard for liquid waste discharge into groundwater (Supreme Decree 46/02, MINSEGPRES).

Likewise, as mentioned in Recommendation 7, the Primary Quality Standard for Fine Particulate Matter (PM 2.5) which goes into effect soon will require that copper smelters, among other facilities, reduce emissions in the medium term.

With regard to priority standards, the most recent Prioritised Standards Programme published in April 2010 in the Official Gazette (Diario Oficial) includes the Emissions Standard for Smelters. This standard is designed to regulate emissions from the country's copper smelters, which historically have been regulated by Prevention and Decontamination Plans. It is also aimed at further reducing emissions of SO₂ and particulate matter. On 15 March 2011, the resolution which starts the enactment process of this standard was issued.

With regard to mine closures, the Mining Safety Regulation (Reglamento de Seguridad Minera) modified in 2004 (Supreme Decree 72/2004, Ministry of Mining), requires the preparation of closure plans. These plans must be approved by the National Geology and Mining Service (Servicio Nacional de Geología y Minería, or SERNAGEOMIN) within a maximum period of 5 years (deadline was 7 February 2009). In that context, as of 31 May 2010 the database of SERNAGEOMIN's Mining Safety Department contained 442 closure projects.

In addition, the Legislative Proposal on Mine Closures is currently in Congress awaiting observations. This initiative is part of a process to modernise the legal framework for mining activity in the country. This law will apply to all extractive mining industry works and installations, as defined in the Mining Safety Regulation, and will be gradually applied to works in operation within a maximum period of three years from its enactment. The proposed legislation requires a financial guarantee be provided to the government in order to ensure the availability of funds to exclusively cover the costs of actions included in closure plans when the company is in full or partial non-compliance with the law. It also provides a certain degree of legal and technical certainty for mining investors, as well as for enforcement organisms in this sector.

In relation to environmental liabilities resulting from mining, SERNAGEOMIN has developed initiatives in an effort to register, research and manage abandoned or non-operating mining works and evaluate their potential risks to human health and safety and to the environment. These initiatives have resulted from international cooperation agreements between the Chilean government and the governments of Germany and Japan, respectively. In this context, the Service prepared a survey of abandoned and non-operating works, as well as a preliminary risk analysis. The survey is updated as of 2010. Also, between 2005 and 2008 work was done on designing the bases of proposed legislation for remediation of environmental liabilities due to mining in Chile.

RECOMMENDATION 33**GIVE SPECIAL ATTENTION TO SMALL AND MEDIUM-SIZED MINING ENTERPRISES THROUGH TECHNOLOGICAL, FINANCIAL AND CONSULTANCY ASSISTANCE AND IMPROVED RELATIONSHIP WITH THE LARGEST MINING FIRMS**

Generally, the government maintains two types of relationships with small-scale and large-scale mining: One focuses on promoting the sector through development instruments while the other creates the business conditions for the sector's development.

The government currently has three development instruments for small-scale mining: The Assistance and Modernisation Programme for Small-scale Mining (Programa de Asistencia y Modernización para la Pequeña Minería Artesanal, or PAMMA); National Funds for Regional Development (Fondos Nacionales de Desarrollo Regional, FNDR); and the Development Programme of the National Mining Company (Empresa Nacional de Minería, known as ENAMI).

ENAMI's development role for small-scale mining consists of providing support for small mining entrepreneurs, who receive technical advice on starting operations and help in adding value to their extraction activities, to enable them to reach international markets with their copper production. The increasing price of copper and the different measures implemented by ENAMI to support the sector when prices declined in late 2008 resulted in a rise in the number of mining producers in 2009, to 1,500 small-scale producers and 15 medium-size producers. This was reflected in an increase in mineral purchases, which reached two million tons of mineral and 333 million tons of concentrate. Small-scale mining producers saw their total sales for this production rise to US\$ 200 million.

In 2010, an additional US\$7.4 million were allocated to ENAMI to increase its development capacity and improve production conditions in small-scale mining works.

The PAMMA programme is focused on small-scale miners in the country. The programme's objective is to provide technical and social assistance for a better quality of life. The programme works in two areas: one focused on generating self-employment and another providing support to entrepreneurs who want to grow their businesses. In 2010, a new management design was implemented for the PAMMA programme which has improved several important aspects of the programme and enabled it to become certified under ISO 9001:2008. Together with the PAMMA programme, the Mining Ministry plans to develop an enterprise support program for a sector with low visibility: small-scale female miners. The idea is to provide them with training as well as technical and financial resources for their businesses.

In another area, in 2006 the Clean Production Agreement (CPA) for Small-scale Mining was signed in order to facilitate comprehensive management improvements in this sector and transform it into a sustainable and competitive activity in the national and international market. The CPA is aimed at providing environmental solutions, as well as solutions in terms of hygiene, occupational health and

handling of inputs and waste, so that these businesses can stabilise and continue developing over the long term. In early 2010, the assessment, implementation and final audit process was finalised and the first 10 businesses were certified after complying with 100% of the actions to which they had committed.

In addition, Supreme Decree 3010/10 (Justice Ministry) granted legal status to and approved the statutes of the Technological Foundation for Mining (Fundación Tecnológica para la Minería). This is a new organisation which has been developed under the auspices of the National Mining Society⁵⁴, or SONAMI), and which aims to promote the sustainability of mining operations through dissemination of technology transfer and to collaborate with universities and research centres, among others. Because the Foundation is closely linked to SONAMI, small-scale mining will be represented in the Foundation, promoting the exchange of information and giving the sector a direct voice for expressing its requirements and needs.

To complement its contribution to the country's development, SONAMI created the National Mining Society Foundation (Fundación Sociedad Nacional de Minería), which was created by Supreme Decree 590 (Justice Ministry) on 30 June 2000. The focus of this foundation is small mining entrepreneurs who work mostly in areas far from urban centres. Because many entrepreneurs in this sector do not receive important information, or are unable to obtain access to important tools such as the pension system, in 2009 the Foundation started the "Education and Promotion of the Pension System for Small-scale Mining" (Educación y promoción del Sistema Previsional para la pequeña minería), with a public tender put out by the Pension Education Fund (Fondo de Educación Previsional) of the Office of the Undersecretary of Social Pensions. The project covered almost 4,000 workers, increasing knowledge and interest within the small-scale mining sector.

In the area of energy, in December 2008 the Energy Efficiency Working Group for Small and Medium-size Mining, comprised of SONAMI, ENAMI, the Office of the Undersecretary of Mining, SERNAGEOMIN, the Centre for Mining and Metallurgical Research (Centro de Investigación Minero y Metalúrgico) and the National Energy Efficiency Programme (Programa País de Eficiencia Energética). One of the lines of action of this working group is to promote efficient energy use in small-scale and medium-size mining. In the first stage of work (2006-2007), the Office of the Undersecretary of Mining prepared a study titled "Assessment and Proposals for Efficient Energy Use in Small-scale and Medium-size Mining." The study served as one of the bases for a work proposal for this mining subsector. The second stage involves an Energy Management Promotion Programme for Small-scale and Medium-size Mining.

In regard to exploration, in order to support the small-scale mining subsector, the Chilean Development Agency (CORFO) plans to allocate up to US\$60 million in 2011 to investment funds

⁵⁴ SONAMI is a private industry association which represents large, medium-size and small-scale metals and non-metals mining companies. Small-scale mining is represented on the entity's board of directors.

for mining exploration. The CORFO funds, in addition to private contributions, would bring total investment to almost US\$ 90 million.

RECOMMENDATION 34

INCREASE THE FINANCIAL CONTRIBUTION OF THE MINING SECTOR TO SUPPORT LONG-TERM INVESTMENT IN HUMAN AND SOCIAL CAPITAL AND TO APPLY THE POLLUTER PAYS PRINCIPLE ACCORDING TO THE GENERAL ENVIRONMENTAL FRAMEWORK LAW; CONSIDER A MECHANISM FOR PROPER CAPTURE OF RESOURCES RENTS ASSOCIATED WITH MINERAL EXPLOITATION

As indicated in Recommendation 4, in 2005 Law 20,026 was enacted, establishing a “Specific Tax on Mining Activity” (known also as the mining royalty). This law went into effect on 1 January 2006. The tax has created significant external savings and is used to finance the Innovation for Competitiveness Policy through a fund established for this purpose in the Budget Laws, starting in 2006.

Law 20,469, which introduced a set of modifications to the mining royalty, went into effect in October 2010. This law was enacted in the context of the country's reconstruction after the 2010 earthquake, in order to increase government revenue derived from mining activity in the country. This law contains a series of reforms, including the creation of the Regional Investment and Reconversion Fund (Fondo de Inversión y Reversión Regional).

The purpose of the Investment and Reconversion Fund is to provide additional resources collected through this new tax regime, to increase the budgets of regions and municipalities for development projects, particularly in mining regions. The government expects this fund to collect US\$ 100 million between 2012 and 2014.

RECOMMENDATION 35**PROMOTE AGREEMENT AMONG STAKEHOLDERS ON STRATEGIC NATIONAL ORIENTATIONS CONCERNING FOREST RESOURCES (PROTECTION, SUSTAINABLE MANAGEMENT, PLANTATION)**

The most important agreement in the area of protection, sustainable management and plantations of forest resources is the publication of the Native Forest Recovery and Forest Development Law (Ley de Recuperación del Bosque Nativo y Fomento Forestal, 2007). This law took 15 years to pass and is the result of a collaborative process involving stakeholders in both the public and private sectors. As part of its general content, the law requires that a management plan be applied prior to any tree felling activity and determines the environmental categories under which felling of native forest is allowed as well as the corresponding prohibitions. Another important activity required by the Law is the creation of a fund to be used for conservation, recovery and sustainable management of native forest and another fund for research on conservation and sustainable use of forest ecosystems.

Among the issues which remain unresolved by this law but which have been postponed for other legislative stages are the substitution-development of sclerophyll forest areas with agriculture and the entering into force of the National System for State-Protected Wilderness Areas. The latter is part of the proposed law on the Creation of the National Protected Areas System, which was submitted to Congress in January 2011.

Furthermore, since 2003 the country has been developing a series of agreements with the private sector in an effort to develop channels for coordinating public-private cooperation to conserve, recover and preserve biodiversity linked to forest ecosystems. Notable actions resulting from these agreements include: Exchange of information about priority biodiversity sites and conservation initiatives and about areas of high environmental value on lands owned by forestry companies, and the formulation of a biodiversity management map for forestry companies.

Large forestry companies in the country have forest certification seals, one of which is national (CERTFOR) and one of which is international: Forest Stewardship Council (FSC). To date, Chile has 534,944 hectares certified by FSC and 1.9 million hectares with CERTFOR certification. The FSC has certified 15 small and medium-sized forestry companies, while eight medium-sized to large companies have CERTFOR certification. To obtain these certifications, the companies must incorporate sustainability and environmental conservation concepts through the Areas of High Ecological Value (AHEV) and High Conservation Value Forests (HCVFs).

Finally, two Chilean companies (CMPC and MASISA) are participating in a global initiative led by WWF and known as the New Generation Plantations Project, or NGPP. The purpose of this project

is to identify, promote and better communicate appropriate plantation design and management practices.

RECOMMENDATION 36

ADOPT AND IMPLEMENT MEASURES TO ASSURE SUSTAINABLE MANAGEMENT OF NATIVE FOREST, INCLUDING REWARDS FOR ENVIRONMENTAL SERVICES, CROSS COMPLIANCE MECHANISMS, PARTNERSHIPS AND CO-OPERATION AMONG STAKEHOLDERS ON OVERALL MANAGEMENT

In addition to the objectives described in the previous recommendation, Law 20,283 on Recovery of Native Forest and Forest Development establishes a native forest conservation, recovery and sustainable management fund through which beneficiaries can obtain –in public competitions– resources provided by the State for appropriate forest management.

In particular, the fund benefits forestry activities for obtaining products other than wood and activities designed to manage and recover native forests for wood production (up to US\$404 per hectare in each case), as well as other activities which promote regeneration, recovery or protection of xerophyte formations of high ecological value or preservation of native forests⁵⁵ (up to US\$808 per hectare). Funds are also available for the preparation of forest management plans which use planning criteria (up to US\$24 per hectare). The fund also establishes different financing levels depending on the size of the owner, with higher amounts for small-scale owners.

The approval and enactment of the law includes, in addition to the new legal text, its consequent regulation containing the operational and functional aspects of the law; the Regulation of the Native Forest Conservation, Recovery and Sustainable Management Fund; the regulatory framework for resources for native forest research; the Regulation on Soils, Water and Wetlands, which is designed to protect water, springs, natural bodies and courses of water and wetlands declared priority sites by the Environment Ministry, and Ramsar sites; and the Regulation of the Native Forest Advisory Council (Reglamento del Consejo Consultivo del Bosque Nativo).

In addition, among the mechanisms to be tested as part of the GEF/Environment Ministry/UNDP Project for generating income to cover financing gap in the National Protected Areas System, in 2011 a pilot project on payment for ecosystem services (PES) will begin, related to the provision of water in the Mediterranean climate zone in Chile. Among the principal actions are the selection of a pilot watershed, the creation of conditions and agreements between key stakeholders and the development of the technical bases of the tender offer.

Finally, it should be mentioned that Law 19,300 on General Environmental Bases (Bases Generales

⁵⁵ A formation which presents or constitutes current habitat of legally protected plant species or those included in one of the national conservation categories. The preservation of native forest also includes unique environments or those which are representative of biological diversity.

del Medio Ambiente) states in Article 10 that all projects for forestry development or exploitation on fragile soil or on land covered by native forest, among others, of an industrial magnitude, must be submitted to the Environmental Impact Assessment System.

RECOMMENDATION 37

STRENGTHEN THE ENFORCEMENT CAPACITIES OF THE NATIONAL FORESTRY CORPORATION (CONAF)

In this period, efforts to improve enforcement by CONAF have basically occurred in two areas: Strengthening enforcement by improving management and budgets, and institutional reforms designed to clearly distribute functions among the different government agencies whose activities are related to the forestry sector.

In terms of enforcing forest and environmental laws, in 2009, 74% of the management plans for priority ecological areas were inspected, surpassing the 70% goal set for that year. These are significant results considering that since 2005, the percentage of evaluations carried out had declined every year in comparison to the proposed goals (49% for 2008 and 58% for 2007). Using new technologies for managing digital geographical information, in 2009 a project was created to develop and apply a GIS system to optimise land management in relation to enforcement of forest regulations. Likewise, for the purposes of improving enforcement of projects with environmental qualification resolutions, the Regulation on Monitoring and Enforcement (Reglamento de Seguimiento y Fiscalización) was prepared by CONAMA (now the Environment Ministry) together with other public agencies. In addition, the Procedural Manual for the Environmental Impact Assessment System (prepared through a Collective Performance Agreement in 2008) was updated.

In regard to institutional changes, along with the proposed law to create the Biodiversity and Protected Wilderness Areas Service, in January 2011 the government submitted to Congress a bill to replace the current National Forestry Corporation (CONAF) with the National Forestry Service. This new service would rectify the institutional irregularity of having a private corporation exercise public functions in forestry matters and it would also modernise CONAF management at the same time. Thus, functions related to developing forestry activities and protecting forest resources will remain in the National Forestry Service, while biodiversity and nature conservation functions will be assigned to the Biodiversity and Protected Areas Service, both through management of wilderness areas protected by the state (the land-based areas are currently managed by CONAF), as well as by promoting private conservation and protection measures for species outside of protected areas.

This proposed legislation would not only create a new public organism but would also modernise the current CONAF, transforming it into a service which contributes to the country's sustainable development by stimulating preservation, conservation, protections, expansion, management and use of forest resources and ecosystems, xerophytic formations, urban forests and renewable natural

resources, without affecting the competency and authority of the Environment Ministry and other organisms in this sector.

The legislation would create the National Forestry Service, a decentralised agency which is part of the Ministry of Agriculture. The Service will be, for all legal purposes, the legal successor to the National Forestry Corporation, and must fulfil all functions and exercise all attributions that current laws and regulations confer on CONAF.

Among other attributions, the Service will be responsible for applying and enforcing regulations regarding forests and forest plantations and the use of fire in rural areas, as well as preventing and fighting forest fires and controlling forest plagues.

RECOMMENDATION 38

IMPROVE ENVIRONMENTAL AND HEALTH PROTECTION IN AQUACULTURE (E.G. AS REGARDS EUTROPHICATION, SALMON ESCAPES, ECOLOGICAL BALANCE OF LAKES, ANTIBIOTICS, EPIDEMIOLOGICAL VIGILANCE, ERRADICATION OF INFECTIOUS DISEASE), PARTICULARLY THROUGH STRENGTHENED ENFORCEMENT CAPACITIES

During this evaluation period the country carried out a series of actions aimed at strengthening the regulatory framework for aquaculture. Although this process began in 2005, the severe crisis in the salmon industry in 2008 which resulted from the introduction of infectious salmon anaemia virus (ISAv) from the northern hemisphere gave urgency to these issues at the national level: on 8 April 2010, Law 20,434 was published, signifying a major reform of the General Fishing and Aquaculture Law (Ley General de Pesca y Acuicultura) in terms of aquaculture matters. This law adopted a series of measures to substantially improve impact prevention and the ability to contain outbreaks of disease and to strengthen the mechanisms for standards compliance, primarily in the Los Lagos, Aysén and Magallanes regions. In April 2011, all of the 15 regulations which implement the changes established by the new law were moving through the approval process.

Among the sanitary measures contained in this new law are the following:

- The territorial reorganisation of the industry through the creation of Concession Groups (“neighbourhoods”), in order to strengthen coordination between cultivation centres for more efficient sanitary management;
- Setting maximum densities applicable to these groups, and therefore to farming centres;
- The possibility of declaring aquaculture appropriate areas (AAA) not available for new concessions;
- Significantly stricter sanitary control over the entire production chain, including the importing of genetic material from outside the country, based on risk management;
- The strengthening and incorporation of new epidemiological oversight mechanisms and the creation of the authority to eradicate diseases, including closing centres and restricting vessel movements in the affected areas.

Environmental protection provisions focused on aquaculture were added, notably the transfer to the government of environmental quality measurement activities in the area surrounding and underneath aquaculture farming centres (these measurements are known as Aquaculture Environmental Reports). The measurements are to be paid for by the owners of the farming centres through the application of a fee, and the results are published.

In this area, there is greater consistency between areas declared aquaculture appropriate and the land uses established in coastal zoning instruments. Finally, Law 20,434 created a National Aquaculture Section within the National Fishing Service to strengthen the enforcement function of the Service in aquaculture matters.

Soon thereafter, on 29 May 2010, Law 20,437 was published. The aim of this law is to organise and specify the regulation of the Benthic Resource Management and Exploitation Areas (Áreas de Manejo y Explotación de Recursos Bentónicos, or AMERB), applicable in the zone reserved for small-scale fishing as set out in the General Fishing and Aquaculture Law.

RECOMMENDATION 39**APPLY THE POLLUTER PAYS PRINCIPLE IN THE AQUACULTURE INDUSTRY IN THE CONTEXT OF THE GENERAL ENVIRONMENTAL FRAMEWORK LAW**

In general, all of the aquaculture regulations contained in Law 20,434 (enacted in 2010) establish that the owners of production facilities are responsible for paying the cost of mitigating environmental and sanitation risks created by the activity. This is done through mandatory regulations which are significantly more comprehensive of risks and potential impacts, combined with flexibility mechanisms, and others that promote coordination among companies and increase the industry's accountability.

Specifically, and as indicated in the previous recommendation, what is notable is the transfer to the state of the preparation of environmental reports with monitoring information on the area of impact of each farming centre, with the owners responsible for covering the preparation costs. It also establishes that the Concession Association is liable for the cost of monitoring environmental quality in the area, particularly those areas which are not included in the environmental reports.

Also, the Law and its regulations set out a series of sanitary control mechanisms through the contracting of independent entities certified by the government and which assist in enforcement tasks. The costs associated with these contracts are also paid by the farming facility owners.

Finally, this law increases the cost of the permit which aquaculture companies must obtain for use of public property, as described in Recommendation 4.

RECOMMENDATION 40**COMPLETE A PRECISE AQUACULTURE COASTAL ZONING PLAN; ADOPT INTEGRATED ENVIRONMENTAL MANAGEMENT FOR COASTAL AREAS**

Within the framework of the National Policy for Coastal Use (Supreme Decree 475/94, Ministry of Defense), in 2004 and 2005 an agreement was signed to begin the process of macro-zoning coastal use; this was finalised in 2010. The zoning includes Ecological Protection Areas which are home to priority sites identified in the Regional Biodiversity Strategies, as well as Multiple Uses Marine and Coastal Protected Areas (Áreas Marinas y Costeras Protegidas de Múltiples Usos) and Marine Reserves.

With regard to application of the instruments in the field, progress has been made in coastal zoning processes in the Aysén, Coquimbo and Bío Bío⁵⁶ regions. As for the conservation and preservation areas identified in those processes, they are included and validated as “areas under official protection” for the purposes of the Environmental Impact Assessment System, or SEIA (Article 10, letter p).

In addition, since 2008 Chile has been participating in the Southeast Pacific Data and Information Network in Support of Integrated Coastal Area Management (SPINCAM). The purpose of the project is to develop a set of Integrated Coastal Area Management (ICAM) indicators in order to optimise the use of information and communication and contribute to a data network for the Southeast Pacific.

In order to establish adequate environmental management of coastal areas, as well as to require consistency among the coastal zoning instruments and the areas declared appropriate for aquaculture (new final paragraph of Article 67 of the General Law of Fishing and Aquaculture), Law 20,434 contains special provisions for temporary suspension of new fish farming concessions in Los Lagos, Aysén and Magallanes regions, and permits –also temporarily– the division and relocation of concessions, in order to overcome the ISA virus crisis. Moreover, the law established the obligation of adapting existing aquaculture appropriate areas to the existing or proposed coastal zoning (articles 2 to 5 of Law 20,434).

⁵⁶ The Supreme Decree on Coastal Zoning for the 8th Region is currently moving through the approval process. It has already been approved by the Regional Commission for Coastal Use and the National Commission for Coastal Use.

ii. Integration of environmental and social concerns

RECOMMENDATION 41

CONSOLIDATE EFFORTS TO PRODUCE ENVIRONMENTAL DATA, STATE OF THE ENVIRONMENTAL REPORTS AND ENVIRONMENTAL INDICATORS SO AS TO STRENGTHEN DECISION MAKING AND PUBLIC INFORMATION, TAKING INTO ACCOUNT INTERNATIONAL METHODOLOGIES

A process to develop, consolidate and improve the National Environmental Information System (Sistema Nacional de Información Ambiental, or SINIA) has been underway since 2005. The SINIA is administered by the Environment Ministry and is made up of a set of databases (cartographic, graphic, documentary, legal, etc.), IT equipment, human resources, programmes, and procedures for managing information about the country's environment and natural resources in a way that is integrated and easily understood. It functions as a web portal encompassing three major content areas⁵⁷, each of which can be cross-checked with the others.

With respect to the first evaluation, during this period the SINIA new online information systems have been added to the SINIA database, in an effort to make it the country's official environmental information system.

In addition to what is expressly stated in Law 20,417 regarding guaranteed access to environmental data, an important contribution in this area was the enactment in 2008 of Law 20,285 on access to public information. This law allows members of the public to obtain access to a variety of information contained in the SINIA, in addition to other aspects which are not directly related to environmental information but which are nevertheless important in terms of citizen participation.

In relation to reports on the environmental situation, since 1999 the country has presented an environmental status report produced by CONAMA (now the Environment Ministry) in cooperation with the University of Chile and the United Nations Environment Programme (UNEP). The third report, which corresponds to 2008, was submitted in 2010. The analytical framework for the development of these reports is pressure-state-response.

With regard to environmental statistics and development of indicators, the National Statistics Institute (Instituto Nacional de Estadística, or INE) has continued to produce its annual statistical

⁵⁷ Environmental Topics: Information about the different aspects, including legal, geographic, documentary, information, etc., of the most important environmental issues.

Environmental Management Instruments: Information about the set of administrative acts related to the functioning of environmental institutions, compiling data on different aspects, including legal, informational, etc.

Access to Regional Information: Access to information detailed by region, showing the environmental information that is available from a regional perspective or grouped by region, including georeferential, documentary, or legal information, etc.

reports on the environment (Informes Anuales de Medio Ambiente). Since 2006, the report has included new statistics regarding:

- Production and trade of industrial wood.
- Greater coverage of emissions from pollution sources.
- Sewage, organic load received by treatment plants and sewage generation with details on treated and untreated volumes.
- Liquid industrial waste discharge volumes with details at the regional level.
- New air quality monitoring stations in the Metropolitan Region.

It has also developed an indicator integration framework which complements the indicators now being developed as part of Chile's admission to the OECD, based on the scheme proposed by Yale University (Environmental Performance Index).

Other important initiatives have also been carried out to develop and disseminate environmental statistics and indicators. Along these lines, the Ministry of the Environment carried out studies to develop biodiversity indicators, the National Climate Change Action Plan includes development of indicators, and the Ministry of Housing and Urban Development has a website with urban indicators (www.observatoriourbano.cl).

RECOMMENDATION 42

CONTINUE TO DEVELOP PUBLIC PARTICIPATION IN PROCESS SUCH AS PROJECT-BASED ENVIRONMENTAL IMPACT ASSESSMENTS AND STRATEGIC ENVIRONMENTAL ASSESSMENTS OF PUBLIC POLICIES, PLANS AND PROGRAMMES

Law 20,417 introduced a series of changes to the Environmental Impact Assessment System (Sistema de Evaluación de Impacto Ambiental, or SEIA), some of which are directly related to public participation in these processes.

The law includes an optional citizen participation process for environmental impact declarations. Regional Directorates or the Executive Director of the Environmental Evaluation Service, as applicable, may issue a decree requiring a 20-day citizen participation process in regard to the environmental impact declarations for projects which generate potential environmental impacts for nearby communities. According to the regulations, two legally constituted citizen organisations may request participation through their legal representatives, or a minimum of 10 individuals who are directly affected may also do the same.

Likewise, it establishes that in the event that an environmental impact declaration or study receives clarifications, corrections or additions during its preparation process which substantially affect the environmental impacts of the project, the competent organisms may open a new stage of public participation and additional publications may be requested. In regard to this, the Superintendency of the Environment is expected to maintain an online public registry of environmental qualification resolutions. This registry must be updated twice each year on the Superintendency's web site, and project owners must regularly report on the status of the same.

According to the new legislation, general regulatory policies and plans and substantial changes to them which have an impact on the environment, as determined by the President of the Republic based on the recommendation of the Ministerial Council, shall be submitted to a strategic environmental evaluation. Nevertheless, all land use instruments implemented in the country must also be subject to a strategic environmental evaluation. The law also sets guarantees for dissemination and citizen participation in the different stages of the strategic environmental evaluation. It establishes that the regulation must take into account the form of participation of interest groups and the way in which such participation is publicized, which must be large-scale, complete and informative.

As for improvements in civil participation on environmental matters, the publication of Law 20,417 set a deadline for submitting to Congress a legislative proposal to create the Environmental Courts;

this proposal is currently being considered by Congress. The courts would be organisms with special jurisdiction, improving access to environmental justice.

In addition, the legislative proposal to create the Biodiversity and Protected Areas System includes citizen participation in the creation of protected areas and local community involvement in applying the management plans for these areas. This is in addition to the approval in 2008 of Convention 169 on Indigenous and Tribal Peoples in Independent Countries, which was adopted by the General Conference of the International Labour Organisation (ILO). The modification of Law 19,300 described above, which was enacted after Convention 169 went into effect, introduced the obligation of state organisms, in the exercise of their environmental authority, to adequately protect indigenous peoples in accordance with the law and the international agreements ratified by Chile.

Given this, and considering that according to Convention 169 the government must consult with indigenous peoples every time legislative or administrative measures could directly affect them, an analysis is underway of the mode and applicability of such a consultation process to projects submitted to the SEIA, both in the case of environmental impact declarations and environmental impact studies which involve indigenous communities. This is occurring as part of the revision of the regulations of the Environmental Impact Assessment System⁵⁸.

⁵⁸ In the context of the legal reforms created by the new institutional framework, consultation processes are currently being carried out which include indigenous communities. Among these are the legislative proposal to create the Biodiversity and Protected Areas System and the modifications to the SEIA regulation.

RECOMMENDATION 43

CONTINUE EFFORTS TO IMPROVE HEALTH THROUGH TARGETED ENVIRONMENTAL PROGRESS, WITH SPECIAL ATTENTION TO THE POOR; REVIEW THE HEALTH IMPACTS OF PESTICIDE USE ON AGRICULTURAL WORKERS AND RURAL COMMUNITIES AND IMPLEMENT RISK REDUCTION STRATEGIES AND MEASURES

In December 2008, Law 20,308 on worker protection in the use of phytosanitary products went into effect and in January 2010, Supreme Decree N° 5/10 of the Health Ministry, which approves the regulation on aerial application of pesticides to protect worker health and public health in general, went into effect.

As for progress in environmental health related to air pollution problems, in addition to applying the air quality measures listed before (recommendations 6 to 12), other efforts have been made to develop health impact indicators associated with mortality, morbidity and analysis of the toxicity of particulate matter by the Regional Secretariat for the Environment of the Metropolitan Region⁵⁹.

Decree N° 157 of 2005 of the Health Ministry, the Regulation on Pesticides for Sanitary and Domestic Use, went into effect in December 2007. This regulation governs all the conditions and procedures related to transport, storage, sale, use and disposal of pesticides for sanitary and domestic use. This regulation resolves one of the country's main issues in laws of this type: although a regulation had existed since 1998, its scope was limited. During this period, in addition to this regulation, new standards and legislative changes have been established to reduce the risk of exposure to and use of pesticides, and to improve working conditions in the agricultural sector⁶⁰. Regarding the latter, the Subcontracting Law (2007) and the obligation to report serious workplace accidents (enacted in 2007) strengthen the process of establishing guarantees for workers in this sector.

To reinforce the regulation and the other laws enacted in this area, in addition to ensuring that the country's position on these issues is consistent, in 2008 the National Policy for Chemical Safety (Política Nacional de Seguridad Química) was passed. This document has clear objectives which adequately protect the health of people and of ecosystems and also has a related Action Plan made

⁵⁹ More details on these indicators are provided in Recommendation 7.

⁶⁰ Modifications to Law 3,557 on Agricultural Protection (Law 20,275/08): Ensures that worker protection includes all international advances; prohibits the use of lindane (hexachlorocyclohexane) in pesticides for sanitary and domestic use and in pharmaceuticals (Decree N° 54/2009); regulates aerial application of pesticides to protect the health of rural communities (Decree N° 5/2010, Health Ministry); standards for evaluation and authorisation of pesticides, Resolution (752/09); provisions concerning the use of pesticides on small crops (Resolution 6666/09); new standards for evaluating pesticides (Resolution 7.935/10).

up of a series of specific, concrete actions and activities to be carried out in the short and medium term.

Among its specific objectives the policy seeks to promote dissemination, training, capacity-building and research in chemical safety through two types of action: a) Prioritize areas of research on the acute and chronic effects of chemical substances and b) Use the Pollutant Release and Transfer Registry (PRTR) as an information system for chemical substances being studied. For this, goals for the short-term (2009-2010) and medium-term (2010-2013) were defined.

In the private sector, the National Association of Agricultural Phytosanitary Product Manufacturers and Importers (Asociación Nacional de Fabricantes e Importadores de Productos Fitosanitarios Agrícolas, AFIPA) has developed training programmes in which 28,000 people had participated by 2010, including workers and educators.

RECOMMENDATION 44

STRENGTHEN ENVIRONMENTAL EDUCATION AND AWARENESS THROUGH A LONG-TERM STRATEGY OF ENVIRONMENTAL LEARNING AND A NATIONAL ENVIRONMENTAL EDUCATION PLAN, INCLUDING: I) FURTHER INTEGRATION OF ENVIRONMENTAL MATERIAL IN PRIMARY AND SECONDARY SCHOOL CURRICULA, AND II) DEVELOPMENT OF ENVIRONMENTAL KNOWLEDGE THROUGH PROFESSIONAL ASSOCIATIONS AND ENVIRONMENTAL MANAGEMENT SYSTEMS WITHIN ENTERPRISES

The main activity in this period was the development of the National Education Plan for Sustainable Development (Política Nacional de Educación para el Desarrollo Sustentable, or PNEDS, 2009), in the context of Resolution 57/254 enacted in 2002 by the United Nations. This initiative began a process that has resulted in new instruments which address more concretely the topic of environmental education and awareness in the country and particularly changes in citizen habits and behavior.

One of its specific objectives is oriented toward intersectoral and institutional linkages and networking, maximising the impact of education programmes for sustainable development. In this regard, progress has been made on coordinating the objectives and activities with the greatest consistency and integration with the objectives of the different programmes and institutions, maintaining the diversity of public offerings. The programme is also aimed at strengthening coordinated intervention on a territorial level, increasing resource efficiency and guaranteeing greater quality, coverage and correct use of educational and professional equipment and materials.

Another specific objective of the policy is to strengthen content on the environment and sustainable development (socio-economic and cultural) in the education field. In 2011, along with UNESCO, an inventory will be carried out to identify work areas for Sustainable Development Education within the curriculum and teachers will be trained in methodologies for correctly implementing this new content.

The Policy also has a specific objective designed to introduce considerations on Education for Sustainable Development into the workplace (companies-employees). In this area, based on the Regional Roundtables on Education for Sustainable Development, the environmental component of the PNEDS has been enhanced through the establishment of public-private work strategies. These strategies include defined programmes and actions for internal implementation such as paper recycling and reuse campaigns and efficient use of energy, as well as external ones, linked to support for environmental education initiatives such as seminars and educational material.

The National Certification System for Educational Establishments (Sistema Nacional de Certificación Ambiental de Establecimientos Educacionales, or SNCAE), a central programme of the policy designed to certify schools according to their environmental programmes and activities, had registered a total of 902 schools throughout the country by 31 December 2010. A second national programme implemented by the Environment Ministry is the Environmental Creators Club (Club de Forjadores Ambientales), which as part of its new guidelines for 2011 will work with professional associations and other important national organizations.

Over the next few years, work will be done on qualification of educational establishments that participate in the National Environmental Certification System for Educational Establishments, for which the coverage indicators have been replaced by quality indicators. Work will also be done to improve the three areas proposed in the SNCAE: teaching, school management and relationship to the environment, through teacher training and support for installing environmental management systems.

For its part, through the Environmental Creators Club directed by the Environment Ministry, since 2011 efforts have been made to broaden perspectives and create dialogue with different stakeholders and public, private and civil society institutions, raising the visibility of their environmentally responsible actions through an electronic platform, increasing skills and preparing informational-educational material.

Among the initiatives promoted by the government in terms of environmental education, the Environmental Creators Club⁶¹ will be broadened to include environmental stakeholders such as workers, companies committed to corporate social responsibility (CSR) on environmental issues, academic circles, social organisations such as senior citizens' clubs, neighborhood committees, etc.

Another instrument for promoting environmental education and awareness among the public is the Environmental Protection Fund (Fondo de Protección Ambiental, or FPA), which has been operating since 1995. This fund underwent an impact evaluation in 2009 and the results are reflected in its new guidelines for the 2011 competition, which seeks to increase coverage and focus on 4 purposes: Local Environmental Management, Information and Research, Creation of Networks and Indigenous Environmental Management.

Finally, another instrument which promotes informal education and enables municipalities to become models for environmental management at the local level is the Municipal Environmental Certification (Certificación Ambiental Municipal), in which the municipality, infrastructure, personnel, internal procedures and services provided by the municipality to the community integrate environmental concerns in their daily activities. The programme has been implemented gradually. In

⁶¹ The Environmental Creators Club programme began in 1999 as a component of the "I care for Chile" campaign aimed at strengthening children's leadership on environmental improvement by promoting environmental awareness in schools, households and communities. The goal is to stimulate people to improve their daily habits and become more responsible in their actions.

2010 it was operating in 4 of the 15 regions; in 2011 it will be in 8 regions and by 2012 it will be implemented throughout de country.

RECOMMENDATION 45**DEVELOP ENVIRONMENTAL EMPLOYMENT, WITH SPECIFIC ATTENTION TO THE MATERIAL AND CULTURAL HERITAGE AS A BASE FOR TOURISM DEVELOPMENT AND TO BIOFOOD PRODUCTION FOR AGRICULTURE DEVELOPMENT**

The country has two specific instruments designed to create the conditions for promotion and development of eco-tourism and organic agriculture: the Institutional System for Tourism Development (2010) and the National Certification System for Organic Agricultural Products (2006). However, neither of these instruments explicitly addresses job creation. Instead, they are limited to the creation of favourable market conditions in these areas. With this approach, organic agriculture has reached a surface area of 151,097 hectares (2009-2010), which represents growth of 29% compared to the previous season.

Special-interest tourism has become increasingly important in recent years because it is associated with longer stays and higher spending. It has grown much faster than the mass tourism market. While mass tourism grows at a rate of about 4% annually, in 2006 special-interest tourism grew 15% annually, according to the National Tourism Service (SERNATUR).

To strengthen this activity, tourism concessions in protected areas were strengthened considerably by Law 20,423 on the Institutional System for Tourism Development.

3. STRENGTHENING INTERNATIONAL COMMITMENTS

RECOMMENDATION 46

CONTINUE EFFORTS LEADING TO RATIFICATION AND IMPLEMENTATION OF INTERNATIONAL AGREEMENTS AND, AS APPROPRIATE, OECD LEGAL INSTRUMENTS, AND PUBLISH PERIODIC REVIEWS OF ACTIONS TAKEN TO MEET INTERNATIONAL ENVIRONMENTAL COMMITMENTS

During this evaluation period the country has signed, ratified and renewed the following global and regional multilateral agreements (Table 13 and 14, respectively):

TABLE 1
GLOBAL MULTILATERAL AGREEMENTS

Year	Place	Name	Action
1986	Vienna	Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency.	Ratified on 23 September 2004.
1999	Basel	Protocol on Liability and Compensation for Damage Resulting from Transboundary Movements of Hazardous Wastes and their Disposal.	Approved by the National Congress (May 2009), including amendment of February 1998.
1998	Rotterdam	Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade.	Ratified on 20 January 2005.
2001	Stockholm	Convention On Persistent Organic Pollutants.	Ratified on 27 January 2005.
1998	Kyoto	United Nations Framework Convention on Climate Change. Copenhagen Accord	Signed on 29 January 2010.

TABLE 2
REGIONAL MULTILATERAL AGREEMENTS

Year	Place	Name	Action
1956	Washington	Antarctic Treaty	Enacts the measures, decisions and resolutions adopted in the special 12th Consultative Meeting and in the 24th, 25th, 26 th , 27 th and 28 th consultative meetings of the parties to the Antarctic Treaty.
1980	Canberra	Convention On Conservation of Antarctic Living Resources	Approves the conservation measures and resolutions adopted by the Commission of the Convention for the Conservation of Antarctic Living Marine Resources at its 25th meeting in 2006.

Likewise, during the OECD accession process our country has committed to different activities in order to comply with OECD instruments. Chile's progress in this regard will be reviewed in 2012.

For its part, and as pointed out, the institutional reform has improved environmental information. Therefore, it is expected to strengthen the periodic evaluation of activities carried out to comply with international environmental commitments. Nevertheless, some notable specific initiatives are listed below:

Within the framework of the free trade agreement between Chile and Canada, specifically as part of the Canada-Chile Agreement on Environmental Cooperation (CCAEC), a Second Review for 2004-2009 was carried out. The review stated that over 12 years, the CCAEC has been implemented in three phases and achieved the following:

Phase I (1997-2003): Identification of deficiencies in Environmental Management Systems (EMS) based on high-level exploratory debates.

Phase II (2003-2007): Addressed deficiencies in Environmental Management Systems (EMS) focusing on the key basic components and matching Chilean needs with specialised Canadian knowledge.

Phase III (2008-present): Maturity of the Agreement with a focus on environmental priorities which are beneficial for both parties.

Canada and Chile have created a solid foundation for environmental cooperation and have demonstrated that issues of trade and environment can be addressed positively and without disagreements. The CCAEC has improved the application of environmental legislation and the institutional capacity of both countries and has proven to be an active bilateral mechanism for environmental cooperation, thus fulfilling the original purpose of the Agreement. Moreover, this sustained bilateral cooperation continues to strengthen the relationship between both governments.

An evaluation system is now being designed for the projects implemented through this cooperation agreement.

Also, in 2009 the Evaluation Office of the Global Environment Facility (GEF) carried out an evaluation of the Chilean portfolio, analysing trends and the predominance of certain focal areas in project selection. This evaluation has been useful for national prioritisation of projects starting with the new funds replacement period of the GEF, in which the System for Transparent Allocation of Resources (STAR) is being applied.

Finally, in 2011 the Government of Chile will present its Second National Communication on Climate Change to the United Nations, having presented the first one in 2000. With this communication, the country fulfills the principal binding commitment made when it signed and ratified the United Nations Framework Convention on Climate Change in 1992. The document contains the country's emissions inventory through 2006 and describes the actions taken in Chile over the past decade, during which there was a significant increase in the importance of this issue at the national level. The national communication also includes and specifies relevant areas in the recent scenario of international climate change negotiations.

RECOMMENDATION 47

CONTINUE TO PROMOTE MUTUALLY SUPPORTIVE TRADE AND ENVIRONMENTAL POLICIES THROUGH EFFECTIVE IMPLEMENTATION AND STRENGTHENING OF THE ENVIRONMENTAL REGULATORY FRAMEWORK AND PROMOTION OF CORPORATE SOCIAL RESPONSIBILITY

On 18 June 2005 the governments of Brunei Darussalam, Chile, New Zealand and Singapore signed the Trans-Pacific Strategic Economic Partnership Agreement, including the Environmental Cooperation Agreement signed on the same date.

This Environmental Cooperation Agreement is based fundamentally on the definition of common environmental objectives, policy and practices, and on cooperation in domestic and global environmental matters. Likewise, a series of commitments designed to increase levels of environmental protection, fulfill multilateral commitments and avoid the use of environmental regulations for trade protection purposes have been established.

Also, the 2005-2007 Work Programme of the Environmental Cooperation Accord with Canada included joint work on strengthening the implementation of the Stockholm Convention on Persistent Organic Pollutants.

Other important actions from this period have arisen from the Association Agreement between Chile and the European Union. This agreement focuses on three areas, two of which are directly related to environmental issues: 1) contribution to the implementation of the Strategic Environmental Evaluation in Chile and 2) improving the quality and implementation of Chilean policies on innovation and competitiveness, through the introduction of new instruments and support tools. In this last area, some notable programmes and actions are as follows:

- Clean Technologies Support Programme for Small Companies, known as TECNOLIMPIA;
- Institutional strengthening to expand the energy Market;
- Preliminary technical evaluation of 15 hydroelectric plants smaller than 20 MW associated with irrigation works.

Among the priority areas included in the Environmental Cooperation Agreement with the United States is the strengthening of environmental legislation related to trade issues, particularly enforcement. In addition, part of the 2008 work programme of the Chile-US Free Trade Agreement involved improving the certainty of environmental compliance and enforcement (2008).

RECOMMENDATION 48

ENSURE THAT CO-OPERATIVE ACTIVITIES ASSOCIATED WITH TRADE AGREEMENTS ARE TARGETED TO MITIGATE ANY ADVERSE ENVIRONMENTAL IMPACTS FROM LARGE-SCALE NATURAL RESOURCES EXPORTATION

The country has signed the following international cooperation and/or trade agreements which address environmental matters:

Environmental Cooperation Agreement with Canada: This agreement was signed in 1997 in the context of the Free Trade Agreement signed between both countries. The 2005-2007 work programme included strengthening implementation of the Stockholm Convention on Persistent Organic Pollutants.

Environmental Cooperation Agreements with the United States: Among the priority cooperation areas are strengthening environmental legislation related to trade issues, particularly in aspects of enforcement. In addition, the treaty addresses the promotion of development and sustainable management of environmental resources, including wild flora and fauna, protected wilderness areas and other ecologically important ecosystems, in order to ensure environmental conservation and protection. It also includes prevention of contamination and degradation of natural resources and ecosystems and promotion of the rational use of natural resources for sustainable development. The treaty has also defined the following areas of cooperation in its work programme: improving agricultural practices (2005); sharing private sector experiences (environmental cooperation agreement on “Wildlife without Frontiers,” from 2006); improving the certainty of compliance and environmental enforcement (2008); reduction of mining pollution (methyl bromide), 2010.

Chile-European Union Association Accord: For 2011, the accord includes the development of a web portal on technical regulations in Chile which will include the environmental and quality requirements of the European market. Work started in 2006 has continued in terms of support for implementation of the Strategic Environmental Evaluation in the country, and the EU-Chile Innovation and Competitiveness Programme, which includes three types of financing related to the environment (clean production; strengthening of public policies on energy efficiency; and evaluation of hydraulic works related to irrigation).

Environmental Cooperation Accord between China and Chile: This agreement was signed in 2005 in the context of the Free Trade Agreement signed between both countries. Among the actions thus far, in 2007 the two countries exchanged information about environmental management in copper mining and refining.

Chile-Brunei-New Zealand-Singapore Environmental Cooperation Agreement (Trans-Pacific Strategic Economic Partnership Agreement): the 2006-2009 Programme included various activities

related to promotion and development of non-conventional renewable energy, invasive exotic species management, wastewater treatment and protected marine areas.

Chile-Colombia Free Trade Agreement: this is Chile's newest free trade agreement (2009). It addresses various matters which establish guarantees for export and protection of natural resources.

In addition, as part of Chile's National Chemical Security Policy, a study was carried out on "Management of Chemical Substances in the Framework of the Conventions, Treaties and Agreements signed by Chile." The study analyses the relationship between compliance with these instruments and their fields of application for management of chemical substances throughout the life cycle (import, manufacture, storage, transport, use and disposal). In addition, the document includes the actions the country has carried out over the last decade to comply with the requirements of international instruments, both binding and voluntary, that Chile has signed and adopted.

RECOMMENDATION 49

STRENGTHEN CHEMICAL AND HAZARDOUS WASTE MANAGEMENT ACCORDING TO INTERNATIONAL AGREEMENTS, NOTABLY THE STOCKHOLM, ROTTERDAM AND BASEL CONVENTIONS; COMPLETE AND IMPLEMENT NATIONAL PLANS FOR PERSISTENT ORGANIC POLLUTANTS AND HAZARDOUS WASTE; STRENGTHEN ENFORCEMENT ACTIVITIES, DEVELOP POLLUTANT RELEASE AND TRANSFER REGISTERS AND IMPROVE THE REGULATORY FRAMEWORK TO BETTER MANAGE CHEMICALS THROUGHOUT THEIR LIFE CYCLE

The Stockholm Convention on Persistent Organic Pollutants and its Appendices was enacted in Chile through Decree N° 38 of 2005 of the Foreign Affairs Ministry. This led to the development of the National Implementation Plan for Management of Persistent Organic Pollutants (Plan Nacional de Implementación para la Gestión de los Contaminantes Orgánicos Persistentes, or PNI), the first phase of which was implemented from 2006 to 2010. This phase of the plan had eight components: Expired POP pesticides, sites contaminated with POPs, sources of dioxins and furans, polychlorinated biphenyls (PCBs), POP analysis capacities, information, citizen awareness and training, research and the Pollutant Release and and Transfer Registry (Sistema de Registro de Emisiones y Transferencia de Contaminantes, RETC). Objectives and activities were defined for each of these.

Implementation of the Plan has resulted in progress in the following areas: Reduction of risks caused by POP pesticides (elimination of all POP pesticides detected in the inventories); sustainable and rational management of POP-contaminated sites (approval in 2009 of the National Policy for Management of Sites with Pollutants; development of an inventory of sites contaminated with dioxins and furans associated with the use of pentachlorophenol in Chile's lumber-producing regions; development of a methodology to carry out technical-economic feasibility studies for contaminated site remediation options); reduction of dioxin releases into the environment (update of the 2009 national inventory of dioxin and furan emissions sources; development of best agricultural practices programme for clean, sustainable production; approval of Supreme Decree N° 6/2009 (Health Ministry, known as MINSAL) on the Regulation of Waste from Medical Establishments; since 2006 all Chilean cellulose plants use whitening processes without elementary chlorine; enactment of Supreme Decree 45/07 on Incineration and Co-incineration Standards (Ministry Secretary General of the Presidency, or MINSEGPRES); enactment of Supreme Decree 138/05 which rule the obligation to declare emissions (MINSAL); publication of Exempt Resolution 1032/09 of the Agriculture and Livestock Service (Servicio Agrícola y Ganadero, SAG) on dioxin limits in animal feed; publication of Supreme Decree 64/09 of MINSAL which introduces maximum dioxin and coplanar PCB maximums in pork, fowl, beef, sheep meat, fish, eggs and milk); identification, management and disposal of PCBs (updating of national PCB inventory and study of

disposal technologies; disposal of 1,517 tonnes of PCBs from 1992 to 2007; development of a national inventory of PCBs for other uses); creation of POP analysis capacities in line with national and international quality standards (feasibility study for the establishment of network of laboratories for POP analysis); promotion of opportunities for public participation, training and information on the national POPs plan (development of information and graphic materials on POPs and design and creation of a web site); identification and promotion of research on POPs (study on identification of capacities and research needs on POPs in Chile; national profile of chemical substance management; evaluation of capacity for rational management of chemical substances and national implementation of the Strategic Approach to International Chemicals Management, or SAICM; implementation of a PRTR system which includes POPs (publication of five reports; technical and legal study to estimate releases of POPs, cadmium, nonylphenols and other substances in water; methodological guide for estimating fixed and mobile sources in the PRTR).

Through Decree N° 37 of 2005 of the Foreign Affairs Ministry, Chile enacted the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade and its Appendices. The designated national authorities have fulfilled the four principal responsibilities of the Convention (notification of regulatory measure, response from importing country, notification of exporter/acknowledgment of receipt and notification of SHPF incidents). From 2005 to 2010, Chile submitted two final decisions regarding imports within the framework of the Rotterdam Convention.

In relation to the synergy between the Rotterdam, Stockholm and Basel conventions, national efforts have been made to improve coordination among the different working groups. It should be noted that as part of the Stockholm Convention, Chile was chosen as one of the 12 pilot countries to carry out the National Implementation Action Plan (Plan de Acción Nacional de Implementación), which generated useful technical information for the Rotterdam Convention. In addition, workshops have been organised targeting different domestic stakeholders (public sector, private sector, NGOs) to inform about issues on the Global Chemicals Agenda.

The following regulations related to chemical substances and hazardous waste were published in between 2005 and 2011, among others:

- Hazardous Substance Storage Regulation, of the Health Ministry: Regulates the basic safety conditions which must be followed for storage of hazardous substances, in order to avoid the risks they pose to people, company facilities and the community at large. (Supreme Decree 78/10). Includes the required use of safety data sheets for substances stored according to Chilean regulation 2245/2003.

Storage of hazardous substances is governed by the regulation contained in Supreme Decree N° 148/03 (MINSAL) which approves the Hazardous Waste Handling Regulation, so this new regulation is not applicable to hazardous waste, only to substances.

- Ministry of Health decree which prohibits the use of lindane or hexachlorocyclohexane in pesticides for sanitary or domestic use and in pharmaceuticals.
- Health Ministry decree which regulates authorisation of cross-border movement of hazardous waste consisting of used lead batteries: Prohibits cross-border movement of used lead batteries from Chile to other countries, as the country has facilities for processing such hazardous waste. (Supreme Decree 2/09, MINSAL)

This decree is framed within the Basel Convention on cross-border movement of hazardous waste and its disposal, ratified by Chile through Supreme Decree N° 685/92 of the Foreign Affairs Ministry.

In addition, a regulation on import and export of waste is being developed by the Health Ministry.

Between June 2008 and February 2009 the National Environmental Commission (Comisión Nacional del Medio Ambiente) updated the National Chemical Profile regarding chemical substance management. This activity implied the evaluation of capacities for rational management of these kinds of substances and the implementation at a national level of the Strategic Approach to International Chemicals Management (SAICM), adopted by Chile in Dubai in 2006. The project resulted in the publication of two books: National Chemical Profile (Perfil Químico Nacional, 2008) and Evaluation of Capacities for Rational Management of Chemical Substances and National Implementation of the SAICM (Evaluación de Capacidades para la Gestión Racional de las Sustancias Químicas y la Implementación Nacional del SAICM, 2009).

For its part, within the framework of the SAICM, start-up funds were recently approved to implement a project on the Globally Harmonised System of Classification and Labelling of Chemicals (GHS), which will be led by the Health Ministry.

In the area of waste management, a draft of the General Waste Law (Ley General de Residuos) has been prepared and is currently being debated by the relevant stakeholders. The legislative proposal seeks to regulate sustainable waste management, in order to prevent waste generation and promote its valuation to protect the environment.

In 2008 Chile signed the Integral Waste Management Agreement with the Inter-American Development Bank (IDB). This agreement involves cooperation on a programme aimed at improving health and environmental quality in urban centres and rural areas of Chile through implementing integral and sustainable systems for efficient management of solid household waste. This is being promoted through the use of a conditional credit line of up to US\$ 400 million. The project includes the following areas: Construction of new landfills, closure of dumps, support for regional management plans and training of enforcement officials.

Regarding hazardous waste, in 2005 the Sanitary Regulation on Hazardous Waste Management went into effect (see details in Recommendation 43). This regulation is now undergoing evaluation to adapt it to OECD requirements.

The Sanitary Regulation on Hazardous Waste Management created the Hazardous Waste Declaration and Monitoring System (Sistema de Declaración y Seguimiento de Residuos Peligrosos, or SIDREP), an alternative electronic system to the paper-based hazardous waste declaration. This is designed to facilitate preparation and submittal of Hazardous Waste Transport Declarations.

In accordance with the application of the Hazardous Waste Regulation, specific rules have also been enacted such as Supreme Decree N° 173/05 (MINSAL) on recognition of private laboratories for characterising hazardous waste and Resolution 292/05 which sets out the methodologies used to characterise hazardous waste.

RECOMMENDATION 50

CONTINUE NATIONAL AND BILATERAL EFFORTS IN THE AREAS OF RESEARCH, MONITORING AND SUSTAINABLE MANAGEMENT OF MARINE ECOSYSTEMS (E.G. SUSTAINABLE FISHERIES, PREVENTION OF MARINE POLLUTION); STRNGTHEN OIL SPILL PREVENTION AND MITIGATION CAPACITIES

Among the most important negotiations and treaties signed by Chile in the area of marine resources are the following:

Negotiation for creation of a regional fishing organisation for the South Pacific. In 2006 Chile, Australia and New Zealand began a multilateral consultation process leading to the establishment of a regional fishing management organisation in the South Pacific. Chile's main interest in this process is ensuring the conservation of jurel (jack mackerel), a species which is present both within its exclusive economic area as well as the adjacent open seas. This resource, which represents half of the pelagic species captured in Chile, is an important input of our aquaculture industry. Also, historically Chile has had a dominant presence in total captures of jurel in the Southeastern Pacific, with an average of 80%.

Marine and Coastal Biological Diversity. Chile recognises the Law of the Sea Convention as the legal framework for all activities carried out in the marine environment. Likewise, following the precautionary and ecosystemic approach, the country supports the adoption of measures to promote adequate conservation of living marine resources in the open seas, a ban on trawling of marine beds, the fight against illegal, nonregulated and undeclared fishing, the establishment of protected marine and coastal areas and the creation of regional fishing administration organisations. In addition, our country subscribes to the notion that genetic resources from marine beds beyond jurisdictional waters are part of humanity's common heritage and an agreement should be developed as part of the Law of the Sea Convention to regulate their exploitation and sustainable use.

International Whaling Commission (IWC). Chile has been a member of the IWC since 1979, when it signed the 1946 Convention for the Regulation of Whaling. In 1982 Chile approved the adoption of a moratorium on commercial whaling. Since then, it has opposed attempts to lift this moratorium and opposes the Japanese government's whaling programme for scientific purposes. In December 2007, Chile, along with 29 other countries and the European Union, sent a letter to Japan's Foreign Ministry expressing its disagreement with this procedure.

In 2008, Law 20,293 was enacted, declaring that maritime areas under national sovereignty and jurisdiction are whaling-free zones in order to protect and conserve whales, safeguard areas that are essential for them and their cycle of life, and to ensure the sustainability of observation activities.

Buenos Aires Group. Chile coordinates its participation in the IWC with members of the Buenos Aires Group, an umbrella group for conservationist Latin American countries which are members of the organisation. This group promotes proper conservation and non-lethal use of whales through measures such as a permanent moratorium on commercial whaling; responsible whale-watching tourism activities; expansion of conservation issues within the IWC; respect for existing whale sanctuaries and the creation of new ones, such as the South Atlantic; and recognition and support for declarations of official whale protection areas within the exclusive economic zones of various countries in the region.

International Maritime Organisation (IMO). The IMO is the specialised technical organism of the United Nations that develops international regulations to strengthen the safety of maritime transport. The IMO convention was adopted in 1948. Chile believes the work of the IMO is very important and demonstrates this through its participation in the IMO Council. Chile has been a member of the Council since 2001.

Standing Commission of the South Pacific (Comisión Permanente del Pacífico Sur, CPPS). The Standing Commission of the South Pacific (CPPS) is the regional organisation for coordination of the maritime policies of its member states: Chile, Colombia, Ecuador and Peru. Its aim is to promote conservation and rational use of natural resources in these countries' respective sovereign and jurisdictional maritime areas for the benefit of the people of those nations. Chile believes that the CPPS plays a fundamental role in articulating the interests of the Southeastern Pacific region in the various dimensions of the maritime area and in promoting these interests on a global level. Therefore, it actively participates in developing commission programmes and supports its strengthening and positioning in the global context.

Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR). The CCAMLR is a multilateral organism which oversees conservation and rational use of marine living resources in an area located largely below the 60th parallel south. The convention is part of the Antarctic Treaty System and in line with national policy in this area, Chile participates in all decisions which affect Antarctica, including protection of its living resources. Chile was one of the original signatories of the Convention and actively participates as a member of the Commission.

International Seabed Authority (ISA). The ISA is an autonomous organism whose purpose is to oversee resource exploration and exploitation activities in seabeds and oceanbeds and their subsoil outside limits of national jurisdiction (known as the Zone), based on the premise that these are part of "humanity's common patrimony". Our country participated in the Group E Council (groups are assigned by geographic location) during 2009-2010. As part of the discussion of preparation of the revised regulation on prospection and exploitation of polymetallic sulphur deposits in the Zone, our country's interest is in safeguarding the rights of coastal nations, as the majority of the resources (particularly deposits of polymetallic sulphurs and cobalt crusts) are within the jurisdiction of coastal

countries. In addition, there is a need to reinforce the points related to marine medium protection and preservation measures in the face of oceanic mining activities, following the precautionary principle.

In relation to the strengthening of national and bilateral initiatives in marine ecosystem areas, an agreement is now being developed by the Environment Ministry and the International Union for the Conservation of Nature (IUCN). The aim of this agreement is to strengthen joint efforts in support of the objectives of the Management Plan for Protected Areas (Programa de Manejo en Áreas Protegidas), including the coastal marine component, specifically related to forging agreements with private parties and species monitoring methodologies.

In addition, as part of the Environmental Cooperation Agreement between the United States and Chile, Chile's Environment Ministry and the National Oceanic and Atmospheric Administration (NOAA) have developed a twinning project between the Francisco Coloane protected marine area and Glacier Bay in Alaska, which is also a protected area. This project was included in the Third Working Programme and the mutual collaboration agreement was implemented in the first half of this year.

RECOMMENDATION 51

DEVELOP A BALANCED, SCHEDULED STRATEGY CONCERNING CLIMATE CHANGE ISSUES; STRENGTHEN ENERGY EFFICIENCY AND GREENHOUSE GAS MITIGATION POLICIES, INCLUDING THROUGH A CLEANER ENERGY MIX, AND PROMOTE THE USE OF CLEAN DEVELOPMENT MECHANISMS IN THE CONTEXT OF THE UNFCCC AND THE KYOTO PROTOCOL

Since 2006 the country has had a National Climate Change Strategy (Estrategia Nacional de Cambio Climático). This strategy was developed as part of the commitments established in the First National Communication (1998), and is the result of the work of the National Advisory Committee on Climate Change (Comité Nacional Asesor sobre Cambio Climático) in 1996, which was charged with starting the process of defining the country's climate change policies and actions⁶².

Based on national and international studies and the commitments made as part of the Kyoto Protocol, the Strategy carried out an assessment and determined three areas of work: adaptation to the impacts of climate change; mitigation of greenhouse gas emissions; and creation and development of climate change capacities.

One of the results of the Strategy was the creation of the 2008-2012 National Climate Change Action Plan (Plan de Acción Nacional de Cambio Climático, 2008-2012) in 2008. This Plan is designed to coordinate and start up a series of actions related to the three work areas of the Strategy, as well as to incorporate new knowledge developed in the country regarding adaptation and vulnerability into the development of public policy instruments.

Regarding efficient energy use, the national policy has been strengthened by the creation of the Centre for Renewable Energy (Centro de Energías Renovables), the expansion of the National Energy Efficiency Programme (Programa País Eficiencia Energética) and the subsequent creation of the Chilean Energy Efficiency Agency (Agencia Chilena de Eficiencia Energética). The latter occurred as part of the creation of the Ministry of Energy in 2010 and Law 20,257 of 2008 which creates the legislative conditions for the introduction of non-conventional renewable energy to the country.

Since the Plan has been in effect and in relation to the mitigation of greenhouse gases, the Plan includes the formulation of a National Greenhouse Gas Emissions Mitigation Plan (Plan Nacional de Mitigación de Emisiones de Gases de Efecto Invernadero) and plans for each sector. Within these efforts, the government has committed to developing mitigation scenarios for various timescales.

⁶² The attributions of this organism are now being revised in the context of the National Action Plan and the new environmental institutions.

With respect to the use of clean development mechanisms, the National Action Plan specifically establishes that these will be strengthened, as part of achievement of national objectives for sustainable development and technology transfer. From 2003 to 2010, Chile approved 77 projects which use clean development mechanisms, as part of the commitments established in the Kyoto Protocol.

In addition, during this period the National Climate Change Office (Oficina Nacional de Cambio Climático) was created. This entity, which is part of the Environment Ministry, proposes policies and develops action plans to address climate change.

RECOMMENDATION 52**DEVELOP FURTHER INTERNATIONAL ENVIRONMENTAL POLICIES REFLECTING POTENTIAL OECD MEMBERSHIP, AND AN INCREASING ROLE IN LATIN AMERICA AND THE WORLD**

Chile's option to include the environment in their overarching global integration strategy is reflected in national policy, trade agreements and the signing and ratification of most international environmental treaties.

On the trade front, the signing of FTAs with several countries and organizations included the negotiation and implementation of environmental chapters or parallel environmental agreements, under which the country is committed primarily to enforce its environmental laws and to develop cooperation projects. In particular, environmental agreements with Canada, the United States, European Union and P4 (New Zealand, Singapore and Brunei) have been successful in areas of environmental cooperation, allowing technical assistance programs in various fields (e.g. environmental legislation, climate change, biodiversity, waste management, capacity building, etc.)..

In the field of international environmental agreements, Chile has ratified the main conventions (e.g. Vienna, Climate Change, Biodiversity, Rotterdam, Stockholm, Basel) and participates actively in the negotiation process in accordance with Rio principles, supporting constructive position to achieve consensus that enable progress in meeting the convention objectives.

At the regional level, Chile has shown a particular interest in regional integration by actively participating in the Environmental Commission of Mercosur, in the bilateral environmental program with Argentina, and in environmental cooperation activities with Uruguay, Colombia and other countries in the region.

As part of the country's commitment to international environmental policies driven by OECD, in 2008 took place in Chile the second meeting of the "OECD Workshop on Regional Trade Agreements and the Environment." This meeting was the result of the country offering to host and promote this initiative in Latin America. Finally, Chile's accession to the OECD has meant an important work on environmental issues as reflected in its participation in various committees and working groups (Chemicals, EPOC, Climate Change, and others) and its commitment to adapt national policies to the recommendations of this body.