



UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION



CHILE

Promoting the development of biogas energy amongst select small- and medium sized agro-industries



BACKGROUND

Chile is committed to reducing GHG emissions through active mitigation measures such as greater deployment of renewable energy. However, so far the legislation that favours non-conventional renewable energies (NCREs) has not contributed to a greater dissemination of RE technology especially in the SME sector due to financial barriers and lack of expertise in the sector. NCREs currently only account for 5,8% of electricity production in Chile despite the country's significant potential in renewable resources. 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. In light of this, the Government of Chile has set itself the goal to actively promote a "market pull" for biogas technologies by starting

with select agro-industries in two regions of Chile.

In February 2012, Chile published the National Energy Strategy 2012-2030, which considers the need to increasingly incorporate NCREs 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 highlights bioenergy as one action line to focus on. In this respect, a study has been carried out in 2013 to elaborate recommendations for a future national bioenergy strategy. Furthermore, Chile has launched a Nationally Appropriate Mitigation Action (NAMA) on 'Self-supply renewable energy (SSRE)', which will also promote biogas technologies.



CHILE'S BIOGAS POTENTIAL FOR ENERGY GENERATION

Biogas, a combustible gas that is generated by the action of micro-organisms in the absence of oxygen (anaerobic digestion), constitutes an economical NCRE source that has been successfully utilized in several countries worldwide. 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 as well as, after certain treatment, to generate electricity, and in cogeneration schemes. In Chile its main sources would be animal manure (poultry, pigs, cattle, etc.) as well as organic waste, sewage and sludge. 90% of agro-industries, where biogas is potentially generated, are small and medium sized and have no or little experience in energy generation. Thus the country's biogas potential for energy generation has not been unlocked so far. The present GEF project will attempt to change the business-as-usual scenario — moving from a scenario where biogas technologies are mainly employed by a few large agro-industries for treating manure and flaring captured gas rather than the generation of energy to one where a market

for biogas to-energy technologies for small- and medium-sized agro-industries exists.

GEF resources shall be used to improve the technology support system for biogas technologies for application in the agro-industrial sector, to fine-tune existing policy and incentive instruments so that agro-industrial enterprises can profit from and invest in methane recovery and utilization for energy generation, taking into account international experiences and lessons learnt. 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 through strengthened policies and targeted incentives, the demonstration of successful pilot projects and the creation of a project portfolio thus 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.

PROJECT OBJECTIVE

The project is designed to reduce GHG emissions by promoting investment and market development of biogas energy technologies in select agro-industries located in two regions of Chile. A strong focus is expected to be on the dairy industry particularly in the southern Regions of Los Lagos and Los Rios of Chile. Once the project approach proves successful it shall be exported to other regions of Chile taking regional differences into consideration. The project aims at supporting the Renewable Energy Centre (CER), the Chilean Economic Development Agency (CORFO) and the Ministry of Agriculture in its efforts to increase generation from NCREs

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. Environmental benefits from the project in the form of direct GHG emissions savings amount to a preliminary estimated total of 480,000 tons of CO₂eq over a seven year period.

Main project partner is the Renewable Energy Centre of Chile. Close cooperation with the Ministry of Energy, the Ministry of Agriculture, CORFO, the private sector and relevant trade and industry associations is expected.



PROJECT COMPONENTS

Policies targeting the development of biogas-based RE have been strengthened and incentives for increased deployment amongst SMEs in the select agro-industries established.

Based on an assessment of how effectively current policy and incentive instruments target SMEs, the enabling environment for biogas applications in agro-industries will be strengthened. The aspects that will be addressed include financial barriers and potential mechanisms to overcome them, 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.

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.

The technical and commercial knowledge about the potentials, costs and benefits of biogas applications shall be enhanced to allow company owners and manager to take informed decisions on biogas investment opportunities. Standardized pre-investment studies will be created that facilitate decision-making amongst SMEs. Another important

component is the organization of technical trainings on biogas plant constructions, installation, operations and maintenance for technical staff of agro-industrial enterprises. This is to assure that bankable proposals can be developed, appropriate technology and technology providers identified and management, operation and maintenance of biogas installations carried out.

Technical and commercial viability of biogas application within select agro-industries demonstrated and framework for scale-up of activities in place.

Technical assistance and investment activities will be carried out to support local agro-industrial SMEs in one geographical area of Chile. At least seven SMEs lacking technical commercial skills will be identified for receiving assistance to prepare successful investment bids through feasibility studies and guided business planning. Furthermore, a non-grant financial instrument for the target region, such as a revolving fund, shall be set-up. The envisaged instrument is intended to be capitalised to provide funding for technical assistance (feasibility studies, training) for around five SMEs each year. Close cooperation with other governmental instruments shall be sought to assure that SMEs who benefit from the new instrument also have easy access to other available funding sources; complementarity between GEF and national funds is envisaged.

KEY BENEFICIARIES

It is envisaged that through the implementation of several biogas-to-energy plants and the associated training as well as the establishment of a financial mechanism, facilitating an enabling environment for future investments, a variety of stakeholders will benefit:

- Local agro-industries that currently depend on high-cost energy sources and insufficient waste management approaches will benefit from training and technical support for their low-carbon waste utilisation installations
- The financial sector will build capacity in energy analyses and financing of RE projects
- Engineering and consulting companies will gain experience and knowledge in areas such as the design, engineering and construction of biogas and low carbon projects as well as the regulatory and legal aspects of biogas projects
- Local communities will profit from better public health since anaerobic digestion kills about 95% of pathogens that occur in wastewater, manure and industrial waste as well as from a reduction of pollutants due to avoided fossil fuel burning.



PROJECT DATA

To be funded by: GEF, CER, CORFO, Ministry of Energy, Ministry of Agriculture, private sector investors, UNIDO
Estimated budget: 10,380,151 USD
Duration: 2014 – 2017

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