

DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK

## **CHILE**

# **INTEGRATED SOLID WASTE MANAGEMENT**

**(CH-L1026)**

## **LOAN PROPOSAL**

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Electronic Links and References	
Basic socioeconomic data	<a href="http://www.iadb.org/RES/index.cfm?fuseaction=externallinks.countrydata">http://www.iadb.org/RES/index.cfm?fuseaction=externallinks.countrydata</a>
Status of loans in execution	<a href="http://ops.iadb.org/approvals/pdfs/CHen.pdf">http://ops.iadb.org/approvals/pdfs/CHen.pdf</a>
Tentative lending program	<a href="http://opsgs1/ABSPRJ/tentativelending.ASP?S=CH&amp;L=en">http://opsgs1/ABSPRJ/tentativelending.ASP?S=CH&amp;L=en</a>
Information available in the INE/WSA technical files	<a href="http://idbdocs.iadb.org/WSDocs/getDocument.aspx?DOCNUM=1090222">http://idbdocs.iadb.org/WSDocs/getDocument.aspx?DOCNUM=1090222</a>
Annex II: Currency	<a href="http://idbdocs.iadb.org/WSDocs/getDocument.aspx?DOCNUM=1275599">http://idbdocs.iadb.org/WSDocs/getDocument.aspx?DOCNUM=1275599</a>

## ABBREVIATIONS

CCLIP	Conditional Credit Line for Investment Projects
CONAMA	Comisión Nacional del Medio Ambiente [National Environmental Commission]
COREMA	Comisión Regional del Medio Ambiente [Regional Environmental Commission]
CPAR	Country Procurement Assessment Report
DGIR	Departamento de Gestión de Inversiones Regionales [Regional Investment Management Department]
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
ESR	Environmental and Social Review Group
FNDR	Fondo Nacional de Desarrollo Regional [National Fund for Regional Development]
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit [German Agency for Technical Cooperation]
ICAS	Institutional Capacity Assessment System
KfW	Kreditanstalt für Wiederaufbau [German development bank]
LCF	Local Currency Facility
MIDEPLAN	Ministry of Planning and Coordination
PDL	Performance-driven loan
PTI	Poverty-targeted investment
SEIA	Sistema de Evaluación de Impacto Ambiental [Environmental Impact Assessment System]
SEN	Secretaría Ejecutiva Nacional [National Executive Secretariat]
SEQ	Social equity enhancing
SESMA	Servicio de Salud Metropolitano del Ambiente [Environmental Metropolitan Health Service]
SNI	Sistema Nacional de Inversiones [National Investment System]
SUBDERE	Subsecretaría de Desarrollo Regional y Administrativo [Regional and Administrative Development Branch, Ministry of the Interior]

## PROJECT SUMMARY

### CHILE INTEGRATED SOLID WASTE MANAGEMENT (CH-L1026)

Financial Terms and Conditions <sup>1</sup>				
Borrower: Republic of Chile			Amortization period:	10 years
Executing agency: Subsecretaría de Desarrollo Regional y Administrativo [Regional and Administrative Development Branch] (SUBDERE)			Grace period:	5 years
			Disbursement period:	5 years
<b>Source</b>	<b>Amount</b>	<b>%</b>	Interest rate:	LIBOR-based
IDB (Ordinary Capital)	US\$100,000,000	50	Inspection and supervision fee:	0%
Local	US\$100,000,000	50	Credit fee:	0.25%
Total	US\$200,000,000	100	Currency:	U.S. dollars from the Single Currency Facility
			Option to convert into Chilean pesos	Local Currency Facility (LCF)
Project at a glance				
<p><b>Project objective:</b> The program's development objective is to improve environmental quality and health conditions in urban and rural areas nationally, by implementing integrated, sustainable systems for efficient residential solid waste management.</p> <p><b>Special contractual conditions:</b>  <i>Special conditions precedent to the disbursement of the advance of the performance-driven loan:</i>                      - Entry into force of the program's Operations Manual (paragraph 3.5).  <i>Special conditions precedent to the first disbursement of the performance-driven loan:</i>                      - Entry into force of the new regulations on basic safety and sanitary conditions in sanitary landfills (paragraph 3.4).                      - Contracting of consulting services for the program's performance evaluations, in accordance with the terms agreed upon with the Bank (paragraph 3.15).  <i>Special conditions precedent to each disbursement of the performance-driven loan:</i>                      - Achievement of the targets indicated in the program's Results Matrix for each of the performance-based disbursements (Annex I).</p> <p><b>Exceptions to Bank policies:</b>                      A waiver is requested with respect to the application of the Bank's funding in local currency interruption clause, referred to in paragraph 3.15 of document GN-2365-2 on the Local Currency Facility (LCF) (see paragraph 3.19 and section 3 of Annex II).  <i>Other financial conditions:</i> In order to expand financing opportunities for the borrower, the conversion of disbursements and outstanding balances into local currency will be subject to two financial conditions in addition to those established in the LCF: (i) greater flexibility in the repayment profiles for disbursements and outstanding balances in local currency; and (ii) price based on the Bank's actual funding costs in the event that the Bank sources its funding by issuing bonds (paragraph 3.19 and sections 2(a) and 2(b) of Annex II).</p>				
<p><b>Project consistent with country strategy:</b>    Yes [ X ]                      No [ ]</p> <p><b>Project qualifies as:</b>                      SEQ [X]              PTI [ ]              Sector [ ]              Geographic [ ]              Headcount [ ]</p> <p><b>Procurement:</b> Procurement will be governed by Bank provisions on performance-driven loans (document GN-2278-2).</p> <p><b>ESR verification date:</b> 12 October 2007 (ESR Meeting 39-07)</p>				

<sup>1</sup> The interest rate, credit fee, and inspection and supervision fee mentioned in this document are established pursuant to document FN-568-3 Rev. and may be changed by the Board of Executive Directors, taking into account the available background information, as well as the respective Finance Department recommendation. In no case will the credit fee exceed 0.75%, or the inspection and supervision fee exceed 1% of the loan amount.\*

\* With regard to the inspection and supervision fee, in no case will the charge exceed, in a given six-month period, the amount that would result from applying 1% to the loan amount divided by the number of six-month periods included in the original disbursement period.

## **I. FRAME OF REFERENCE**

### **A. Background**

- 1.1 The proposed program is framed within the US\$400-million Conditional Credit Line for Investment Projects (CCLIP) approved by the Board of Executive Directors through operation 1828/OC-CH. The objective of this line is to support the regional development and decentralization process, for which the following may be financed: (i) individual investment projects in all areas eligible for financing by the National Fund for Regional Development (FNDR); (ii) institutional and management capacity strengthening; and (iii) studies. Solid waste management is one of the areas eligible for FNDR financing, so this program is consistent with the CCLIP objective. The exception approved by the Bank for operation 1828/OC-CH allows submission of the proposed program to the Board of Executive Directors for consideration in parallel with execution of the first CCLIP operation and the Rural Sanitation Program (CH-L1025), the second operation under this line, approved in July 2007. The financing modality will be a performance-driven loan (PDL), in accordance with the policy set out in document GN-2278-3.

### **B. Solid waste management in Chile**

- 1.2 Since the entry into force of the regulations for the Environmental Impact Assessment System (SEIA) in 1997, requiring the environmental assessment of residential solid waste projects, Chile has made significant progress in the collection, minimization, and final disposal of such waste. Today, nearly 60% of all residential solid waste is collected in the country's municipios, and it is estimated that in close to 80% of municipios with over 50,000 inhabitants, this service is operated by third parties, mainly under service contracts. Moreover, the country has a recycling market for paper, cardboard, aluminum, plastics, glass, and scrap metal, which has pushed the percentage of recycled material up to 12% in the metropolitan region. In terms of final disposal, while in 1995, collected residential solid waste was disposed of at sites lacking the minimum sanitary and environmental conditions (dumps), in 2005, 60% of this waste was placed in sanitary landfills meeting a series of sanitary and environmental requirements. The country also has sanitary regulations for hazardous waste management, which took effect in June 2005. Their implementation was supported by the international cooperation project with the German Agency for Technical Cooperation (GTZ) entitled "Hazardous Waste Management in Chile."
- 1.3 Notwithstanding the progress made, the challenges the country faces, particularly in terms of waste treatment and final disposal, are associated with growing volumes of residential solid waste generated by per capita income growth over the last decade, as well as demographic growth. The most significant sanitary and environmental problems occur at final disposal sites—mainly outside of Santiago—that lack the relevant sanitary and environmental authorizations. Of the 245 final disposal sites for solid waste registered with Chilean sanitary authorities in 2005, fewer than half had a sanitary authorization and one in six had an environmental authorization (Table 1). Sites lacking the respective authorizations have coverage and compacting

problems, lack efficient controls for gas and liquid emissions (leaching), do not have closed perimeters, are pest infested, are located in residential areas or areas restricted for environmental or cultural preservation purposes, or lack land use authorization. Moreover, growing volumes of garbage are bringing an end to the life cycles of many of these sites throughout the country. The 2005 cadastre estimated that almost seven of every eight final disposal sites should be closed before 2010, mainly in cities like Iquique, Antofagasta, Valparaíso, Temuco, and Valdivia (Table 1).

**Table 1. Final solid waste disposal sites by region, with authorizations and expected closure, 2005**

Region	Waste (000 MT/year)	Registered sites	With sanitation authorization	With environmental authorization	Closure ≥ 2010
Tarapacá	115.8	22	2	4	0
Antofagasta	251.6	36	26	17	8
Atacama	98.6	10	1	1	3
Coquimbo	231.4	17	12	1	3
Valparaíso	612.2	16	11	0	3
O'Higgins	163.6	6	2	2	1
Maule	253.3	20	11	3	4
Bio-Bio	686.8	13	9	3	3
Araucanía	190.2	26	22	3	9
Los Lagos	362.9	35	11	2	6
Aisén	57.8	29	6	2	2
Magallanes	128.3	11	2	0	1
Metropolitan	2,327.0	4	4	3	2
<b>TOTAL</b>	<b>5,479.5</b>	<b>245</b>	<b>119</b>	<b>41</b>	<b>45</b>
%	--	<b>100.0</b>	<b>43.6</b>	<b>16.7</b>	<b>13.4</b>

Source: Ministry of Health

- 1.4 The central government, regional governments, and municipalities are undertaking joint efforts to address the environmental and sanitary challenges posed by the growing volumes of residential solid waste in the country. As part of its public investment program administration and management activities, the Regional and Administrative

**SUBDERE's experience in the Los Lagos region**

In the Los Lagos region, SUBDERE and the respective regional government have been preparing the sustainable solid waste management program, the objective of which is to use intermunicipal integrated solid waste management systems for the provinces of Llanquihue, Osorno, and Valdivia. Considering the lessons learned from similar experiences in the metropolitan and O'Higgins regions, these systems are based on partnership agreements between municipalities committed to disposing of waste in a single facility in order to reduce the unit costs of management for all parties.

Development Branch (SUBDERE) of the Ministry of the Interior is administering and coordinating regional investment activities in the solid waste sector through its

Regional Investment Management Department (DGIR).<sup>1</sup> These activities include projects eligible for cofinancing from the FNDR, a financing instrument for public investments in social and economic infrastructure in regions and municipios considered priorities by the respective Regional Council. As is the case for any project applying for financing from the FNDR, residential solid waste projects must be included in the National Investment System (SNI) and submit documentation guaranteeing a rigorous technical-economic analysis by entities responsible for these tasks: the Ministry of Planning and Coordination (MIDEPLAN), in the case of works, and the Budget Division, in the case of individual equipment. The country also has detailed methodologies and procedures for the complete cycle of these projects in the FNDR Operations Manual, which are consistent with those used by the Bank.

- 1.5 The Chilean authorities are aware that the sustainability of any activities they may carry out to properly address the growing volumes of residential solid waste requires simultaneous actions aimed at improving the quality, efficiency, and comprehensiveness of public waste management at the national, regional, and municipal levels. In this regard, three key considerations have been identified to be addressed at the municipal, regional, and national levels, respectively: (i) the weak capacity to recover the actual costs of the services at the municipal level; (ii) the lack of participatory regional planning instruments; and (iii) the inadequate level of sanitary and environmental oversight. These three considerations are detailed below.

#### **1. Weak municipal capacity to recover the actual costs of the services**

- 1.6 Municipalities are responsible for collecting, transporting, and disposing of residential solid waste in the areas under their jurisdiction. To finance this service, the municipalities are authorized by the 2005 Municipal Revenues Act to charge for garbage collection services through the Municipal Garbage Collection Fee, calculated by dividing the costs incurred in the preceding year by the total number of users. The legislation automatically exempts users from payment of this fee if the tax assessment on their serviced home or housing unit is at or below 255 monthly tax units (US\$8,300, at the current exchange rate).
- 1.7 A SUBDERE study reviewing the 2004 budget performance of every municipality in the country showed that revenues from garbage collection fees covered the estimated costs of the service in only 22 of the jurisdictions. As a whole, the 340 municipalities analyzed managed to finance, on average, 54% of this cost. Table 2 summarizes the results of this study for the country's 19 largest cities, including Easter Island. It shows that just four cities managed to finance 100% of

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<sup>1</sup> The DGIR is executing the rural electrification program (1475/OC-CH) and the program for sustainable tourism development in the communities of Chiloé and Palena (1507/OC-CH), and will be responsible for execution of the rural sanitary programs (CH-L1025), approved in July 2007. This department also administers the Regional Fund for Regional Development and is executing neighborhood improvement, rural infrastructure, and regional investment projects.

the respective estimated costs of the service through garbage collection fee revenues. For many of these municipalities, this cost represented a high percentage of their budget—more than 9% for seven municipalities.

**Table 2. Estimated costs and garbage collection revenues in Chile's largest municipios, 2004**  
(millions of 2004 pesos)

<b>Municipio</b>	<b>Cost of garbage collection* (A)</b>	<b>Garbage collection fee revenues (B)</b>	<b>% Financing of costs (B/A*100)</b>	<b>Collection cost as % of budget</b>
Arica	249.4	206.2	82.7	2.1
Iquique	489.0	971.3	198.6	2.9
Antofagasta	925.3	538.0	58.1	4.2
Copiapó	511.4	310.6	60.7	7.1
La Serena	997.0	316.8	31.8	10.0
Coquimbo	981.8	337.1	34.3	6.8
Valparaíso	1,214.2	2,184.6	179.9	6.6
Viña del Mar	3,712.6	2,065.3	55.6	10.1
Easter Island	64.1	-	0.0	5.8
Rancagua	1,400.2	885.9	63.3	13.3
Talca	1,369.1	573.5	41.9	12.9
Concepción	1,148.6	763.3	66.5	7.7
Talcahuano	1,638.1	450.2	27.5	9.6
Temuco	994.4	611.4	32.6	7.8
Puerto Montt	961.8	770.9	80.2	7.2
Osorno	748.1	270.8	36.2	9.6
Valdivia	701.6	465.9	66.4	6.3
Punta Arenas	749.8	1,170.6	156.1	9.8
Santiago	2,110.3	3,070.2	145.5	2.2

\* Includes estimated costs for cleaning, collection, transport, and final disposal

Source: Municipal Information Unit, Municipalities Division, SUBDERE.

- 1.8 Financial management of solid waste faces two problems at the municipal level. First, the management systems in many Chilean municipalities do not provide a breakdown of the actual costs of their solid waste collection, transport, treatment, and final disposal services, which prevents them from charging appropriate garbage collection fees. This may be causing overcharging for services in some municipios, and undercharging in most of them (Table 2), with the resulting distortions in the generation of garbage among the various types of generators: residential, business, industrial. Second, SUBDERE estimates that 65% of Chilean homes receiving garbage collection services do not pay for these services due to the tax assessment-based exemptions established in the 2005 Municipal Revenues Act. This weak capacity to recover operating costs has a negative impact on the quality of the service offered and generates delays in payment to operators by many municipalities. The mechanisms being designed by the government to mitigate the impact of the exemptions on their capacity to collect garbage collection fees are

expected to allow municipalities to increase the proportion of the actual costs of the service covered by this source of revenue.

## **2. Lack of regional planning instruments**

- 1.9 International experience has shown that the economies of scale generated by coordinated regional planning of actions among adjacent municipios contribute to improved efficiency in the use of the resources that each municipality applies individually to residential solid waste management, particularly transport and final disposal. In Chile, demonstrating the economic and socioenvironmental benefits of intermunicipal associations has been hampered by the lack of participatory regional plans for integrated solid waste management. As a result, many municipalities opt for individual solutions to their waste problem and final disposal facilities have proliferated throughout the country's regions. Disposal costs at those facilities range from Ch\$15,000 to Ch\$20,000 per ton (between US\$30 and US\$40, at the current exchange rate). By contrast, in a 2006 study the National Environmental Commission (CONAMA) estimated final solid waste disposal costs ranging from Ch\$4,000 to Ch\$8,000 per ton for intermunicipal associations.
- 1.10 Since 2005, the country has been making progress in the creation of planning instruments for residential solid waste management. With the support of CONAMA, regional governments and municipalities have a set of 19 handbooks to help them develop their respective regional and municipal plans for integrated solid waste management. These handbooks seek to help make collection, minimization, transport, and final disposal services more cost-effective by leveraging the economies of scale produced as a result of intermunicipal associations. The handbooks also propose tools for improving municipal management, including the collection of relevant information for monitoring the services, the identification of indicators to evaluate quality, and guidelines for private sector participation in the services. In order to begin to implement the regional solid waste management plans in 2008, CONAMA has been undertaking national dissemination and training efforts on the content of these handbooks.

## **3. Inadequate sanitary and environmental oversight**

- 1.11 The Environmental Metropolitan Health Service (SESMA), in the metropolitan region, and the Regional Sanitation Authorities throughout the country as well as CONAMA and its Regional Environmental Commissions (COREMAs) are respectively responsible for oversight and control of compliance with sanitary and environmental regulations.
- 1.12 SESMA, in the metropolitan region, and the Regional Sanitation Authorities throughout the country are responsible for overseeing and controlling compliance with the sanitary standards established for final residential solid waste disposal sites. These standards are governed by the Regulations on Basic Safety and Sanitary Conditions in Sanitary Landfills (submitted to the Comptroller General of the Republic on 20 August 2007 for review of constitutionality and legality, prior to publication by the Ministry of Health (MINSAL) and subsequent entry into force).

These regulations establish strict parameters for the location, design, operation, monitoring, control, and closure that all final disposal sites must meet in order to be called sanitary residential solid waste landfills. They also require that final solid waste disposal sites meet the sanitary and environmental conditions for a sanitary landfill within an established term or be closed. The Sanitary Landfill Regulations replace Resolution 2444 of 1980, which, by establishing sanitary standards limited to the location and operation of dumps, gave rise to coverage, compacting, and health issues identified at many of the country's final disposal sites (paragraph 1.3).

- 1.13 CONAMA and its Regional Environmental Commissions (COREMAs) are responsible for overseeing compliance with the rules and conditions under which residential solid waste disposal projects or activities are authorized for communities with more than 5,000 inhabitants, including sanitary landfills and transfer stations. According to Chile's Environmental Impact Assessment System Regulations, such rules and conditions are established in the Environmental Monitoring Plan that is part of the approved Environmental Impact Assessment (EIA), if the project creates or poses risks to health or the environment, or the voluntary environmental commitments included in the Environmental Impact Statement (EIS) accepted by CONAMA.
- 1.14 Although the scope and responsibilities for sanitary and environmental supervision of final disposal facilities are clearly defined in current Chilean legislation, the effectiveness of such supervision is limited. In the context of the implementation of the Integrated Solid Waste Management Policy (paragraph 1.15), in 2005, CONAMA's Executive Secretariat conducted a survey on the Chilean sanitary authorities' capacity to supervise and inspect final solid waste disposal facilities. The survey reflected uneven capacity nationally, with some regions having limited human resources devoted exclusively to this work and little training. The study also indicated the need for training and strengthening to improve the supervision authorities' performance nationwide. The government is also finalizing preparation of a work methodology that will allow the country's sanitary authorities to systematically comply with the provisions to be established in the Regulations on Basic Safety and Sanitary Conditions in Sanitary Landfills.

## C. The country's strategy in the sector

1.15 In response to the challenges the country faces in terms of solid waste, in January 2005, the Integrated Solid Waste Management Policy was approved. This policy was developed by an interministerial team coordinated by the Ministry of the General Secretariat of the Office of the President, and made up of the Ministry of Health, the Ministry of the Economy, SUBDERE, the Metropolitan Environmental Health Service, and CONAMA. Its final language

<b>Integrated Solid Waste Management Policy: Specific objectives</b>	
1.	To minimize sanitary and environmental problems caused by poor solid waste management.
2.	To create and promote a quality residential solid waste management utility at a cost-based price.
3.	To promote a regional approach to residential solid waste management.
4.	To encourage the development of efficient, dynamic waste management markets, while promoting the development of a culture of minimization.
5.	To promote environmental education, citizen participation, and greater awareness with respect to solid waste management.
6.	To build and implement solid waste information systems.
7.	To create a modern, efficient institutional framework for solid waste management.

was the result of broad input by citizens from all regions of the country, with the participation of the academic, industrial, governmental, municipal, and nongovernmental sectors. The policy's objective is to manage solid waste with the least risk to the health of the population and the environment. It adopts an integrated approach, ensuring the long-term sustainability and efficiency of the sector. It includes seven specific objectives (see box above) and 10 guiding principles, including phased implementation, standardization (setting minimum standards from generation to final disposal), prevention (actions must be aimed at minimizing amounts and risks), polluters pay (those who generate waste must assume the costs of the integrated management of their waste), and economic fairness (parties involved must seek to maximize social benefits or minimize social costs).

1.16 The solid waste management problems identified in the diagnostic assessment for the Integrated Solid Waste Management Policy are consistent with the three management aspects that need to be improved to achieve sustainability in the country's activities aimed at addressing the growing volumes of residential solid waste: lack of participatory regional planning instruments; the weak capacity to recover the actual costs of the services at the municipal level; and the inadequate level of sanitary and environmental oversight (paragraph 1.5). The policy also identified as a problem the limited effectiveness of the existing incentives to minimize garbage generation through mechanisms such as recycling or reuse. To address the identified problems, the policy outlines a plan of action comprising 35 concrete short-term measures (March 2006) and 19 medium-term measures (March 2010), each associated with a specific policy objective (Box 1). CONAMA is responsible for compliance with this plan of action. The short-term measures

implemented include the following: approval of rules and regulations related to waste; training of oversight personnel, officials, users, and waste-generators; development of a National Solid Waste Information System, integrated into CONAMA's National Environmental Information System, as well as the creation of a registry of all types of waste management facilities; regulation of the rate systems and compensation mechanisms for undesired locations of sanitary landfills; and the drafting of handbooks for the preparation of regional or municipal residential solid waste management plans. The medium-term measures stress the strengthening and positioning of regional executive authorities, technical support for the development of waste management plans, and the implementation of the National Minimization Strategy.

- 1.17 At the institutional level, a National Executive Secretariat (SEN) was established under CONAMA's Executive Division, as an operational committee for the implementation and monitoring of the policy. Made up of representatives of the Ministers of the General Secretariat of the Office of the President, Health, the Economy, and Housing, SUBDERE, and CONAMA, and with the participation of the Chilean Association of Municipalities, the SEN has become the authority coordinating public agencies involved in waste management and the contact for nongovernmental participants. The SEN has established coordination programs with regional governments and municipalities through Regional Executive Secretariats, in order to expand these functions at the subnational level.

**D. The Bank's strategy with the country and its actions in the sector**

- 1.18 The Bank's country strategy with Chile (document GN-2431) aims to help the country pursue growth and, in particular, improve equality of opportunity and ensure the social inclusion of vulnerable population groups. The three actions to address the challenges for 2006-2010 are: (i) reducing the opportunity gap; (ii) reducing competitiveness and income gaps with developed economies; and (iii) making government more efficient and bringing it closer to the citizenry. The proposed program squares well with the third action through the promotion of intermunicipal association-building mechanisms and cooperation between municipalities and regional governments, as well as through the strengthening of local solid waste management in order to improve the quality and lower the cost of the services for the beneficiary population.
- 1.19 The Bank has been supporting these communities in the development of integrated solid waste management plans and solutions for final disposal, through the Sustainable Community-based Tourism Development Program in Chiloé and Palena (1507/OC-CH). Although there are still no lessons learned from this operation, the Bank's experience in integrated solid waste management operations in other Latin American and Caribbean countries has provided the following lessons for the design of the proposed operation:
- a. *Integrated solid waste management requires the implementation of mechanisms to finance operating costs in the responsible entities in order to*

*be sustainable over time.* Low levels of revenue collection for the garbage collection service affect its quality, and may impact the health and environment of the population served. In this regard, the program will support municipalities, as the parties responsible for this service, in designing actions that enable better financial management in the sector.

- b. *Regional planning for the final disposal of solid waste reduces economic and environmental costs.* International experience has shown that final disposal sites shared among multiple municipios enable significant economies of scale in terms of costs, and also increase the likelihood of meeting desired environmental standards. For this reason the program is promoting association-building among adjacent municipios, allowing least-cost solutions—in terms of investment, operation, maintenance, and transport—for environment-friendly final disposal.

#### **E. Coordination with other international agencies**

- 1.20 GTZ [German Agency for Technical Cooperation] has been supporting CONAMA with the Hazardous Waste Management Project. This technical assistance project aims to improve hazardous waste management in Chile, and its activities have been contributing to the implementation of existing legislation (paragraph 1.2). The most significant aspect of the project is the promotion of new methods of public- and private-sector cooperation.
- 1.21 KfW [German development bank] has also been supporting the Integrated Solid Waste Management Program, to be executed by SUBDERE and the regional government of Los Lagos. This program includes the construction and outfitting of three central sanitary landfills and transfer stations, equipment for local collection and transport, and training, technical assistance, and measures to minimize solid waste for the association of municipios in three of the region's provinces: Llanquihue, Valdivia, and Osorno. Its total cost is €38.8 million, of which €28.8 million are financed by KfW.

#### **F. Program strategy**

- 1.22 The program has been designed to support efforts by the Chilean government to consolidate its achievements in residential solid waste management, by focusing attention on the environmental and health challenges posed by the growing volumes of waste being produced nationally. In this regard, the outcomes the program seeks include an increase in the amount of residential solid waste treated and disposed of in environmentally appropriate, cost-efficient sanitary landfills, as well as the permanent closure of final disposal facilities that fail to meet minimum environmental and health standards.
- 1.23 In order to ensure the sustainability of the activities undertaken by the country to achieve these outcomes, the program will promote complementary actions aimed at improving municipal financial management, regional planning, and sanitary and environmental oversight, to enhance the quality, efficiency, and comprehensiveness

of public residential solid waste management at the municipal, regional, and national levels. Through these actions, the program is expected to achieve the following additional outcomes: greater financial coverage by municipalities of the real costs of collection, transport, and final waste disposal through garbage collection fees; the implementation of regional plans for integrated residential solid waste management that create incentives for intermunicipal association-building in order to achieve economies of scale and lower garbage collection costs; and an increase in the number of final disposal facilities that are inspected by the country's sanitary and environmental authorities. All of the program's expected outcomes are consistent with the specific objectives proposed by the country's Integrated Solid Waste Management Policy.

- 1.24 Four considerations allow the program's approach to focus on the measurement of outcomes associated with the development objective established in the country's Integrated Solid Waste Management Policy and, therefore, create the proper framework to justify financing through a PDL: (i) SUBDERE's demonstrated capacity to execute investment projects, according to the findings of the institutional analysis performed using the institutional capacity assessment system (ICAS) methodology, which was completed during preparation of operation 1828/OC-CH, as well as the outcomes of Bank-financed operations (paragraphs 4.1 to 4.3); (ii) the compatibility of the country's procurement systems with the principles of competition, economy, transparency, equality, publicity, and due process (paragraph 3.9); (iii) the existence of sources for the systematic collection and analysis of data on outcomes (paragraph 3.14), laying the foundation for proper program monitoring and evaluation; and (iv) the existence of procedures and methodologies consistent with the Bank's best practices for the planning, development, analysis, supervision, and monitoring of solid waste projects undertaken in various public sector agencies (paragraphs 3.2 to 3.5, 3.14, 4.4 to 4.6, 4.9, and 4.10). The Bank's experience in integrated solid waste management projects in Latin America and the Caribbean enabled it to work with the country to fine-tune these procedures and methodologies, in order to incorporate best practices during the cycle of these projects and provide better instruments to evaluate the performance of future operations in the sector.

## **II. THE PROGRAM**

### **A. Objective**

- 2.1 The program's development objective is to improve environmental quality and health conditions in urban centers and rural areas nationally, by implementing integrated, sustainable systems for efficient residential solid waste management.

### **B. Structure and expected outcomes**

- 2.2 The program is structured to obtain five outcomes: (i) an increase in the percentage of solid waste received for final disposal in sanitary and environmentally sound facilities; (ii) the closure of residential solid waste final disposal facilities lacking

sanitary or environmental permit; (iii) improved regional planning capacity for solid waste management; (iv) improved municipal financial management of residential solid waste programs; and (v) capacity-building for governmental sanitary and environmental oversight and control. The proposed indicators for each of these outcomes seek to measure the coverage and cost-effectiveness of the final disposal service, environmental quality, and the financial and environmental sustainability of the investments. The indicators, baseline values, and targets associated with each performance-based disbursement under the loan are presented in the Results Matrix (Annex I). The methods for calculating these parameters are presented below.

- 2.3 **Outcome #1.** The first outcome is treatment and disposal of the residential solid waste generated by the country's *comunas* [political subdivision in Chile] in sanitary and environment-friendly facilities. The performance indicator is the number of tons of solid waste treated and placed in sanitary landfills that have the respective environmental and sanitary authorizations. The environmental authorization is granted by COREMA; the sanitary authorization is granted by the Regional Sanitation Authority, according to the provisions established in the Regulations on Basic Safety and Sanitary Conditions in Sanitary Landfills. In order to improve the service's cost-effectiveness, the performance indicator establishes that the economic cost per ton for transport and final disposal in these landfills will be less than Ch\$11,000 (May 2006 pesos), the average unit value between the top of the range established by CONAMA for group solutions and the minimum achieved for individual solutions (paragraph 1.9). The economic cost of transport and final disposal for a sanitary landfill is the present value of the flow of the costs of investment, operation, maintenance, transport, monitoring, and closure of the least-cost solution in the corresponding feasibility study, which must be designed according to the MIDEPLAN National Investment System methodology for the preparation and evaluation of residential and assimilable solid waste projects. The baseline of 3.2 million tons represents 60% of the total residential solid waste disposed of in environment-friendly sanitary landfills in 2005 (see Table 1). The targets to be achieved for the program's three disbursements represent percentages of final disposal service coverage of 66% (equivalent to 3.5 million tons), 75% (equivalent to 4 million tons), and 86% (equivalent to 4.6 million tons) of the total amount of residential solid waste generated in the country.
- 2.4 **Outcome #2.** The second outcome is to close final disposal facilities that do not have sanitary or environmental authorizations, in order to improve the quality of the country's environment. The performance indicator is the number of these facilities closed by the program, in accordance with a closure plan approved by the sanitation authority and in execution with recovered liabilities, if applicable, and with an environmental monitoring plan in operation. This plan must be adapted to the provisions established in the Regulations on Basic Safety and Sanitary Conditions in Sanitary Landfills (paragraph 1.3). The targets are 30 and 30 facilities closed for the last two performance-based disbursements of the program.

- 2.5 **Outcome #3.** The third outcome is to improve the regional planning capacity for integrated solid waste management. The performance indicator is the number of regions that have a regional plan for integrated residential solid waste management approved by the respective Regional Council. A regional plan for integrated residential solid waste management will be understood as the document the text and content of which are consistent with the provisions of the applicable instruction handbook approved by CONAMA's Executive Council. The targets are five and ten plans approved for the last two performance-based disbursements of the program.
- 2.6 **Outcome #4.** The fourth outcome is to improve the financial management of the municipalities participating in the residential solid waste management program. The performance indicator is the percentage-point increase in the proportion of real garbage collection costs covered by the garbage collection fee in each of the municipios participating in the program. Real garbage collection costs are the costs of operation, maintenance, and depreciation of assets for the collection, street sweeping, cleaning, transport and transfer, minimization, and final disposal services, calculated based on the budget executed by each municipio for these services. The baseline will be the estimated data on costs and revenues from the garbage collection fee for 2007 collected by the Municipal Information Unit of SUBDERE's Municipalities Division. The final target is a five percentage-point increase in cost coverage for all municipios participating in the program.
- 2.7 **Outcome #5.** The fifth outcome is to strengthen the government's capacity for residential solid waste sanitary and environmental oversight and control. The performance indicator is the number of regions where final disposal facilities are subject to oversight and control by the relevant regional authorities, pursuant to current legislation. The pertinent regional authorities will be the Regional Sanitation Authorities, which will ensure compliance with the sanitary provisions set forth in the Regulations on Basic Safety and Sanitary Conditions in Sanitary Landfills (paragraph 1.3), and the COREMAs, which will oversee and control compliance with the environmental provisions included in the respective environmental qualification resolution for the facility, as set forth in SEIA regulations. There are currently three regions that meet these requirements. The targets will be seven and five for the first two performance-based disbursements of the program.

**C. Eligible financing**

- 2.8 To meet the program's targets, the borrower will incur expenditures in the following categories of financing:
- 1. Support for local management and oversight**
- 2.9 For the regional governments and municipalities, the expenditures will include diagnostic assessments and project profiles; procurement of land for sanitary landfills; regional or municipal solid waste management plans; institutional, administrative, technical, operational, and financial capacity-building;

implementation of minimization strategies; dissemination and public education campaigns; management, monitoring, and evaluation of solid waste projects; implementation of social inclusion plans for persons affected and displaced by the closure or rehabilitation of sanitary landfills; development and implementation of carbon finance plans through the use of gases at the final disposal sites. For the sanitary and environmental authorities, the expenditures will be aimed at strengthening their capacity to oversee and enforce compliance with the sanitary and environmental provisions established in national legislation.

## **2. Transport, minimization, and final disposal of residential solid waste**

- 2.10 The expenditures in this category will cover studies, designs, equipment, and works for the transport, transfer, minimization, and final disposal of residential solid waste in environment-friendly sanitary landfills, as well as the rehabilitation, closure, and recovery of liabilities, and subsequent monitoring of facilities that lack the applicable environmental and sanitary authorizations.

## **3. Program administration and supervision**

- 2.11 The expenditures under this category will cover the execution, administration, and supervision of the program; SUBDERE's costs related to the general studies and projects to support the program, including the general studies for evaluation, production of sector guidelines and manuals; and operation of the monitoring system and performance evaluations.

## **D. Financing and cost**

- 2.12 The proposed program will be financed using a performance-driven loan (PDL), in accordance with the policy set out in document GN-2278-3. The total cost of the program is US\$200 million. The Bank will finance US\$100 million (50%) with resources from the Single Currency Facility of Ordinary Capital, while the local counterpart, equivalent to US\$100 million (50%), will be provided by the Republic of Chile. The cost plan by category of financing is presented in the following table:

**Cost by category of financing**  
(millions of U.S. dollars)

<b>Category</b>	<b>Cost</b>	<b>%</b>
1. Support for local management and oversight	35.0	17.5
2. Transport, minimization, and final disposal of residential solid waste	140.0	70.0
3. Administration and supervision	10.0	5.0
4. Financial costs	15.0	7.5
<b>TOTAL</b>	<b>200.0</b>	<b>100.0</b>

### III. PROGRAM EXECUTION

#### A. Program administration and execution

- 3.1 SUBDERE will be the program's executing agency. Through its Regional Investment Management Department, this unit will be responsible for the program's overall administration and coordination. To fulfill these responsibilities, SUBDERE will use its own procedures for activities scheduling, fiduciary management, and financial-accounting management, which are considered satisfactory according to the ICAS analysis conducted for operation 1828/OC-CH.
- 3.2 Regional governments and municipalities throughout the country will submit projects providing joint solutions to the problem of residential solid waste management through municipal associations or corporations, or individual solutions, in the case of geographically isolated municipios. The applications for projects in the *Support for local management and oversight* category will be 100% financed through SUBDERE's Concurrent Actions Line. These applications must be accompanied by the following documentation: (i) standard form, terms of reference, and itemized budget; (ii) a certification signed by the president of the Association of Municipalities; and (iii) a letter of support for the project from the Regional Executive Secretariat for Solid Waste. For land purchases, the applications must also be accompanied by the applicable tax assessment, the contract of sale, the commercial or bank assessment of the property, and a letter from the Sanitation Authority guaranteeing its conditions. SUBDERE will evaluate the viability of these applications.
- 3.3 Applications for studies and projects by regional governments and municipalities in the *Transport, final disposal, and dump closure* category, will be 50% cofinanced by the requesting regional government, with the balance financed using FNDR resources. The Ministry of Planning (MIDEPLAN) will analyze the technical and economic feasibility of the studies and projects in this category. The information requirements will depend on the type and stage of investment to be made. In the case of sanitary landfill and transfer station construction, improvement, expansion, and/or replacement projects, MIDEPLAN will follow the guidelines of the National Investment System (SNI), which require submission of the following information: (i) studies conducted according to the methodology for the preparation and evaluation of residential and assimilable solid waste projects, which requires a comparative analysis of alternative costs to identify a least-cost solution, consistent with the Bank's best practices for this type of project (paragraph 4.4); (ii) the Municipality Association Agreement, in the case of intermunicipal projects, or a Municipal Council Resolution, for individual projects, establishing the corresponding commitment for the operation and maintenance of the works and a financing plan for associated costs; and (iii) the Environmental Qualification Resolution issued by the respective COREMA, ensuring compliance with Chilean environmental legislation. For purposes of the program, participating municipalities will also be required to submit evidence of having initiated training activities and/or

technical assistance on integrated solid waste management under the program. MIDEPLAN will issue an unconditional technical recommendation for eligible projects.

- 3.4 Once projects are declared eligible and their financing has been approved, the regional governments and municipalities will proceed with the relevant procurement, payments to contractors, and technical supervision of the works under their jurisdiction. Upon completion of the works, operation and maintenance, future investments for opening new cells in sanitary landfills, and final closure will be the responsibility of the municipality in whose jurisdiction the works are located. The costs associated with these tasks will be financed with own resources or through third parties. For intermunicipal works, the municipal association agreements will establish the obligation of the participating municipalities to dispose of their solid waste in a single sanitary landfill and make the payments due to the operator responsible for its operation and maintenance. These payments will be made based on an agreed rate per ton equivalent to the actual cost of operating, maintaining, making new investments in, and closing the landfill, according to the corresponding financing plan that will accompany each agreement. In the case of individual works, the financing plan to accompany the respective Municipal Council Resolution will propose the mechanisms for generating revenues to cover these costs, to be implemented by the operator. The Regional Sanitation Authorities will oversee and enforce compliance with the sanitary provisions established in the Regulations on Basic Safety and Sanitary Conditions in Sanitary Landfills. **Submission by SUBDERE of evidence that the Sanitary Landfill Regulations have entered into force will be a condition precedent to the first performance-based disbursement.**

- 3.5 SUBDERE has prepared an operations manual incorporating the program's specific procedures. **Submission by SUBDERE of evidence that the program's Operations Manual has entered into force will be a condition precedent to the disbursement of the advance.**

**B. Disbursement schedule**

- 3.6 The program's disbursement period will be five years. According to the tentative net disbursement plan presented below, an initial disbursement will be followed by three subsequent performance-based disbursements. The following table presents the expected net disbursement schedule, including the discount of the initial disbursement.

**Net disbursement schedule**  
(millions of U.S. dollars)

	<b>Initial disbursement</b>	<b>First performance- based disbursement</b>	<b>Second performance- based disbursement</b>	<b>Third performance- based disbursement</b>	<b>Total</b>
<b>IDB</b>	20.0	20.0	30.0	30.0	100.0
<b>%</b>	20.0	20.0	30.0	30.0	100.0

- 3.7 The program will have an advance equivalent to 20% of the amount of the financing, and three performance-based disbursements. The advance will be released upon entry into effect of the loan contract and after the contractual conditions precedent to the first disbursement are met (paragraph 3.15). This initial advance will be gradually discounted from the three subsequent disbursements.
- 3.8 The authorization to make the performance-based disbursements will be linked to achievement of the targets agreed upon in the program's Results Matrix (Annex I) and subsequent verification by the Bank of the eligibility of the expenditures required to meet these targets. The Bank will validate verification that these targets have been met based on a favorable performance evaluation report to be issued by an independent consulting firm (paragraph 3.15). The Bank will also validate verification of expenditures incurred by the borrower based on favorable audit reports issued by the Comptroller General of the Republic. In general terms, the first disbursement of the performance-driven loan is expected to be released beginning in the third year of program execution.

### **C. Procurement**

- 3.9 In accordance with the Bank's policies for performance-driven loans (documents GN-2278-3 and GN-2278-4), national procedures will apply to the procurement of goods and services with program resources and should be consistent with principles of competition, economy, transparency, equity, publicity, and due process and generally compatible with Bank policies on bidding processes. The only exception will be the hiring of independent consultants for performance evaluations (paragraph 3.15), which will be done using the policies for selection and contracting of consultants financed by the IDB of July 2006 (document GN-2350-7).
- 3.10 The Bank has the analysis of the public financial administration and procurement systems, including a review of *ChileCompra*. These diagnostic assessments of capacity were completed by the IDB (Country Financial Accountability Assessment

- CFAA<sup>2</sup>), and the World Bank (Country Procurement Assessment Report - CPAR<sup>3</sup>). These analyses served to confirm that the standards and procedures set out in Chilean legislation for the procurement of works, goods, and services related to the activities to be financed with resources from this operation are, in general terms, consistent with the principles established in policy documents GN-2278-3 of 14 April 2006 and GN-2278-4 of 1 May 2006. These documents establish the concept and conditions for use of the IDB's new financial instrument: performance-driven loans or PDLs. At the Chilean government's request, the IDB and the World Bank are updating the CPAR to include an analysis of the subnational governments' procurement of works, goods, and services. The findings of this analysis, expected to be completed by December 2007 or January 2008, will help identify, early in the execution of this operation, weaknesses of subnational governments in applying national legislation on procurement, while observing the Bank's procurement policies. In the event of weaknesses, the report will make any applicable recommendations and the necessary measures will be taken to correct such situations. Nevertheless, until the CPAR is updated and its recommendations begin to be implemented, the Bank's Country Office in Chile should identify several national consultants specializing in different areas who would be available to assist the subnational governments in strengthening their procurement management.

- 3.11 In addition, the fiduciary risk analysis done by the Bank during preparation of the pilot program to simplify operations supervision procedures in Chile and make them more flexible (CC-6066), approved on 10 January 2006, found that the fiduciary risk related to procurement in Chile is low.
- 3.12 Based on the foregoing, the use of Chilean legislation for the procurement of works, goods, and services related to the activities to be financed with resources from this operation is considered appropriate.

#### **D. Recognition of expenditures**

- 3.13 The executing agency asked the Bank to retroactively recognize expenditures incurred for up to US\$5 million, in activities related to the pursuit of the program's outcomes. The Bank may recognize expenses incurred during program preparation

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<sup>2</sup> The Country Financial Accountability Assessment (CFAA), completed jointly with the World Bank and published by the latter in 2005 (document No. 32630-CL), concluded that the level of financial administration risk is low. This conclusion reflects the satisfactory level of the Chilean public sector's institutional capacity and financial management, and the progress made by the country in recent years in raising the level of public sector management to the performance standards observed in more developed countries.

<sup>3</sup> The Country Procurement Assessment Report (CPAR), completed and published by the World Bank in 2004 (document No. 28914-CL), concluded, in general, that Chile has adopted a sound, consistent procurement strategy and a plan of action that is an example to be followed. The strength of the strategy is that it recognizes deficiencies, collects lessons learned, and has the strength of commitment at the highest level of government, as well as a competent team responsible for its implementation.

that will be covered with the first performance-based disbursement, in accordance with the related provisions set out in paragraphs 3.6 and 3.7.

## **E. Monitoring and evaluation**

### **1. Monitoring system**

- 3.14 SUBDERE will have a performance measurement and monitoring system, which will use information provided by various entities in the country, depending on the indicator in the Preliminary Results Matrix (Annex I). CONAMA's National Solid Waste Information System will allow verification of the volumes of solid waste at the national level placed in sanitary landfills (Outcome #1); Regional Council resolutions will make it possible to factor in the number of regions that have regional management plans (Outcome #2); the number of final disposal facilities lacking the respective authorizations that are closed will be verified by the respective certificates of closure of works (Outcome #3); budget information provided by each municipality to SUBDERE's National Municipal Information System will enable verification of improvements in municipal financial management of solid waste activities (Outcome #4); and the number of regions with final disposal facilities subject to oversight and control will be verified using oversight certificates from the respective Regional Sanitation Authorities (Outcome #5).

### **2. Performance evaluation**

- 3.15 Together with the disbursement request for each performance-based disbursement, with the exception of the initial advance, SUBDERE will submit a performance evaluation report on achievement of the respective targets in the program's Results Matrix (Annex I). SUBDERE will contract the services of independent consultants to carry out this evaluation. The selected consultants will have proven experience in the technical, economic, financial, and environmental evaluation of projects, particularly in the sanitation area. The costs of the performance evaluation are included as eligible program expenditures. **The contracting of the consulting services for the performance evaluation, in accordance with the terms agreed upon with the Bank, will be a special condition precedent to the first disbursement of the performance-driven loan.**
- 3.16 The specific activities to be undertaken as part of the performance evaluation include: (i) examining and evaluating the quality of the data from SUBDERE's monitoring system and reported to the Bank by the executing agency in its disbursement request for each performance-based disbursement; this will involve analyzing the accuracy, reliability, pertinence, validity, and credibility of the data used to express the outcomes (see proposed terms of reference: [1138855](#)); (ii) determining the level of achievement of the specific targets established (see Results Matrix in Annex I); (iii) verifying that the expenditures submitted by the executing agency for reimbursement are consistent with those comprising the list of eligible program expenditures (see the list of eligible expenditures: paragraphs 2.8

to 2.11) and (iv) making a recommendation to the Bank on whether the disbursement should be made.

- 3.17 The performance evaluation reports, including statistical support information and documentation, will remain available for an ex post evaluation, if the government or the Bank should decide to conduct one after completion of the program.

**F. Financial audit**

- 3.18 The financial audit will be performed by the Comptroller General of the Republic within the framework of its legal authority and in accordance with Bank rules and procedures for such purposes. As part of its activities, the Comptroller General of the Republic will review the documentation in support of disbursements on an ex post basis and by sampling.

**G. Currency**

- 3.19 The Chilean government has requested use of the Local Currency Facility (LCF). The Integrated Solid Waste Management Program (CH-L1026) will be implemented using resources from the Single Currency Facility in United States dollars from the Bank's Ordinary Capital, and will be subject to the Operational Framework for Lending in Local Currency (document GN-2365-2). To have the opportunity to minimize the exchange risk, under the provisions of the LCF the Chilean government will be entitled to convert the disbursements and outstanding balances into Chilean pesos. In order to increase the borrower's financing options, conversion of disbursements into local currency will be subject to two financial conditions in addition to those established in the LCF: (i) more flexible repayment profiles for disbursements in local currency; and (ii) pricing based on the Bank's actual financing costs in the event that the Bank sources its financing by issuing bonds. These conditions, together with the waiver with respect to the application of the Bank's funding in local currency interruption clause, are detailed and justified in Annex II and its appendices.

## **IV. VIABILITY AND RISKS**

**A. Institutional viability**

- 4.1 For almost 20 years, SUBDERE has successfully executed four successive stages of programs with the Bank. The preparation of the CCLIP for the Subnational Governance Support Program (CH-L1018) included an institutional capacity assessment (ICAS), which concluded that SUBDERE is a competent executing agency in multiple sectors. The assessment classified SUBDERE as a low-risk executing agency and indicated that despite having areas that could be improved, SUBDERE was capable of assuming the functions necessary to execute that operation. The scope of the first loan granted under the CCLIP (CH-L1018, Program to Support Subnational Governance in Chile) includes actions to strengthen the areas that require improvement, as indicated in the ICAS. The original ICAS was expanded to consider the requirements of the Rural Sanitation

Program (CH-L1025). It shows that SUBDERE has the institutional capacity to execute the program. It is worth noting that the same executing agency that is executing the sanitary program will execute this operation.

- 4.2 The analysis conducted shows that the program is highly viable from an institutional point of view. First, the assessments completed for prior stages, both by external consultants (primarily midterm and final evaluation reports) and internal Bank consultants (draft Project Completion Report) highlight SUBDERE's high capacity for effective execution and the existence of adequate management controls. Second, the ICAS assessment considered the achievement of the project's development objectives as "very likely," the system's highest grade. Moreover, the ICAS completed for the CCLIP concluded that SUBDERE's institutional capacity is more than sufficient to execute any type of operation with the Bank, as demonstrated in each and every one of the programs executed to date.
- 4.3 Lastly, SUBDERE has a team of professionals (a coordinator, two engineers, and an environmentalist) to execute the Integrated Solid Waste Management Program. The team's capacity to fulfill this mission has been determined through analysis of the execution of programs of a similar scope (see paragraphs 1.20 and 1.21). SUBDERE has a Regional Control Unit in each provincial capital that includes a technical team responsible for coordinating projects in the respective region. The country's regional governments and municipalities have completed projects with support from SUBDERE, which has experience in all the activities necessary to adapt projects to the program's requirements as well as those of MIDEPLAN and CONAMA. In cases requiring assistance in a specific area, usually of a technical or legal nature, SUBDERE provides funds to hire the necessary specialists. The program provides resources to support local management and oversight (see paragraphs 2.9 and 2.11).

## **B. Socioeconomic viability**

- 4.4 The assessment of the economic viability of the program's residential solid waste transport, treatment, and final disposal projects will be conducted using the SNI methodology for the preparation and assessment of residential and assimilable solid waste projects. This methodology establishes guidelines for selecting the optimum location and size of facilities (sanitary landfills, transfer stations) based on a least-cost analysis. This makes it possible to select the alternative that minimizes the discounted annual flow (present value) of the costs of investment, operation, maintenance, and transport from among a set of alternatives that meet adequate sanitary, environmental, and engineering standards. The guidelines outline the calculation of current and projected demand for solid waste in a given area, the rate for final disposal service, as well as the size, life cycle, and private and social costs of each alternative. In order to ensure that the alternatives considered in the analysis meet technical, sanitary, and environmental standards, the methodology defines relevant variables and parameters in these areas and makes reference to the conditions established in the Sanitary Landfill Regulations and in the Environmental Impact Assessment System. In this regard, the methodology for

preparing and assessing residential and assimilable solid waste projects is consistent with the Bank's best practices for similar projects in other countries in the region.<sup>4</sup>

- 4.5 In order to improve the service's cost-effectiveness, the economic cost per ton of transport and final disposal for these landfills must be less than US\$22 (equivalent to Ch\$11,000 (May 2006 pesos), or 0.8 Chilean development units), the average unit value between the top of the range established by CONAMA for group solutions and the minimum achieved for individual solutions. The economic cost of transport and final disposal for a sanitary landfill is the present value of the flow of the costs of investment, operation, maintenance, transport, monitoring, and closure of the least-cost solution in the corresponding feasibility study, which must be designed according to the MIDEPLAN National Investment System's methodology for preparing and evaluating residential and assimilable solid waste projects.
- 4.6 For projects involving the closing of dumps that do not meet sanitary and environmental standards, the assessment will be completed using a MIDEPLAN methodology for preparing and assessing residential and assimilable solid waste dump closure projects. In order to ensure the cost-effectiveness of closure projects, the solution involving the least economic cost will be selected.

### **C. Socioenvironmental viability**

- 4.7 The program will have positive environmental impacts by providing a solution to the problems generated by the final disposal of growing volumes of residential solid waste in dumps that do not meet minimum sanitary and environmental conditions for operation and have been having a negative impact on the health and natural environment of neighboring communities (paragraph 1.3). The program will also generate positive environmental externalities by reducing the number of sites in the country that lack the respective sanitary and environmental authorizations.
- 4.8 The Environmental Impact Assessment System (SEIA) incorporates the environmental component in the design and execution of projects, ensuring that they are environmentally sustainable and certifying that they meet all applicable environmental requirements. The SEIA regulations establish that residential solid waste and sanitary landfill projects must be subject to this system and indicates in which cases an environmental impact assessment (EIA) or an Environmental Impact Statement (EIS) is required. These regulations also establish guidelines for community participation in the environmental impact assessment process. The general considerations for sanitary landfill and transfer station construction, improvement, expansion, and/or replacement projects established by the National Investment System, which is responsible for project evaluation, establish the environmental information requirements for public projects under the SEIA, as well as the requirement for these projects to have been issued an Environmental

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<sup>4</sup> For an economic analysis methodology for final solid waste disposal alternatives used by the Bank, see H. Malarín and J. V. Vaughan, *An Approach to the Economic Analysis of Solid Waste Disposal Alternatives*, Technical Study No. ENV-119, Environment Division, IDB, Dec. 1997.

- Qualification Resolution by the respective Regional Environmental Commission for the corresponding EIA or EIS. The analysis of operation 1828/OC-CH concluded that the SEIA operated satisfactorily in the environmental qualification of projects financed with IDB resources through the FNDR and that its criteria and operation are consistent with Bank environmental regulations and requirements.
- 4.9 During preparation of the proposed program, the national environmental management systems were also analyzed to verify the level of equivalence and acceptance between the country's own environmental safeguards for the solid waste sector and the specific requirements of the Bank's policies. This analysis focused on comparing the set of laws, rules, standards, and procedures for oversight and control applied in Chile, as part of the environmental management of residential solid waste management projects, and the requirements of policies OP-703 (Environment and Safeguards Compliance) and OP-710 (Involuntary Resettlement). In particular, it studied the level of equivalence and acceptance of the SEIA regulations, specific sector rules, and the respective authorization processes, as well as the applicable institutional framework, including the level of public consultation. It also considered whether the Ministry of Health's new Regulations on Basic Safety and Sanitary Conditions in Sanitary Landfills were consistent with the pertinent policy guidelines.
- 4.10 The analysis found that the current systems were consistent with the Bank's Environment and Safeguards Compliance Policy (OP-703) as a whole. Since the program's financing modality is a performance-driven loan, the country's socioenvironmental safeguard system will be used. The country's environmental management system provides equivalent and acceptable mechanisms and requirements with respect to the directives applicable to this program. The weakest aspect of the regulatory framework involves the formal mechanisms for ensuring full participation by the affected and/or beneficiary community over the project's life cycle. Although the practices adopted by CONAMA since 2004 aim for 100% of complex projects requiring SEIA to have broader citizen participation programs than those established in the SEIA regulations, these practices have yet to be standardized. The program's Operations Manual (see paragraph 3.5) includes specifications for ensuring the early participation of stakeholder communities in the analysis of all projects to be financed, complementing the requirements established in the SEIA regulations.
- 4.11 With respect to social considerations, CONAMA applies the World Bank's guidelines in cases of impacts due to resettlements, which require broad compensation plans for affected families. It also has a specific, detailed manual of criteria for evaluating social and cultural changes of other types, within the framework of the EIA processes. The country's experience and the already completed diagnostic assessments indicate that the number of families living in or on the periphery of the dumps do not constitute large communities. Since 2004, in the specific, small-scale cases of dump closures, municipalities have provided solutions to affected families for their resettlement and economic, social, and

psychological reintegration through the *Chile Solidario* program or other available social safety net systems. There are no standardized mechanisms, however, to ensure solutions for families living in the dumps, particularly the medium-sized and large ones, slated for closure. Accordingly, the program's Operations Manual includes instructions for the preparation and execution of closure or rehabilitation projects for solid waste final disposal facilities (dumps), with specifications—consistent with the principles of the Bank's Involuntary Resettlement policy (OP-710)—for the preparation and implementation of resettlement and social inclusion plans for low-income individuals or families living in or dependent on the operation of these facilities.

- 4.12 In addition, the program will support the development and implementation of carbon finance plans through the use of gases from the final disposal sites, since the sanitary landfill regulations and the SEIA regulations require projects to have capture and management devices for the gases they generate. Lastly, among the outcome commitments to be met, the program calls for strengthening the solid waste treatment plant oversight agencies to verify compliance with environmental and sanitary standards, as well as the quality of the service provided.

**D. Benefits and beneficiaries**

- 4.13 The program will benefit the populations of participating municipios through the improvement of the environmental and sanitary quality of their surroundings resulting from the improved management of their residential solid waste, including its disposal in sanitary landfills that meet appropriate environmental and sanitary standards, the closure of dumps that currently represent an ongoing threat to public health and the environment, and better oversight and control thereof. The program's promotion of municipio association-building at the regional level will also allow these populations to benefit from a higher quality service that is more efficient, with lower costs than the current individual solutions in each municipio.

**E. PTI/SEQ**

- 4.14 The proposed program qualifies as a social equity enhancing project, as described in the indicative targets mandated by the Bank's Eighth Replenishment (document AB-1704). However, it does not qualify as a poverty-targeted investment.

**F. Risks**

- 4.15 *Association of municipalities.* Chile lacks a significant tradition of coordination and integration among adjacent municipios to generate economies of scale in residential solid waste management, particularly for final disposal. Without intermunicipal associations in the regions and least-cost solutions to the problems of final disposal and transport for adjacent municipios, the potential for implementing economically viable sanitary landfill projects is reduced. In order to minimize this risk during execution, SUBDERE will work closely with the regional governments and municipalities to introduce the concepts of regional planning into project design. In this regard, regional integrated solid waste management plans are promoted by the

proposed program and their approval by the relevant authorities is an expected outcome of the program. Moreover, during execution SUBDERE will take into account the lessons learned from the experience with the Integrated Solid Waste Management Program in the Los Lagos Region, in order to promote and demonstrate the economic and environmental advantages of municipal cooperative arrangements.

**CHILE**  
**INTEGRATED SOLID WASTE MANAGEMENT PROGRAM (CH-L1026)**  
**OUTCOMES MATRIX**

Outcomes	Performance indicators	Baseline	Targets		
			First performance-based disbursement	Second performance-based disbursement	Third performance-based disbursement
To increase the percentage of residential solid waste received for final disposal in sanitary and environmentally appropriate facilities.	<u>Outcome #1</u> : Tons of residential solid waste nationwide treated and deposited in sanitary landfills with sanitary and environmental authorizations, implemented by the program, meeting the standards of the Regulations on Basic Safety and Sanitary Conditions in Sanitary Landfills, and whose economic cost per ton for transport and final disposal is less than US\$22 (Ch\$11,000 in May 2006 pesos or 0.8 Chilean development units).	3.2 million tons (equivalent to 60% of the total amount generated)	300,000 tons  Benchmark total = 3.5 million tons (equivalent to 66% of the total amount generated)	500,000 tons  Benchmark total = 4.0 million tons (equivalent to 75% of the total amount generated)	600,000 tons  Benchmark total = 4.6 million tons (equivalent to 88% of the total amount generated)
To close final disposal facilities that do not have sanitary or environmental authorization.	<u>Outcome #2</u> : Number of final disposal facilities without sanitary or environmental authorization closed by the program in accordance with an approved closure plan in execution, with recovered liabilities, if applicable, and with an environmental monitoring plan in operation, as established in the applicable regulations.	0 facilities closed		30	30 Total = 60
To improve regional planning capacity for integrated residential solid waste management.	<u>Outcome #3</u> : Number of regions with an approved regional integrated solid waste management plan.	0 regions		5	15 Additional = 10

Outcomes	Performance indicators	Baseline	Targets		
			First performance-based disbursement	Second performance-based disbursement	Third performance-based disbursement
To improve the financial management of the municipalities participating in the residential solid waste management program.	<u>Outcome #4</u> : Percentage point increase in the coverage of real garbage collection costs covered by garbage collection fees in each of the municipios or associations of municipios participating in the program.	Percentage calculated by SUBDERE's Municipal Information Unit for 2006			5 percentage points
To strengthen the government's capacity for residential solid waste sanitary and environmental oversight and control.	<u>Outcome #5</u> : The number of regions where final disposal facilities are subject to oversight and control by the relevant regional sanitation authorities in accordance with current environmental and sanitation legislation	3 regions	10 Additional = 7	15 Additional = 5	15 Additional: 0

DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK

PROPOSED RESOLUTION DE-\_\_\_/07

Chile. Individual Loan \_\_\_/OC-CH to the Republic of Chile  
Utilization of the resources of the Conditional Credit Line for  
Investment Projects established by Resolution DE-170/06  
Comprehensive Solid Waste Management

The Board of Executive Directors

RESOLVES:

That the President of the Bank, or such representative as he shall designate, is authorized, in the name and on behalf of the Bank, to utilize the resources of the Conditional Credit Line for Investment Projects approved pursuant to Resolution DE-170/06, by entering into such contract or contracts as may be necessary with the Republic of Chile, as Borrower, for the purpose of granting financing for an individual operation for cooperating in the execution of a program to support comprehensive solid waste management. Such financing will be in the amount of up to US\$100,000,000, from the resources of the Single Currency Facility of the Bank's Ordinary Capital, and will be subject to the Financial Terms and Conditions and the Special Contractual Conditions of the Project Summary of the Loan Proposal.