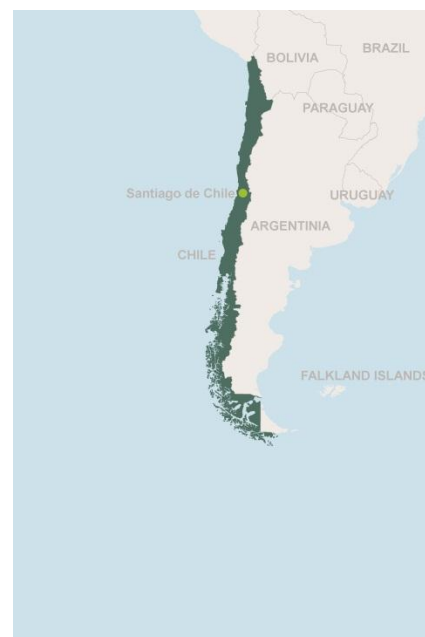


Ex post evaluation – Chile

>>>

Sector: Power generation/renewable energies (CRS code 23030)
Programme/Project: Renewable energies and energy efficiency programme III and IV - A) Phase III (BMZ No.: 2005 65 499)* and B) Phase IV (BMZ No.: 2005 65 986)
Implementing agency: Corporación de Fomento de la Producción (CORFO)



Ex post evaluation report: 2015

		Project A (Planned)	Project A (Actual)	Project B (Planned)**	Project B (Actual)**
Investment costs (total)	EUR million	30.76	30.76	186.32	186.32
Own contribution***)	EUR million	15.76	15.76	121.32	121.32
Funding	EUR million	15.00	15.00	65.00	65.00
of which BMZ budget funds	EUR million	0,00	0,00	0,00	0,00

*) Projects in 2014 random sample; **) Converted from USD at disbursement rate (EUR 1 : USD 1.31)

***) i.e. counterpart contribution of investors and CORFO financing

Summary: In two consecutive phases the programme envisaged the funding of investments in "non-conventional" renewable energies (RE - including small hydroelectric power plants) and energy efficiency (EE) in Chile. Thirteen small hydroelectric power plants, a biogas plant and a transmission line were ultimately funded at concessional interest rates. The programme funds were disbursed via commercial banks by the state-owned development finance institution CORFO to private investors, who benefited from the favourable conditions.

Objectives: Intended impact: As a result of the increased use of renewable energies (RE) and the greater energy efficiency (EE) in Chile, the FC programme was designed to 1.) Mitigate the negative environmental and climate impacts of Chilean energy supply, and 2.) Improve the country's energy supply security.

Intended outcome/s: Providing loans at attractive conditions was to result in an increase in RE/EE investment.

Target group: The indirect target group of the programme was Chile's entire population, with the investors constituting a direct target group.

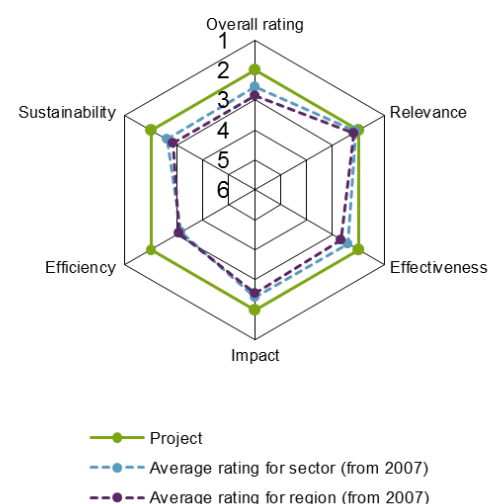
Overall rating: 2 (both phases)

Rationale: The FC funds totalling the equivalent of roughly USD 110 million in both phases facilitated investment of approximately USD 285 million, and were a key source of start-up funding for investment in non-conventional RE (including small hydroelectric plants), particularly on account of long term credit periods.

Highlights:

- For comparable programmes it would seem advisable to strengthen and/or expand the professional and technical advisory skills of the project-executing agency and financial intermediary at the same time.

- Given the much more advanced maturity of the market for the financing of **renewable energies**, we consider the promotion of investments in **energy efficiency** measures as a matter of priority for Chile.



Rating according to DAC criteria

Overall rating: 2 (both phases)

General conditions and classification of the programme

The Republic of Chile was granted two FC development loans totalling EUR 80 million (EUR 15 million in composite finance and EUR 65 million in low-interest loans) in two consecutive phases with almost identical content – the latter amount was provided in USD. The Republic of Chile forwarded the funds to the Chilean development bank CORFO under the same conditions. CORFO, in turn, added its own contribution to the FC funds. The entire loan amount of at least EUR 96 million in total was forwarded by CORFO to two private commercial banks (BICE and BCI), which then disbursed the funds in the form of loans at their own risk to private investors in the fields of “non-conventional” renewable energies (RE) and energy efficiency (EE). The commercial banks charged a risk-adequate margin from the ultimate borrowers (investors), but for CORFO they had to document that favourable funding terms had been passed on. On account of the long terms in particular – and considering all of the margins mentioned above – the ultimate borrowing conditions were therefore very attractive for the investors and achieved the desired developmental effect. The programme was fully implemented in just 4 years (2009-2012).

Relevance

The project complied with the guidelines of German-Chilean intergovernmental cooperation in the fields of RE and EE from 2005, and was set up to complement other donor interventions. The Chilean energy mix is not very diversified, and largely consists of power generated from fossil fuels and large hydroelectric plants (the latter being increasingly controversial from a political perspective). RE expansion of 10 % by 2024 and the reduction of national energy consumption by 12 % until 2020 using appropriate EE measures are declared priorities of Chilean energy policy. The FC programme has therefore taken the right approach. Its concept included the provision of cheap, long-term refinancing funds in order to use the country’s high geological and meteorological potential for environmentally friendly power sources more efficiently. At the beginning of the programme those sources were largely unattractive or non-competitive for private companies operating on the liberalised Chilean energy market. One key constraint consisted in the lack of long-term funding opportunities for non-conventional RE and EE projects in Chile.

Retrospectively it should be pointed out that the market for EE – which basically offers high potential given the high electricity tariffs – was far less developed than the RE market at the time. Despite these limitations, we can state that the programme’s intervention logic was adequate and coherent overall as well as in accordance with the overall developmental goals of both partner countries. Altogether, programme relevance is rated as good.

Relevance rating: 2 (both phases)

Effectiveness

This project ultimately financed 15 individual projects all related to RE (even the only power transmission project supported was designated to connect small hydroelectric plants to the interconnected grid). As a result, there was no investment in EE (see above). The short implementation period of only 4 years demonstrates the high demand for the programme. Apart from favourable interest rates, long term maturities were particularly crucial for the high demand in the RE area from the investors’ side.

The programme objective was to increase investment in RE/EE. The attainment of outcomes defined at programme appraisal can be summarised as follows:

Indicator	Status Appraisal	Ex post evaluation
Between 2008 and 2013 CORFO provides funding of at least EUR 96 million in total,	EUR 0	Met by the end of 2012 with the equivalent of approximately

all of which was drawn by commercial banks and investors.		EUR 109 million
By the end of 2013 at least 25 MW in power generation capacity – based on RE and financed from the credit lines – was either under construction or already supplying the network.	0 MW	Fulfilled with a total of roughly 62 MW installed by the end of 2012
Project-supported RE/EE technologies installed or under development avoid more than 147,000 tonnes of carbon dioxide every year	0 t CO ₂	Met in 2012 with 183,370 t CO ₂ avoided p.a. (base: 62 MW installed during the programme)
The EE measures funded from the credit lines result in average energy savings of at least 7 %.	0 %	Not applicable – no EE measures were realised.

The first indicator was chosen sensibly at appraisal and was easily exceeded. Equally, the second indicator was adequately selected in principle; however, the definition of the target value (25 MW) seems arbitrary from today's perspective. Nevertheless, the achieved generation capacity of approximately 62 MW, which already feeds into the grid, can be considered a success indicator. The third indicator was chosen sensibly, but the reasons for the target value's specification at 147,000 t CO₂ appear unclear from today's perspective. Nevertheless the avoided carbon dioxide emissions of approximately 183,000 t illustrate the programme's significant climate impact. The fourth indicator on energy efficiency cannot be applied as no investment in EE occurred under the programme.

Despite the above-mentioned limitations regarding energy efficiency, we assess the effectiveness as good.

Effectiveness rating: 2 (both phases)

Efficiency

The programme met with all of the banks' and the investors' economic expectations, due to its clear concept, attractive financing conditions, fast implementation and its swift availability on the market. According to participating investors, a substantial portion of the investment would not have happened without the programme. This assessment appears particularly plausible for the "start-up phase" mentioned here, as previously no long-term funding opportunities were available. The collaboration between KfW, CORFO, the commercial banks and the investors went smoothly and without major delays. The investment costs per installed MW were relatively high by international comparison, so production efficiency can only be assessed as satisfactory. Due to high electricity tariffs, the investments' profitability is not compromised. Accordingly, allocation efficiency can even be rated as very good. Excessive promotion of ultimate borrowers or crowding out of private financial institutions can largely be ruled out: there are no feed-in tariffs for RE/EE (spot market), no comparable long-term funding opportunities exist for relatively small-scale RE/EE investments through the banking industry, and because the remainder of RE/EE investments is largely financed directly by large companies and investors.

Altogether we rate the programme's efficiency as good.

Efficiency rating: 2 (both phases)

Impact - Overall developmental impact

The FC programme's ultimate objective was 1) to mitigate the negative environmental and climate impacts of Chilean power system, and 2) to enhance the country's energy supply security by increasing the

use of RE and improving EE in Chile. The attainment of the ultimate objective defined at the programme appraisal can be summarised as follows:

Indicator	Status PA	Ex-post evaluation
The proportion of “non-conventional” RE in power generation in Chile increased by at least 50 % in 2013 compared to 2006 (2.4 %).	285 MW	Fulfilled with an increase to 1,117 MW up to 2013 (proportion of energy mix: 5.9 %)

The contribution to climate protection can be plausibly derived from the approximately 183,000 t in avoided carbon dioxide (see “effectiveness”). The indicator regarding the RE share of the energy mix was chosen sensibly and was fulfilled very well. It can therefore be considered a success indicator, even though an increase of 50 % over 7 years defined ex ante has to be considered conservative, given the low base line.

Looking at the programme’s immediate beneficiaries, - investors - a good developmental impact can be derived from their universally positive feedback and their willingness to invest. Since, in particular, no competing long-term funding opportunities existed at the beginning of the programme, we can infer there was no excessive promotion, especially in the “start-up phase” promoted through the programme (see above). A positive developmental impact can also be assumed for the indirect target group - the entire Chilean population - as a result of the programme beneficial economic and climate effects, especially given the continuously high energy intensity and the high proportion of fossil fuels in the Chilean power mix.

All told, we rate the overarching developmental impact of the programme as good.

Impact rating: 2 (both phases)

Sustainability

Credit lines transferred through CORFO to commercial banks seem to be a sustainable option in the future, with follow-up projects already in the pipeline. From an economic perspective, the area of energy efficiency, which is still in its early stages of “market maturity”, seems to be in particular need and worthy of more support. By contrast, a more in-depth examination from a regulatory point of view appears called for on whether RE still requires designated support like, e.g., subsidised financing conditions.

With regard to the individual projects ultimately financed, the sites inspected (4 individual projects) during the ex post evaluation revealed that all investments were carried out diligently and in good quality. Altogether, operational management was also very professional by international comparison, investment costs are admittedly considered to be relatively high but this is apparently caused by the investments' high-quality standards. Consequently, we can assume an above-average lifecycle and therefore a good and sustainable utilisation of the facilities.

From today’s perspective, the programme’s overall sustainability is rated as good.

Sustainability rating: 2 (both phases)

Notes on the methods used to evaluate project success (project rating)

Projects (and programmes) are evaluated on a six-point scale, the criteria being **relevance, effectiveness, efficiency** and **overarching developmental impact**. The ratings are also used to arrive at a **final assessment** of a project's overall developmental efficacy. The scale is as follows:

Level 1	Very good result that clearly exceeds expectations
Level 2	Good result, fully in line with expectations and without any significant shortcomings
Level 3	Satisfactory result – project falls short of expectations but the positive results dominate
Level 4	Unsatisfactory result – significantly below expectations, with negative results dominating despite discernible positive results
Level 5	Clearly inadequate result – despite some positive partial results, the negative results clearly dominate
Level 6	The project has no impact or the situation has actually deteriorated

Rating levels 1-3 denote a positive assessment or successful project while rating levels 4-6 denote a negative assessment.

Sustainability is evaluated according to the following four-point scale:

Sustainability level 1 (very good sustainability): The developmental efficacy of the project (positive to date) is very likely to continue undiminished or even increase.

Sustainability level 2 (good sustainability): The developmental efficacy of the project (positive to date) is very likely to decline only minimally but remain positive overall. (This is what can normally be expected).

Sustainability level 3 (satisfactory sustainability): The developmental efficacy of the project (positive to date) is very likely to decline significantly but remain positive overall. This rating is also assigned if the sustainability of a project is considered inadequate up to the time of the ex post evaluation but is very likely to evolve positively so that the project will ultimately achieve positive developmental efficacy.

Sustainability level 4 (inadequate sustainability): The developmental efficacy of the project is inadequate up to the time of the ex post evaluation and is very unlikely to improve. This rating is also assigned if the sustainability that has been positively evaluated to date is very likely to deteriorate severely and no longer meet the level 3 criteria.

The **overall rating** on the six-point scale is compiled from a weighting of all five individual criteria as appropriate to the project in question. Rating levels 1-3 of the overall rating denote a "successful" project while rating levels 4-6 denote an "unsuccessful" project. It should be noted that a project can generally be considered developmentally "successful" only if the achievement of the project objective ("effectiveness"), the impact on the overall objective ("overarching developmental impact") and the sustainability are rated at least "satisfactory" (level 3).