



RESTRUCTURING PAPER  
ON A  
PROPOSED PROJECT RESTRUCTURING  
OF  
CL TECHNICAL ASSISTANCE FOR GEOTHERMAL DEVELOPMENT IN CHILE  
APPROVED ON OCTOBER 12, 2016  
TO  
CHILEAN INTERNATIONAL COOPERATION AGENCY (AGCI)

ENERGY and EXTRACTIVES

LATIN AMERICA AND CARIBBEAN

Regional Vice President:	J. Humberto Lopez (acting)
Country Director:	Marianne Fay
Regional Infrastructure Director:	Franz R. Drees-Gross
Practice Manager/Manager:	Stephanie Gil
Task Team Leader(s):	Laura Wendell Berman, Patricia Marcos Huidobro



## ABBREVIATIONS AND ACRONYMS

AGCI	Chilean International Cooperation Agency (AGCI)
AGCID	Agencia Chilena de Cooperación Internacional para el Desarrollo ( <i>Chilean International Cooperation Agency for Development</i> )
BETF	Bank-executed Trust Fund
ESCOs	Energy Service Companies
ESF	Environmental and Social Framework
FM	Financial Management
ME	Ministry of Energy
IFC	International Finance Corporation
NCRE	Non-conventional renewable energy generation
PDO	Project Development Objective
PIU	Project Implementation Unit
SEC	Superintendence of Electricity and Fuels

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## BASIC DATA

### Product Information

Project ID P152820	Financing Instrument Investment Project Financing
Original EA Category Partial Assessment (B)	Current EA Category Partial Assessment (B)
Approval Date 12-Oct-2016	Current Closing Date 30-Jun-2020

### Organizations

Borrower Chilean International Cooperation Agency for Development (AGCID)	Responsible Agency Ministry of Energy
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### Financing (in USD Million)

## SUMMARY

Total Project Cost	0
Total Financing	0
Financing Gap	0

## DETAILS

### Project Development Objective (PDO)

Original PDO

Assist the Government of Chile to improve geothermal energy market conditions by removing key barriers, leading to sustainable investments in this sector.



Summary Status of Financing

TF	Approval	Signing	Effectiveness	Closing	Net		
					Commitment	Disbursed	Undisbursed
TF-A3726	12-Oct-2016	08-Nov-2016	24-Apr-2017	30-Jun-2020	1.78	.98	.80

Policy Waiver(s)

Does this restructuring trigger the need for any policy waiver(s)?

No

I. PROJECT STATUS AND RATIONALE FOR RESTRUCTURING

A. Project Status

1. The project was approved on October 12, 2016 and the project closing date is June 30, 2020. The Project Development Objective is to assist the Government of Chile to improve geothermal energy market conditions by removing key barriers, leading to sustainable investments in this sector. Project implementation progress has been steady over the past fiscal year with a number of activities under each component completed and underway.

2. During the last project supervision mission, the team confirmed that all the necessary Project Implementation Unit (PIU) technical, fiduciary, and safeguards professionals were in place, and the project was moving ahead with the preparation of Terms of References (ToRs), contracting of consultancies, and implementation of key project activities required to reach the project development objectives. The team has also held bi-weekly coordination meetings with the project counterparts since the last mission to closely supervise and work to expedite project implementation. Annex 1 provides a full list of all completed and ongoing project activities to date. While good progress has been made, there is still a substantial amount of work to be completed before the project closes on June 30, 2020. The CL Technical Assistance for Geothermal Development in Chile (P152820) is a US\$3.5 million grant, and this restructuring corresponds to the recipient-executed portion of US\$1.78 million. The remaining amount of US\$1.23 million is a Bank executed trust-fund (BETF) for which a separate one-year closing date extension (with no changes in the overall project budget or costs) will be requested through a separate extension process.

3. Information on achievements to date and status of each component is provided below:

- (a) **Component 1. Improve policy framework and strengthen management capabilities to help mobilize investments in geothermal energy.** Under this component, critical just-in-time support has been provided to assist the Government of Chile in proposing modifications to its geothermal concessions Law 19657, which was successfully submitted to Congress in April 2019. The modification of the geothermal concessions law is a crucial step to removing regulatory barriers to the development of low-enthalpy geothermal energy in Chile. Support to the Ministry of Energy for creating an online platform to manage geothermal concessions in collaboration with the Superintendence of Electricity and Fuels (SEC) is also currently being provided. In addition, significant stakeholder engagement to raise awareness regarding geothermal development and to account for environmental and social considerations has been undertaken, including 15 capacity building/consultative workshops with indigenous populations in areas where geothermal exploitation concessions have been requested, three technological tours with leaders from indigenous communities to see examples of geothermal installations in operation, and development of informative materials (brochures and videos) used in the public



consultation and stakeholder awareness activities. A Sector Level Social and Environmental Assessment is also currently being implemented to undertake a gaps analysis and recommend measures to better align the Chilean framework with international standards, such as the WB Environmental and Social Framework (ESF) and International Finance Corporation (IFC) Performance Standards.

Despite good progress being made under this component, there are still various activities pending implementation, including: i) study on proposed safety norms for geothermal direct uses projects, ii) geothermal direct uses applications/engineering study for indigenous communities; iii) consultation/workshops with three indigenous communities and one additional geothermal technological tour with indigenous leaders, iv) an assessment to review and recommend measures to optimize Chile's geothermal concession management framework, and v) a study to analyze ways to modernize Chile's power market and increase system flexibility to enable increased integration of new technologies (wind, solar, etc.), satisfy current and future energy security needs, and provide a stable pricing signal. It is expected that the consultations/workshops and technological tour with indigenous leaders can be completed before project closure. Completion of the terms of reference and contracting of the remaining studies is planned during the second half of FY20, but implementation is expected to extend into FY21. Annex three of this Restructuring Paper contains the updated implementation schedule indicating the expected date for finalization of the Terms of Reference, the contracting, and implementation of these activities.

**(b) Component 2. Enhancing market conditions for promoting sustainable development of the geothermal energy sector.**

A number of key activities have been completed and several studies are underway under this component. This includes supporting the creation and implementation of the Geothermal Roundtable, a joint public-private exercise that brought together more than 35 entities from the geothermal industry in Chile, including public institutions, academia, and private developers. The Roundtable discussions enabled analyzing the status of geothermal energy in Chile and the main challenges developers face hindering further development. A total of 13 workshops took place, starting in December 2016 and finalizing in December 2017, and analytical work was also conducted to inform these discussions. The final report with conclusions and recommendations from the Geothermal Roundtable was published in July 2018. The Project is now supporting implementation of various recommendations stemming from the Roundtable discussions report. In 2018 and 2019, various studies were completed including: i) Technical and economic feasibility analysis of the installation of geothermal heat pumps for self-consumption in agricultural facilities in the Regions of Aysen and Magallanes, and ii) Dynamic Simulation Study of the National Stadium Pool for the application of a geothermal heat pump. An additional assessment on the potential to use Energy Service Companies (ESCOs) to deploy geothermal heat pumps in the National Stadium Complex is also currently being undertaken. Furthermore, an "Assessment of District Heating Project for the Cities of Coyhaique and Puerto Williams", two of the most polluted cities in Chile due to significant woodfuel use for heating, was completed in October 2019.

Although good progress has been made, there are still several activities under this component pending implementation including: i) an assessment of geothermal thermal potential for population centers in Southern Chile, particularly those with adverse climatic conditions, where geothermal heating applications may be viable, ii) development of a micro-documentary of successful cases of direct uses of geothermal for different sectors, and iii) construction of an online tool for calculating the estimated financial returns from geothermal heat pump projects. Completion of the terms of reference and contracting of these remaining studies is planned during the second half of FY20, but implementation is expected to extend into FY21. Annex three of this Restructuring Paper contains the updated implementation schedule indicating the expected date for finalization of the Terms of Reference, the contracting, and implementation of these activities.

4. Disbursement: As of January 23, 2020, US\$ 976,958 of the funds have been disbursed (55 percent of the US\$1.78 million recipient-executed Clean Technology Fund grant amount).



5. Relevant project fiduciary and safeguards aspects: As reported in the Implementation Status and Results Report (ISR) of May 31, 2019,<sup>1</sup> Progress towards achievement of the Project Development Objective (PDO) is rated as Satisfactory, Overall Implementation Progress as Moderately Satisfactory, and the Overall Safeguards Rating is also Satisfactory. All safeguards requirements have been complied with, and there have been no deviations from safeguards requirements during implementation. In addition, based on the last Financial Management (FM) supervision mission in June 2019, the FM performance rating is also Satisfactory as the arrangements for financial management are considered adequate, and the interim financial reports are being submitted on time. There are also no qualified or overdue audit reports. In February 2020, the Procurement rating for the Project was also rated Satisfactory as the client has adequate arrangements and capacity in place.

## **B. Rationale for Restructuring**

6. While project implementation is moving ahead, the pace of implementation has been slower than originally anticipated given changes in government administration in March 2018, evolving Chilean energy market conditions, and the ongoing social unrest in the country which started in October 2019 in protest to increases in the costs of public services stagnant wages, low pensions and among other concerns. Project implementation was originally planned to start in October 2016, however effectiveness was not reached until April 2017 given the need for the grant package to be reviewed and approved by the Contraloria de la Republica prior to issuance of the required legal opinions. Afterwards, some project activities were also delayed due a change in government and key government authorities, including the Minister of Energy in June 2019. Furthermore, the Chilean energy sector has changed drastically since project approval, with the introduction of generation auctions and transmission reforms that have resulted in a significant increase of non-conventional renewable energy generation (NCRE) sources and drastic reductions in electricity market prices. This has led to the need for the Government to re-prioritize and redefine the scope of various project activities. Despite these early challenges, implementation progress has moved ahead, with many project activities initiated and undertaken. However, the recent social unrest in the country has again slowed down the pace of implementation as it has caused government office closures on numerous occasions and a temporary halt to the field work needed to complete the social consultations as well as the geothermal resource assessment work. The confluence of these factors has resulted in overall implementation progress delays, and it is expected that the remaining project implementation timeframe is insufficient to fully meet the PDO of assisting the Government of Chile to improve geothermal energy market conditions by removing key barriers, leading to sustainable investments in this sector.

7. Consequently, and as per the attached Government request, a 12-month extension of the project closing date from June 30, 2020 to June 30, 2021 is being proposed through this Restructuring to allow the Agencia Chilena de Cooperacion Internacional para el Desarrollo (AGCID)<sup>2</sup> and Ministry of Energy (ME) sufficient time to successfully complete the Project. Based on the historical implementation progress to date and PIU projections, it is expected that achievement of the project development objectives and full disbursements should be feasible within this additional timeframe. No additional financing would be required as there is still enough project funding to cover PIU related implementation costs for this additional time period and the ME will continue providing counterpart funding<sup>3</sup> to cover the costs of its staff working on the Project.

8. To speed-up the implementation progress, the World Bank and the Project Implementing Agencies (AGCID) and the Ministry of Energy) have already established a protocol of bi-weekly calls and agreed to an Action Plan for delivery of remaining project activities (see Annex 2 for Action Plan). Furthermore, based on the recommendation of the World Bank during the last implementation supervision mission from July 16-23, 2019, the Ministry of Energy is considering hiring an additional professional to support the project focal point and the technical-administrative coordinator to further accelerate the execution of the remaining project activities.

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<sup>1</sup> Please note for small recipient executed grants, the Implementation Status Reporting is done once per year.

<sup>2</sup> Formerly called the Chilean International Cooperation Agency (AGCI).

<sup>3</sup> The Government of Chile has already complied with 100 percent regarding its counterpart funding contribution to the project, but has committed to having the Ministry of Energy technical staff working on the project continue supporting implementation until project closing and will report this additional contribution in the project IFRs and audits.



## II. DESCRIPTION OF PROPOSED CHANGES

### *Proposed changes*

9. The project closing date of the original Grant (TF0A3726) will be extended from June 30, 2020 to June 30, 2021.

10. Relevant project indicator target end dates and disbursement estimates will be adjusted to reflect the new proposed closing date of June 30, 2021.

## III. SUMMARY OF CHANGES

	Changed	Not Changed
Loan Closing Date(s)	✓	
Disbursement Estimates	✓	
Implementation Schedule	✓	
Implementing Agency		✓
Project's Development Objectives		✓
Results Framework		✓
Components and Cost		✓
Cancellations Proposed		✓
Additional Financing Proposed		✓
Reallocation between Disbursement Categories		✓
Disbursements Arrangements		✓
Change in Overall Risk Rating		✓
Safeguard Policies Triggered		✓
EA category		✓
Legal Covenants		✓
Institutional Arrangements		✓
Financial Management		✓
Procurement		✓
Other Change(s)		✓



#### IV. DETAILED CHANGE(S)

##### LOAN CLOSING DATE(S)

TF	Status	Original Closing	Revised Closing(s)	Proposed Closing	Proposed Deadline for Withdrawal Applications
TF-A3726	Effective	30-Jun-2020		30-Jun-2021	30-Oct-2021

##### DISBURSEMENT ESTIMATES

Change in Disbursement Estimates

Yes

Year	Current	Proposed
2017	60,000.00	60,000.00
2018	500,000.00	385,079.00
2019	512,000.00	321,212.00
2020	500,000.00	404,339.00
2021	0.00	609,370.00
2022	0.00	0.00
2023	0.00	0.00





**Annex 1: List of Completed and Ongoing Project Activities**

ESTADO	ACTIVIDAD	REALIZACIÓN (FECHA FINALIZACIÓN)
R E A L I Z A D A S	Asistencia Congreso Bombas de Calor en Holanda.	Abril 2017
	Taller de Bombas de Calor, Puerto Varas.	Enero 2018
	Estudio "Análisis de Factibilidad Técnica y Económica de la Instalación de Bombas de Calor Geotérmicas, para fines de autoconsumo, en instalaciones agrícolas de las Regiones de Aysen y Magallanes".	Junio 2018
	Redacción e impresión Informe Final Mesa de geotermia	Julio 2018
	Asistencia Taller "Salva Guardas Ambiental del Banco Mundial", en Lima, Perú.	Agosto 2018
	Impresión Brochure sobre geotermia para comunidades indígenas.	Agosto 2018
	Contratación Profesional Socio Indígena (Francisca Romero)	Octubre 2018 (comenzó a trabajar en Octubre 2017)
	Servicio de "Producción de dos Videos de Animación Educativos sobre Tecnología Geotérmica y sus Aplicaciones en Chile".	Noviembre 2018
	Estudio "Simulaciones Dinámicas de la Demanda Térmica del Centro Acuático del Estadio Nacional (Chile)".	Noviembre 2018
	Seminario sobre Energía Distrital y Geotermia en Punta Arenas.	Enero 2019
	Servicios Adicionales "Producción de dos Videos de Animación Educativos sobre Tecnología Geotérmica y sus Aplicaciones en Chile". (Subtítulos en inglés, aymara y mapudungun y maqueta 3D sobre movimiento subterráneo de las aguas).	Marzo 2019
	Presentación al Congreso del Proyecto de Ley que perfecciona la Ley 19.657 sobre Concesiones de Energía Geotérmica	Abril 2019
	Impresión manual sobre Energía Distrital.	Mayo 2019
	Gira tecnológica de calefacción distrital en Europa.	Junio 2019
	Coordinación y apoyo en la gestión de GEOLAC 2019.	Julio 2019
	Estudio "Evaluación de Proyecto de Calefacción Distrital para las Ciudades de Coyhaique y Puerto Williams".	Septiembre 2019
	Contratación softwares, material informático y comunicacional.	Diciembre 2017 y Julio 2019
	Giras Tecnológicas con Comunidades Indígenas a la Planta Geotérmica Cerro Pabellón.	Diciembre 2017 y Julio 2019
	Contratación Profesional Socio Indígena (Fernando Manzur)	Noviembre 2019 (comenzó a trabajar en enero 2019)
	Realización de 15 Talleres de formación para Líderes Indígenas sobre energía geotérmica.	Diciembre 2019
Elaboración y tramitación del Convenio institucional con el SERNAGEOMIN.	Diciembre 2019	
Diseño e implementación de la plataforma de gestión en línea de las solicitudes de concesiones geotérmicas.	Diciembre 2019	
EN CURSO	Estudio "Análisis Integración Distrito Térmico para el Centro de Alto Rendimiento, Centro Acuático y Polideportivo del Estadio Nacional".	En ejecución
	Estudio de Evaluación Social y Ambiental a Nivel Sectorial, Proyecto Geotermia.	En ejecución
	Contratación Profesional Coordinador Técnico Administrativo	En ejecución (contratado en noviembre 2017)
	Contratación Profesional Analista Financiero	En ejecución (contratada en octubre 2017)
	Contratación Profesional Analista Adquisiciones	En ejecución (contratada en enero 2017)
	Contratación Profesional Socio Indígena (Soledad Quilaleo)	En contratación
PRIMER SEMESTRE 2020	Contratación Geólogos SERNAGEOMIN para mapa de favorabilidad geotérmica	En contratación
	Contratación estudio flexibilidad	Marzo 2020 (se considera fecha de inicio)
	Contratación consultoría para la mejora del sistema concesional	Marzo 2020 (se considera fecha de inicio)
	Contratación estudio comparado reglamento asociado a la Ley 19.657	Abril 2020 (se considera fecha de inicio)
	Contratación servicio realización calculadora bombas de calor	Mayo 2020 (se considera fecha de inicio)



### Annex 2: Action Plan for Project Implementation

	Acción	Responsable	Fecha
<b>Aspectos Financieros</b>			
1	Enviar al BM notas explicativas de la propuesta sobre el cese de la rendición del aporte nacional una vez cumplido el 100% comprometido.	ME	Realizado. Se continuará rindiendo de acuerdo a lo señalado por la AGCID en el oficio N° 2221/2019.
2	Enviar al BM la presentación de la situación financiera del Proyecto.	AGCID	Enviada el 24 de Julio del 2019.
<b>Subcomponente 1A – Mejora Marco Regulatorio</b>			
3	Informar al BM sobre decisión del ME en cuanto a la preparación de una guía para inversionistas o alguna propuesta alternativa.	ME	Se modificó por las siguientes actividades: i) procedimiento sistema concesional, y ii) análisis legal comparativo internacional en seguridad geotérmica y registro de aprovechamientos someros.  Se programan para comenzar la ejecución durante junio 2020.
<b>Subcomponente 1B – Mejora Gestión Concesiones Geotérmicas</b>			
4	Informar al BM sobre decisión del ME en cuanto a la realización de un estudio de optimización del marco actual de gestión de las concesiones o alguna propuesta alternativa.	ME	Se programan para comenzar la ejecución durante junio 2020 con fondos CTF ejecutados por BM.
<b>Subcomponente 1C – Unidad Ejecutora del Proyecto</b>			
5	Informar a la AGCID disponibilidad de capacitaciones sobre marco de adquisiciones BM	BM	Realizado.
6	Enviar al BM propuesta de contratación de un profesional adicional en apoyo a la gestión del Proyecto, incluyendo TdR	ME	Pendiente.
7	Informar al BM si hay interés en recibir apoyo justo-a-tiempo de un experto internacional en temas de calefacción distrital, o en otros temas.	ME	Taller se efectuará después de abril del 2020. Se solicitará traer un experto al taller.
<b>Subcomponente 1D – Gestión Social y Ambiental</b>			
8	Enviar al BM TdR del estudio de prefactibilidad geotérmica en comunidades indígenas	ME	A desarrollarse durante el segundo semestre del 2020.
<b>Subcomponente 2A2 – Análisis de Mercado de la Energía Geotérmica</b>			



9	Enviar al BM borrador de TdR para Estudio de Flexibilidad.	ME	Borrador TdR enviado al BM y bajo revision. Se programan para comenzar la ejecución durante junio 2020 con fondos CTF ejecutados por BM.
<b>Subcomponente 2B1- Potencial Geotérmico</b>			
10	Enviar al BM metodología de trabajo del SERNAGEOMIN, ejemplo de mapa ya elaborado y TdR para la contratación de tres especialistas para las mapas de favorabilidad geotérmica.	ME	Enviados TdR de geólogos observados por el Banco.  Metodología se enviará durante la semana del 10 de febrero.
<b>Subcomponente 2B2- Elaboración y difusión de videos, manuales, trípticos, etc.</b>			
11	Enviar a la AGCID TdR para elaboración de micro-documental sobre casos exitosos de usos someros de la geotermia.	ME	A desarrollarse durante el segundo semestre del 2020.
<b>Subcomponente 2B4.4 - Construcción Índice de Precio Geotérmico y Planilla para Servidor Virtual</b>			
12	Enviar a la AGCID TdR para elaboración de planilla y calculadora.	ME	Se enviarán en marzo del 2020.
<b>Subcomponente 2B6 - Estudio análisis integración y modelos ESCO en el estadio nacional</b>			
13	Completar contratación del estudio de integración y modelos ESCO en el estadio nacional.	ME	En ejecución.
<b>Otros</b>			
14	Revisión Plan de Adquisiciones para integrar modificaciones acordadas durante la misión.	ME	Realizado.
15	Informar al BM cuales otros estudios se financiarían con fondos CTF ejecutados por el BM, en adición al Estudio de Flexibilidad ya concordado.	ME	Informado en enero del 2020.
16	Enviar al BM información actualizada sobre cumplimiento de los indicadores del Proyecto	ME	Realizado.





1	Preparación/Revisión TdRs (Licitación Estudio-Licitación Consultoría-Concurso Honorarios). Preparación Solicitud Adquisición Servicio/Bienes.
2	Licitación/Adjudicación de Estudio/Consultoría. Concurso/Adjudicación Honorarios. Cotización/Emisión Orden de Compra Servicio/Bienes.
3	Ejecución Estudio/Consultoría. Ejecución Trabajos Honorarios. Adquisición de Servicios/Bienes.