

Cover Page for CTF Project/Program Approval Request

1. Country/Region	Chile	2. CIF Project ID#	(CIF AU will assign ID.)
3. Project/Program Title	Chile Energy Efficiency and Self-Supply Renewable Energy Program (PEEERA) ¹		
4. Terms and Amount Requested in million USD equivalent	Private sector First Loss Guarantees / Subordinated Debt: 22.00 Grant (TC activities): 1.60 Fee (for implementation of TC / KM activities): 0.08 Fee (for implementation of investment operations): 0.82 Total: 24.50		
5. Implementing MDB(s)	Inter-American Development Bank		
6. National Implementing Agency	N/A		
7. MDB Focal Point	Claudio Alatorre (calatorre@iadb.org)		
8. Brief Description of Project/Program (including objectives and expected outcomes)	<p>For the last few decades, Chile has been one of the leading countries in Latin America in terms of economic development and growth, achieving the third highest rate of GDP growth per capita in the region in 2012. This high growth has been coupled with higher final energy demand, with a 40% increase in the last decade. Projected energy demand growth until 2020 is 5.5%-6.5% per year, with an additional 7-8 GW of installed electricity generation capacity required by then. Some important coal and hydro projects have been put on hold because of environmental concerns. Natural gas currently accounts for approximately 25% of the national installed generation capacity, but all of it is imported and it is more expensive in terms of production costs than both coal and large hydro. As a consequence electricity prices for final consumers have been very high in Chile and are expected to increase by 34% during the next decade.</p> <p>On the other hand Chile has a potential of several hundred GW of non-conventional renewable energy resources (NCRE) and an estimated USD 3-4 billion per year could be saved by implementing energy efficiency measures in the industry, mining, as well as the commercial and residential sector. Recent actions from the government of Chile (GoC) to promote renewable energy (RE) and energy efficiency (EE) include a new regulation for the RE net billing law (20.571) which entered into force on October 22, 2014, promoting distributed RE generation of up to 100kW. A new EE law targeting the decoupling of GDP growth from energy demand is also currently prepared and expected to be sent to Congress.</p> <p>The technical potential for EE and self-supply RE projects across all sectors in Chile is estimated at around USD 8-10 billion, which could be tapped through a wide range of mature and readily available EE and in-situ RE technologies to generate electricity or heat. This market is however fragmented into several submarkets, still incipient and considered as too risky and too small by local banks. In addition, barriers including economic viability and cost competitiveness with grid electricity, awareness of technologies, and limited local capacity exist. In order to maximize the reach of the Energy Efficiency and Self-Supply Renewable Energy Program (PEEERA), it is suggested to establish a broad and diversified base of projects in several market segments including the following: (i) commercial and industrial sectors; (ii) residential sector; and (iii) third party financed projects.</p> <p>This program expects to provide concessional investment support to local financial intermediaries by delivering effective risk mitigation (e.g. first-loss guarantees) or by allowing mobilization of financing beyond balance sheet constraints (e.g. recognizing project cash flows), targeting the above defined market</p>		

¹ Spanish Acronym for *Programa de Eficiencia Energética y Energía Renovable para Autoabastecimiento*.

segments. CTF funds will be structured to enhance the risk profiles of eligible projects to help make the project viable while using the minimum guarantee coverage necessary. Eligible financial instruments for the use of CTF funds will be first-loss guarantees, subordinated and senior loans, and limited capital investment (in the form of equity, mezzanine finance, or small grants). Furthermore an IDB-implemented technical cooperation (TC) component will be structured to support local financial intermediaries (LFIs) and their clients, as well as equipment providers and other lenders of this program. The TC objective is to support the implementation and scale-up by providing independent technical advisory services, support on transaction costs, marketing and dissemination as well as impact evaluation.

The technologies targeted by PEEERA include solar PV, biogas, biomass, cogeneration, efficient illumination, motors, compressors, boilers, chillers, thermal insulation and other EE technologies. The USD 22M of CTF investment support for development of PEEERA projects expects to result in at least 36MW of new RE generation capacity, at least 87 GWh annual energy savings for EE projects, and PEEERA program-wide GHG emissions savings of at least 1.6 MtCO_{2e}.

9. Consistency with CTF Investment Criteria

See 4. Fit with CTF Investment Criteria pp. 16-20

- (1) Potential GHG Emissions Savings: see p. 16
- (2) Cost-effectiveness: see p. 16
- (3) Demonstration Potential at Scale: see p. 17
- (4) Development Impact: see p. 17
- (5) Implementation Potential: see p. 18
- (6) Additional Costs and Risk Premium: see p. 18
- (7) Financial Sustainability: see p. 19
- (8) Effective Utilization of Concessional Finance: see p. 19
- (9) Mitigation of Market Distortions: see p. 20
- (10) Risks: see p. 20

10. Stakeholder Engagement

A wide range of actors within both public and private institutions were consulted in the design of this Program. On the public side, consultations included the Ministry of Energy, the Center for Renewable Energy and the Corporation for Production Development (CORFO, for its acronym in Spanish). Private institutions and NGOs consulted included the Chilean Agency for Energy Efficiency (AChEE) and the National Association of Energy Efficiency Companies (ANESCO). Private firms consulted included energy services companies (ESCOs), solar leasing companies, energy utilities, equipment suppliers, engineering firms and developers involved in self-supply renewable energy and energy efficiency projects, and potential beneficiary companies from the mining and metals, construction, commercial, food, paper and agricultural sectors. In addition, a number of local financial institutions were consulted, including BBVA Chile, BCI, BICE, Corpbanca, Banco Itaú Chile, MBI, Banco Santander Chile, Scotiabank, and TANNER. The technical cooperation (TC) component of this Program also envisions support for stakeholder dissemination such as the development of (i) marketing activities for new financial products; and the (ii) dissemination of information and lessons learned through conferences and seminars.

11. Gender Considerations

There are no data available to determine the gender-relevant issues in the adoption and implementation of the EE/self-supply measures and markets in Chile targeted by this program. This project will therefore help to set the baseline for the future, as the data collected in the context of the project monitoring and evaluation activities will be disaggregated by gender, where possible. In addition, gender aspects will be relevant for inclusion in the market studies to be conducted to inform decisions by financial institutions as they assess demand for EE/RE investments in some of the target markets (e.g. residential).

12. Co-financing Indicators and Targets (consistent with results framework)		
Core Indicators	Targets	
Tons of GHG emissions reduced or avoided	1.58 MtCO ₂ e (cumulatively) 0.093 MtCO ₂ e/year (maximum annual value)	
Volume of direct finance leveraged through CTF funding	USD 120 M	
Annual energy savings (GWh) (excludes self-supply renewable energy generation)	1,141 GWh (cumulatively) 87 GWh/year (maximum annual value)	
New RE installed capacity (MW)	36 MW	
Development indicator: Energy saved or generated (see §56 for an explanation of the development impact of energy saved or generated)	173 GWh/year	
13. Co-financing		
	Please specify as appropriate	Amount (in million USD)
• CTF (reimbursable)	Loan / Guarantee	22.00
• CTF (non-reimbursable)	TC Grant	1.60
• IDB	Loan / Guarantee	22.00
• Private Sector (LFIs, ESCOs, Companies)	Loans / Equity	88.00
Total		133.60
14. Expected Date of MDB Approval		
Q1 2015		

Chile Energy Efficiency and Self-Supply Renewable Energy Program
(PEEERA)

IDB Private Sector CTF Proposal
for Submission to the CTF Trust-Fund Committee

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EXECUTIVE SUMMARY

1. For the last few decades, Chile has been one of the leading countries in Latin America in terms of economic development and growth, achieving the third highest rate of GDP growth per capita in the region in 2012. This high growth has been coupled with higher final energy demand, with a 40% increase in the last decade. Projected energy demand growth until 2020 is 5.5%-6.5% per year, with an additional 7-8 GW of installed electricity generation capacity required by then. Some important coal and hydro projects have been put on hold because of environmental concerns. Natural gas currently accounts for approximately 25% of the national installed generation capacity, but all of it is imported and it is more expensive in terms of production costs than both coal and large hydro. As a consequence electricity prices for final consumers have been very high in Chile and are expected to increase by 34% during the next decade.
2. On the other hand Chile has a potential of several hundred GW of non-conventional renewable energy resources (NCRE) and an estimated USD 3-4 billion per year could be saved by implementing energy efficiency measures in the industry, mining, as well as the commercial and residential sector. Recent actions from the government of Chile (GoC) to promote renewable energy (RE) and energy efficiency (EE) include a new regulation for the RE net billing law (20.571) which entered into force on 22 October 2014 promoting distributed RE generation of up to 100kW. A new EE law targeting the decoupling of GDP growth from energy demand is also currently prepared and expected to be sent to Congress.
3. The technical potential for EE and self-supply RE projects across all sectors in Chile is estimated at around USD 8-10 billion which could be tapped through a wide range of mature and readily available EE and in-situ RE technologies to generate electricity or heat. This market is however, fragmented into several submarkets, still incipient and considered as too risky and too small by local banks. In addition, barriers including economic viability and cost competitiveness with grid electricity, awareness of technologies, and limited local capacity exist. In order to maximize the reach of the Energy Efficiency and Self-Supply Renewable Energy Program (PEEERA), it is suggested to establish a broad and diversified base of projects in several market segments including the following: (i) commercial and industrial sectors; (ii) residential sector; and (iii) third party financed projects.
4. This program expects to provide concessional investment support to local financial intermediaries by delivering effective risk mitigation (e.g. first-loss guarantees) or by allowing mobilization of financing beyond balance sheet constraints (e.g. recognizing project cash flows), targeting the above defined market segments. CTF funds will be structured to enhance the risk profiles of eligible projects to help make the project viable while using the minimum guarantee coverage necessary. Eligible financial instruments for the use of CTF funds will be first loss guarantees, subordinated and senior loans as well as limited capital investment (in the form of equity, mezzanine finance, or small grants). Furthermore an IDB-implemented technical cooperation (TC) component will be structured to support local financial intermediaries (LFIs) and their clients, as well as equipment providers and other lenders of this program. The TC objective is to support the implementation and scale-up by providing independent technical advisory services, support on transaction costs, marketing and dissemination as well as impact evaluation.
5. The technologies targeted by PEEERA include solar PV, biogas, biomass, cogeneration, efficient illumination, motors, compressors, boilers, chillers, thermal insulation and other EE technologies. The USD 22M of CTF investment support for development of PEEERA projects expects to result in at least 36MW of new RE generation capacity, at least 87 GWh annual energy savings for EE projects, and PEEERA program-wide GHG emissions savings of at least 1.6 MtCO₂e.

LIST OF ABBREVIATIONS

CO ₂	carbon dioxide
CO ₂ e	carbon dioxide equivalent
CORFO	<i>Corporación de Fomento de la Producción</i> (Production Development Corporation)
CSP	concentrated solar power
CTF	Clean Technology Fund
DFI	development finance institution
DPSP	Dedicated Private Sector Programs (CTF)
ECA	export credit agency
EDC	Energy Development Corporation (Philippines)
EE	energy efficiency
ESCO	energy service company
GDP	gross domestic product
GHG	greenhouse gases
GoC	Government of Chile
GW	gigawatt
HVAC	heating, ventilation and air conditioning
IDB	Inter-American Development Bank
IE	Impact evaluation
IP	Investment Plan
KfW	<i>Kreditanstalt für Wiederaufbau</i> (German development bank)
LCOE	levelized cost of energy
LFI	local financial intermediaries
MINENE	<i>Ministerio de Energía</i> (Ministry of Energy)
MINVU	<i>Ministerio de Vivienda y Urbanismo</i> (Ministry of Housing and Urbanism)
MMA	<i>Ministerio del Medio Ambiente</i> (Ministry of Environment)
MOP	<i>Ministerio de Obras Públicas</i> (Ministry of Public Works)
MRV	measuring reporting and verification
MW	megawatt
MWh	megawatt hour
NCRE	non-conventional renewable energy
PEEERA	<i>Programa de Eficiencia Energética y Energía Renovable para Autoabastecimiento</i> (Renewable Energy Self-Supply and Energy Efficiency Program)
PPA	power purchase agreement
PV	photo-voltaic
RE	renewable energy
RPS	renewable portfolio standard
SIC	<i>Sistema Interconectado Central</i> (Central Interconnected System)
SING	<i>Sistema Integrado del Norte Grande</i> (Northern Interconnected System)
SMEs	small and medium-sized enterprises
TC	technical cooperation
Tcal	teracalories
TFC	Trust-Fund Committee
USD	United States Dollars

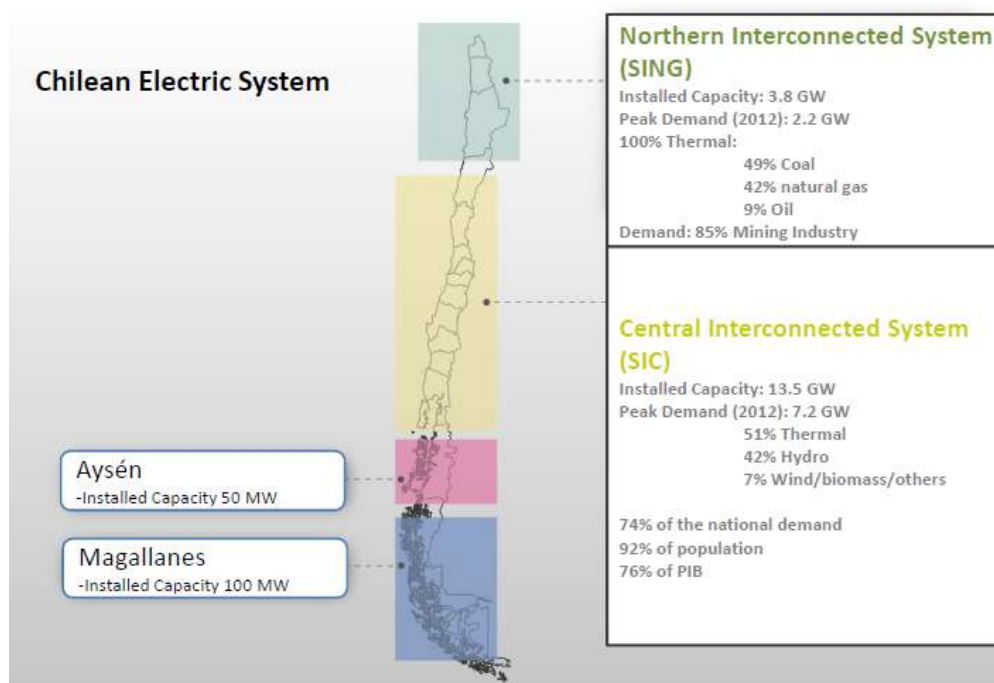
I. COUNTRY AND SECTOR CONTEXT

6. For the last few decades, Chile has been one of the leading countries in Latin America in terms of economic development and growth, and its economic fundamentals are expected to continue driving growth in the period from 2014-2018. Forecasts of Chile's GDP annual growth rate for the period (4.7 - 5% annually) are almost twice the OECD average (2-2.3%)². However, Chile will be exposed to global developments, in particular to changes in commodity prices. Minerals account for more than 50% of Chile's total exports and fuel purchases account for more than 40% of its imports. The mining and energy sectors are expected to expand in terms of capacity. The agricultural sector, which is the second-largest source of Chilean exports, will continue to grow, supported by its large network of free trade agreements. The construction sector will be boosted by investment in commercial and retail projects.

7. In 2012, Chile had the third highest rate of GDP growth per capita in Latin-America.³ Its economic growth has been coupled with higher energy demand. In fact, during the last decade, its final energy consumption increased by 41% from 200,858 Tcal in 2002 to 282,933 Tcal in 2012.⁴ Oil and electricity were the main energy sources. The transportation sector had the highest share in oil consumption, and the industry and mining sector had the highest share in electricity consumption.

8. Chile today has an installed power generation capacity of 17.6 GW, of which approximately 74% corresponds to the Central Interconnected System (SIC) and 25% to the Norte Grande Interconnected System (SING). The remaining 1% corresponds to the intermediate systems of Aysen and Magallanes (see Figure 1). Mining operations are geographically located in the northern part of the country, serviced mostly by the SING system.

Figure 1. Chilean Electric System



Source: Ministry of Energy 2013

² Economist Intelligence Unit, Country Report, October 2013

³ World DataBank

⁴ <http://bit.ly/BalanceEnergia>, National Energy Balance 2012

9. In 2012, Chile generated a total of 66TWh of electricity. Large hydro is the country's largest electricity source, accounting for a third of power generated. In addition, 8% was produced from other renewable energy technologies (small hydro, biomass, wind and solar). The rest of the electricity is generated from imported fossil fuels. Keeping pace with rising energy demand is a challenge for the country. Chile is the world's largest copper exporter, and the energy-intensive nature of that industry creates substantial challenges in meeting power demand. In 2012, copper industry consumed 19TWh, which represents 32% of the total power generated in the country that year. Electricity consumption in Chile is projected to grow at an annual rate of 5.5%-6.5% until 2020.⁵ As a result, Chile relies heavily on imported fossil fuels for electricity.

10. These projections indicate that, by 2020, Chile will need an additional 7-8 GW of installed capacity. Hydropower expansion could meet an important percentage of the expected demand, but one important project⁶ has been canceled in June 2014 by the government due environmental concerns. Development of coal plants can also face opposition when the plants are located in the vicinity of population centers, given the local pollution impact. Natural gas currently accounts for approximately 25% of the national installed generation capacity and its sizable contribution is expected to continue or increase in the coming years, but all natural gas is imported and is more expensive in terms of production costs than both coal and large hydro.

11. Given that Chile is a net importer of energy resources and dependent on fossil fuels, whose costs have been continuously rising in recent years, the GoC has developed policies to promote both energy efficiency and the harnessing of renewable energy sources. A new regulation for the net billing law (20.571) went into operation on October 22, 2014, promoting distributed energy generation of up to 100kW. A new EE law targeting the decoupling of GDP growth from energy demand is also currently prepared and expected to soon be sent to Congress.

12. With regards to non-conventional renewable energy technologies (NCRE), the GoC has sought to diversify its energy sources in a sustainable way, contributing to a diversified, clean and safe energy matrix. Since the 2004 natural gas crisis, the GoC has actively fostered diversification of energy sources. The GoC recently approved legislation to increase the percentage of NCRE to 20% of all new contracts by 2025, which demonstrates the ambitious path being followed by the GoC and further supports the clear goal to increase the share of RE in the current energy matrix.⁷ Chile also encourages clean energy through total exemption of transmission charges to renewable projects up to 9MW, and partial exemption for projects between 9MW and 20MW.

13. Chile has significant non-conventional renewable energy resources (NCRE) spread across the country with potentials of more than 220GW of solar energy, 160GW of wave energy, 30GW Wind as well as several GWs of biomass, small hydro and geothermal energy⁸ some of which are highly concentrated regionally. The solar resource for example is extremely good in the north while biomass is nonexistent, whereas biomass is concentrated in the south and center while the solar resource is weaker there. GHI (Global Horizontal Irradiation) levels of 1100-1200kWh/m²a in Puerto Montt in southern Chile are still equal or higher than in most parts of central and northern Europe. At the same time there is

⁵ <http://bit.ly/PAEE20>, p.9, 2013

⁶ The HydroAysen project proposed to build five mega-dams, for a combined capacity of 2,750 MW, and across the Baker and Pascua rivers in the Aysén Region, [connecting the dams with a 2,000 mile transmission line](#) which would intersect national parks and land held by various indigenous communities.

⁷ For contracts signed after July 1, 2013, this law contemplates a progressive growth of the contribution of NCRE of 1% yearly to reach 12% by 2020, 1.5% yearly from 2021 to 2024 to reach 18%, and 2% by 2025, in order to reach the 20% share of NCRE by 2025. This means that over the next decade the role of all NCRE sources will become increasingly important, as will the need to incorporate appropriate technical standards and the adequacy of a distribution matrix that facilitates the injection of distributed generation.

⁸ Centro de Energías Renovables; 2012

enough potential to save an estimated USD 3-4billion⁹ per year by implementing energy efficiency measures in industry, mining as well as the commercial and residential sector

14. The incentives for the adoption of both energy efficiency and renewable energy technologies by the consumers in all sectors depends on energy prices. Marginal costs as well as electricity prices for final consumers (regulated costumers) have been very high within the last decade in Chile and the bidding process carried out by the distribution companies in 2013 have resulted in prices well above competitive long term generation costs. If this trend continues the energy price is expected to increase by 34%¹⁰ during the next decade. Recent studies point out that Chilean industry already loses competitiveness compared to its peers, and Chilean families suffer high energy-related spending¹¹.

II. PROPOSED PROGRAM

A. Description and Market Segments

15. The Investment Plan (IP) for the Clean Technology Fund (CTF), endorsed by the CTF Trust-Fund Committee (TFC) on 3 May 2012 includes a Renewable Energy Self-Supply and Energy Efficiency Program (PEEERA) for USD 49 million. Furthermore a preparation grant for the PEEERA program of USD 1 million was approved on 17 August 2012.

16. As a result of the studies carried out during the preparation stage, the technical potential for PEEERA projects across all sectors was estimated at around USD 8-10 billion,¹² which could be tapped through a wide range of mature and readily available energy efficiency and in-situ renewable energies technologies to generate electricity or heat like solar PV, solar thermal, biomass, and biogas. Solar PV as a modular and easily scalable technology that could be used in the residential, commercial or industrial sector to reduce electricity demand, represents the majority of this potential (USD 6-7 billion). This market, fragmented into several submarkets, is still incipient and considered as too risky and small for local banks. In addition, barriers including economic viability and cost competitiveness with grid electricity, awareness of technologies, and limited local capacity.

17. In order to maximize the reach of the PEEERA Program, it is suggested to establish a broad and diversified base of projects in several market segments. Based on preparatory activities including market and technical feasibility studies, meetings with LFIs, private sector companies, ESCOs, and government agencies, among other stakeholders, the following sectors were identified for priority focus for the PEEERA program.

i) Commercial and Industrial sector

a. Target Market, Market Failures and Barriers

18. The commercial and industrial PEEERA market involves EE and RE opportunities within existing industrial (various EE measures, self-supply RE) and commercial businesses (typically large scale heating, ventilation and air conditioning (HVAC) and lighting in hotels, malls, hospitals, etc.). These projects have an investment range of USD 100,000 to USD 10 million per project. The project preparation assessments already identified more than 20 of these projects worth more than USD 60 million, which include self-supply rooftop solar PV, biomass or biogas heating, electricity generation or cogeneration, heat recovery, boiler substitution and frequency shift controls in escalators. If these projects are replicated

⁹ Econoler; 2010

¹⁰ Agenda de Energia; Ministerio de Energia – Gobierno de Chile; 2014

¹¹ Several factors contribute to high prices including a lack of competition in both the regulated as well as the unregulated market, lower output from hydroelectric plants due to record droughts and domestic demand for energy that is growing at more than twice the global average.

¹² PEEERA Preparation Grant Consultancy

in their respective industries they would require at least around USD 150 million worth of investments. However, these studies only represent a small share of the market as, according to one of the studies carried out during Program preparation, the size of this market can be estimated at around USD 2.5 billion. Nevertheless, many opportunities such as biomass or biogas heating and electricity generation, frequency variators were not considered in this analysis, and so the market potential could be even larger.

19. Local Financial Intermediaries (LFIs) in Chile currently do not serve this market in a systematic way, as these projects are too small for their project finance departments, which generally look for projects larger than USD 10 million. After several discussions with companies and banks it seems that commercial and industrial PEEERA projects in large corporations (> USD 100 million in revenues) could generally be financed by corporate loans in which these projects could be bundled with other capital requirements of the company. However, these projects will compete for scarce capital and require collateral pledges. Many of these large corporations suggested that they would prefer that a third-party (e.g. an ESCO) company develop and finance these projects.

20. On the other hand, mid-size (USD 10 to USD 100 million in revenues) and small enterprises (<USD 10 million in revenues) have higher borrowing costs and less access to capital at the scale needed to implement self-supply renewable projects. Many LFIs have confirmed that some of these companies have already approached them with PEEERA projects. The main barrier that these projects encounter is unprepared and untrained LFI windows which assess these projects and their risks in the same way as any other financing needs of the company. Leasing windows of LFIs do not operate with EE or RE equipment as they have little knowledge of the products. Moreover, this lack of knowledge in many cases forces LFIs to ask for high collateral or additional guarantees. This, in combination with high interest rates, makes many projects unfeasible.

b. Proposed intervention model

21. Several LFIs have a large client base of small and mid-size and companies and are interested in exploring the PEEERA market as they see a large market potential. However, they have not addressed the PEEERA market with a systematic approach that is linked to their leasing or corporate lending windows. They need technical support and some financial incentives to tailor their financial instruments for this market. (NOTE: Direct finance of these companies is a complementary approach that, if done in a very targeted way, can catalyze –when and where needed- the initial demonstration of some technologies, applications or financing schemes that some LFIs may need before pursuing directly these opportunities. A regional IDB/CTF program under preparation will provide this complementarity when/where needed.)

22. CTF resources can help overcome these barriers with a combination of concessional credit lines, first loss guarantees and technical cooperation resources. Concessional credit lines may have little additionality for most banks in Chile in current market conditions (high liquidity, low costs of funding), although this may not be the case for smaller LFIs or may change in the next couple of years as international financial market conditions evolve. In contrast, there was a consensus within LFIs that first-loss guarantees will be additional and overcome the risk barriers to the PEEERA market. Technical cooperation to support the design of new financial products for the LFIs, identify potential customers, assess the existing portfolio, and provide training is also critical in order to ensure successful market entry by LFIs.

ii) Residential sector:

a. Target Market, Market Failures and Barriers

23. The residential sector accounts for around 20%¹³ of energy use in Chile, primarily for space heating, 56%, water heating, 18%, and cooking, 8%¹⁴. The sector produces 26% of GHG emissions, including both construction and use of residential buildings. A number of opportunities exist for increasing the efficiency of appliances and improving the thermal performance of buildings. The national strategy for sustainable construction developed by MOP, MINVU, MINENE, MMA in 2014¹⁵ includes the reduction of energy consumption in the buildings sector. This national strategy developed an energy rating system for buildings (*calificación energética de viviendas*) which supports the energy-consumption reduction goal through the classification of residential energy efficiency in seven categories, where A is the most efficient and G the least efficient. The current building regulation (article 4.1.10 OGUC) will gradually require new buildings to comply with at least category E starting in 2016. A strategy and timeline for the retrofit of existing buildings has not been defined yet.

24. The total existing Chilean residential building stock in 2010 was 5.3 million units out of which 86% was built before 2001 where no regulation was in place for thermal insulation, and fourteen percent was built after 2001, when a new regulation for thermal insulation was implemented. This regulation was updated in 2008, requiring around 60% less energy for heating.

25. In 2011 a total of 151,000 new homes¹⁶ were built with an average energy consumption of 192kWh/m² for heating, lighting and hot water, equivalent to category E in the energy rating system. According to MINVU estimates, savings of more than 50% are feasible by implementing only cost effective measures, reducing average consumption to 88kWh/m², equivalent to category C.

26. Even though there is a huge market opportunity for new and refurbished energy efficient buildings, the issue is very new in Chile and therefore has not reached the end user yet on a broader basis. A survey recently conducted¹⁷ identified high cost, disinformation and missing financial solutions as the main barriers for homeowners to carry out EE refurbishment in existing buildings. There is also a lack of trust towards the building industry to deliver projects with the necessary quality, especially with regards to refurbishments. The same barriers, but especially the cost premium, create a lack of demand for new buildings above category E - which currently is the minimum EE standard. These barriers are the main reason why the housing developers¹⁸ only build higher standard EE solutions on a limited basis and only targeted to the higher income segments.

b. Proposed intervention model

27. Increasing residential energy efficiency and self-supply with solar energy is a challenge that has been tackled in many different ways globally. Success generally depends on strong supportive policies or energy efficiency mandates, and direct homeowner financial incentives (generally rebates funded by grants). Reaching the residential market in Chile with concessional debt from the CTF therefore is a challenge. There are three possible market opportunities identified that may be addressable by the CTF: a) construction of new homes; b) refurbishment of existing homes and c) energy efficient appliances. For new home construction, CTF resources will be used to provide financial solutions to real estate developers to mitigate the additional costs for new energy efficient homes including the integration of RE

¹³ Balance de Energía; 2010

¹⁴ Estudio de Usos Finales y Curva de Oferta de Conservación de la Energía en el Sector Residencial de Chile. 2010

¹⁵ Estrategia Nacional de Construcción Sustentable (<http://bit.ly/EMSB26>)

¹⁶ Instituto de Estadísticas; Informe anual 2011.

¹⁷ Support to Energy Efficiency in Residential and Municipal Sector; IDB/MINENE/CDT; 2014

¹⁸ Around 70% of the real estate industry in Chile is vertically integrated and project developers usually also own a construction company.

solutions such as solar PV and hot water. Due to their favorable position as delivery agents for market scale up, a primary focus will therefore be given to the real estate industry as potential beneficiaries of CTF funding. In order to create the necessary market demand, a secondary focus will be on final consumers for new as well as existing homes. The proposed financial instruments may include concessional finance combined with guarantee products to reduce equity and collateral requirements. Technical cooperation will be provided for the real estate industry to improve energy related design criteria for new buildings.

28. To target the adoption of energy efficient appliances, the Program will further explore partnerships with retailers to offer financial incentives to consumers for energy efficient equipment.

iii) Third party finance

a. Target Market, Market Failures and Barriers

29. Third-party financing is an established financing solution in the United States, and has recently emerged in the solar industry as one of the most popular methods of solar financing for consumers to realize the benefits of solar energy. It is also applicable to EE through the ESCO-shared savings model where the ESCO provides financing for the implementation of an EE project which gets paid for with the energy savings it generates. ESCOs provide implementation of EE across a spectrum of projects and execution stages including simple energy audits for the design, implementation and O&M. A recent study on the Chilean ESCO market¹⁹ indicated that from 2010–2013 there were 442 projects developed under the ESCO model considering two types of concepts: (i) only service delivery, and (ii) performance contracting including shared savings and guaranteed savings models. Fifteen companies have developed these projects; however only two of them concentrate 80% of the projects. The total investments were USD 5 million with an average of only USD 11,000 per project resulting therefore in very small projects. This is mainly due to the fact that ESCOs are usually SMEs with small balance sheets and therefore have very limited access to credit, and under unfavorable conditions. Projects are thus financed by ESCO equity only or limited in size to what the balance sheet can support. While some programs have been piloted to address this barrier, there are no existing mechanisms on the market with attractive financing for ESCOs that have shown to be effective yet in allowing ESCOs to receive and/or channel financing to their clients beyond these limits. As a consequence the ESCO market in Chile is still at an early development stage and there are virtually no companies that could offer design, implementation and financing as well as O&M for PEEERA projects above USD 50,000. Projects with higher investment needs are usually financed by the beneficiary company itself paying the ESCO as a contractor for design and implementation of the project.

30. Solar leasing is similar to the ESCO model but focused on design, financing, installation and O&M of solar PV plants which include the closing of a PPA between the leasing company and an off-taker which could be an industrial/commercial or even residential client. The PPA pricing must be lower than the current electricity tariff the leasing company's client pays. There are currently only a couple of companies working on designing this model for the Chilean market though on a very limited scale on a pilot project level. The recent passing of the net metering law can help spur this market (although with some limitations for certain segments given that it is effectively a net billing –instead of a net metering-model, hindering the economic viability in the short term of these investments in –for example- the residential market). The financing barriers are very similar to those ESCOs face as mentioned above. Solar PV however by far represents the highest potential for scale up in the PEEERA market.

31. Often corporate RE and EE projects are not selected for inclusion in the annual budget, because it seems more attractive to allocate the company's limited capital on growing the core business, even if RE

¹⁹ Análisis y propuestas para la consolidación de empresas de servicios energéticos en Chile: MINENE/Sustentank, 2014

or EE measures would be more profitable. The third party finance models can tackle this issue by requiring only limited or no investment from these companies to generate energy savings from EE or reduce their monthly energy spending with on-site RE like solar PV.

a. Proposed intervention model

32. Since financing plays a key role in the development of the third party finance model, new and innovative approaches are needed where the limiting factors for financing are not size and financial strength of the third party finance company but project relevant factors, like energy savings similar to a project finance structure. Based on the initial stages of development of these models, CTF investment support may include equity, mezzanine finance, and limited grants. Technical cooperation resources would also be required to develop a new project finance model for small projects, design standard documentation and provide due diligence in order to reduce transaction costs. TC resources may also be required to help first-mover third-party finance companies to reduce the high first-mover incremental cost of assessing and testing this market and business model.

33. The combination of the above mentioned CTF resources, to be used in very limited amount and well targeted cases (no more than a couple of cases), could help spur significant innovation in this market, bringing to Chile business models that have been piloted with success in recent years in developed countries, and capitalizing favorably evolving economic and regulatory enabling conditions by targeting the risk and cost barriers that still prevent the development of these new ventures.

B. Other Programs

34. There are several other programs currently in preparation by MINENE, CORFO and KfW with a focus on RE Self Supply and EE, and could generate synergies with the CTF-PEEERA program.

35. **MINENE Initiatives/Programs:** In terms of EE, a new law is in preparation focusing on big consumers requiring them to conduct EE audits and develop EE implementation plans. A thermal retrofit program for public hospitals will be launched providing around USD 10 million to finance project implementation. Decoupling efforts will be made with distribution companies to unlink GDP growth from increasing energy consumption.

36. Solar thermal and PV will be supported with a strong focus on social inclusion. A set of market pull activities are in preparation or already implementation like a modification of tax exemption law for installation of solar water heaters, implementation of the program “*Techos Solares Públicos*” which provides around USD13 million to install solar PV on public buildings or “*Calama ciudad solar*” through targeting the main photovoltaics and thermal initiatives in this city. At the same time instruments to generate public information and knowledge about solar and support the supply side sector will be created.

37. **CORFO Programs:** A KfW credit line of Euros 65 million for on lending to local banks to finance EE and RE projects is currently in preparation. CORFO and KfW are also preparing a USD 10 million partial credit guarantee including a support package of USD 3.5 million Investment Grant, USD 1 million grant for prefeasibility studies and USD 1 million for MRV financed by the NAMA facility.

38. In order to ensure that these other programs in Chile and CTF funds complement each other and avoid duplication of efforts, IDB will closely coordinate with the relevant agencies and counterparts when designing the related financial operations.

C. Financial Instruments and Proposed CTF Terms

39. Over the next five years, the Program expects to provide concessional investment support to local financial intermediaries (broadly defined as not only banks but also other companies providing financial

intermediation and solutions in these markets, as described in previous sections) to overcome the barriers described above. In general FI’s in Chile have access to low cost finance, but they face risk barriers in extending finance for PEEERA projects. CTF financing will be most financially additional when they provide effective risk mitigation (e.g. first-loss guarantees) or allow mobilizing financing beyond balance sheet constraints (e.g. recognizing projects cash flows). CTF funds will be structured to enhance the risk profiles of eligible projects to help make the project viable while using the minimum guarantee coverage necessary. The pricing, terms and conditions of the financial support offered will be structured on a case-by-case basis. CTF investment criteria and principles, including minimum concessionality, additionality, cost-effectiveness, and avoidance of market distortions, will be observed in all cases.

E. Technical Cooperation & Knowledge Management

40. The TC component will be structured to support LFIs and their clients as well as equipment providers and other lenders of this program in the eligible sectors. The objective is to support the implementation and scale-up of this program by providing:

- a. **Independent technical advisory services for eligible projects:** This will entail, among other, (i) project origination through reviewing existing client portfolio and identifying new potential customers; (ii) project evaluation through feasibility studies and technical due diligence; (iii) development of new financial products, potentially including models for small scale project finance and the required standard documentation; (iv) support for improving energy related design criteria for new building developments; (v) provide energy ratings for new and existing buildings, and (vi) training activities for LFIs including strategy setting and specific training for FI staff from various areas. It will include an introduction to PEEERA technologies and finance needs and benefits.
- b. **Support on transaction costs:** This will entail (i) payment of fees for any additional technical, legal and environmental consultants which might be required to implement new financial products within LFIs and with different stakeholders in the local market.
- c. **Marketing and dissemination:** This will entail (i) marketing activities for new financial products, and (ii) dissemination of information and lessons learned through conferences and seminars

Indicative TC & KM Budget

Component	CTF (USD)
A) Independent technical advisory services	1,200,000
B) Support on transaction costs	300,000
C) Marketing and dissemination	100,000
Total	1,600,000

41. This TC will be implemented by IDB but also benefit operations under this program. The program will coordinate with relevant government agencies and other donors and seek for possible synergies in TC implementation.

42. Finally, the design of an impact evaluation (IE) is part of the intended scope of the Program. However, details on specific interventions are yet to be defined as a result of negotiations with individual LFIs or developers. Once a specific project with an LFI has been confirmed, the project team will develop

an impact evaluation proposal and analyze with the relevant private client/s the feasibility of taking it forward. Funding to complete this study will be sought at that point from the Evidence Based Learning Initiative of the CIF and other donors, if needed.

III. PROGRAM'S STRATEGY FOR ACHIEVING MARKET TRANSFORMATION

43. Eligible RE technologies within the program will include biogas, biomass, solar thermal and solar PV and low enthalpy geothermal for heating purposes. In the case of EE eligibility will be based on specific criteria which are either of the following.

- a. 10% energy or greenhouse gas emissions reduction;
- b. New buildings achieve a prequalification level at least category C according to the Chilean building energy rating system (A to E).
- c. Existing buildings improving its build shell through wall and/or roof insulation, replacement of windows and doors;

44. Feasibility studies prepared as part of the PEEERA preparation grant will serve as pilot experience to demonstrate that:

- a. PEEERA technologies are proven and low risk
- b. Contractual and financial arrangements can be developed to provide reliable revenue streams
- c. Different financing arrangements for private sector projects can be developed and be effective to overcome the high transactions costs for small scale project development and financing.

45. These demonstration efforts will improve capacity in the PEEERA industry in Chile and prove the technical and economic viability of PEEERA projects, therefore increasing the confidence on the PEEERA demand side as well as of financial institutions to finance projects.

46. The Program adequately fits the country's existing regulatory environment and government policies. As explained in previous sections, recent regulations have given clear signals and incentives in support of further renewable energy supply (e.g. increase of renewable portfolio standard to 20% by 2025, net metering/billing regulation). Moreover, the strong private sector orientation of the power sector in Chile makes this program appropriate for the business context.

47. IDB will leverage its experience in financing private and public sector RE and EE projects as well as green financing lines with LFI across Latin America to support the Chilean LFIs in developing these initial projects. IDB will build on the experience of financing one of the first PEEERA projects with the fruit company Subsole which included the first commercial PV plant in Chile, a 300kW solar PV plant for irrigation purposes and several EE projects financed by an IDB loan. This project set the base for the Chilean government to include PEEERA in their IP.

48. Moreover, IDB will seek synergies with other similar CTF programs currently being developed in the region like the Colombian EE Fund and the Mexican Green Bond program. Most importantly, IDB will leverage its knowledge and profound engagement in the Chilean power sector, where it currently has a diverse portfolio of renewable energy projects, including solar PV and CSP and wind energy, as well as of EE efficiency projects.

49. IDB will capitalize all these conducive conditions, capabilities and resources to use CTF funds in the most targeted and effective manner with minimum concessionality to address the key barriers preventing progress of private sector investment in PEEERA projects .

IV. FIT WITH CTF INVESTMENT CRITERIA

A. Potential GHG Emissions Savings

50. The technologies that are being targeted by PEEERA involve a wide range of commercially available technologies with different performances including solar PV, biogas, biomass, cogeneration, efficient illumination, motors, compressors, boilers, chillers, thermal insulation and other EE technologies. However, we expect that many of these projects will use solar PV technology and an even investment split between proposed interventions (see tables 1 and 2 for assumed costs and performance of the range of technologies). The USD 22M of CTF investment support for development of PEEERA projects will result in GHG emissions savings of at least 1.6 MtCO₂e²⁰.

PEEERA Projects ²¹	Project Costs (MM USD/MW)	Capacity Factor (MWh per year /MWp)
Solar PV	2.15	1750
Biogas / Biomass	2.20	4380
Wind	2.00	3504

Table 1. Assumed Costs & Performance RE self-supply Projects

EE Projects	Costs (kWh/USD)
Heat recuperation	5.81
Efficient motors	3.34
Efficient compressors	3.10
Efficient illumination	2.98
Heat pumps	2.00
Cogeneration	1.59
Frequency Variators in Pumping Systems	1.38
Efficient Boilers	1.20
Controlled compressors	1.15
Efficient Chillers	0.49

Table 2. Assumed Costs & Performance of EE Projects

B. Cost-Effectiveness

51. Given the direct GHG mitigation potential mentioned above, the cost effectiveness of CTF investments is estimated at around 15.5 USD/tCO₂e. Total abatement costs (i.e. taking not just CTF investment but from all sources) is estimated at around USD 93 /tCO₂e.

²⁰ This assumes that CTF/IDB financing will have a co-financing leverage ratio of 1:5 or about \$120 million. These values assumes that 60% of investments related to electricity will be on the SIC grid and the rest on the SING (emissions factors used are 0.391 tCO₂e/MWh in SIC and 0.806 tCO₂e/MWh in SING). Given the significant difference in grid emission factors between SIC and SING, there could be significant deviations from this estimated value, if assumptions on where the final investments occur differ significantly from final distribution.

²¹ Source: ACERA, 2012.

52. Energy efficiency and self-supply renewable energy project development costs in Chile are expected to decrease over the years further developing local capacity and contributing to reduction of future cost. Some opportunities for cost reductions would be:

- a. **Cost reduction through capacity building:** Successful performance of this Program will increase the interest of other financing institutions, as risk perception is reduced and financing structures mitigating resource and other relevant risks are demonstrated. Broader access to debt financing (increasing the debt/equity ratio of projects) could have a significant impact in reducing development cost, enhancing the economic and financial viability of these technologies and incentivizing companies to accelerate investment and development..
- b. **Cost reduction through equipment:** the cost of equipment is also another major driver of the cost projects and great economies of scale can be achieved when volume of equipment increases. Right now equipment purchases are one-off with no economies of scale for the pricing of the equipment, and further complicated with high import costs relative to the size of projects.

C. Demonstration Potential at Scale

53. As stated above, the estimated market potential for PEEERA is of around USD 8-10 billion. Assuming the CTF's demonstration effect helps reach 10% of this potential, it will contribute to the installation of over 200 MW of self-supply renewable generation, and almost 550 GWh of EE annual savings. The demonstration effect is expected to help catalyze further investment and development in this sector. Scale-up speed and therefore timing for this is however difficult to predict, as well as specific future conditions such as marginal emissions factors, for adequate estimation of future GHG savings potential; but if future values were the same as the ones assumed under this proposal, indirect abatement of this program would be around 10 MTonCO₂.

54. The prospect for replication is not only supported by the vast solar PV potential that has been estimated along Chile, but also the presence of a strong push for this market by the government such as the Public Solar Roof Program, a cogeneration in public buildings program, the development of a net metering regulation and bill, and the presence of other international cooperation programs with CORFO to support this market.

D. Development Impact

55. This Program has a significant number of potential development co-benefits. Some of them (e.g. energy security, improvement of trade balance, employment) are certain, but will become significant as the demonstration effect of the Program impacts in a scale larger than that of the directly supported investments. Other potential co-benefits are uncertain at this stage, as they depend on the specific location of the plants, but their existence would be assessed as specific investments are defined and confirmed (and as part of IDB's development effectiveness assessment of private sector investments). Expected co-benefits are:

- **Energy security:** About 76% of Chile energy supply is based on fossil fuels, of which approximately 91% is imported, given the absence of significant oil, gas or coal production in Chile²². Chile has already experienced the vulnerability of its economy to price or supply shocks of these fuels. Beyond the vulnerability to fossil fuel price changes, Chile experienced a shocking shortage of supply of gas when Argentina's supply capacity started experiencing challenges since 2004. In addition, higher power supply costs result in reduced competitiveness of the Chilean industry (and particularly in energy intensive, commodity producing sectors –like mining- where cost increases cannot always be proportionally transferred to prices). Energy security concerns are heightened by the fact that two

²² National Energy Balance 2012. <http://www.minenergia.cl/documentos/balance-energetico.html>

base-load technologies (large hydro and coal) have been facing significant environmental and social barriers for further development.

- **Trade balance:** fossil fuel imports represent 23% of total imports in Chile (IEA, 2010). Any reductions on fossil fuel needs resulting from scale-up of energy efficiency and self-supply renewable energy would directly improve the trade balance position.
- **Employment:** lower cost power and the resulting increased competitiveness of local industry (as explained in the points above) has the potential to protect and promote employment, as Chilean products become more competitive internationally and export volumes can be maintained or increased.
- **Freeing up capacity at transmission/distribution grid:** PEEERA projects provide energy (RE) or reduce its demand (EE) at the exact point of demand and therefore reduce demand from the grid, therefore freeing up grid capacity. This is especially important where grid capacity is already limited.

E. Implementation Potential

56. The implementation potential of the Program is good, given a number of favorable conditions outlined in previous paragraphs. The recently implemented regulation for net metering for distributed renewable generation with a capacity of less than 100kW and, amongst others, an EE law for industry currently in preparation provide the necessary incentives from the policy and regulatory angle.

57. In addition, Chile has a very positively regarded regulatory environment for private sector investment across the economy. This is of special importance because of a lack of domestic EE and RE technology providers and therefore very strong dependence on international suppliers. The GoC has strongly supported the development of the private sector since the eighties, when a series of economic reforms were made to open the Chilean economy to the world through liberal policies, such as privatization of social security, free trade agreements, and low government intervention. As a result, Chile consistently ranks very high (normally at the top among Latin American countries) in investment climate rankings (such as the *Doing Business* ranking).

58. As explained in previous paragraphs there is enormous potential for RE self-supply projects in Chile due to enabling conditions for private businesses, along with high and increasing power prices and big renewable resource potential. In the specific case of solar, this has attracted more than 100 solar PV developers to Chile mainly focusing on utility scale projects. The learning effects in the solar industry as well as a very crowded utility scale market will help diversify the focus towards medium and small scale projects. At the same time large corporations like Walmart are already in the process of contracting parts of their electricity demand through RE. There are an estimated 15,000 roofs with potential for installation of solar PV plants only in the commercial and industrial sector in Chile.

59. Finally, this program with both investment and advisory services is expected to help build a business model for LFIs to enter the PEEERA market and reach the momentum needed to carry on financing these after the Program ends.

F. Additional Costs & Risk Premium

60. In many cases, the investments to be supported by the Program are currently perceived as having superior technology and implementation risks and therefore face higher financing costs and first-mover implementation costs. Currently, many companies are interested in the ESCO model, as their balance sheets are constrained and the investments require private companies to take on long-term debt which is not available. As ESCOs and SMEs need to finance the projects with equity, the cost of capital often times becomes prohibitive. CTF resources would enable LFIs to provide the missing project debt financing, leverage sponsors equity and enhance the economics of projects, in order to achieve a

competitive LCOE. Depending on each specific project and the relevant financing structure, CTF would provide price and/or risk concessionality to achieve this objective.

61. Due to the degree of knowledge that IDB has developed with the CTF preparation grant, working with private companies on detailed feasibility studies, the economic and regulatory viability of the projects is not a risk.

G. Financial Sustainability

62. As part of the PEEERA Preparation TC several projects of these types were identified and some are being analyzed in more detail. Most of these projects have demonstrated to be economically viable in the commercial and industrial sectors. Solar PV, which has enormous potential, also was found to be feasible in many contexts particularly in the North of the country. A recent study carried out for the IDB in Chile in the residential market shows that wall, windows and ceiling thermal insulation, heat pumps and solar collectors are economically feasible for existing housing in most climatic areas of the country²³.

63. The Program's financial sustainability is inherent in the economic viability of identified PEEERA investments and the demonstration that these projects will offer, which will reduce perceived risks and financing costs in the Chilean market. Furthermore, the Program's efforts will involve LFI, ESCOs, companies, and developers through co-financing, technical cooperation and training. Specifically, the grant funding requested will be used in part to provide additional training to local banks which is focused on the opportunities to lend for small-scale self-supply and energy efficiency projects. The grant funding requested may be used to pay for the contractual and legal documentation necessary for the establishment of a business model to access the PEEERA market and its acceptance by local financial intermediaries. Once this business model is established, it is expected that legal, feasibility and due diligence costs will decrease for future projects.

64. In addition, as the project supports the expansion of the sector through demonstration of the first few projects, the following factors will contribute to future cost reductions, replicability and sustainability of PEEERA market:

- Reduced project development cost if local content (technical and financial expertise; construction and installation services supply) is further developed, incentivized by the evidence of a growing sector.
- Successful financing schemes are demonstrated, reducing financing risk perception and cost.

H. Effective Utilization of Concessional Finance

65. As explained in previous sections, investment in PEEERA is limited by difficult access to financing, unfavorable financing conditions, and equity requirements for SMEs, ESCOs or third party financing. At the same time there is limited interest from lenders for smaller-scale projects due to higher transaction costs and preference of large-scale projects. PEEERA projects are generally perceived higher risk by lenders and therefore worsening its financing conditions.

66. At the same time PEEERA technologies are still not well understood and there is uncertainty amongst business and homeowners about the benefits these can offer. Also high-quality information regarding a limited number of existing self-supply renewable energy projects is not publically available and often difficult to obtain and few demonstration projects are open to the public

²³ CDT (August, 2014) Support to Energy Efficiency in Residential and Municipal Sector in Chile. Study for IDB and Ministry of Energy.

67. In both these scenarios, the TC and the different concessional finance instruments by CTF under the proposed Program as mentioned previously will help overcome the risk and cost barriers faced by developers, companies and financial institutions in Chile. The proposed first-loss guarantee Program would allow local FI's to provide the financing these projects need.

68. As this proposal is prepared there are no other known concessional investment resources readily available to support PEEERA development in Chile, but the CORFO/KfW NAMA Renewable energy self-supply program under development is expected in the future to provide additional concessional resources.

I. Mitigation of Market Distortions

69. CTF concessional finance will be mostly used to address risk barriers as well as capacity building needs. Whenever concessional pricing is offered, it will be to:

- i. off-set risk premium required for investments in EE/RE technologies based on exacerbated risk perceptions.
- ii. to buy down the higher cost of EE/RE technologies whose limited use have not yet allowed them to achieve economies (in production, procurement or distribution) of scale in Chile.
- iii. to provide an economic incentive to LFIs to develop business lines they would otherwise not considered given perceived inadequate risk/reward balance.

70. Concessional conditions will be therefore offered in a very targeted way to make certain investments viable and provide a track record that allows to mitigate risk perception and attract further interest in these investments. Any distortion will therefore be only temporary and positive in essence, crowding LFIs and other investors in rather than out of these incipient markets

J. Risks

71. The main risks for the Program are the following:

72. **Low demand** for the Program's guarantees and direct lending, which will be addressed by promoting and introducing the Program to companies receiving TC for feasibility studies and capacity-building within the nascent industry of PEEERA project developers in Chile. This risk will also be mitigated by trying to capitalize the existing client portfolios of interested LFIs, who would likely be an immediate and cost-efficient target for marketing and evaluation efforts for the new credit lines.

73. **Overlap with other government initiatives.** As explained, this risk will be mitigated through continued coordination with the government, to seek synergies and complementarities instead of duplication.

74. **Financial feasibility.** The pilot studies on specific EE/RE investment undertaken during project preparation confirmed the economic and financial feasibility of a number of potential projects across a number of industries, giving evidence and confidence that these investments make business sense in the Chilean context.

V. PERFORMANCE INDICATORS

Key Performance Indicators	Target
Capacity of PEEERA plants constructed/to be constructed enabled by the project	36MW
Energy expected to be generated based on PEEERA projects supported	1,956 GWh (cumulatively) 86 GWh/year
Energy expected to be saved based on EE projects supported	1,141 GWh (cumulatively) 87 GWh/year (annually)
GHG tons abated	1.6 MtCO ₂ e (cumulatively) 0.092 MtCO ₂ e/year (annually)
Financial leverage	1:5

The program will have a five-year implementation period, upon which the above-referenced annual reductions/generation and total capacity targets are expected to be reached.

Cumulative energy or emission reductions figures were calculated for each technology considering its lifetime. Technology lifetimes vary from 5 years (e.g. piping insulation) to 40 years (houses).

Each loan or guarantee beneficiary will be contractually bound to report on the abovementioned indicators, as applicable, on an annual basis throughout the life of each transaction. This is part of IDB's Annual Review of Operations. During the structuring phase of each transaction IDB will either ensure that the beneficiaries generate internal capacity to identify, collect and report the appropriate indicators, or allocate the necessary resources to provide the support of technical experts that can fulfill this requirement.

Annex I - Estimated implementation and supervision costs of TC/KM and investment operations

Activity	Amount (USD)
Management of TC and KM activities	80,000
Implementation (staff costs for appraising, structuring, negotiating and closing the financing)	170,000
Legal expenses (external legal counsel)	250,000
Supervision, monitoring & evaluation (staff costs and expenses)	400,000
Total	900,000

Notes:

- TC and KM costs calculated as 5% of TC+KM budget.
- It is assumed that 3 investment projects are supported.