PROJECT IDENTIFICATION FORM (PIF)

PROJECT TYPE: Medium-sized Project
TYPE OF TRUST FUND:GEF Trust Fund

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PART I: PROJECT INFORMATION

Project Title:	Promoting the Development of Biogas Energy Amongst Select Small - and Medium-Sized Agro-Industries		
Country(ies):	The Republic of Chile	GEF Project ID:[1]	5335
GEF Agency(ies):	UNIDO	GEF Agency Project ID:	100181
Other Executing Partner(s):	Renewable Energy Centre of Chile (CER)	Submission Date: Resubmission Date:	2013-03-13 2013-04-25
GEF Focal Area (s):	Climate Change	Project Duration (Months)	36
Name of parent program (if applicable): • For SFM/REDD+ ☐ • For SGP ☐ • For PPP ☐	N/A	Project Agency Fee ($):	162,939

A. INDICATIVE FOCAL AREA STRATEGY FRAMEWORK[2]:

Focal Area Objectives	Trust Fund	Indicative Grant Amount ($)	Indicative Co-financing ($)
CCM-3 Renewable Energy: Promote investment in renewable energy technologies	GEFTF	1,715,151	8,665,000
Total Project Cost		1,715,151	8,665,000

B. INDICATIVE PROJECT DESCRIPTION SUMMARY

Project Objective: To reduce GHG emissions by promoting investment and market development of biogas energy technologies in select agro-industries located in one region[3] of Chile.

Project Component	Grant Type[4]	Expected Outcomes	Expected Outputs	Trust Fund	Indicative Grant Amount ($)	Indicative Cofinancing ($)
1) Policy and institutional support for biogas use within SMEs strengthened.	TA	Policies targeting the development of biogas-based RE have been strengthened and incentives for increased deployment amongst SMEs in the select agro-industries established.	1.1 Existing policies and incentives are fine-tuned to the needs of biogas utilization, particularly with a view to SME. 1.2 Promotional instruments and/or incentives for biogas utilization in select agro-industries, particularly for fostering investments for such utilization,	GEFTF	90,000	200,000

[1] Project ID number will be assigned by GEFSEC.
[2] Refer to the reference attached on the Focal Area Results Framework and LDCF/SCCF Framework when completing Table A.
[3] The exact region will be determined during the PPG phase.
[4] TA includes capacity building, and research and development.

			have been established.			
2) Capacities for the development of biogas technologies for agro-industrial applications in SMEs strengthened.	TA	Technical and commercial knowledge of the potential of biogas amongst the beneficiary agro-industries as well as the technology providers increased. Technology delivery and support system strengthened.	2.1. Delivery of commercial training on the potentials, costs and benefits for biogas applications for SME company owners and managers of the select agro-industries. 2.2. Delivery of technical training on biogas technologies for technical staff from select SME agro-industrial enterprises. 2.3 Delivery of technical and commercial training for biogas technology providers to assure offered solutions and after-sales service are suited to the needs of agro-industrial SMEs.	GEFTF	150,000	350,000
3) Enhancement of investment in biogas-to-energy technologies in select small- and medium-sized agro-industries.	TA	Technical and commercial viability of biogas application within select agro-industries demonstrated and framework for scale-up of activities in place.	3.1 Identify and assist select agro-industrial SMEs with the technical and financial design of their biogas investment plan. 3.2 Activities to disseminate potentials and best practices for biogas applications in select small- and medium-sized agro-industries amongst different target groups active in the field have been carried out;	GEFTF	45,000	320,000

	Inv		3.3 Feasibility studies have been carried out and project implementation initiated for at least seven biogas-based energy generation projects (especially for self-supply) amongst select small- and medium-sized agro-industries in one region of Chile to prove techno-economic viability and replication.; 3.4. A non-grant financial instrument supporting an enabling environment for and facilitating investments in biogas-based energy technologies for small- and medium-sized agro-industries has been initiated.		1,230,000	7,300,000
4) Monitoring and evaluation.	TA	Monitoring and evaluation carried out.	4.1. M&E plan established; 4.2. Project progress report(s) prepared; 4.3. Midterm review and final evaluation report carried out.	GEFTF	50,000	50,000
Subtotal					1,565,000	8,220,000
Project Management Cost (PMC)[5]				GEFTF	150,151	445,000
Total Project Cost					1,715,151	8,665,000

C. INDICATIVE CO-FINANCING FOR THE PROJECT BY SOURCE AND BY NAME IF AVAILABLE, ($)

Sources of Cofinancing	Name of Cofinancier	Type of Cofinancing	Amount ($)
GEF Agency	UNIDO	Cash	60,000
GEF Agency	UNIDO	In-kind	40,000
National Government	CORFO/Ministry of Energy/Ministry of Agriculture	Cash	3,700,000
National Government	CER	In-kind	600,000
Private Sector	Private sector investors	Cash	3,600,000
Private Sector	Private sector investors	In-kind	665,000
Total Cofinancing			8,665,000

[5] To be calculated as percent of subtotal.

D. INDICATIVE TRUST FUND RESOURCES ($) REQUESTED BY AGENCY, FOCAL AREA AND COUNTRY[1]

GEF Agency	Type of Trust Fund	Focal Area	Country Name/Global	Grant Amount ($) (a)	Agency Fee ($) (b)[2]	Total ($) c=a+b
(select)	(select)	(select)				0
(select)	(select)	(select)				0
Total Grant Resources				0	0	0

[1] In case of a single focal area, single country, single GEF Agency project, and single trust fund project, no need to provide information for this table. PMC amount from Table B should be included proportionately to the focal area amount in this table.

[2] Indicate fees related to this project.

E. PROJECT PREPARATION GRANT (PPG)[6]

Please check on the appropriate box for PPG as needed for the project according to the GEF Project Grant:

	Amount Requested ($)	Agency Fee for PPG ($)[7]
• No PPG required.		
• (up to)$50k for projects up to & including $1 million		
• (up to)$100k for projects up to & including $3 million	50,000[8]	4,750
• (up to)$150k for projects up to & including $6 million		
• (up to)$200k for projects up to & including $10 million		
• (up to)$300k for projects above $10 million		

PPG AMOUNT REQUESTED BY AGENCY(IES), FOCAL AREA(S) AND COUNTRY(IES) FOR MFA AND/OR MTF ROJECT ONLY

Trust Fund	GEF Agency	Focal Area	Country Name/ Global	(in $)		
				PPG (a)	**Agency Fee** (b)	**Total** c = a + b
(select)	(select)	(select)				0
(select)	(select)	(select)				0
(select)	(select)	(select)				0
Total PPG Amount				**0**	**0**	**0**

MFA: Multi-focal area projects; MTF: Multi-Trust Fund projects.

[6] On an exceptional basis, PPG amount may differ upon detailed discussion and justification with the GEFSEC.

[7] PPG fee percentage follows the percentage of the GEF Project Grant amount requested.

[8] This will be complimented by USD 40,000 in cash from UNIDO as well as USD 10,000 in-kind from the counterpart.

PART II: PROJECT JUSTIFICATION[9]

A. PROJECT OVERVIEW

A.1. Project Description. Briefly describe the project, including ; 1) the global environmental problems, root causes and barriers that need to be addressed; 2) the baseline scenario and any associated baseline projects, 3) the proposed alternative scenario, with a brief description of expected outcomes and components of the project, 4) incremental cost reasoning and expected contributions from the baseline , the GEFTF, LDCF/SCCF and co-financing; 5) global environmental benefits (GEFTF, NPIF) and adaptation benefits (LDCF/SCCF); 6) innovativeness, sustainability and potential for scaling up

1) According to the Fourth Assessment Report of the International Panel for Climate Change (IPCC AR4), global greenhouse gas (GHG) emissions have grown since pre-industrial times, with an increase of 70 per cent between 1970 and 2004. These emissions will continue to grow over the next few decades if current climate change mitigation policies and related sustainable development practices are kept up. Chile is party to the United Nations Framework Convention on Climate Change (UNFCCC) and as such committed to reducing GHG emissions through active mitigation measures such as greater deployment of renewable energy. So far mitigation via the introduction of non-conventional renewable energy (NCRE) sources has not made sufficient progress though; NCREs currently account for only approximately 4.4% of electricity production in Chile[10]. This is despite the fact that Chile shows significant potential in renewable resources, which can be exploited to generate electricity, heat and biofuels. In fact, the increased integration of NCREs into Chile's electricity matrix is considered key to assure that future development by all sectors of the economy can rely on a secure energy supply and a low-carbon development pathway.

   Many investment projects associated with NCRE technologies have not been implemented on a large scale for a variety of reasons including the high cost of the initial investment, the limited possibilities for financing as well as difficulties in the access and connection to transmission lines and in signing long-term contracts (power purchase agreements). Deployment on a large and particularly small-scale (as would be the case for SMEs) has additionally been hindered by a lack of operating projects that would reduce risk perceptions, build capacity to boost the local industry and develop best practices in the use of these technologies. The challenges and barriers outlined above have also been identified in the CTF Investment Plan for Chile that was released in April 2012. In fact, one of the CTF co-financing priorities will be the promotion of renewable energy self-supply under which concessional financing and training to local financial institutions will be provided[11].

2) Biogas, a combustible gas that is generated by the action of micro-organism in the absence of oxygen (anaerobic digestion), constitutes one NCRE source that has been successfully utilised in several countries worldwide and should be economical in Chile. It can be generated using various organic materials as substrate, such as animal manure, agro-industrial waste and wastewater and can be used to replace fossil fuels in thermal application (e.g. stoves, boilers, furnaces) as well as, after certain treatment, to generate electricity, and in cogeneration schemes (combined heat and power).

   In Chile its main sources would be animal manure (poultry, pigs, cattle, etc.) as well as organic waste and wastewater from agro-industries (e.g., wine, beer, and slaughterhouses), municipal waste, sewage and sludge. Most of these agro-industries, where biogas is generated, are small- and medium sized. In fact, more than 90% of the companies active in

[9] Part II should not be longer than 5 pages.
[10] See CER´s Bulletin, August 2012.. http://cer.gob.cl/wp-content/uploads/downloads/2012/08/Jul-2012-boletin_CER_ENG-VF.pdf
[11] CTF Trust Fund Committee. 2012. Clean Technology Fund Investment Plan for Chile, pg. 28.

the agricultural sector are classified as SMEs[12]. Looking, for example, at a sample of dairy cattle farms in two southern regions that adhere to cleaner production standards, there are a total of 107 small-and medium-sized producers, while only 4 are large producers (see also Table 1)[13].

Size of producer	No. of producers per zone	
	Región de los Rios	Centro (V,VI & RM)
Large (Sales above 100,001 UF*)		4
Medium (Sales between 25,001 and 100,000 UF)	16	19
Small (Sales between 2,400 and 25,000 UF)	31	41
Micro (Sales below 2,400 UF)		11

*Unidad de Fomento (UF) is a unit of account that is used in Chile.

Table 1: Dairy cattle farms according to region and size.

The baseline for this project is characterized by a few experimental plants at universities and about 20 commercial projects, which have been implemented – though mainly at landfills and wastewater treatment facilities (some of which are approved under the CDM). In the agro-business only a few very large pig farms have implemented methane capture[14]. Most of these projects, however, focus on the treatment of manure and flare the captured gas rather than using it as an energy source. Hence, neither have these projects been conceived for energy generation nor do these companies represent the agribusiness sector as a whole.

The legislation that favours NCRE has so far not contributed to a greater dissemination of biogas technology. In fact, for most companies in the agro-industrial sector, biogas for power and heat generation lacks attractiveness. Particularly for small- and medium-sized agro-business companies, the additional cost of acquiring power generation and cleaning of the gas for electricity generation is relatively high, because these companies do not have the same economics of scale as the very large companies might have. Energy production is not their core business and most companies would have to hire external expertise to advise/support them on these matters at additional cost.

Therefore, there currently exist several challenges with respect to utilizing biogas for self-supply in small- and medium-sized agro-industries that these companies are highly unlikely to address on their own i.e.: SMEs neither have a) the financial means or access to the financial means; nor b) the knowledge and available local expertise to engage in what they would consider a risky technology; and c) the recently introduced legislation on NCRE has so far not facilitated the dissemination of biogas technologies amongst SMEs either, as preference has been given to grid-connected electricity generation by independent power producers, which has favoured mainly utilities that employ hydropower and wind energy applications for electricity generation. In the case of bio-methanisation, only large landfill gas facilities have benefitted; so far the country's biogas potential for energy generation has not been unlocked. Furthermore, with the focus being on grid-connected applications in the current government incentive schemes, thermal applications and/or on-site use of energy, which could hold significant opportunities for SMEs, have not profited from these regulations.

Baseline Project: In line with its intent to promote renewable energy via tender processes,

[12] Instituto Nacional de Estadísticas. 2009. Las pequeñas y medianas explotaciones. VII Censo agropecuario y forestal 2006-2007, pg. 9.

[13] Ministerio de Energia / CER / Sustentank. 2012. Diseño de un instrumento de fomento para proyectos de biogás – biomasa que apunten a la asociatividad de tenedores del recurso biomásico, pg. 30.

[14] For example, the CDM project 0033 "Methane capture and combustion from swine manure treatment for Pocillas and La Estrella" deals with 230,000 pigs at each of the two sites of the project, which is considered very large in size.

the Government of Chile is holding two public calls in 2013 with the aim to leverage private sector resources for renewable energy projects for self-supply. The first call is being prepared by the Innovation Committee of the Economic Development Agency (CORFO) and considers a total fund of USD 10 million to co-finance up to 50% of the investment and operation of projects in different industrial sectors. The second call is being prepared by the Ministry of Agriculture and is focused exclusively in the agricultural sector, with a budget of USD 4 million. It is expected that in both calls an important share of the grants will be awarded to biogas projects; however, it is likely that even though a wide range of companies will apply for the tenders, only companies with projects at advanced stages as is the case primarily for large-scale farms will benefit. A further two bids will be launched in 2014[15], whereby the government will make USD 7 million available that is to be complimented by at least USD 7 million from the private sector.

Overall, at the present stage of development, there is no 'market pull' from the small- and medium-sized agro-industries to implement biogas-to-energy technologies due to a lack of appropriate incentives, a lack of technical and commercial capacity and a lack of awareness including transparent and standardised pre-investment studies.

3) Therefore, the government of Chile has set itself the goal to actively promote such a market by starting with select agro-industries in one region of Chile. The Project will pursue this through the following four components:

Component 1: Policy and institutional support for biogas use within SMEs strengthened. Activities in this component will support the strengthening of an enabling environment for biogas application in agro-industries based on an assessment of how effectively current policy and incentive instruments target SMEs. The particular aspects that will be addressed will be explored and specified during the PPG phase (including amongst others e.g. financial barriers and potential mechanisms to overcome these, necessary performance standards for biogas equipment, requirements for substrate handling and transportation, etc.). Existing policies and incentives will be fine-tuned to the needs of biogas utilisation for (select) agro-industrial SMEs and promotional instruments and/or incentives to encourage further uptake of this NCRE will be established.

Component 2: Capacities for the development of biogas technologies for agro-industrial applications in SMEs strengthened. Under this component a set of activities will aim at raising the technical and commercial knowledge about the potentials, costs and benefits of biogas applications in order to allow company owners and managers to take an informed decision on biogas investment opportunities. The aim will be to generate standardised pre-investment studies that facilitate the decision-making amongst SMEs. Furthermore, the project will organize specific technical training on biogas plant construction, installation, operation and maintenance for agro-industrial enterprises' technical staff. This is to assure that bankable proposals can be developed as well as appropriate technology and technology providers identified and to be able to carry out management, operation and maintenance of the biogas installations. In addition, biogas technology providers will be supported with technical assistance to enable them to provide a high-quality[16] and affordable product and to deliver appropriate and affordable after-sales service to their clients.

Component 3: Enhancement of investment in biogas-to-energy technologies in select small- and medium-sized agro-industries. This component encompasses technical assistance and

[15] In addition to these bids, the extensive support mechanisms that CORFO offers will be available. It is expected that through the scheduled calls, a pipeline of projects will be identified which then can be implemented with funding from the calls, CORFO as well as the newly to be created non-grant instrument.

[16] Synergies with developments in the area of international standardisation in the field of renewable energy will be made full use of.

investment activities. At least seven biogas-based energy generation plants for self-supply in select agro-industries in one region of Chile (such as e.g. the dairy industry in the XIV region) are to be supported. The majority of projects to be supported are planned to be identified during project preparation through the two public calls for proposals that the Chilean government plans to launch in 2013. Farmers/SMEs whose projects are deemed potentially viable, but who were unable to benefit from the calls due to their lack of technical and commercial skills to prepare successful investment bids, will benefit from the GEF resources. They will receive support to develop feasibility studies and investment plans to apply for the next round of calls, which will take place in 2014. In total, feasibility studies for at least seven projects will be carried out and project implementation initiated. Table 2 provides a general description of possible projects.

Furthermore, a non-grant financial instrument for the target region, such as a revolving fund, shall be set-up. The envisaged instrument will be further defined during project preparation but it is intended to be capitalised to provide funding for technical assistance (feasibility studies, training) for around five SMEs each year[17]. The instrument could be managed by Renewable Energy Centre of Chile (CER) with the support of CORFO, which operates nationally and has extensive experience with and the structures for managing and administrating grants, credits as well as funds that require the beneficiary to pay back some of the resources received. In addition, close cooperation with other CORFO instruments shall be sought to assure that SMEs who benefit from the new instrument also have easy access to other available funding sources; complementarily between GEF and CORFO funds is envisaged. Besides potential future calls for proposals and the potential CTF loans, the following CORFO funds are particularly relevant for agro-industrial SMEs: Development and Growth Fund[18], Seed Fund[19], Technological Investment Support Program[20], Investment Support Program in Opportunity Zones[21].

Table 2: Characteristics of potential demonstration projects

Project 1	Pig	
Size	9,818	heads
Biogas	451,644	m3 biogas/yr
Methane	280,020	m3 methane/yr
CO2	3,940	tCO2/yr
Investment	417,665	USD
Project 2	**Cattle**	
Size	237	heads
Biogas	63,519	m3 biogas/yr
Methane	39,382	m3 methane/yr
CO2	554	tCO2/yr
Investment	58,740	USD
Project 3	**Poultry**	
Size	100,000	heads
Biogas	244,779	m3 biogas/yr
Methane	151,763	m3 methane/yr
CO2	2,135	tCO2/yr
Investment	226,363	USD

[17] Assuming e.g. that the fund would be set up during the last year of the project, that each SME would receive a package worth USD 40,000, that 65% of SMEs receive a "positive" feasibility assessment and are expected to pay back into the fund after 3 years and that there are no additional in-flows, an initial capitalization of USD 1,050,000 would assure that the fund would be operational for at least 5 years after the end of the project. Please note that no reflows to the GEF are expected.

[18] http://www.english.corfo.cl/programs/programs/development-and-growth-fund

[19] http://www.english.corfo.cl/programs/programs/seed-fund

[20] http://www.english.corfo.cl/programs/programs/technological-investment-support-program

[21] http://www.english.corfo.cl/programs/programs/investment-support-program-in-opportunity-zones

The planned financial instrument intends to bring sustainability to GEF resources and will be a key component in assuring the replicability of biogas-based applications in SMEs. Replication and up-scaling will be further promoted through appropriate dissemination activities under this component; activities will make best use of synergies with the activities being conducted under the existing UNDP GEF-5 project as well as those that form part of CTF Investment Plan.

Component 4: Monitoring & Evaluation. Under this component, monitoring and evaluation activities will be carried out to assure that the outputs, outcomes and ultimately outcomes of the project are being achieved.

Once the approach taken by the project has proven successful, it is planned for this model to be exported to other regions of Chile (with slight adjustments for regional differences)[22] thus actively promoting private sector investments and contributing to the transformation of the market for biogas utilisation amongst SMEs.

4) The present UNIDO/GEF Project aims at supporting the CER, CORFO and the Ministry of Agriculture in its efforts to increase generation from NCRE by agro-industrial SMEs in order to reduce GHG emissions as well as increase awareness of these technologies and their role in providing a secure energy supply in the long term. The objective of the proposed GEF Project "*Promoting The Development Of Biogas-Based Energy Generation Amongst Select Small- and Medium-Sized Agro-Industries*" is thus to reduce GHG emissions by promoting investment and market development of biogas energy technologies in select agro-industries in one region in Chile. To this purpose, it is envisaged that the implementation of at least 7 biogas-to-energy plants will have been imitated and associated training carried out as well as a financial mechanism created that will facilitate an enabling environment for future investments in biogas technologies by SMEs, thus contributing to the dissemination of the technology.

   It is envisaged that through the assistance received from the GEF Trust Fund and the activities that will be carried out with it, a large part of the funding that the government has allocated in 2014 to two calls for proposals for NCRE projects can be leveraged. This funding will be complimented by private sector funding. UNIDO has also committed support (cash) during project implementation amounting to USD 60,000. Moreover, the project will actively work on exploring synergies with existing funds hosted by CORFO a well as the CTF Investment Plan[23].

5) The project aims to achieve global environmental benefits by reducing greenhouse gas (GHG) emissions through the capture and burning of methane gas (converting into CO_2) that otherwise would have escaped into the atmosphere (noting that methane's global warming potential, GWP, is 21 to 25 times the GWP of CO_2). In addition, in case where the gas is used to replace fossil fuels (in thermal or power generation applications), emission of GHG resulting from fossil fuel burning are avoided.[24] Considering only the GHG reductions obtained from the avoidance of methane and assuming an equipment lifetime of 7 years, cumulative emission reductions of the entire project portfolio on the basis of an investment

[22] It is envisaged that the CER will be in charge of this process since they have staff assigned for every region, who works closely with all the relevant stakeholders and have a vast knowledge of the specific needs and baseline situation in each of the regions.
[23] Please note that at this point in time one million has been given to the RE & EE program of the CTF Investment Plan for the purpose of developing studies to identify possible financing mechanisms and address the impact of the RE & EE program. See http://www.climateinvestmentfunds.org/cif/sites/climateinvestmentfunds.org/files/Approval_by_Mail_Request_to_Release_First_Tranche_of_CTF_Funding_for_Chile_India_and_Nigeria.pdf for further info.
[24] Fossil fuel replacement has not been taking into account in the CO2 calculations of the three cases in the table.

of USD 7.3 million would be just over 480 ktons of CO_{2eq}[25].

6) The project approach is deemed to be innovative in the way that it targets SMEs, whose core business is of an agro-industrial nature rather than related to energy production. The project promotes a market pull for the specific technology not only through strengthened policies and targeted incentives, the demonstration of successful pilot projects and the creation of a project portfolio but by facilitating a business model in which SMEs, who are unfamiliar with waste-to-energy technologies, can become engaged with biogas energy generation within a framework of limited risk. Furthermore, the project approach is considered most cost-effective and most likely to lead to sustainable results, because the combination of funding from the GEF and support from the government (through specific Calls for Proposals as well as close cooperation with existing funds) will leverage substantial investment from agro-industrial enterprises to install biogas plants, not only during the project's period of implementation, but thereafter as an indirect result by having enhanced the awareness and technical as well as commercial capacity of future project developers, by having created a wider portfolio of investment opportunities and by having initiated a non-grant instrument providing technical assistance (feasibility studies, training) to small- and medium-sized agro-industries interested in exploring biogas applications. Moreover, and in general, by creating the conditions for commercialization of biogas technology in one region as well as raising the quantity and quality of services provided for application in agribusinesses, the approach can be exported to other regions with only slight modifications (mainly on a technological level). Thus, the GEF support of USD 1,715,151 would not only trigger at least USD 8,665,000, but also have longer-term indirect investment impacts that could be an order of magnitude higher, due to the institutional and human resources strengthening activities of Components 1 and 2 as well as the financial instrument to be initiated under Component 3.

A.2. Stakeholders. Identify key stakeholders (including civil society organizations, indigenous people, gender groups, and others as relevant) and describe how they will be engaged in project preparation:

The project will engage with a broad range of stakeholders on a national as well as regional level, incl.:

- CER (Renewable Energy Centre): *Main Executing party.* Agency of the Ministry of Energy, set up in 2009 as a CORFO committee with a board of directors including representatives from the Ministry of Energy, Environment, Agriculture, Economy and CORFO, for supporting policy formulation and responsible for the implementation of policies related to NCRE. The Centre works alongside CORFO and CNE (National Energy Commission) and provides support to NCRE projects as well as serving as an information and guidance centre for government bodies, investors, project developers and academic researchers. Its extensive experience in organising and conducting capacity building activities will be drawn upon when defining the training components during project preparation. Furthermore, the envisaged non-grant instrument will be hosted at CER as in this way it can be closely managed and due to the centre's close relationship with CORFO, easily administered. That is, CER will act as the 'visible' counterpart, receiving proposals, evaluating them and

[25] This is based on the values presented in Table 2 from which it can be determined that to reduce 1 tCO_{2eq} p.a., an investment of USD106 on average needs to be made. Hence an initial investment of USD7.3 million would thus lead to 68,868 tCO_{2eq} p.a., resulting in 482,075tCO_{2eq} for a seven year period. Please note that a more detailed estimate of total GHG reductions, that also takes into consideration the type of fermentation that occurs in the baseline, will be prepared during the PPG phase.

supporting the beneficiaries along the process, while CORFO will provide all 'back-office' support (administrative and financial)[26].

- CORFO (Economic Development Agency): Public agency in charge of the promotion of the economic development, focusing on the national production of goods and services. CORFO, which was founded in 1939, has been providing support mechanisms to entrepreneurs for many years and in 2012 alone supported 167,188 beneficiaries with grants and non-grant instruments. They are the counterpart responsible for designing and implementing current tenders and will be instrumental in the design and set-up of a new non-grant financial mechanism during project preparation and implementation. CORFO will also be expected to be an active participant in the capacity building activities that are envisaged.
- Ministry of Environment: Responsible for implementing and coordinating the National Climate Change Action Plan, this comprises the development and implementation of mitigation actions at national and local level. One of the areas of this plan is to incorporate non-conventional renewable energy (including biogas) into the national energy matrix. The GEF Operational Focal Point in Chile belongs to this Ministry. Synergies with activities being undertaken under this ministry will be sought in finalising the project design during the PPG phase.
- Ministry of Energy: Responsible for formulating the energy policy and industry regulations, including the validation and implementation of the institutional and regulatory framework regarding non-conventional renewable energies (NCREs). Relevant experiences and resources will be drawn upon when analysing the policy/regulatory framework during project preparation.
- Ministry of Agriculture: Responsible for formulating the policy and industry regulations in the agriculture sector, including the promotion of the use of non-conventional renewable energies (NCREs) within relevant sub-sectors. Relevant experiences and resources will be drawn upon when analysing the policy/regulatory framework during project preparation.
- Trade Associations and Chambers of Commerce and Industry of the export and industrial sector: These associations gather companies in the manufacturing and export sector and are an important channel to disseminate knowledge and valuable information among the different companies that belong to them as members. The most relevant of these associations for the project region will be identified during project preparation and closely cooperated with, especially for dissemination activities.
- Private sector: These form the main beneficiaries of the project, including SMEs in select agro-industries (such as dairy) as well as engineering companies that supply biogas technology and consultancy services. Special attention will be given to the training and employment of women during the finalisation of the project design in the PPG phase.

A.3 Risk. Indicate risks, including climate change, potential social and environmental risks that might prevent the project objectives from being achieved, and, if possible, propose measures that address these risks to be further developed during the project design (table format acceptable):

Main risks and proposed measure to address them:

Risks	**Remedial actions**
1. Delay on the validation and the implementation of improvements to the policy	The Government of the Chile, through the Renewable Energy Centre, is strongly committed to the project. It is considered a key element to develop a biogas market as well as to reduce GHG emissions from the agro-industrial sector. Hence, a delay with respect to the improvement of the policy and institutional framework is not expected.

[26]As an example, CORFO has specific bank accounts, where beneficiaries can return payments received from non-grant instruments.

and institutional framework ***Likelihood: Low***	
2. Lack of trust or interest about the benefits of implementing biogas technology. ***Likelihood: Medium***	The planned implementation of several demonstration projects under Component 3 of the project should prove the commercial and technical feasibility of the biogas technologies in the select agro-industrial sector(s) in the targeted region of Chile. That is, it will show that technology which has been utilized in large installations in Chile can also be implemented successfully in SMEs. So far, any lack of trust / interest has been due to the lack of demonstration projects in a relevant setting in Chile. In fact, experiences from other countries show that while post-sales service is an important component of a successful biogas operation (see risk #3 for further info); it can be implemented successfully in small- and medium-sized agro-industries. Hence, it is not expected that a lack of trust / interest regarding the benefits of implementing biogas technology will entail.
3. Lack of a well-functioning technology support system. ***Likelihood: Medium***	As biogas utilization is a technology that does demand a certain level of active management, it will be vital that any existing potential gaps and needs will be addressed within Component 2 of the project through the strengthening of the technology delivery and support system as well as specific technical training. Moreover, an assessment of issues and constrains in existing biogas technology supply and service provision will be carried out during the PPG phase to assure that any trainings and/or provisions undertaken during project implementation are appropriate. That way, scaling-up and replication of the demonstration projects in the region should be without technical disruptions.
4. Lack of financial incentive after the end of the scheme ***Likelihood: Low***	Besides placing a strong regulatory emphasis on the wider application of clean technologies, the government of Chile has an extensive array of supports to renewable energy including flexible loans for investment. The proposed project aims to equip SMEs with the necessary knowledge and expertise to participate in existing loan as well as other incentive schemes, while also assuring that relevant existing schemes are fine-tuned to the needs of agro-industrial SMEs. Through the envisaged non-grant instrument and by building upon synergies stemming from the activities for the promotion of self-use NCRE under the CTF Investment Plan, the project aims to enhance access of SMEs to finance for RE. In that way, it is to be ensured that even after the initial investment into biogas-to-energy technologies during the project, uptake by other SMEs can be further promoted. Hence, the risk of a lack of financial incentive is considered low. In fact, the project will facilitate the greater utilisation of available and future incentives, leading to greater implementation of renewable energy solutions amongst agro-industrial SMEs.
5. Climate change, social and environmental risks ***Likelihood: Low***	The project is not expected to be negatively impacted by climate change since the planned investments are unlikely to be located in zones that are vulnerable to sea level changes. Neither is the waste streams that are to be utilised expected to vary much with climatic changes. Furthermore, as the project aims to actively mitigate GHG emissions, it is expected that climate change implications, from e.g. methane that escapes and is not captured, are negligible. Similarly, as the biogas utilisation plants will need to obtain permits for operation, environment implications are considered minor. Moreover, technology providers will receive training as part of the project which should further assure that any environmental risks related to the equipment and its operation are minimised. As there is currently no alternate financial use of the substrate, and both men and women are to be involved in the project e.g. training activities, social risks are expected to be low also.

A.4. Coordination. Outline the coordination with other relevant GEF financed and other initiatives:

The project will build on the experience with a number of initiatives that CNE has implemented in the past, notably the UNDP/GEF/CNE project "Removal of barriers to Rural Electrification with Renewable Energy" (2001-2011)[27] and CNE's program on "Rural and Social Energization"[28] (PERYS), and in particular build on their experiences with bio-methanisation. Specifically, the UNDP/GEF/CNE-funded project targeted the removal of barriers to rural electrification with renewable energy. Amongst the outputs achieved was capacity building for non-conventional renewable energy, the elaboration of 44 technical norms for systems based on clean technologies, the establishment of procedures for the certification of clean energy projects as well as the conduct of workshops covering biogas for productive uses. The PERYS program targeted the use of non-conventional renewable energy in vulnerable, isolated, and public facilities with the goal of helping to improve the quality of life. Several workshop and pilot projects have been implemented. Moreover, several biogas related studies have been undertaken in Chile more recently e.g. *Manual de biogás, Modelos de negocio que rentabilicen aplicaciones de biogás en Chile y su fomento,* etc., the results of which will also be taken into consideration. The results generated during these studies will be particularly useful in defining the types of companies that will be targeted with the proposed project. It should be noted though that at this point in time, there exists no conclusive information regarding the range of energy output considered financially worthwhile for SMEs in the select agro-industries. The Project aims to generate this type of information in a transparent and standardized fashion.

The project will in particular draw on synergies from the UNIDO GEF-5 project "Towards a green economy in Uruguay: stimulating sustainable production practices and low- emission technologies in prioritized sectors", which aims to transform the different kinds of waste generated in agriculture and agro-industry production chains in Uruguay into various types of energy and/or other by-products, aiming at the development of a low carbon sustainable production model, supported by an adequate technology development and transfer. Furthermore, the proposed Project will collaborate closely with the ongoing UNDP GEF-5 project "Supporting civil society and community initiatives to generate global environmental benefits using grants and micro loans in the Mediterranean Ecoregion of Chile". This multi-focal area project aims to develop, demonstrate and mainstream the delivery of globally significant environmental benefits by community-based organisations in the management of critically endangered landscapes in the Chilean Mediterranean Ecoregion. As far as feasible, joint activities between these projects to best use synergies will be promoted. Synergies with other UNIDO branches such as Agro-Business Development and Environmental Management will also be explored. A number of other activities have provided useful background info for the formulation of the biogas Project's concept, such as UNIDO's "Regional Observatory on Renewable Energy" and the GTZ-CNE project "Renewable Energy in Chile" (2004-2010).

B. Description of the consistency of the project with:

B.1 National strategies and plans or reports and assessments under relevant conventions, if applicable, i.e. NAPAS, NAPs, NBSAPs, national communications, TNAs, NCSAs, NIPs, PRSPs, NPFE, Biennial Update Reports, etc.

The proposed UNIDO/GEF initiative primarily builds upon the following national policy documents:

[27] See http://www.minenergia.cl/programas/proyecto-internacional-gef-pnud-cne.html for further info.
[28] See http://www.minenergia.cl/programas/programa-de-energizacion-rural-y-social.html for further info.

- First and Second National Communications[29];
- Energy Policy: New Guidelines[30];
- The National Energy Strategy 2012-2030[31].

The *First National Communication* from 2000 mentions that the role of non-conventional renewable energy (NCRE) in the overall energy mix is small, however within the NCRE sector methane recuperation plays an important role, mainly in sanitary landfills and waste water treatment plants. Chile's *Second National Communication* on climate change released in 2011 mentions that Chile has large potential for renewable energy and works towards having 20% of its electricity supplied by NCRE[32] by 2020. A number of laws have been introduced to allow easier access of small power producers and NCRE to generate electricity and sell to the grid, such as Laws No. 19.940, 20.018 and 20.257. The first two laws contributing to the opening of the spot market, guaranteeing small-scale plants (i.e. the size of many NCRE plants) the right to connect to distribution networks and exempting them from main transmission tolls (full exemption for plants producing less than 9MW and partial exemption for plants producing between 9MW and 20MW). The latter law makes it obligatory for power companies to incorporate a certain percentage of NCRE-generated power in their sales with a specific target of 10% NCRE in 2024. In 2008, the Government published the document *Energy Policy: New Guidelines*, which manifests the importance of clean energy. In addition, a technology needs assessment exercise done by the Economic Development Agency (CORFO) during 2009 and included in the Second National Communication of Climate Change highlights the potential uses for anaerobic digestion in waste management and renewable energy supply.

In February 2012, Chile published the *National Energy Strategy 2012-2030*, which considers the need to increasingly incorporate non-conventional renewable energies (NCRE) into the Chilean electricity grid as one of its fundamental pillars, while recognising that some improvements upon current legislation are necessary to provide further impetus to the development of NCREs. The strategy also indicates that the state will hold open tender processes to further promote NCREs in order to support those technologies that are currently not competitive enough to develop[33].

Chile also approved Law No. 20.571 on net metering recently, which allows end users (e.g. small businesses) to install technologies (under 100kW) for generating electricity from NCRE sources thus further consolidating distributed generation as an effective solution towards a more efficient electricity system with increased supply.

Moreover, the Ministry of Agriculture has set five strategic objectives to support the development of the agricultural sector in the country. Two of these objectives highlight the need to incorporate new technologies to improve the competitiveness of the sector and that these must ensure the sustainability of resources used. NCRE fits both of these purposes; therefore the Ministry of Agriculture has formed an alliance with the Ministry of Energy to promote the use of these NCRE systems in all sub-sectors of agriculture.

Finally, though Chile has not yet conducted a formal NPFE process, a voluntary, consultative workshop (financed by Chile) was held in November 2010, which explored priorities and

[29]Comisión Nacional del Medio Ambiente (CONAMA). 2000. Chile. Chile's first national communication to the United Nations Framework Convention on Climate Change (FCCC). Executive summary.
Ministerio del Medio Ambiente (2010-2011) / Comisión Nacional del Medio Ambiente (2007-2010). 2011. Segunda comunicación nacional de Chile ante la Convención Marco de las Naciones Unidas sobre Cambio Climático
[30] Comisión Nacional de Energía. 2008. Política Energética: Nuevos Lineamientos. Transformando la Crisis Energética en una Oportunidad Política.
[31] Ministerio de Energía. 2012. Estrategia nacional de energía 2012-2030. Energía para el futuro.
[32] Within the Second National Communication, NRCE is defined as wind energy, small scale hydro power (plants up to 20MW), biomass, biogas, geothermal energy, solar and tidal energy.
[33] The details of which will be designed for each tender.

suggestions for topics for projects and resulted in a National Programming Report. This report identifies NCRE as one of the areas for project development.

B.2. GEF focal area and/or fund(s) strategies, eligibility criteria and priorities:

The Project is aligned with Objective 3 of the GEF-5 Climate Change Focal Area Strategy. It aims to reduce GHG emissions by promoting investment and market development of biogas energy technologies in select agro-industries in Chile. The Project will facilitate the mobilisation of direct and indirect investment in biogas energy technologies for SMEs in select agro-industries located in one region of Chile. In addition, as a result of the proposed project intervention, Chile will also have a strengthened policy framework particularly with respect to incentives for biogas promotion amongst these types of SMEs. The Project will thus promote the deployment of renewable energy technologies in developing countries and help the market on its pathway towards one with a larger absorption of new and innovative technologies that have the capacity to generate global environmental benefits. This project is in line with the initiatives for the implementation of this strategy.

B.3 The GEF Agency's comparative advantage for implementing this project:

Since its establishment, UNIDO has built up a long track record assisting countries to implement industrial support programmes. UNIDO's Energy and Climate Change Branch pursues the integration of low-carbon objectives into industrial development policies and activities, especially with respect to small- and medium-sized industries. In particular, UNIDO helps its clients solve two fundamental problems: (i) de-linking intensity of energy and material use from economic growth, and (ii) reducing the environmental damage that occurs with energy and material use.

GEF council document GEF/C.31/5 states that UNIDO's overall comparative advantage is that it can involve the industrial / private sector in projects. This is also the case in the proposed project, where the focus will be on facilitating a low carbon development pathway for selected agro-industries in Chile. Furthermore, the document illustrates the comparative advantages of UNIDO services in sustainable energy and climate change as providing access to modern energy services for the poor through rural energy for productive uses with emphasis on renewable energy; increasing productivity and competitiveness through improving industrial energy efficiency projects; and reducing GHG emissions through capacity building projects for climate change in general and Kyoto Protocol mechanisms in particular.

UNIDO has widespread experience to interact with all levels of stakeholders from the private and public sector as well as NGOs. The proposed GEF project draws on this experience by strengthening the competitiveness of local industries and by introducing renewable energy technologies. Gender relevant aspects will be paid particular attention to. UNIDO is well-placed to implement this project with its broad network of experts and past experiences in the region; e.g. Brazil's first biogas laboratory was launched at Itaipu-Brazil in mid-2012 as part of the Observatory for Renewable Energy in Latin America and the Caribbean programme[34]. UNIDO has a regional office in Uruguay that also covers Chile, Argentina, Paraguay and Brazil, with 6 staff: 2 professional staff with extensive project management experience; 4 general service staff, three of whom have extensive experience in administering projects.

[34] Please note that UNIDO also has existing experience in the successful implementation of non-grant instruments within the framework of GEF projects (e.g. evolving funds in Zambia and Cuba).

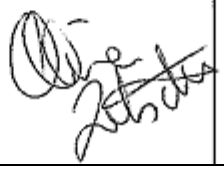
PART III: APPROVAL/ENDORSEMENT BY GEF OPERATIONAL FOCAL POINT(S) AND GEF AGENCY(IES)

A. RECORD OF ENDORSEMENT OF GEF OPERATIONAL FOCAL POINT (S) ON BEHALF OF THE GOVERNMENT(S): (Please attach the Operational Focal Point endorsement letter(s) with this template. For SGP, use this OFP endorsement letter).

NAME	POSITION	MINISTRY	DATE *(MM/dd/yyyy)*
Mrs. Ximena George-Nascimento	GEF Operational Focal Point	**MINISTRY OF ENVIRONMENT**	**02/01/2013**

B. GEF AGENCY(IES) CERTIFICATION

This request has been prepared in accordance with GEF/LDCF/SCCF/NPIF policies and procedures and meets the GEF/LDCF/SCCF/NPIF criteria for project identification and preparation.

Agency Coordinator, Agency name	Signature	DATE *(MM/dd/yyyy)*	Project Contact Person	Telephone	Email Address
Philippe Scholtès Officer-in-Charge Programme Development and Technical Cooperation Division (PTC) UNIDO GEF Focal Point		04/25 2013	Nina ZETSCHE, Industrial Development Officer, PTC/ECC/RRE, UNIDO 	+43 (1) 260 26 35 69	n.zetsche@unido.org