



**GREEN  
CLIMATE  
FUND**

**Meeting of the Board**  
28 – 30 June 2016  
Songdo, Incheon, Republic of Korea  
Provisional agenda item 12(e)

**GCF/B.13/16/Add.09**

23 June 2016

---

# Consideration of funding proposals – Addendum 09

## Funding proposal package for FP017

---

### **Summary**

This addendum contains the following four parts:

- a) A funding proposal summary titled “Climate Action and Solar Energy Development Programme in the Tarapacá Region in Chile” submitted by CAF – Banco de Desarrollo de America Latina;
- b) A no-objection letter issued by the national designated authority or focal point; and
- c) Environmental and social report(s) disclosure;

These documents are presented as submitted by the accredited entity and the national designated authority(is) or focal point(s), respectively. Pursuant to the Comprehensive Information Disclosure Policy of the Fund, the funding proposal titled “Climate Action and Solar Energy Development Programme in the Tarapacá Region in Chile” submitted by CAF is being circulated on a limited distribution basis only to Board Members and Alternate Board Members to ensure confidentiality of certain proprietary, legally privileged or commercially sensitive information of the entity.



## Table of Contents

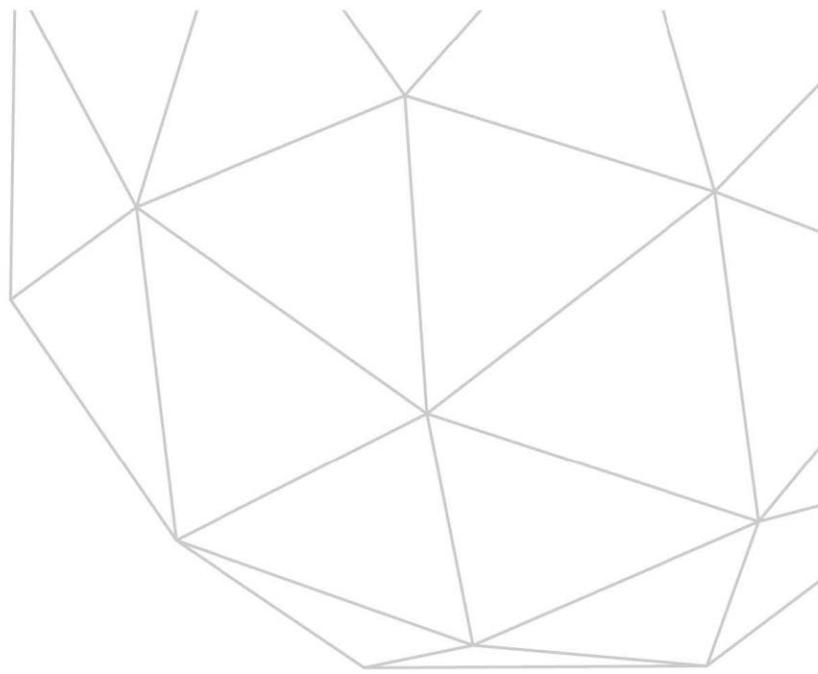
Funding proposal summary submitted by the accredited entity

No-objection letter issued by the national designated authority or focal point

Environmental and social report(s) disclosure



GREEN  
CLIMATE  
FUND



# Funding Proposal

Version 1.1

**The Green Climate Fund (GCF) is seeking high-quality funding proposals.**

Accredited entities are expected to develop their funding proposals, in close consultation with the relevant national designated authority, with due consideration of the GCF's Investment Framework and Results Management Framework. The funding proposals should demonstrate how the proposed projects or programmes will perform against the investment criteria and achieve part or all of the strategic impact results.

Project/Programme Title:	<b><u>Climate Action and Solar Energy Development Programme in the Tarapacá Region in Chile</u></b>
Country/Region:	<b><u>Chile</u></b>
Accredited Entity:	<b><u>CAF - Banco de Desarrollo de América Latina</u></b>
Date of Submission:	<b><u>[ May 2016 ]</u></b>

## Contents

Section A	<b>PROJECT / PROGRAMME SUMMARY</b>
Section B	<b>FINANCING / COST INFORMATION</b>
Section C	<b>DETAILED PROJECT / PROGRAMME DESCRIPTION</b>
Section D	<b>RATIONALE FOR GCF INVOLVEMENT</b>
Section E	<b>EXPECTED PERFORMANCE AGAINST INVESTMENT CRITERIA</b>
Section F	<b>APPRAISAL SUMMARY</b>
Section G	<b>RISK ASSESSMENT AND MANAGEMENT</b>
Section H	<b>RESULTS MONITORING AND REPORTING</b>
Section I	<b>ANNEXES</b>

### *Note to accredited entities on the use of the funding proposal template*

- Sections **A, B, D, E** and **H** of the funding proposal require detailed inputs from the accredited entity. For all other sections, including the Appraisal Summary in section F, accredited entities have discretion in how they wish to present the information. Accredited entities can either directly incorporate information into this proposal, or provide summary information in the proposal with cross-reference to other project documents such as project appraisal document.
- The total number of pages for the funding proposal (excluding annexes) is expected not to exceed 50.

**Please submit the completed form to:**

[fundingproposal@gcfund.org](mailto:fundingproposal@gcfund.org)

Please use the following name convention for the file name:

“[FP]-[Agency Short Name]-[Date]-[Serial Number]”

A.1. Brief Project / Programme Information		
A.1.1. Project / programme title	Climate Action and Solar Energy Development Programme in the Tarapacá Region in Chile	
A.1.2. Project or programme	programme	
A.1.3. Country (ies) / region	Chile	
A.1.4. National designated authority (ies)	Ms. Marcela Palominos, Ministerio de Hacienda	
A.1.5. Accredited entity	CAF – Banco de Desarrollo de América Latina	
A.1.5.a. Access modality	<input type="checkbox"/> Direct <input checked="" type="checkbox"/> International	
A.1.6. Executing entity / beneficiary	Executing Entity: Atacama Solar S.A Beneficiary: Atacama Solar S.A.	
A.1.7. Project size category (Total investment, million US\$)	<input type="checkbox"/> Micro ( $\leq 10$ ) <input type="checkbox"/> Small ( $10 < x \leq 50$ ) <input type="checkbox"/> Medium ( $50 < x \leq 250$ ) <input checked="" type="checkbox"/> Large ( $> 250$ )	
A.1.8. Mitigation / adaptation focus	<input checked="" type="checkbox"/> Mitigation <input type="checkbox"/> Adaptation <input type="checkbox"/> Cross-cutting	
A.1.9. Date of submission	May 2016	
A.1.10. Project contact details	Contact person, position	Antonio García, Environment and Climate Change Executive
	Organization	CAF
	Email address	agarciap@caf.com
	Telephone number	+57 1 743 7369
	Mailing address	Carrera 9 76-49 Bogotá, Colombia

A.1.11. Results areas <i>(mark all that apply)</i>	
<b>Reduced emissions from:</b>	
<input checked="" type="checkbox"/>	Energy access and power generation (E.g. on-grid, micro-grid or off-grid solar, wind, geothermal, etc.)
<input type="checkbox"/>	Low emission transport (E.g. high-speed rail, rapid bus system, etc.)
<input type="checkbox"/>	Buildings, cities and industries and appliances (E.g. new and retrofitted energy-efficient buildings, energy-efficient equipment for companies and supply chain management, etc.)
<input type="checkbox"/>	Forestry and land use (E.g. forest conservation and management, agroforestry, agricultural irrigation, water treatment and management, etc.)
<b>Increased resilience of:</b>	
<input checked="" type="checkbox"/>	Most vulnerable people and communities (E.g. mitigation of operational risk associated with climate change – diversification of supply sources and supply chain management, relocation of manufacturing facilities and warehouses, etc.)
<input type="checkbox"/>	Health and well-being, and food and water security (E.g. climate-resilient crops, efficient irrigation systems, etc.)
<input type="checkbox"/>	Infrastructure and built environment (E.g. sea walls, resilient road networks, etc.)
<input type="checkbox"/>	Ecosystem and ecosystem services (E.g. ecosystem conservation and management, ecotourism, etc.)

## A.2. Project / Programme Executive Summary (max 300 words)

**Please provide a brief description of the proposed project/programme, including the objectives and primary measurable benefits (see [investment criteria in section E](#)). The detailed description can be elaborated in [section C](#).**

An enabling setting shall be made available by the GCF and CAF – Latin American Development Bank to set up the first Chilean national-level convergence instance between climate funding, private funding, and sector plans for adaptation and active institutional programmes toward a low-emission sustainable development.

The international financing mechanism led by the GCF and CAF will support a project (Atacama Solar) being driven by Sonnedix company, expanding the photovoltaic solar energy projects scale in an area where the electricity generation matrix is highly intensive in thermoelectricity (intensive in GHG emissions), making it more competitive in one of the main mining development regions in Chile.

Atacama Solar consists on a 143 MW solar photovoltaic plant in the Atacama Desert region of Chile, located in an area with the highest level of solar radiation in South America. Currently, Chile is at a crossroad with regards to its energy matrix future. This development represents a clean, sustainable solution to Chilean energy challenges, since the country is still heavily dependent on fossil fuels (which are mostly imported) and hydrological sources (which are becoming less reliable). With a commitment to have a 20% of non-conventional renewable power generation by 2025, the decisions and investments taking place now will shape the transition to an energy system based on renewables.

When fully completed, the site will have an installed capacity of at least 250 MW to be built-out in two phases:

- Phase I: 143 MW – documentation & financing (this Project)
- Phase II: 107 MW – in development (future growth)

The Atacama Project – due to its scale, adoption of top tier technology, and favorable cost structure – provides an estimated annual CO<sub>2</sub> reduction of approximately 193,949 tones/year for Phase (3,697,440 tons of CO<sub>2</sub>e over 20 year lifespan, allowing for 0.98% annual deterioration).

The Project seeks to contribute to Chile's stated and quantified policy goals of shifting towards a low emission sustainable development pathway by developing and connecting a large-scale, expandable, clean energy power generation using top-tier solar photovoltaic components, within an electrical transmission system (SING) currently dominated (>94%, Sept 2015) by fossil-fuel based thermal power generation, and providing the lowest cost per t CO<sub>2</sub>e among its solar project peer group in Chile

In an innovative financial design for solar power generation projects in Chile, the proposed financial model of the Project is based on cash flows calculated at estimated market prices, since the Project will not count on a fixed price guaranteed from any contract of sale of energy (PPA). Based on market conditions, the Project will compete and displace other more polluting power generation plants demonstrating that solar power generation in Chile has the potential to meet both energy requirements from the country and help meeting its emission reductions and renewable power generation target.

The Project seeks to be a turning point demonstrating access to loans and investments for renewable projects with high upfront capital costs and need for long repayment tenors which are currently unavailable in Chile's capital markets.

In addition to the Project finance, CAF will expand its work in a strategic partnership with Chile aimed to build resilience at local and regional level vis a vis climate change impacts. This articulation seeks to permanently set in place the resilience of the communities involved, while being a national reference model for cross cutting programmes that will ensure a low emission and climate resilient development in the northern region of Chile.

<b>A.3. Project/Programme Milestone</b>	
Expected approval from accredited entity's Board (if applicable)	The Project was approved by CAF on December 2015.
Expected financial close (if applicable)	[08/2016]
Estimated implementation start and end date	Start: [2017] (Commercial Operations Date) End: [2042]
Project/programme lifespan	<u>20</u> years [ <u>0</u> ] months (Land concession: 30 years)

## B.1. Description of Financial Elements of the Project / Programme

Please provide:

- an integrated financial model in [Section I \(Annexes\)](#) that includes a projection covering the period from financial closing through final maturity of the proposed GCF financing with detailed assumptions and rationale; and a sensitivity analysis of critical elements of the project/programme

The Financial Model used in this document has been reviewed and modified by CAF, using as a base the original Financial Model provided by the Sponsor of the Project. It is worth mentioning that:

- i. The Model was not prepared by the Sponsor, but by its financial advisers (Pan-American Finance), using data from technical Advisors such as: DNV KEMA Renewables (solar radiation); Synex (spot-market-price consultant); equipment costs estimates from the procurement process followed by the Sponsor of the Project; and operation costs from the selected O&M contractor's experience (Biosar).
- ii. CAF made further assumption adjustments to the Financial Model, in order to present a more reasonable and conservative base case scenario, with included, among others, using the P90 Solar Radiation Scenario as Base Case Scenario.
- iii. Finally, technical advisers to CAF provided opinions regarding the reasonability of the results of the Financial Model. Opinions were provided by professionals from the engineering firm Hatch; by Systep (spot-market-price adviser to CAF); and by CAF's own extensive financial experience.
- iv. The definitive Financial Model should include all definitive financial information from Senior Lenders, updated investment amounts, and adjustments to Electricity Spot Market Prices, if any.

Results were sound and CAF approved this operation in December 2015, showing its commitment to this low-emission and climate-resilient Project.

### Cost Structure

The Project's cost structure is around US\$ 255 million

The largest component is the Engineering, Procurement and Construction work, which represents more than 70% of total costs. It has been deemed reasonable by the Independent Engineer in comparison with similar projects in the region.

Some of the items in the Construction Cost section, particularly the EPC cost, have been revised downwards since CAF's approval due to improvements in the technology and materials used. Consequently, the Total Investment amount and financing are expected to be lower than those shown in this Funding Proposal. However, those changes will not have any negative impact on the project risks nor its performance. Throughout this document, an asterisk (\*) sign has been placed next to figures that may end up being lower than presented.

### Sources of Funds

- Proposed co-financing will allow the Project to be developed, possibly involving involve local banks despite the recent lack of appetite in financing merchant generation of projects in Chile:

Senior Debt: [19.5%] CAF -assuming it provides senior debt financing of US\$ 50 million for 20 years-

[19%] GCF

[16.5%] Local banks

Equity: [45% remaining] Sponsor; (these figures exclude the [US\$ 8 million] VAT facility).

- Sonnedix is a strong and well-capitalized sponsor willing and ready to support the Project with a base equity contribution of [US\$ 116 million], representing 45% of project costs.
- With the proposed financial structure, in which leverage is modest, the Project is expected to provide strong

Senior DSCRs of [ $\sim 1.47x$ ] minimum and [ $\sim 1.8x$ ] average at P90 under a 100% merchant case.

### Financial Model

- *an integrated financial model in that includes a projection covering the period from financial closing through final maturity of the proposed GCF financing with detailed assumptions and rationale; and a sensitivity analysis of critical elements of the project/programme*

The Project is able to generate EBITDA of approximately 80% once its operations and expected market prices have stabilized (year 2022). In the base case projection, the Project is able to repay its debt according to the designed amortization schedule, including additional prepayment of the last 4 capital amortizations with part of the cash flows available after regular debt service (cash sweep).

The minimum amortization schedule (assuming no additional prepayment) will be as follows:

Year	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Amortization	0.0%	0.0%	0.0%	0.0%	0.0%	3.8%	4.1%	4.4%	4.7%	5.1%	5.5%	5.9%	6.3%	6.8%	7.3%	7.9%	8.5%	9.2%	9.9%	10.6%

The projected amortization schedule in the base case (assuming additional prepayments) will be as follows:

Year	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Amortization	0.0%	0.0%	0.0%	3.8%	3.9%	7.9%	6.6%	8.1%	7.2%	5.1%	5.5%	5.9%	6.3%	6.8%	7.3%	7.9%	8.5%	9.2%	0.0%	0.0%

A sensitivity analysis has been made taking into account the effect of several variables, the most important being the spot price, on the capacity of operation and repayment by the Recipient.

- **Price:** It is the most critical variable for the Project. While all the energy will be sold due to the preference of dispatch that renewable energy sources enjoy in Chile, the price will be uncertain. The following table shows the projected prices for the spot market (in US\$/MWh):

2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
44	52	49	52	61	74	77	79	77	73	79	83	85	84	82	84	78	78	80

The Project will be able to service its debt with different degrees of amplitude depending on the price scenarios used. The following table shows the coverage ratios (DSCR) assuming different constant prices across the life of the senior loan:

	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Base Case (Average Price=72USD/MWh)	1.50	1.53	1.88	1.47	1.71	1.86	1.92	1.93	1.86	1.93	2.04	2.10	2.09	2.05	2.07	1.98	N/A
Scenario with Price level=65 US\$/MWh	1.89	2.15	2.47	1.68	1.67	1.66	1.61	1.61	1.63	1.64	1.64	1.63	1.63	1.63	1.62	1.61	N/A
Scenario with Price level=55 USD/MWh	1.59	1.74	2.06	1.41	1.41	1.43	1.39	1.40	1.42	1.42	1.42	1.41	1.41	1.40	1.39	1.37	N/A
Scenario with Price level=46 USD/MWh	1.30	1.35	1.60	1.11	1.08	1.09	1.03	1.07	1.11	1.14	1.15	1.16	1.16	1.16	1.15	1.15	2

The break-even price for the debt repayment would be around 46 US\$/MWh. In this case, the Project is still able to service debt every year. The same occurs when stressing the series prices projected downward by 22%.

- **Radiation:** It affects the amount of energy that can be generated by the Project and injected in the system. Given that the solar resource does not vary considerably, it is not a critical variable for the repayment capacity, as it can service debt in every scenario contemplated (P50-P99) in the base case of prices. When comparing the energy produced in the 4<sup>th</sup> year of operation in P50 and P99 scenarios taking also into account the equipment degradation, the total energy generated in GWh would drop by 17%.

In every radiation scenario the Project is able to service its debt under the base case of prices, being the minimum DSCR equal to 1.30x in the P99 scenario.

It is important to note that some modifications will be made to the Financial Model in order to better reflect the reality faced by the Project. The core assumptions of it remain the same and provide a solid basis for Lenders' base case. The main changes will relate to the following aspects of the Model:

- Updated price projections: more conservative prices (capped at 67 US\$/MWh) based on data provided by external consultants.
- EPC price (and consequently, investment needs) and irradiation (which in turn affects energy production): will be updated based on the latest information provided by Biosar, the contractor.
- Senior Loan amount and final leverage are lower (US\$ 119 million and maintaining a Debt-Equity ratio of no more than 60%/40%), resulting in a more solid financing scheme. Under a P90 100% merchant sales conservative scenario the Project is expected to provide strong Senior DSCRs of [-1.32x] minimum and [-2.17x] average.
- Any decrease in the financing required to develop the Project will generate an adjustment to the required commercial bank financing, leaving the participation of CAF in US\$ 50 million and the participation of the GCF in US\$ 49 million.
- Senior Loans Amortization New Proposed Scheme: Dual amortization schedules for CAF/GCF loans to determine minimum and target amortization:
  - Minimum amortization schedule- for default covenant purposes
    - Based on a 20-year door-to-door tenor
    - A DSCR of at least 1.10x, of the Minimum Amortization Schedule.
    - Principal payments under this schedule are not required during the grace period
  - Target amortization schedule - for distribution purposes
    - Based on an 18-year door-to-door tenor
  - A DSCR of at least 1.30x, of the Target Amortization Schedule. Third-party Senior Loan will have a minimum 15-year door-to-door tenor.
  - Grace period has been shortened to 2.5 years.
  - After applying the aforementioned change, resulting Senior Loan lives are shorter than initially expected.
- Taxes: Corporate and Stamp Tax were updated.

## B.2. Project Financing Information

	Financial Instrument	Amount	Currency	Tenor	Pricing
<b>(a) Total project financing</b>	<b>(a) = (b) + (c)</b>	273*	<u>million USD (\$)</u>		

(b) GCF financing to recipient	(i) Senior Loans	49 <sup>1</sup>	<u>million USD (\$)</u>	20 years	Not less than LIBOR + 375		
	(ii) Subordinated Loans	.....	<u>Options</u>				
	(iii) Equity	.....	<u>Options</u>				
	(iv) Guarantees	.....	<u>Options</u>				
	(v) Reimbursable grants *	.....	<u>Options</u>				
	(vi) Grants *		<u>million USD (\$)</u>				
* Please provide economic and financial justification in <a href="#">section F.1</a> for the concessionality that GCF is expected to provide, particularly in the case of grants. Please specify difference in tenor and price between GCF financing and that of accredited entities. Please note that the level of concessionality should correspond to the level of the project/programme's expected performance against the investment criteria indicated in <a href="#">section E</a> .							
Total requested (i+ii+iii+iv+v+vi)		49	<u>million USD (\$)</u>				
(c) Co-financing to recipient	<b>Financial Instrument</b>	<b>Amount</b>	<b>Currency</b>	<b>Name of Institution</b>	<b>Tenor</b>	<b>Pricing</b>	<b>Seniority</b>
	<u>Senior Loans</u>	50+42*=92*	<u>million USD (\$)</u>	CAF+Other	20 yrs	Min. LIBOR+375	<u>senior</u>
	<u>Equity</u>	116*	<u>million USD (\$)</u>	Sponsor	(TBD)	12,8 <sup>2</sup> % IRR	<u>junior</u>
	<u>Senior Loans</u>	8 (VAT)	<u>million USD (\$)</u>	TBD	years		<u>senior</u>
	<u>Options</u>	.....	<u>Options</u>	.....			<u>Options</u>
Lead financing institution: CAF							
* Please provide a confirmation letter or a letter of commitment in section I issued by the co-financing institution.							
(d) Financial terms between GCF and AE (if applicable)	In cases where the accredited entity (AE) deploys the GCF financing directly to the recipient, (i.e. the GCF financing passes directly from the GCF to the recipient through the AE) or if the AE is the recipient itself, in the proposed financial instrument and terms as described in part (b), this subsection can be skipped.						
	<b>[Not applicable]</b>						
If there is a financial arrangement between the GCF and the AE, which entails a financial instrument and/or financial terms separate from the ones described in part (b), please fill out the table below to specify the proposed instrument and terms between the GCF and the AE.							
	<b>Financial instrument</b>	<b>Amount</b>	<b>Currency</b>	<b>Tenor</b>	<b>Pricing</b>		

<sup>1</sup> CAF is syndicating the transaction, and possibly will be requiring extra financial support from the GCF. In the event that there are no sufficient funds in the market to complete the syndication, CAF might enter into an approval process to support a possible participation increase, with the support of the GCF, that in turn might require further approvals.

<sup>2</sup> The Expected IRR of the Sponsor at P50. The IRR calculated on Section B is the IRR to the Project, and based on CAF's adjustments.

	Choose an item.	.....	<u>Options</u>	( ) years	( )%
<p>Please provide a justification for the difference in the financial instrument and/or terms between what is provided by the AE to the recipient and what is requested from the GCF to the AE.</p> <p style="text-align: center;"><b>[Not applicable]</b></p>					

### B.3. Financial Markets Overview (if applicable)

#### **How market price or expected commercial rate return was (non-concessional) determined?**

The final price is in the process of being determined, and will depend on the market evaluation and participants in the financing. However, the objective is that final pricing is fair. A reasonable and fair price of the loan is required in order to:

- i. Allow (if needed) sell-down of the loans to commercial (local and international) financial institutions at some point of time after Project Completion.
- ii. Disincentive (as much as possible) the refinancing of the loans at one point of time after Project Completion.

Currently, CAF is in talks with local commercial banks and other development agencies to promote their participation in the financing of the Project, along with CAF and the GCF.

Please refer to section D.1 of this Funding Proposal for more information on GCF's value added to the transaction.

**Table: Comparable solar PV transactions developed in the period 2013-15**

Project name	Closing (MM/YYYY)	Size (in MW)	Investment amount (US\$ M)	Leverage	Debt amount (US\$ M)	Offtake
<b>Atacama Solar (Phases I &amp; II)</b>	<b>07/2016</b>	<b>142.5</b>	<b>265*</b>	<b>55%*</b>	<b>140.0*</b>	<b>Merchant</b>
Quilapilun	07/2015	110.0	230.0	70%	160.0	PPA
Los Loros	05/2015	53.8	134.0	70%	93.8	Merchant
Laberinto	04/2015	146.0	334.0	56%	187.0	Merchant
San Pedro III	02/2015	54.0	N/A	N/A	104.0	Merchant
Cerro Dominador (CSP)	01/2015	100.0	1,000.0	50%	500.0	Merchant
Javiera	10/2014	69.5	160.0	81%	130.0	PPA
Luz del Norte	06/2014	141.0	366.0	79%	290.0	Merchant
Maria Elena (CSP)	06/2014	72.8	N/A	N/A	N/A	Merchant
Chañares, Diego de Almagro, Lalackama I & II	05/2014	155.0	272.0	N/A	N/A	PPA
La Huayca II	11/2013	30.5	67.1	73%	49.0	Merchant
San Andres	11/2013	50.7	142.0	71%	100.8	Merchant

Amanecer Solar	10/2013	100.0	267.0	80%	212.5	PPA
Salvador	09/2013	70.0	200.0	70%	140.0	Merchant
Pozo Almonte & Calama	04/2013	26.5	82.7	79%	65.0	PPA

## C.1. Strategic Context

***Please describe relevant national, sub-national, regional, global, political, and/or economic factors that help to contextualize the proposal, including existing national and sector policies and strategies.***

The following sections highlights the global (COP21), Chile's national, CAF's and GCF's institutional context relevant to the Atacama Solar Project.

- I. **Global Context:** On December 12, 2015, 195 nations adopted the Paris Agreement to combat climate change and unleash actions and investment towards a low carbon, resilient and sustainable future. The Atacama Project provides a “shovel ready”, large scale, and expandable solar PV project with peer-leading CO2 offset potential in Chile (see also section E.1).
- II. **Chile's Context:** In preparation for this 2015 Agreement, Chile submitted its new climate action plan (“Intended Nationally Determined Contribution”) to the UN Framework Convention on Climate Change (UNFCCC). It outlines that (a) 45% of new power-generation capacity installation between 2014 to 2025 is expected to be non-conventional renewable capacity, and (b) that related investments will be driven by the private sector. A signature goal of the Chilean government's 2014-18 energy agenda is the “20/25” objective, which calls for 20% of Chile's power generation to come from renewable sources by 2025. Given this context and the scale of the Atacama Solar development, the project will act as and enable a paradigm shift in Chile.

Regarding other issues in Chile's Context, we can add the following:

Hydro Situation in the Country: Hydro Projects are very important in the SIC. They account for around 50% of the SIC's energy generation capacity. However, there are certain inconveniencias for further developing these types of projects:

- Variability of Hydrology (Hydrological Risk, see section C.5 on this issue);
- Environmental concerns of the Chilean people and the Chilean State with regard to large scale hydro developments (see section C.5 on this issue);
- Capital costs.

Argentina Gas Issue: In 1997, Argentina and Chile signed a trade agreement that brought a significant natural gas supply at convenient prices. Several investments followed this agreement, including gas pipelines to supply residential and industrial clients, and the development of thermal power plants with combined cycle power generation units. Thus, an important share of SIC and SING (Chilean interconnected grids – see Section C.5 for more info on SIC and SING networks) capacity started to depend on the Argentinean fuels market.

- III. **Institutional Context - CAF:** CAF's involvement in the Project would be aligned with four of its institutional objectives:
  - i. CAF's Strategic Climate Change Mitigation Program highlights a desire for an increased engagement in new renewables, including solar projects.
  - ii. CAF's green financing, which accounted for 24% of approvals in 2014, is expected to increase to 30% by 2020.
  - iii. CAF is seeking suitable opportunities to make its first major direct investment in Chile, one of CAF's member countries.
  - iv. CAF has certain restrictions on the amounts to be allocated to Non-Sovereign clients, and therefore, the US\$ 50 million commitment shows a strong commitment of CAF on the Project.
  - v. CAF is pursuing its first co-financing opportunities with the GCF, which – in turn – seeks to secure significant CO2 offset per unit of investment, and additionality, by bridging riskier stage (construction &

connection), and seeking “crowding in” additional private sector funding over time.

CAF’s experience in Chile is not extensive. However, Chile is a member country of CAF, and one of the current objectives of both Chile and CAF is to strengthen CAF’s presence in the country.

**IV. Institutional Context - GCF:** GCF’s involvement in the Project would be aligned with its institutional objective of “Investing into low-emission and climate resilient development”. Solar generated energy, from a non-renewable-energy- import-dependent country, fits very well into the mentioned main objective of the GCF.

Furthermore, given current global financial situation, the participation of CAF and the GCF promotes the development of this type of large-scale renewable projects, acting as counter-cyclical and patient providers of capital.

## C.2. Project / Programme Objective against Baseline

***Describe the baseline scenario (i.e. emissions baseline, climate vulnerability baseline, key barriers, challenges and/or policies) and the outcomes and the impact that the project/programme will aim to achieve in improving the baseline scenario.***

Chile “Intended Nationally Determined Contribution” (Sept 2015) to the UNFCCC details the country’s baseline conditions and vulnerabilities. These include the country’s reliance on energy intensive copper mining (57% of the Chile’s national exports), which is also the main energy consumer in northern Chile currently served predominantly by fossil-fuel based power generation, with energy costs rivaling the highest in OECD countries. The northern SING electricity system, in which the Project is located, features over 90% of total energy production by thermal sources: mainly coal (75%), followed by natural gas (12%) and diesel generation (9%).

As noted in Section C.1, Chile has developed its “20/25” objective which calls for 20% of Chile’s power generation to come from renewable sources by 2025. As of September 30, 2015, the installed capacity of renewable energy represented 2,269 MW (or 11.4% of total installed capacity), the large majority of which (90%) is located in the SIC transmission system (while the Project is located in the northern SING system). Chile – and the Project – are benefitting from declining levelized cost of energy (“LCOE”) for solar PV, which is already less than that of natural gas CCGT and approaching parity with wind, small hydro and coal-fired technologies.

The large-scale Atacama Project is aligned with Chile’s renewable energy policies and strategies. The Project also leads its solar PV peers in the Atacama Region, including in terms of investment cost per tCO<sub>2</sub> offset (see also Section E.1). As in the context described above, the Projects acts as and enables a paradigm shift to renewable energy, mobilizing private sector developer and financing, in the energy intensive, northern Chile.

## C.3. Project / Programme Description

***Describe the main activities and the planned measures of the project/programme according to each of its components.***

- 1) Development, construction, commissioning and operation of a large-scale solar park (143 MW) in the Atacama Desert of Chile. The Project site is located in an unpopulated area, and in a region with the highest level of solar radiation in South America. The associated main activities and preliminary timelines are presented in the chart below. The Project is permitted for and can be expanded to reach a total of 250 MW.
- 2) In partnership with Transelec, the largest transmission line operator in Chile, and utilizing a Build-Own-Operate & Transfer (BOOT) to model, develop, construct, connect the Atacama Solar PV plant via a 45.5 km transmission line to the Lagunas Substation, a major and existing node of the Northern Electrical Interconnection System of Chile (known as SING in its Spanish acronym).

- 3) Implementation of a Stakeholder Engagement Plan, which provides for structured engagement, gender mainstreaming, a grievance mechanism, and a series of proposed voluntary corporate responsibility oriented proposals.

Other important third-party activities include the Government of Chile's efforts to interconnect the Northern Electrical Interconnection System (SING), to which the Project will be connecting, with the Central Interconnected System (SIC) to improve capacity. This interconnection of the transmission line systems is planned to occur by the end of 2017, although the Project's related conversion factors for CO2 emissions and related estimates assume a 1-year delay.

***Provide information on how the activities are linked to objectives, outputs and outcomes that the project/programme intends to achieve. The objectives, outputs and outcomes should be consistent with the information reported in the logic framework in section H.***

The linkages, outputs and outcomes are outlined from (1) GCF institutional perspective, and (2) a project implementation and project-financing perspective below.

- 1) In terms of broader GCF objectives and indicators, the successful completion, connection and operation of the large-scale Project, acting as and enabling a paradigm shift, would result in a substantial displacements of CO2 (quantified further below) by increasing the number of large, low-emission power suppliers in the SING transmission system, currently characterized by over 90% fossil fuel based thermal power generation (used mainly by energy intensive copper mining operations). The Project would also enable and support the realization of Chile's COP21-related ambitious commitments to increase its energy generation matrix from, currently, 11.4%, to 20% of renewables by 2025.

The Project is expected to take a leading rank among its solar PV project peers in the Atacama Desert in terms of size (Phase I 143 MW, expandable to 250 MW), energy generation (Phase I: 412 GWh/year, P90 value), low specific unit costs (Phase I: 71.67US\$/t CO2 eq for total investment of US\$265) for CO2 offset (Phase I: 3,697,442 tons of CO2 eq. over 20 year lifespan, and 0.98% annual deterioration), and displacement of large number of households' energy use (Phase I: 190,565, based on average Chilean household power use of 2,160 kWh/year).

- 2) In terms of Project implementation, outputs include progress and completion along defined physical, performance and financial milestones typical of project-financed private sector developments. Key elements are presented in the table "Key Milestone" and the simplified Gantt "Preliminary Project Schedule" further above. Physical outputs which can be monitored and are tied to payments of EPC contractor include delivery of components on site, civil works, electrical works, installation solar panels, installation of monitoring systems and security installation, mechanical and electrical completion, grid connection and energization, commissioning and testing, provisional acceptance testing, and final completion. Once completed, the plant will generate and transfer clean PV power into Chile's merit order based dispatch grid, therefore reducing the CO2 intensity of the system and displacing CO2. Project finance loan documents and related completion tests will define relevant indicators which will also be tied to any GCF co-financing. Related key financial performance indicators are presented in section B.1 further above.

Other Project-related corporate responsibility-oriented social objectives, activities, outputs and expected outcomes relate to the successful implementation of the Stakeholder Engagement Plan, is summarized in the following table.

<b>Objectives</b>	<b>Activities</b>	<b>Outputs</b>	<b>Outcomes</b>
Stakeholder engagement	Resources: setting up one office in Pica, completion of grievance mechanism, min. of one quarterly meeting and/or similar engagement activity	Informed, engaged stakeholders; knowledge of concerns and intervention opportunities;	100% of grievances captured; 100% of captured grievances in process of or fully resolved; reduced discontent and maintaining good reputation

Gender & minority mainstreaming	Implement a non-discrimination policy. Liaison with EPC, Municipality, Civil Society, training; providing information and access. Posting relevant vacancies and procurement opportunities through the local municipalities.	Nominate one Community Relations Officer and Women Champion; generate one list populated with women-owned or managed enterprises or associations; screened and trained 10 or more women interested in employment during construction or operation	Improved access, engagement and participation of women for vacancies, procurement opportunities; simplified access to grievance mechanism and resulting reduction of use of judicial processes(which will continue to be available)
Capacity building	Training & development initiatives, engaging with municipalities, vocation and academic centers, civil society	Generate up to 3 MOUs during 2016 or construction period; obtain outline of curricula by academic/training MOU partners, target reaching goal of 20 trained and qualified graduates within construction period; prepare and provide populated list of qualified persons available to EPC/O&M contractor and encourage local hiring;	Improved access and uptake on project un/related job and procurement opportunities;
Local hiring, procurement	Advertising and outreach	Liaise with local municipalities for vacancy and procurement announcements; identify and collate register of qualified job seekers and enterprises/associations which can be trained or used to serve project needs to simplify local hiring and procurement by EPC/O&M contractor; generate quarterly summary of vacancy announcements and successful local recruiting (matching).	Increased % local workers (baseline assumed to be zero), quantify spending on local goods & services; achieve a sense of fairness and equity; quantify reduced EPC costs (such as reduced accommodation and transportation costs)

#### C.4. Background Information on Project / Programme Sponsor (Executing Entity)

***Describe the quality of the management team, overall strategy and financial profile of the Sponsor (Executing Entity) and how it will support the project/programme in terms of equity investment, management, operations, production and marketing.***

**Project Sponsor:**

- Founded in 2010, Sonnedix is a large global solar photovoltaic (“Solar PV”) independent power developer and producer, incorporated in Bermuda.
- Sonnedix has raised over €500MM in equity to date from founders, management, private and institutional

investors.

- Sonnedix is a joint-venture owned and controlled by Sonnedix Global Holdings Ltd. and IIF Solar Investment Ltd. (“JPM IIF”), an entity controlled by the Infrastructure Investment Fund, an investment fund advised by J.P. Morgan Asset Management on behalf of institutional investors.
  - J.P. Morgan Asset Management has over US\$ 1.7 trillion in assets under management.
  - J.P.M. IIF has broad experience in investing into energy companies globally and provides access to a global network of executives, institutions and governments.
  - Sonnedix’s management is very experienced in the electricity sector.
  - As of August 2015, operated and/or mechanically completed 22 power plants with 126 MW of installed capacity.
  - Sonnedix owns and is developing controlling interests in 39 parks in nine countries: Chile (this Project), France, Italy, Japan, Puerto Rico (USA), South Africa, Spain, Thailand, and the UK.
- **Asset management approach:**
    - **O&M:** Sonnedix, in line with industry practice, outsources the O&M activities (with the related warranties) to trusted partners, ideally capitalizing on existing relationships. However, Sonnedix follows a proactive approach to asset management and maintains close follow up of O&M activities.
    - **Team:** Sonnedix retains an asset management team that proactively improves performance of the operating plant portfolio by:
      - Developing specialized engineering capabilities.
      - Providing detailed daily monitoring and issue detection of each plant as well as long-term performance tracking and optimization.
      - Proactive driving of the O&M contractors to address issues quickly.
      - Best-practice development – O&M procedures, O&M provider selection, EPC and O&M contract improvements and equipment selection.
- **Asset management components:**
    - **Central leadership:** Head of Asset Management with two staff located in London control center with oversight across the global portfolio.
    - **Monitoring and analytics:** Online monitoring of whole portfolio with single monitoring system (Skytron) – driving standard reports and alarms and simplifying issue detection (both daily and long-term trends). Redundant feeds for main inputs (meter and irradiation).
    - **Local presence:** Asset managers in each country dedicated to managing plants: performance analytics, site visits, contractor and local authority relationship management, punch-list management – with guidance and support from London.
    - **Outsourced O&M:** Management of the operation and predictive and corrective maintenance. Contractual incentives to drive outperformance through availability and partially through performance ratio guarantees.

The Chilean Electricity Market is influenced by Chile's general economic and political characteristics:

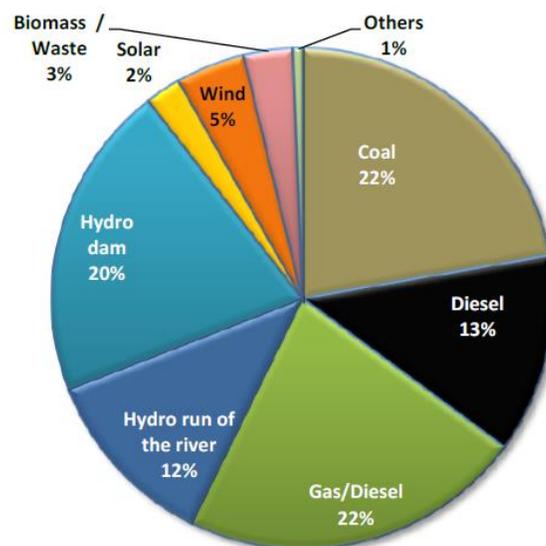
- Chile is the highest credit rated country in Latin America with AA- according to S&P
- Attractive business climate – The Ease of Doing Business Index, created by the World Bank, lists Chile as 34th in the world as of 2014
- The Global Competitiveness Report for 2014 – 2015 ranked Chile as being the 33th most competitive country in the world and the first in Latin America, well above Brazil (57th), Mexico (61th) and Peru (65th)
- Chile was the first Latin American country to establish a binding renewable energy mandate, with its latest objective that at least 20% of all the electricity generated in the country come from renewable sources (biomass, geothermal, marine, small hydro less than 20 MW, solar, and wind) by 2025
- Chile offers a stable regulatory framework in a politically stable country
- Chile is one of the best rated economies in Latin America and among the emerging economies worldwide
- Its sustained economic growth and social progress have been highlighted by different international organizations and, in 2010, it became the first South American country to join the Organization for Economic Co-operation and Development (OECD).

***Describe the market for the product(s) or services including the historical data and forecasts.***

The Chilean electric power grid is organized in four independent systems. From north to south, they are the Northern Interconnected System (SING), the Central Interconnected System (SIC), and two medium size systems in the extreme southern region. The Project will be part of the SING.

The SING system has an installed gross capacity of 4,202 MW as September 2015, of which 94.1% is thermal generation. Maximum demand in year 2014 was 2,372 MW. It provides energy mainly to large non-regulated customers as mining and industrial customers that represent nearly 90% of the total system demand.

Under such scenario, Chile currently has the following gross power generation capacity, as of September 2015:

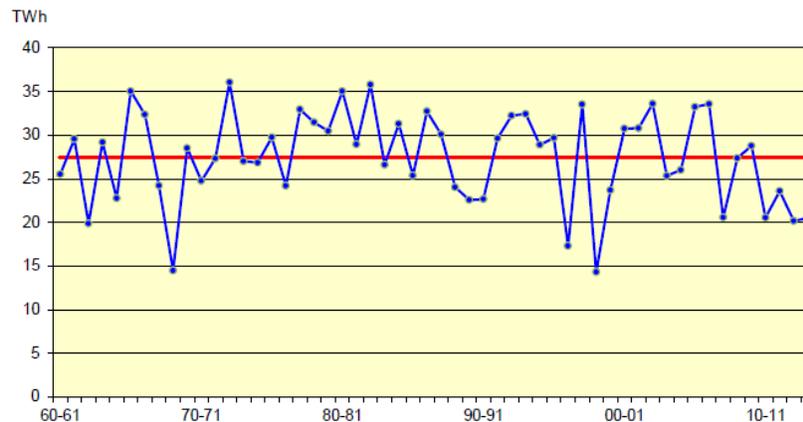


Power generation in Chile, is characterized as a competitive market where several generator companies offer energy at different prices, according to their production costs and commercial strategies.

The system operator (CDEC) has to balance the market aiming to meet the electric demand at a minimum cost, preserving system security levels. It should be noted that the dispatch is done centrally, so the CDEC decides autonomously generation levels of all central system as if it were the owner of virtually every one of them.

Chile imports almost all fossil fuel demanded by the electricity generation segment, which makes the country dependent on external suppliers of these resources.

Furthermore, the electricity generated with hydro-power plants suffer from high volatility. The annual hydroelectric generation is highly variable, depending on hydrology, as can be seen in the next chart. The chart presents the hydroelectric generation with all the existing power plants in 2010, considering the historical inflows for the hydrological years from 1960-61 until 2013-14.



New large hydroelectric projects, that are financially feasible, have been opposed by the Chilean people and government's opposition. Those projects would be on the Chilean Patagonia, and not only extensive land would be flooded, but the Transmission Lines would be too long, crossing thousands of Km of wild areas.

***Describe the competitive environment including the list of competitors with market shares and customer base and key differentiating factors (if applicable).***

In Chile, the electricity generation, transportation and distribution activities operate as separated businesses, which are mostly developed by the private sector. The government fundamentally plays a regulatory, supervising and subsidiary role.

Private electricity companies are free to decide about their investments, the commercialization of their services. However, they must also fulfill some obligations established by law, regulations and technical standards that form part of the electricity regulatory framework.

The ownership of power plants in SING is highly concentrated in three market agents: GDF Suez (E-CL), AES Gener and Endesa:

Regarding electricity demand, since 1998 the demand has increased at rates of 5.0% for the SIC and 6.0% for the SING. The latest official estimations forecast a 4.46 % and 6.08% mean growth rate for the SIC and SING (2014-2023), respectively.

Demand in SING system is basically driven by non-regulated, almost 90% corresponding to industrial consumption, mainly mining industry. In turn, for SIC system almost 70% of consumers have regulated tariffs, mainly residential and commercial.

The SIC and SING new projects are considered in construction when they have approved all permits required, such as environmental approval and others.

The generation projects with environmental approval but not yet under construction are presented in the following

table, where the total new generation capacity is 12,556 MW, solar plants being the most relevant, followed by wind and coal-fired. Solar and wind power plants projects account for 55% and 17%, respectively.

It is important to mention that there is a Project underway to connect the SIC with the SING, and to strengthen the SIC (which is larger and more complex than the SING). The State is promoting such projects, and they should be ready by 2018 or 2019. The projected line (600 km) would connect the Mejillones S/S (SING) and Cardones S/S (SIC), calling for an investment of approximately US\$ 700 million.

***Provide pricing structures, price controls, subsidies available and government involvement (if any).***

Tariffs are indexed to the US\$, even though clearing is in Chilean Pesos. The denomination is in US\$ in order to generate a natural hedge with the energy sources used given that most energy sources in Chile are imported and denominated in US\$ (oil, gas, carbon). Therefore, there is a pass-through to the final consumer, avoiding subsidies.

Generation companies have different alternatives to commercialize their energy and power:

1. Supply large consumers in the market at non-regulated prices;
2. Establish long term supply contracts with distribution companies through competitive auction processes;
3. Sell their energy in the Spot Market at marginal costs that are set on an hourly base by the dispatch entity.

The Project will be selling energy using the third alternative: the Spot Market.

## **C.6. Regulation, Taxation and Insurance (if applicable)**

Regarding the regulation issues, it is important to start by mentioning that in Chile there is a stable institutional framework in place, that can be summarized as follows:

- Respect for democratic values
- Low corruption levels
- High judicial independence
- Confidence in the political system
- Strong safeguards for investment contracts

### **Rationale for Awarding Sonnedix with the Electricity Generation Concession**

- Sonnedix, through Atacama Solar S.A., holds all of the development, permitting and transmission rights, as well as the public land mining concessions, for a period of 30 years.
- Generation of Energy in Chile is subject to market competition (Open Market Scenario).
- In that respect, once Permits are obtained (including mining concessions), electricity generation is permitted.
- Sonnedix is protected from new entrants due to the following reasons:
  - Obtaining the concessions and the permits challenging and applicants have to present strong cases and show implementing and operating capabilities.
  - Lower Marginal Cost Producers have the right to enter into the grid first.
  - Lower Marginal Cost Producers are still limited in Chile, and there is space in the market for them.
  - As more Low Marginal Cost Producers enter into the market, new Projects will fail to be able to make the required returns on investments.

***Provide details of government licenses or permits required for implementing and operating the project/programme, the issuing authority, and the date of issue or expected date of issue.***

***Permits not Awarded – In Progress***

- Resolution which approves the Favorable Informe for Construction (PAS 96). Permit is under development.
- Building-permit for the Project and permit for temporary facilities and camp. There is a Building Project for the Pilot Project. We are reviewing if it applies for the whole site/project.
- Pertinence Letters filed under the Environmental Authority regarding modifications to the Project. In progress.
- Definitive Electricity Transmission Concession. Transelec is working on this issue.

Please notice that more than 50 permits/concessions etc. are around the Project.

***Describe applicable taxes and foreign exchange regulations.***

**Taxes**

- Primarily Value Added Taxes, which can be returned once sales start.
- Income taxes are around 35% of Income Before Taxes.

**Foreign Exchange Regulations**

- As mentioned, Chile promotes foreign investments, and conditions are positive for dividend payments. Please be aware that tariffs are indexed to US Dollars.

***Provide details on insurance policies related to project/programme.***

**Insurance**

- Insurance policies for all-risk, business interruption and third-party liability in accordance with usual industry practice will be contracted, and they should be acceptable to Senior Lenders.

## **C.7. Institutional / Implementation Arrangements**

***Please describe in detail the governance structure of the project/programme, including but not limited to the organization structure, roles and responsibilities of the project/programme management unit, steering committee, executing entities and so on, as well as the flow of funds structure. Also describe which of these structures are already in place and which are still pending. For the pending ones, please specify the requirements to establish them.***

**Project Structure**

Atacama Solar S.A., a Chilean subsidiary of Sonnedix Power Holdings, will be the recipient of the GCF funds and will be responsible for the project's development. The legal entity that will sign the financing documentation (the Borrower) will be Atacama Solar.

Atacama Solar qualifies as "Project Finance" because debt providers will provide funding through a special purpose vehicle ("SPV") that has no cash flows at the time the financing is disbursed. In addition, the debtors will only rely on the cash flows generated from the Project alone, once it begins operations, with limited or no recourse to cash flows from entities outside the Project/SPV or the Project's equity investors.

In order for funds to be disbursed to the recipient, a number of conditions precedent will have to be met. These conditions will be agreed upon during the loan documentation phase.

### Organization Structure

Sonnedix's executive leadership and management consists of a group of executives with a proven track record in developing, constructing, acquiring, financing, and operating solar PV assets globally.

Sonnedix has a solid presence to develop its business in Chile. The company will provide administrative services, including supervision of the EPC and O&M agreements, accounting, administration, tax filings, debt compliance and regular review of changes to the legal/ administrative environment.

The project's key personnel biographies are shown below.

#### *Paulo Pimentel – Sonnedix's Engineering and Construction Manager Chile*

- Mr. Pimentel has almost 25 years track record in the energy and industrial sectors. Before starting with Sonnedix, Mr. Pimentel served 8 years as COO at SelfEnergy, a Portuguese ESCO, mainly dedicated to the areas of Energy Efficiency and Decentralized Production (solar PV), with offices in UK, Spain, Mozambique and Angola. In this role he was responsible for several projects of PV rooftops projects, with more than 20 MW installed in Portugal and Spain, and also for PV development projects of 50 MW in Africa and Eastern Europe. The total asset values worth around 100MEuros.
- Earlier in his career, Mr. Pimentel worked during almost 15 years for ABB, Maclellan International plc and VW as Technical Director, Site Manager and Senior Engineer in the Industrial Maintenance and Facilities Management areas, as an outsourced service provider for the complete maintenance management facilities of automotive, pulp and paper plants, with annual value more than 15MEuros
- Mr. Pimentel graduated as an electrical engineer from Polytechnic Institute of Lisbon and has also a Post Graduation in Energy Efficiency and Renewables and Business Management.

#### *Felipe Ribbeck – Sonnedix's Chile Country Manager*

- Mr. Ribbeck has over 20 years of experience in the power industry, his first position at Gener S.A., second largest Chilean IPP. During 6 years he led the Latin America expansion closing over a billion dollars of investment
- Company grew from 500 MW to a diversified energy conglomerate traded on the NYSE, controlling over 7000 MW in 6 countries
- Since 2000 he assists European and US utilities, investors and mining companies on, among other: M&A, greenfield development, corporate strategy and climate change policy
- Mr. Ribbeck has an MBA from the Universidad Adolfo Ibáñez; a bachelor's degree in Administration from the Universidad Adolfo Ibáñez; and an Electric Engineering Degree from the Universidad de Chile.

#### *Idris Tayebi – Sonnedix's Chile Business Development Manager*

- Mr. Tayebi has more than 11 years of experience in the Power sector. After 7 years serving as economist and Finance Manager for EDF and GDF SUEZ where he was in charge of conventional and renewable energy projects financing and part of the development team, in France and Chile
- In addition, Mr. Tayebi worked as Independent Financial Advisor in the Renewable Energy Sector, across European, African and Latin American Jurisdictions. He successfully contributed to the sale of 600 MW of Solar PV projects in Chile to major Equity investors in the course of 2013 and 2014. He also advised the World Bank, GIZ, DFID and the Chilean Government on the design and implementation of Financial Instruments associated with Carbon Finance topics and Renewable Energy policies, in Chile and various African countries

- Mr. Tayebi is currently in charge of the Business Development of Sonnedix in Chile, bringing the existing portfolio of projects to “Ready to Build” and leading the acquisition process of new assets. He is especially focused on the commercial structuring of Atacama Solar and the overall definition of power contracting strategy.

***Describe construction and supervision methodology with key contractual agreements. Also describe operational arrangements with key contractual agreements following the completion of construction. If applicable, provide the credit analysis of key counterparties of key contractual agreements and/or structural mitigants to cover the counterparty risks.***

**Key Contractual Arrangements:**

*Engineering, Procurement and Construction (EPC) and Operation & Maintenance (O&M)*

Biosar is the EPC and O&M contractor.

- Biosar is the brand name of the international company AKTOR S.A., a Greek Company, listed in Athens Stock Exchange, operating in 23 countries in several continents.
- EPC company with experience of large utility scale PV plants constructed (or in construction) for ENEL and EDF, in the Atacama Desert area. It has experience in multiple countries, including U.S.A, Panama and Chile, Italy, Bulgaria and Romania.

***Transmission line***

PV plant power substation, transmission line and grid connection equipment at Lagunas substation will be developed by Transelec under a Build, Own, Operate and Transfer (BOOT) contract and repaid under a 25 year lease with fixed payments and repurchase option of US\$ 1.

***Insurance***

Insurance policies for all-risk, business interruption and third-party liability in accordance with usual industry practice are in the process of being contracted.

***CAF's Monitoring Activities During Construction***

- i. CAF has engaged Hatch as independent engineer for supporting the Lender's technical information requirements and the Chilean Legal Firm Carey, for identifying and support on all legal issues around the Project.
- ii. Environmental issues will be followed up by CAF's own personnel.
- iii. Issues regarding the specific monitoring of the Project's emissions, etc., will be engaged by CAF.

## C.8. Timetable of Project/Programme Implementation

Please provide a project/programme implementation timetable in [section I \(Annexes\)](#). The table below is for illustrative purposes. If the table format below is used, please refer to the activities as numbered in Section H. In the case of outputs, please mark when all the required activities will be completed.

The key project finance, transmission line, and EPC milestone schedule is presented below. Selected monitoring and evaluation criteria are also presented in Section H.

The granting of Project required permits might take more time than expected, which would delay the start of construction. Such risk will be covered with a longer Grace Period. However, having the permits or a favorable opinion of the Local Legal Counsels to Senior Lenders regarding the status of the registry of such permits would be a condition precedent to disbursements.

Milestone	
<b>Project financing milestone schedule</b>	
Preparation/update market, of irradiation, and E&S reports by third party consultants	Apr-15
Information memorandum/ presentation and financial model	May-15
CAF mandate letter	Sep-15
CAF due diligence finalization and Board of Directors approval	Dec-15
Green Climate Fund due diligence	Mar-16
GCF board of directors presentation and approval	June-16
Commercial banks due diligence	May-16
Common term sheet: commercial banks, CAF, GCF	June-16
Documentation and signing	Aug-16
First disbursement	Sept-16
<b>Transmission line milestone schedule</b>	
Transmission line - preliminary engineering completed	Mar-15
Transmission line - business strategy	Jul-15
Transmission line - NTP to Transelec for detailed engineering and RFPs	Aug-15
Transmission line - Project CAPEX determined	July-16
Notice to proceed for construction	Aug-16
COD	Oct-17
<b>Phase II EPC milestone schedule</b>	
EPC - Preparation of RFP	Mar-15
EPC contractors prepare bids	Jun-15
Selection of EPC contractor	Sep-15
Preparation and negotiation of EPC contract	Oct-15
Notice to proceed	Sept-16
COD	Nov-17

In addition to lenders' project monitoring activities, which will be supported by the Independent Engineer already selected by CAF. Given the relatively short-term nature of constructing solar project and its associated transmission line, and the need to capture more high-level and institutional lessons through an evaluation exercise, it is proposed to conduct the mid-term evaluation within 1 year of physical completion of the Project, with the full evaluation to be completed 5-year thereafter, and, in any case, prior to GCF's exit.

It is assumed that the evaluation will be carried out by an independent third party satisfactory to CAF.

It is anticipated that a summary of the evaluation report (excluding proprietary, business confidential or personal information) may be disclosed by the GCF to the public.

## D.1. Value Added for GCF Involvement

The participation of the GCF, along with CAF, would complete the US\$ 141 million\* in long term project financing required to bring this worthy large-scale, “shovel ready” and private sector-led solar photovoltaic power Project to fruition.

- The participation of the GCF is additional and key for attracting other financial institutions to participate in the financing.
- Current economic and financial market conditions restrict the participation of commercial banks (local and international), and even, other development agencies. GCF and CAF would act as countercyclical and patient financial institutions, for sound projects like this one, which achieve fast, quantifiable results (CO2 displacement), and will act and enable a paradigm shift in Chile.
- Being able to take electricity spot-market risk will be a step forward in promoting sustainable green energy projects in Chile. Many countries could learn from the Chilean experience in the electricity generation market. In this sense, the Project will act as and support a paradigm shift in Chile and beyond.

Other issues worth mentioning:

- The “shovel ready” Atacama Solar Project would assist the government of Chile to achieve its mandate to generate 20% of electrical power from renewable energy sources by 2025.
- The Project is located in the Atacama Desert in the SING (northern power grid) where power is predominantly generated by coal-fired and LNG power plants serving nationally important and energy intensive copper mining sector; the Project is a low cost, clean and renewable alternative to new coal-fired and/or LNG generated power.
- Nevertheless, a number of development banks who would traditionally have participated in this type of long term project financing already have substantial exposure to solar in Chile and are not willing to finance more Chilean solar projects.
- Furthermore, the local banking market lacks depth and availability for loans of this type and tenor and electricity spot-market risk.
- The participation of the GCF along with CAF would complete the US\$ 141 million in long term project financing required to bring this large-scale and “shovel ready” solar PV power project to fruition, and realize fast and quantifiable results in terms of CO2 displacement.

The first five years of the Project are expected to be the riskiest and, therefore, the ones most difficult to finance, and there is where the GCF and CAF's support provides the most additionality. This is mainly in light of (i) the risks associated with the construction of the Project and its corresponding transmission line and (ii) the uncertainties surrounding the SIC-SING interconnection and the resulting price volatility.

- GCF role will be additional when financing the Project during this period with the possibility to locally refinance (or “crowd in”) once these Project and market risks are reduced.
- This financing will support the increase in Chile's renewable generation capacity (and associated CO2 displacement) and allow for local financial institutions to safely increase their exposure to large-scale renewables in the medium term.

## D.2. Exit Strategy

*Please explain how the project/programme sustainability will be ensured in the long run, after the project/programme is implemented with support from the GCF and other sources, taking into consideration the long-term financial viability demonstrated in [E.6.3](#). This should include a description of strategies for longer term maintenance of physical assets (if applicable).*

The Project is structured in such a way that its financial sustainability is assured, providing the framework for a possible sell-down of the loans to financial markets. It includes not only the Project's fundamentals, but also the financing structure:

#### **Chilean Electricity Market – Regulatory Fundamentals**

- Lower marginal cost electricity providers enter to the grid prior to other energy providers (oil, gas and carbon plants).
- Electricity generation permits are given for 30 years, facilitating capital investment recovery and therefore promoting private investments.

#### **Technical Fundamentals (see section F.2)**

- Technology used is proven and available in the market.
- Technology used comes from Solar Energy Technology developers in Germany and China (panels).

#### **Construction and Operating Fundamentals**

- Construction risks will affect only the initial years of the life of the Project, and there is where CAF and the GFC participate and mitigate such risks.
- Construction of this type of power plants is perceived as of low complexity. Most costs are equipment costs. Construction of facilities etc., are less than 20% of the total EPC value.
- Operation of this type of plants is not complex, and it is almost commoditized.
- O&M Agreement with Biosar will be for a 5-year period: local operation might be developed. Please take into account that solar plants are relatively common in Chile, providing a sustainable source of trained personnel to manage and operate the Project.

#### **Financial Structure Fundamentals**

- Relatively Low Leverage: The leverage of the Project will be around 60/40 or lower. Similar projects with PPA's could reach up to 90/10 leverage levels (depending, primarily, of the strength of the PPA).
- Long Tenor: The tenor of the loans helps in decreasing the pressure of cash-flows of the Project.
- Grace Period: The grace period should be sufficient to mitigate any project construction delays.

In this section, the accredited entity is expected to provide a brief description of the expected performance of the proposed project/programme against each of the Fund's six investment criteria. Activity-specific sub-criteria and indicative assessment factors, which can be found in the Fund's [Investment Framework](#), should be addressed where relevant and applicable. This section should tie into any request for concessionality made in [section B.2](#).

## E.1. Impact Potential

Potential of the project/programme to contribute to the achievement of the Fund's objectives and result areas

### E.1.1. Mitigation / adaptation impact potential

Specify the mitigation and/or adaptation impact, taking into account the relevant and applicable sub-criteria and assessment factors in the Fund's [investment framework](#).

When applicable, specify the degree to which the project/programme avoids lock-in of long-lived, high emission or climate-vulnerable infrastructure.

- **Total tons of CO2 equivalent to be avoided or reduced per annum**  
184,872 tCO<sub>2</sub>e (20 year life, 0.98% annual efficiency loss)
- **Expected total number of direct and indirect beneficiaries and number of beneficiaries relative to total population (e.g. total lives to be saved from disruption due to climate-related disasters)**  
No estimates directly attributable to Project available

### E.1.2. Key impact potential indicator

Provide specific numerical values for the indicators below.

GCF core indicators	Expected tonnes of carbon dioxide equivalent (t CO <sub>2</sub> eq) to be reduced or avoided (Mitigation only)	Annual	184,872 t CO <sub>2</sub> e
		Lifetime	3,697,442 tons
	<ul style="list-style-type: none"> <li>• Expected total number of direct and indirect beneficiaries, disaggregated by gender (reduced vulnerability or increased resilience);</li> <li>• Number of beneficiaries relative to total population, disaggregated by gender (adaptation only)</li> </ul>	Total	Not relevant
		Percentage (%)	Not relevant

Other relevant indicators	<ul style="list-style-type: none"> <li>• The realization of the Project would add a large scale (US\$ 265 million*, 143 MW plus expansion opportunity for an additional 107 MW) clean power generation facility to Chile's northern SING electric system, which is currently dominated (&gt;94%) by fossil-fuel based thermal power generation serving energy intensive and nationally important copper mining sector</li> <li>• Enables the development of Project which leads Atacama Desert solar PV peers in terms of size, and specific unit costs, including unit CO<sub>2</sub> offset per unit of investment</li> <li>• Further encourages the government to improve the interconnection and capacity of the main electric transmission systems in Chile to accommodate emerging new and cost effective solar parks which can take advantage of abundant solar irradiation of Atacama Desert</li> </ul>
---------------------------------	---

Describe how the project/programme's indicator values compare to the appropriate benchmarks (i.e. the indicator values for a similar project/programme in a comparable context).

The Project was benchmarked against a selection of solar peers (for which relevant information could be obtained from public sources) based in the Atacama Desert region. The results are presented below and associated approaches and assumptions are listed further below.

Project Name	Closing Date	Size (MW)	Investment Amount (US\$ M)	Off-take	Power Generation GWh	Completion date	Regional Grid	Calculated '000t CO2e offset over lifespan	kg CO2e / US\$ invested over lifespan	Offset household energy use/year (Chile)
<b>Atacama Solar (Phases I &amp; II)</b>	<b>Juln-16</b>	<b>142.5</b>	<b>265*</b>	<b>Merchant</b>	<b>412</b>	<b>Jul-17</b>	<b>SING</b>	<b>3,697</b>	<b>13.95</b>	<b>190,565</b>
Quilapilun	Jul-15	110	230	PPA	242	Mar-16	SIC	2,069	9.00	112,037
San Andres	Nov-13	50.7	142	Merchant	99	Mar-14	SIC	838	5.90	45,833
Amanecer Solar	Oct-13	100	267	PPA	270	Jun-14	SIC	2,289	8.57	125,000
Pozo Almonte & Calama	Apr-13	26.5	82.7	PPA	45	Sep-14	SING	457	5.52	20,833
Carrera Pinto	May-15	97	180	PPA	260	Aug-17	SIC	2,236	12.42	120,370

1. Estimated annual output and completion dates for Project's solar peers in the Atacama region, as well as their regional grid connections, were extracted from the latest [www.bnamericas.com](http://www.bnamericas.com) publications or elsewhere.
2. We assumed an expected lifespan of 20 years for all peers to enable comparison of CO<sub>2e</sub> generation over useful life of peers.
3. Claimed CO<sub>2e</sub> offset data by peers are published data, as available (and probably not adjusted for P90 output and 0.98% annual efficiency degradation as applied to the Atacama Project).
4. Specific emission data were taken from the web site of the Chilean Ministry of Energy: <http://huelladecarbono.minenergia.cl/> and used in such a way, that until December 2017 the 2010-2014 five years averages were taken for both SING and SIC transmission systems. From January 2018 onwards, when the two systems are expected to be interconnected, a weighted average was calculated on the basis of the July 2015 installed capacity of 4,829.1 MW @ SING & 18,458.4 MW @ SIC.
5. An adjustment of 0.98% year efficiency deterioration was incorporated over the lifespan CO<sub>2e</sub> offset calculation.
6. For the average household energy use we used 2,160 kWh/year (source: Chilean Ministry of Energy).

## E.2. Paradigm Shift Potential

Degree to which the proposed activity can catalyze impact beyond a one-off project/programme investment

### E.2.1. Potential for scaling up and replication (Provide a numerical multiple and supporting rationale)

***Describe how the proposed project/programme's expected contributions to global low-carbon and/or climate-resilient development pathways could be scaled-up and replicated including a description of the steps necessary to accomplish it.***

- Current economic and financial market conditions restrict the participation of commercial banks (local and international), and even, other development agencies in Chile. Availability of countercyclical and patient capital for sound projects will promote and enable a paradigm shift in Chile and beyond.
- Being able to take electricity spot-market risk will be a step forward in promoting sustainable green energy projects in Chile. Many countries could learn from the Chilean experience in the electricity generation market.
- The project is located in the vast Atacama Desert in the SING (northern power grid) where power is predominantly generated by coal-fired and LNG power plants serving nationally important and energy intensive copper mining sector; the project is a low cost, replicable, clean and renewable alternative to new coal-fired and/or LNG generated power.
- Atacama Desert provides ideal solar radiation, low population density, lack of competing land use, and otherwise suitable environmental and social conditions and could host many more large-scale solar PV projects
- The Project demonstrates the declining cost structure of solar PV projects associated with adoption of technological improvement, the appropriate project siting in low environmental and social risk area
- The government will be encouraged to pursue/improve interconnecting the grid system to take advantage of the energy production capability of AS Phase I & II (250MW) – and possibly other projects
- Project has developed a stakeholder engagement plan, including gender mainstreaming (summarized below), and is seeking collaboration opportunities with academic and vocational centers to further promote non-conventional renewable projects in Chile.

### E.2.2. Potential for knowledge and learning

***Describe how the project/programme contributes to the creation or strengthening of knowledge, collective learning processes, or institutions.***

- The Atacama Desert features highest solar radiation in the world but this has not been translated into largest or most solar PV developments in the world.
- The experience with solar PV in northern Chile (broader Region I) is based on smaller and modular scales and is mainly contracted through PPAs.
- The Atacama Solar Project would demonstrate the technical and financial viability of large scale operations, crowd-in private sector funding from various sources at scale, and allow a more rapid ramp-up of renewable energy generation, and associated economy of scale.
- Also, the government will be encouraged to pursue/improve interconnecting the grid system to take advantage of the energy production capability of AS Phase I & II (250MW) – and possible other projects.
- Significant learning is also expected to emerge from this Project which is CAF's first major direct project finance deal in Chile, CAF's first major direct investment in Chile's renewable energy generation sector in Chile, and CAF's first co-financing with the GCF. At the same time, this Project would also be Chile and CGF's first collaboration, which comes on the heels of the COP21/Paris Agreement.
- Project is developing expanded stakeholder engagement plans (including gender mainstreaming) and seeking collaboration opportunities with academic and vocational centers to further promote – and share knowledge about - non-conventional renewable projects in Chile.

**E.2.3. Contribution to the creation of an enabling environment**

***Describe how proposed measures will create conditions that are conducive to effective and sustained participation of private and public sector actors in low-carbon and/or resilient development that go beyond the program.***

***Describe how the proposal contributes to innovation, market development and transformation. Examples include:***

- Project's power generation will further provide incentive to government to pursue the interconnection and reinforcement of the north-south grid systems, thus encourage access for more renewable projects
- Demonstrate access to loans and investments for renewable projects with high upfront capital costs and need for patient capital with long repayment tenors

The Atacama Solar PV Project is a low-cost substitute for coal-fired and LNG generated power that is prevalent in the SING (northern power grid) in Chile.

**E.2.4. Contribution to regulatory framework and policies**

**Describe how the project/programme strengthens the national / local regulatory or legal frameworks to systematically drive investment in low-emission technologies or activities, promote development of additional low-emission policies, and/or improve climate-responsive planning and development.**

- Chile was the first Latin American country to establish a binding renewable energy mandate. In October 2013, the country approved the mandate increase, which rose to 20% renewable electricity generation by 2025. Project will contribute to achieving this mandate.
- Project has already been permitted under Chilean regulatory requirements. The Project has introduced additional elements and activities, such as submission of verified project documents under the UNFCCC Clean Development Mechanism.
- The Project has gone beyond national permitting requirements, inviting external environmental and social impact evaluation based on the IFC Performance Standards (adopted also by the GCF).
- Project has developed stakeholder engagement plans and is seeking collaboration and capacity building opportunities with academic and vocational centers to further promote non-conventional renewable projects in Chile.
- Even though: i) Chile has a robust regulatory regime; ii) the State is promoting the development of these types of non-conventional renewable-energy projects; and iii) local banks have participated in the financing of merchant generators, this specific Project will have a better financing structure (more flexible to face spot-price risk), and will not face the Transmission restrictions that generation projects in the SIC faced.
- Finally, promoting the participation of institutions with little financial and risk exposure to Chile helps in the diversification of projects and financial sources.

### E.3. Sustainable Development Potential

#### Wider benefits and priorities

##### E.3.1. Environmental, social and economic co-benefits, including gender-sensitive development impact

#### Economic co-benefits:

- **Total number of jobs created:** As detailed further in the Project's Summary ESIA and Annex I of this proposal, the Project will use EPC contractors who, in turn, will recruit temporary workers for a variety of skilled, semi-skilled and unskilled tasks during construction. Only a very small number (<20) of permanent jobs will be created during operations for O&M support. The Project's Stakeholder Engagement Plan contains measurable gender mainstreaming initiatives and expected outcomes, as outlined also below:

Activity	Output	Outcome
Resourcing, liaison with EPC, Municipality, Civil Society, training; providing information and access	Set up Women Champion role, office in Pica, lists of women-owned enterprises; screened & trained women interested in employment; grievance mechanism	Improved access, engagement and participation of women for vacancies, procurement opportunities; simplified access to grievance mechanism

- Given the presence of a developed tourism infrastructure, the population centers near the Project, particularly Matilla and Pica (population ca 5,000), and Pozo Almonte (ca 10,000), are expect to benefit from provision of goods and services (including accommodation) to the Project during the construction period lasting approximately over one year.
- 2011 tourism statistics show that Pica has capacity to provide over 17,000 room nights (and 65,000 bed nights) per year, while Pozo Almonte has a capacity of approximately 16,000 room nights (and ca 36,500 bed nights).

This means that the population centers near the Project area are already well positioned to capture additional economic benefits associated with the construction phase of the Project.

- Amount of foreign currency savings: N.A.
- Amount of government's budget deficits reduced: N.A.

#### **Social co-benefits:**

- Improved access to education: Project is seeking collaboration opportunities with academic and vocational centers to promote renewable energy and related training opportunities. The Project's formalized Stakeholder Engagement Plan is designed to make Project opportunities more accessible to women (though gender mainstreaming efforts, see further below) and indigenous groups by tapping into existing organizational structures and activities
- Improved regulation or cultural preservation: While the project site is devoid of population and cultural heritage, the broader region features indigenous people and world class cultural heritage, such as geoglyphs. Project and its scale is locally viewed as an opportunity for additional touristic attraction
- Improved health and safety: Project would provide and apply world class occupational health and safety standards, including compliance with core ILO conventions

#### **Environmental co-benefits:**

- Project independently analyzed by Prizma (staffed by former E&S specialists and current STC of the EBRD and the World Bank Group) using the IFC Performance Standards which is also used by the GCF for its project evaluation process. Project is located in an OECD member country with associated strong institutional structures. Project falls in a "B" category, meaning that the Projects has limited adverse social or environmental impacts that are few in number, generally site-specific, largely reversible and readily addressed through standard mitigation measures. Given site characteristics, including lack of competing land use in desert flat largely devoid of population and biological resources, no major or unique environmental and social risks were identified. EPC contractors will be required to follow Good International Industry Practice, including in areas such as occupational, health and safety. The main environmental benefit of the Project is its clean and renewable energy generation potential detailed elsewhere in this GCF proposal. Additional details are provided in Annex I.
  - Improved air quality: N.A.
  - Improved soil quality: N.A.
  - Improved biodiversity: Project has committed to conduct surveys of flora along the transmission line route, which is characterized by hyper-arid desert. The collected information will improve the biodiversity knowledge base of this region. Developer is also developing a wildlife rescue/relocation plan, and plans to avoid certain flora, both common for projects in the Atacama Desert.
- **Gender-sensitive development impact**
- Proportion of men and women in jobs created:
    - In line with Chile's regulatory requirements, which prohibit gender discrimination, Atacama Solar is committed to developing a human resources policy that states that discrimination in hiring will not be allowed.

CAF's Gender Assessment Report for Chile and associated recommendations for the Project have been disclosed by CAF on its website. The Project has integrated a gender mainstreaming effort into its Stakeholder Engagement Plan, as summarized in terms of planned activities, outputs and expected outcomes in the table below. The Sponsor plans to have an office in nearest community to improve to project benefits (procurement, temporary employment, and access to grievance mechanism), designate a "Women Champion" as part of its environmental and social organizational structure, and engage with locally-based organizations and institutions which promote women entrepreneurs. The Sponsor will also work closely with the EPC contractor to ensure that the human resources policy will be establishing non-discrimination in hiring will be applied by all contractors working on the Project.

Activity	Output	Outcome
Resourcing, set up office in Pica, liaison with EPC, Municipality, Civil Society, training; providing information and access	Nominate one Community Relations Officer and Women Champion,; list of women-owned enterprises or associations; screened & trained 10 or more women interested in employment during construction or operations; functional grievance mechanism	Improved access, engagement and participation of women for vacancies, procurement opportunities; simplified access to grievance mechanism

#### E.4. Needs of the Recipient

Vulnerability and financing needs of the beneficiary country and population

##### E.4.1. Vulnerability of country and beneficiary groups (Adaptation only)

*Describe the scale and intensity of vulnerability of the country and beneficiary groups, and elaborate how the project/programme addresses the issue (e.g. the level of exposure to climate risks for beneficiary country and groups, overall income level, etc).*

##### Level of exposure to climate risks for beneficiary country and groups

- The SING (northern power grid) in Chile currently has a predominance of coal-fired and LNG generated power plants serving mainly the energy intensive and nationally important copper mining sector (nationally contributing 57% of national exports) which are subject to high energy prices and commodity price swings
- The Atacama solar PV Project is a low cost alternative to new coal-fired power plants currently being planned in the SING
- The Project is expected to reduce exposure to climate risk and to contribute to the reduction of CO2 emissions in a region which - due to hyper-arid climatic conditions and low population density - provides limited other Climate Change mitigation opportunities (such as reforestation)
- The Project will contribute to helping Chile to achieve its mandate to generate 20% of its electrical power from renewable sources by 2025

##### Does the country have a fiscal or balance of payment gap that prevents from addressing the needs?

- The Project will be financed by the sponsor and senior debt from development financial and commercial institutions. Hence, Chilean fiscal accounts are not a factor; and in any event; Chile has strong public finances
- Chile may be experiencing a contraction of its budget and tax revenues due to contracting base metals and mining market (by about 1/3 over last year), making Chile now even more reliant on private sector-driven projects like Atacama Solar to successfully achieve its ambitious renewable energy policies

**Does the local capital market lack depth or history?**

- While the Chilean capital markets are among the most solid and developed in Latin America, the local banking market lacks depth and availability for new long term debt financing for renewable energy, including solar PV
- The majority of long term project financing for renewable energy power projects over the past 5 years has been provided by development banks
- Many of the development banks who have been active in financing renewable energy projects in Chile have withdrawn from the market, given the level of exposure and amount of financing that they have provided to date
- Local banks face the issues of size of the deals, tenor, currency, and in this particular case, electricity spot-market price risks

**Needs for strengthening institutions and implementation capacity**

- Chile is an OECD member country and has a robust regulatory framework and a well-established energy regulation.

**E.4.2. Financial, economic, social and institutional needs**

**Describe how the project/programme addresses the following needs:**

- *Economic and social development level of the country and the affected population*

The World Bank categorizes Chile as a High Income OECD country with related well developed institutional context. The Project site is located in a more remote, desert area which is devoid of population. The more remote, hyper-arid conditions and low population density contributes to relatively lower rankings of the population centers near the Project related to Chile's national human development index. However, the region has access to reasonably good infrastructure, including road and power (serving also the regionally important mining sector), and social infrastructure, including education. Agriculture and tourism are also important economic activities in the region. The existing tourism infrastructure positions population centers such as Pica and Pozo Almonte well to capture temporary economic opportunities associated with the construction period lasting approximately over one year (construction start to mechanical completion for Phase I: 143MW).

- *Absence of alternative sources of financing (e.g. fiscal or balance of payment gap that prevents from addressing the needs of the country; and lack of depth and history in the local capital market)*

At present, there is a financing gap with limited financing sources for solar merchant projects in Chile. Development banks that typically finance those types of projects have already reached their internal exposure limits and are reluctant to finance additional projects, leaving a substantial gap in projects that could be developed and available financing. For instance, OPIC, IFC, IDB, and DEG have already financed over US\$ 2 billion in solar PV projects. Furthermore, international commercial banks are only willing to finance projects with PPAs in place, leaving only local commercial banks as the financing source for these type of projects on merchant basis; however, local commercial have limited lending capacity due to their relatively small size.

- *Need for strengthening institutions and implementation capacity.*

No specific institutional strengthening or capacity building efforts are required or anticipated as part of the Project. The Project's Stakeholder Engagement Plan foresees a structured engagement and liaison with the EPC contractors and other stakeholders (including municipal committees) to make Project benefits, such as employment and provision of goods and services, more accessible to local communities, including women and indigenous population. Also, the developer intends to engage in MOUs with academic and vocational institutions to provide relevant capacity building opportunities and promote renewable projects in Chile.

## E.5. Country Ownership

Beneficiary country (ies) ownership of, and capacity to implement, a funded project or programme

### E.5.1. Existence of a national climate strategy and coherence with existing plans and policies, including NAMAs, NAPAs and NAPs

*Please describe how the project/programme contributes to country's identified priorities for low-emission and climate-resilient development, and the degree to which the activity is supported by a country's enabling policy and institutional framework, or includes policy or institutional changes.*

The Project will contribute towards Chile's renewable generation targets.

- In advance of its participation in COP21, Chile submitted its climate action plan to the UN Framework Convention on Climate Change (UNFCCC) in September 2015. This "Intended Nationally Determined Contribution" ("INDC") includes the following commitments on Chile's behalf:
  - Reduce CO<sub>2</sub> emissions per capita by 30% versus 2007 levels (i.e., down from 1.02 tCO<sub>2</sub>e/million CLP\$ 2011 to 0.71 tCO<sub>2</sub>e/million CLP\$ 2011)
  - Additionally, contingent upon receiving international grants, Chile commits to reduce CO<sub>2</sub> emissions per capita by 35-45% versus 2007 levels (i.e., down from 1.02 tCO<sub>2</sub>e/million CLP\$ 2011 to 0.56-0.66 tCO<sub>2</sub>e/million CLP\$ 2011)
  - Sustainable management and recovery of 100,000 hectares of forest, representing captures and reduction of greenhouse gases estimated at 600,000 tCO<sub>2</sub>e per annum beginning 2030
  - Contingent on extension of Decree-Law 701 and the approval of a new forestry development act, Chile commits to reforestation of 100,000 hectares, representing captures of 900,000-1,200,000 tCO<sub>2</sub>e per annum beginning 2030
- A signature goal of the Chilean government's 2014-18 energy agenda is the "20/25" objective, which calls for 20% of Chile's power generation to come from renewable sources by 2025. As of September 30, 2015, the installed capacity of renewable energy represented 2,269 MW (or 11.4% of total installed capacity), the large majority of which (90%) located in the SIC.
- Based on the pipeline of projects under construction, solar PV is expected to become the largest source of renewable energy in Chile by mid-2017. Furthermore, solar PV is expected to represent 60% of an additional 28.0GW of renewable energy projects that are in pre-construction stage. Part of this acceleration in solar PV investments is attributable its declining levelized cost of energy ("LCOE"), which is already less than that of natural gas CCGT and approaching parity with wind, small hydro and coal-fired technologies.

In 2012, the Atacama Project had already developed a Project Design Document under the Clean Development Mechanism of the UNFCCC and, as part of that process, had received a letter of support (dated October 2, 2012) by Chile's Ministry of Environment, Chile's designated national focal point under the UNFCCC [see Annex in Section I].

### E.5.2. Capacity of accredited entities and executing entities to deliver

#### Accredited Entity: CAF

CAF is a development bank created in 1970, made up by 19 countries - 17 of Latin America and the Caribbean, Spain and Portugal- as well as 14 private banks in the region. With headquarters in Caracas, Venezuela, CAF has offices in Buenos Aires, La Paz, Brasilia, Bogota, Quito, Madrid, Mexico D.F, Panama City, Asuncion, Lima, Montevideo and Port of Spain. It promotes a sustainable development model through credit operations, non-reimbursable resources, and support in the technical and financial structuring of projects in the public and private sectors of Latin America. CAF offers several products and services: loans, structured financing, guarantees and collaterals, credit lines and technical cooperation.

In addition to above climate finance sums, CAF has a successful and measurable track-record of integrating climate change into its development mandate; enjoy trust from both donor and recipient countries governments and private sectors in the region; could contribute substantially to catalyzing additional climate finance and has extendedly demonstrated capacity to develop and implement climate programs at scale in a timely and efficient manner.

Specifically, in Project Finance related deals, CAF has a strong track-record in energy related deals, acting primarily as leading financial institution (please see credentials annexed).

For evaluating this Project Finance transaction, such as the Atacama Solar, CAF has performed the following activities:

- i. Evaluate the strategic issues around the Project, including understanding of the Sponsor, needs in the country and the specific sector.
- ii. CAF set up a multidisciplinary team to perform the due diligence, and to coordinate the analysis work of external consultants.
- iii. The team was led by the Structured Finance Team, and is composed of: i) a Sector Specialist and a Sector Business Manager; ii) an in-house Environmental and Social Specialist; iii) an in-house legal counsel; and iv) a local business manager.
- iv. Independent engineers and external legal counsels were engaged, for supporting on the due-diligence.
- v. Results of the due diligence (legal, technical, environmental and social, and financial) were presented to the Structured Finance Head, the Sector Vice-presidency (energy in this case) and to CAF's Credit Risk team.
- vi. General and specific monitoring covenants were agreed, as well as risk mitigation structures.
- vii. The Project was then presented to a Credit Committee, which recommended its approval to the approving bodies.
- viii. CAF reviews each disbursement, as well as follows up on quarterly information showing advance in the development of the Project.
- ix. Specific monitoring of the Project's financials, environmental and social aspects, emissions, legal, etc., is engaged by CAF throughout its entire life.

It is important to mention that CAF's approving and monitoring processes are constantly audited (both internal and external), as it is part of its obligations, not only for its shareholders, but for its bondholders. CAF is the institution that has the largest and broader number of bond issuances in international markets of Latin America.

#### **Executing Entity: Sonnedix**

With regards to the Executing Entity, Sonnedix's executive leadership and management consist of a group of executives with a proven track-record in developing, constructing, acquiring, financing, and operating solar PV assets globally. CAF has assessed Sonnedix's capability to deliver based on its standards of corporate governance, strong project-execution track record and overall financial and market position.

In terms of financial management, the AE feels comfortable with Sonnedix's managerial experience in reputable financial, energy and engineering firms. Sonnedix boasts a well-diversified revenue base and works with credit-worthy off-takers and contractors, as reflected by their financial statements, which have been considered satisfactory by CAF's business and risk teams.

The same applies to Sonnedix's procurement capability and overall adequacy of its system of internal control for the Project. Sonnedix's experience and capability is demonstrated by the fact that it owns more than 35 solar power projects at various stages of maturity in different regions with control of more than 800 MW of production capacity and

is expanding its global operations.

These arguments are reinforced by the fact that in 2014 institutional investors advised by J.P. Morgan Asset Management joined Sonnedix's management and shareholders in a new 50/50 joint venture platform company, Sonnedix Power Holdings, to pursue opportunities in the global solar market. The due diligence undertaken prior to closing the deal was comprehensive.

### E.5.3. Engagement with NDAs, civil society organizations and other relevant stakeholders

- Previously, as part of the environmental permitting process, the developer submitted an environmental and social impact declaration (DIA) and received the required environmental approval/license, the Resolution of Environmental Qualification (RCA). The related studies and official records of notifications, evaluations, and meetings continue to be disclosed to the public on the government's website.
- A Clean Development Mechanism (CDM) Project Design Document Form (CDM PDD) was generated for the previous version of the Project and filed (disclosed) with the UNFCCC, and was supported by the relevant Designated National Authority at that time: Chile's Ministry of Environment. As part of this process, the developer conducted a stakeholder meeting in the town of Pica, following notification via invites, web-posting, posters, and local radio announcements. Eleven representatives from the local communities, in addition to representatives from the developer and consultants, attended the meeting. Questions asked related to other solar projects, opportunity for self-sufficiency at household level using solar, concerns about electromagnetic fields, and business opportunities for tourism. All attendees expressed their support for the Project.
- The Project has developed a Stakeholder Engagement Plan designed to continue to develop and maintain a constructive relationship with key stakeholders over the life of the Project. This plan has been designed to allow the views, concerns and interests of stakeholders, particularly of the local communities to be heard, understood, and taken into account in project decisions.
- The Project is committed to implementing an effective two-way process of engagement that will be guided by the following four principles:
  1. Timely – meaning that engagement begins early in the process of identification of risks and impacts, and will continue in a structured manner and on an ongoing basis;
  2. Accessible – meaning that engagement is based on the disclosure and dissemination of relevant, transparent, objective, meaningful and easily accessible information in the local language;
  3. Inclusive – meaning that engagement is inclusive of all those directly affected; and
  4. Free – meaning that engagement is free of external manipulation, interference, coercion, or intimidation.
- The specific objectives of this plan are to:
  - Identify key project stakeholders;
  - Consult and allow for the meaningful participation of stakeholders;
  - Provide for ongoing updates to the local communities;
  - Formalize a grievance mechanism.

Additionally, CAF has pursued several meetings with Chile NDA in order not only to strengthen the present proposal but also to create closer ties and to serve Chile's national development and climate priorities acting as an regional

accredited entity able to channel resources to the country.

To this date, the interactions have been positive, and CAF expects to obtain the No-Objection Letter from the NDA.

## E.6. Efficiency and Effectiveness

Economic and, if appropriate, financial soundness of the project/programme

### E.6.1. Cost-effectiveness and efficiency

*Describe how the financial structure is adequate and reasonable in order to achieve the proposal's objectives, including addressing existing bottlenecks and/or barriers; providing the least concessionality; and without crowding out private and other public investment.*

*Please describe the efficiency and effectiveness, taking into account the total project financing and the mitigation/adaptation impact that the project/programme aims to achieve, and explain how this compares to an appropriate benchmark. For mitigation, please make a reference to [E.6.5 \(core indicator for the cost per tCO<sub>2</sub>eq\)](#).*

The financial structure is necessary (see section E.6.2 below), as the Project faces market uncertainties, even though it is aligned with Chilean Renewable Energy Strategies, and, as explained in sections B and D2, it is financially viable with no subsidies around it.

In that respect, without the support from the GCF and CAF:

- The Project will not have access to the local and international financial markets, given the size of the financial requirements, the expected tenor and the electricity spot market risks.
- Current global energy and commodities markets are passing through a downturn, and the participation of CAF and the GCF help in the promotion of these types of necessary projects. In this respect, CAF and the GCF will be acting as countercyclical financing providers.
- The structure tries to mitigate main structural risks (Electricity Spot Market Risk), providing a framework for an exit strategy when market conditions improve.

CAF does not envision any risk of crowding out private or public investment in this sector:

- Chile is a country with deficits in energy generation: physical infrastructure still uses imported commodities for energy generation. This Project will substitute not sustainable sources of energy, with reliable and clean sources of locally generated energy.
- Chile has implemented a strategy to promote clean and renewable energy. However, the State is not subsidizing the sector, but has set up conditions for private and public sector to participate on a sustainable way:
  - Promotes private sector participation.
  - Promotes the entrance of lower marginal cost energy producers first in the electricity grid.
  - Has provided longer tenor permits to renewable electricity producers, in order to assure the recovery of capital invested.

### E.6.2. Co-financing, leveraging and mobilized long-term investments (mitigation only)

*Please provide the co-financing ratio (total amount of co-financing divided by the Fund's investment in the project/programme) and/or the potential to catalyze indirect/long-term low emission investment.*

*Please make a reference to [E.6.5 \(core indicator for the expected volume of finance to be leveraged\)](#).*

Sources	Amount (US\$ M)	%
Base Equity	[116]	45%
CAF Senior Debt	[50]	20%
GCF Senior Debt	[49]	19%
Local Senior Debt	[42]	16%
<b>Total</b>	<b>[257]</b>	<b>100%</b>
VAT Line	8	NA
<b>Total project cost</b>	<b>[265]*</b>	<b>NA</b>

### E.6.3. Financial viability

**Please specify the expected economic and financial rate of return with and without the Fund's support, based on the analysis conducted in [F.1](#).**

#### IRR

Base Case (Average Price=72USD/MWh)	7.3%
Scenario with Price level=65 US\$/MWh	6.5%
Scenario with Price level=55 USD/MWh	4.8%
Scenario with Price level=46 USD/MWh	3.0%

	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Base Case (Average Price=72USD/MWh)	1.50	1.53	1.88	1.47	1.71	1.86	1.92	1.93	1.86	1.93	2.04	2.10	2.09	2.05	2.07	1.98	N/A
Scenario with Price level=65 US\$/MWh	1.89	2.15	2.47	1.68	1.67	1.66	1.61	1.61	1.63	1.64	1.64	1.63	1.63	1.63	1.62	1.61	N/A
Scenario with Price level=55 USD/MWh	1.59	1.74	2.06	1.41	1.41	1.43	1.39	1.40	1.42	1.42	1.42	1.41	1.41	1.40	1.39	1.37	N/A
Scenario with Price level=46 USD/MWh	1.30	1.35	1.60	1.11	1.08	1.09	1.03	1.07	1.11	1.14	1.15	1.16	1.16	1.16	1.15	1.15	2

Please notice that these calculations have been made at P90.

**Please describe financial viability in the long run beyond the Fund intervention.**

The Project is totally viable, given:

- i. Chile's need of this type of electricity generation projects, in order to achieve energy independence, and to comply with its environmental commitments.
- ii. There are no subsidies around the Project, and energy is sold at Spot Market Prices.
- iii. Technology used has been widely proven.
- iv. Construction and operation are not complex.

v. The Project is Environmental and Social friendly.

**Please describe the GCF's financial exit strategy in case of private sector operations (e.g. IPOs, trade sales, etc.).**

The Project is structured in such a way that its financial sustainability is assured, providing the framework for a possible sell off of the loans to financial markets. It includes not only the Project's fundamentals, but also the financing structure (see section D2).

In that respect, as soon as the Project is operational, and the Interconnection between the SIC and the SING occurs (see Section C.5) , providing the whole Chilean electricity market more stability and open access to all players, opening the possibility of signing Power Purchase Agreements by generators like Atacama Solar. Such contracts would improve the bankability of the Project.

#### E.6.4. Application of best practices

**Please explain how best available technologies and practices are considered and applied. If applicable, specify the innovations/modifications/adjustments that are made based on industry best practices.**

The Project is using some of the best proven solar technology available in the market. Through a competitive selection process, technical considerations were evaluated.

The process included requesting the EPC Contractor Bidders to present an equipment proposal along with the general EPC considerations. That process helped in the identification of the mix of equipment that would be used, even though such mix was not originally presented by the entity finally chosen.

For more information on Technology for the Project, please refer to section F2.

#### E.6.5. Key efficiency and effectiveness indicators

GCF core indicators	Estimated cost per t CO <sub>2</sub> eq, –	
	(a) Total project financing	US\$ <u>265</u> million*
	(b) Requested GCF amount	US\$ <u>49</u> million
	(c) Expected lifetime emission reductions overtime	3, 697,439 tCO <sub>2</sub> eq
	(d) Estimated cost per tCO <sub>2</sub> eq (d = a / c)	US\$ 71.67 / tCO <sub>2</sub> eq*
	(e) Estimated GCF cost per tCO <sub>2</sub> eq removed (e = b / c)	US\$ 13.25 / tCO <sub>2</sub> eq
	<p><i>Describe the detailed methodology used for calculating the indicators (d) and (e) above.</i></p> <ol style="list-style-type: none"> <li>1. We assumed P90 power generation output and an expected lifespan of 20years.</li> <li>2. Specific emission data were taken from the web site of the Chilean Ministry of Energy: <a href="http://huelladecarbono.minenergia.cl/">http://huelladecarbono.minenergia.cl/</a> and used in such a way, that until December 2017 the 2010-2014 five years averages were taken for both SING and SIC transmission systems. From January 2018 onwards, when the two systems are expected to be interconnected, a weighted average was calculated on the basis of the July 2015 installed capacity of 4,829.1 MW @ SING &amp; 18,458.4 MW @ SIC.</li> </ol> <p>An adjustment of 0.98%/year efficiency deterioration was incorporated over the lifespan CO<sub>2</sub>e offset calculation.</p>	

	<p><i>Please describe how the indicator values compare to the appropriate benchmarks established in a comparable context.</i></p> <p>A review of the Project against peers in the Atacama Desert (for which relevant data could be obtained) shows a peer leading position in various key categories, ranging from cost per tCO2e to energy of Chilean households offset. Please refer to table in Section E.1.</p>
	<p>Expected volume of finance to be leveraged by the proposed project/programme and as a result of the Fund's financing, disaggregated by public and private sources (mitigation only)</p>
	<p>CAF is expected to raise around US\$ 49 million from the GCF, and this will help to mobilize US\$ 216 million* to this low-emission and climate-resilient Project. CAF has approved US\$ 50 million already for this Project, and is actively supporting the participation of local banks and/or other development agencies.</p> <p>Even though CAF would prefer to mobilize private sector funds, current financial and commodities markets situation are temporarily lowering the appetite for this type of Projects across the Region.</p> <p>Following CAF's countercyclical role, efforts will continue in promoting this Project, with funds from either private or non-private sectors.</p>
<p>Other relevant indicators (e.g. estimated cost per co-benefit generated as a result of the project/programme)</p>	

*\* The information can be drawn from the project/programme appraisal document.*

## F.1. Economic and Financial Analysis

*Please provide the narrative and rationale for the detailed economic and financial analysis (including the financial model, taking into consideration the information provided in section E.6.3).*

- i. The Project is financially feasible, as seen in the evaluation of CAF's Base Case Scenario (with solar radiation at P90), and after evaluation of spot-market price sensitivities. Sensitivities included the analysis of results using average spot prices of 46 US\$/MWh (equilibrium point) and scenarios of 55 US\$/MWh, 65 US\$/MWh and 72 US\$/MWh (Base Case as per Market Consultants recommendations and expectations).
- ii. Solar radiation on the site is one of the best in the region.
- iii. The Project is technically sound and its operation present low complexity levels.
- iv. Being a low-emission and climate-resilient Project, it requires support from institutions like CAF and GCF, more so, during the current volatile global environment.
- v. Economic, technical, operational and, obviously, environmental sustainable viability are found in this Project.

*Based on the above analysis, please provide economic and financial justification (both qualitative and quantitative) for the concessionality that GCF provides, with a reference to the financial structure proposed in section B.2.*

- i. Chile needs support in its strategy to increase the development of non-conventional renewable energy.
- ii. Current market conditions are preventing other regular players to finance the Project, and CAF and the GCF would act as countercyclical entities in this financing.
- iii. The financial structure and the fundamentals of the Project assure its long term viability and sustainability.
- iv. Tenor is hard to obtain by local players, and Construction Risks as well as Spot Market Energy Price risk prevent this Project from raising funding from more traditional sources.

## F.2. Technical Evaluation

*Please provide an assessment from the technical perspective. If a particular technological solution has been chosen, describe why it is the most appropriate for this project/programme.*

Solar Photovoltaic (PV) is a method of generating electrical power by converting solar radiation into direct current electricity using semiconductors that exhibit the photovoltaic effect.

PV power generation employs solar panels composed of a number of solar cells containing a PV material. Solar PV is now, after hydro and wind power, the most important renewable energy source in terms of global installed capacity.

The Sponsor has chosen proven technologies and proven technology providers for the development of the Project. Hatch, the independent engineer, is of the opinion that the technology to be used is robust.

The following are pictures of the Pilot, on the site of the Project:

*Pilot Pannels on the Project Site (operational)*

*Project's Pilot Plant being connected to grid (Nov 2015)*



*Low Voltage Transmission Line to site (connected)*

*Electric Substation (owned by Transelec)*



### F.3. Environmental, Social Assessment, including Gender Considerations

The Project has developed a high-level Environmental and Social Management System (ESMS), which is scaled to the limited and readily manageable risks associated with the Atacama Solar Project. The key components of the ESMS are:

- (i) Sustainability Policy;
- (ii) Identification of risks and impacts (ESIA process, stakeholder engagement);
- (iii) Management and emergency response plans;

- (iv) Organizational structure and competency;
- (v) Stakeholder engagement and grievance management; and
- (vi) Monitoring and review.

With regards to Gender considerations, CAF has developed a Gender Assessment plan and report to provide contextual gender-related information and performance of Chile, as well as to develop an action plan ensuring equal gender participation and women empowerment. The Project's Stakeholder Engagement Plan contains measurable gender mainstreaming initiatives and expected outcomes, as summarized below.

Activity	Output	Outcome
Resourcing, liaison with EPC, Municipality, Civil Society, training; providing information and access	Set up Women Champion role, office in Pica, lists of women-owned enterprises; screened & trained women interested in employment; grievance mechanism	Improved access, engagement and participation of women for vacancies, procurement opportunities; simplified access to grievance mechanism

#### F.4. Financial Management and Procurement

***Describe the project/programme's financial management and procurement, including financial accounting, disbursement methods and auditing.***

The Executing Entity's procurement policy is aligned with that of CAF's Manual on Goods and Services Procurement, as reviewed by the GCF. Similarly, Sonnedix's financial management policies are aligned with CAF's to ensure strong internal control.

##### **Construction Procurement and O&M Contractor**

The contractors for EPC and O&M were selected through a competitive bidding process. The selection was based on the following criteria: experience, quality of equipment, price, energy production, scheduled time to perform the work, leverage and bankability.

##### **Financial Management**

Financial management and other accounting, administrative and asset management services will be provided to Atacama Solar via an administrative services agreement with a Sonnedix affiliate in Chile.

Those services will be further enhanced by a support agreement with Sonnedix UK Services Limited in London where a centralized team of experts for the Sonnedix Group provides additional accounting and asset management services to all subsidiaries, including Europe, South Africa and Japan. More details on Sponsor's involvement on the management of the Project are included in Section C.4.

##### **CAF's Monitoring Activities**

CAF performs a series of Monitoring activities to all operations it enters, without prejudice to binding GCF monitoring and performance framework conditions to be detailed in the Accreditation Master Agreement and that CAF is willing to follow once the AMA is finalized between the Parties. Subject to that, CAF's monitoring will ensure that the Executing Entity is compliant with CAF's policies and requirements.

CAF's oversight policies applied to the Atacama Solar Project will include, but are not limited to, the following activities:

- Disbursement and Administration up to Project Completion.
- Administration after Project Completion.

### G.1. Risk Assessment Summary

**Please provide a summary of main risk factors. Detailed description of risk factors and mitigation measures can be elaborated in G.2.**

1. Spot Market Risk – Risk of lower than expected electricity prices.
2. Energy Volume Risk – Risk of not having the right to dispatch power to the electricity grid.
3. Construction Risk – Photovoltaic Plant – Risk of having schedule delays and/or costs overruns in the construction of the photovoltaic plant.
4. Construction Risk – Transmission Line – Risk of having schedule delays and/or cost overruns in the construction of the transmission line required by the photovoltaic plant.
5. Technology Risk – Risk of adverse effects in the technology used in the photovoltaic plant.
6. Operation & Maintenance Risk – Risk of mismanagement of the photovoltaic plant.
7. Solar Radiation Risk – Risk of having lower than expected solar radiation.
8. Environmental & Social Risk – Environmental and social risks around the Project.

These risks are further described in the G.2 section (below)

### G.2. Risk Factors and Mitigation Measures

*Please describe financial, technical and operational, social and environmental and other risks that might prevent the project/programme objectives from being achieved. Also describe the proposed risk mitigation measures.*

#### Selected Risk Factor 1 Spot Market Risk

Description	Risk category	Level of impact	Probability of risk occurring
Lower than expected electricity prices in the long-run.	Financial	High (>20% of project value)	Medium

#### Mitigation Measure(s)

**Please describe how the identified risk will be mitigated or managed. Do the mitigation measures lower the probability of risk occurring? If so, to what level?**

- Leverage level (60/40) is lower than similar projects with signed Power Purchase Agreements (up to 90/10), in order to lower the annual cash flow requirements to serve debt.
- Tenor (20-years) is relatively extended, in order to lower the annual cash flow requirements to serve debt.
- Electricity demand is expected to continue its long-term growth in Chile (average of 5% per annum).

#### Selected Risk Factor 2 Energy Volume Risk

Description	Risk category	Level of impact	Probability of risk occurring
Risk of not having the right to dispatch power to the Chilean electricity grid. In Chile, as well as in several other countries in Latin America, lower-marginal-cost-	Technical and operational	Low (<5% of project value)	Low

<p>electricity-generators have a priority to dispatch energy generated, to the respective electricity grid.</p> <p>This right allows the promotion of efficiencies in electricity generation activities, and promotes the pass through of savings to the final consumer.</p>			
Mitigation Measure(s)			
<p><b>Please describe how the identified risk will be mitigated or managed. Do the mitigation measures lower the probability of risk occurring? If so, to what level?</b></p> <ul style="list-style-type: none"> <li>- There are no explicit mitigation measures to this risk.</li> </ul>			
<b>Selected Risk Factor 3 Construction Risk – Photovoltaic Plant</b>			
Description	Risk category	Level of impact	Probability of risk occurring
<p>Risk of having schedule delays and/or costs overruns in the construction of the photovoltaic plant.</p>	<p>Technical and operational</p>	<p>Low (&lt;5% of project value)</p>	<p>Low</p>
Mitigation Measure(s)			
<p><b>Please describe how the identified risk will be mitigated or managed. Do the mitigation measures lower the probability of risk occurring? If so, to what level?</b></p> <ul style="list-style-type: none"> <li>- The construction of the plant has a low level of complexity, and civil works are less than 20% of total EPC costs. The EPC is mainly composed of the value of the equipment.</li> </ul>			
<b>Selected Risk Factor 4 Construction Risk – Transmission Line</b>			
Description	Risk category	Level of impact	Probability of risk occurring
<p>Risk of having schedule delays and/or cost overruns in the construction of the transmission line required by the photovoltaic plant.</p> <p>The Transmission Line will be built, owned and operated by the Chilean company: Transelec.</p>	<p>Technical and operational</p>	<p>Low (&lt;5% of project value)</p>	<p>Low</p>
Mitigation Measure(s)			
<p><b>Please describe how the identified risk will be mitigated or managed. Do the mitigation measures lower the probability of risk occurring? If so, to what level?</b></p> <ul style="list-style-type: none"> <li>- Construction delays, due to technical issues, are expected to be minimal, given the low complexity of construction of the Transmission Line.</li> </ul>			

<b>Selected Risk Factor 5 Technology Risk</b>			
Description	Risk category	Level of impact	Probability of risk occurring
Risk of adverse effects in the technology used in the development of the photovoltaic plant.	Technical and operational	Medium (5.1-20% of project value)	Low
Mitigation Measure(s)			
<p><b>Please describe how the identified risk will be mitigated or managed. Do the mitigation measures lower the probability of risk occurring? If so, to what level?</b></p> <ul style="list-style-type: none"> <li>- The Sponsor has chosen proven technologies and proven technology providers for the development of the Project.</li> </ul>			
<b>Selected Risk Factor 6 Operation &amp; Maintenance Risk</b>			
Description	Risk category	Level of impact	Probability of risk occurring
Risk of mismanagement of the photovoltaic plant.	Technical and operational	Low (<5% of project value)	Low
Mitigation Measure(s)			
<p><b>Please describe how the identified risk will be mitigated or managed. Do the mitigation measures lower the probability of risk occurring? If so, to what level?</b></p> <ul style="list-style-type: none"> <li>- The operation of a photovoltaic plant of the characteristics of the one to be developed by the Project is of low complexity.</li> </ul>			
<b>Selected Risk Factor 7 Solar Radiation Risk</b>			
Description	Risk category	Level of impact	Probability of risk occurring
Risk of having lower than expected solar radiation	Technical and operational	Low (<5% of project value)	Low
Mitigation Measure(s)			
<p><b>Please describe how the identified risk will be mitigated or managed. Do the mitigation measures lower the probability of risk occurring? If so, to what level?</b></p> <ul style="list-style-type: none"> <li>- The site is recognized as one of the best places in Latin America for this type of projects, given the solar irradiation levels and almost non-existent precipitation levels.</li> </ul>			
<b>Selected Risk Factor 8 Environmental &amp; Social Risk</b>			
Description	Risk category	Level of impact	Probability of risk occurring
Environmental and social risks around the Project	Social and environmental	Low (<5% of project value)	Low
Mitigation Measure(s)			
<p><b>Please describe how the identified risk will be mitigated or managed. Do the mitigation measures lower the probability of risk occurring? If so, to what level?</b></p>			

- The completed required studies and, through EPC, will continue to develop and implement related environmental, social (E&S) and health & safety related management plans, also monitored by developer.
- No critical aspects were identified.

## H.1. Logic Framework.

Please specify the logic framework in accordance with the GCF's [Performance Measurement Framework](#) under the [Results Management Framework](#).

### H.1.1. Paradigm Shift Objectives and Impacts at the Fund level<sup>3</sup>

#### Paradigm shift objectives

<i>Shift to low-emission sustainable development pathways</i>	<p>Please elaborate on the paradigm shift objectives to which the project/programme contributes.</p> <ul style="list-style-type: none"> <li>- The Project involves a large-scale, “shovel ready,” private sector-led, solar PV, which will result a long term, readily quantifiable, significant and cost-effective CO2 emission savings.</li> <li>- Project, supported by risk-taking and patient capital, demonstrates ability of a sound projects to take a long-term view of electricity spot-market risk relevant to Chile and other markets, out-competing fossil fuel power generation options.</li> <li>- Project would assist and support the government of Chile's ambitious commitment to generate 20% of electrical power from renewable energy sources by 2025, despite of challenging financial and commodity markets impacting Chile's economy.</li> <li>- The project is located in the Atacama Desert in the SING (northern power grid) where power is predominantly generated by coal-fired and LNG power plants serving nationally important and energy intensive copper mining sector; the project is a low cost, clean and renewable alternative to new coal-fired and/or LNG generated power.</li> <li>- Following GCF financing, local financial institutions will feel safer to increase their exposure to large-scale renewables, thus help increase Chile's renewable generation capacity (and associated CO2 displacement).</li> </ul>					
Expected Result	Indicator	Means of Verification (MoV)	Baseline	Target		Assumptions
				Mid-term (if applicable)	Final	
Fund-level impacts						
<i>M1.0 Reduced emissions through increased low-emission energy access and power generation</i>	<i>Tonnes of carbon dioxide equivalent (t CO2eq) reduced (core indicator)</i>	Annual CO2 performance monitoring reporting and validation. <sup>4</sup>	Zero (no Project)		184,872 tCO2e per year	Participation of other investors; Regulatory support;

<sup>3</sup> Information on the Fund's expected results and indicators can be found in its Performance Measurement Frameworks available at the following link (Please note that [some indicators are under refinement](#)): [http://www.gcfund.org/fileadmin/00\\_customer/documents/Operations/5.3\\_Initial\\_PMF.pdf](http://www.gcfund.org/fileadmin/00_customer/documents/Operations/5.3_Initial_PMF.pdf)

<sup>4</sup> Project to commit to developing an annual CO2 performance monitoring plan before disbursement. This plan will be applicable after Project Completion and will be based on on GCF's initial monitoring and evaluation framework. Plan to include annual self-reporting (self-certification), externally validating annual self-reporting at least every 5 years, including prior to GCF's exit. Given ready access to Chile's sophisticated merit order based dispatch grid system and related statistics and conversions factors, there is no need to duplicate these by attempting to apply CDM methodologies and incurring associated transaction costs and current unviable state of the carbon credit market (see also Section H.1.2).

### H.1.2. Outcomes, Outputs, Activities and Inputs at Project/Programme level

Expected Result	Indicator	Means of Verification (MoV)	Baseline	Target		Assumptions
				Mid-term (if applicable)	Final	
<b>Project outcomes</b>	<b>Outcomes that contribute to Fund-level impacts</b>					
M6.0 Increased number of small, medium and large low-emission power suppliers	6.3 MWs of lowemission energy capacity installed, generated and/or rehabilitated as a result of GCF support: Installed 144 MW solar park	Commissioned and project completion certificates	0		143MW	Participation by other investors; supporting government and regulatory environment
<i>Specify other expected results</i>						
<i>Specify other expected results</i>						
<b>Project outputs</b>	<b>Outputs that contribute to outcomes</b>					
1.	Built 45.5 km transmission line, connected to grid	Project completion, power sales	0		45.5 km t-line, connection	Successful lease,agreement and construction by Transelec
2.	Power generation delivered to grid	Metering, power sale	0		412GWh/year	Successful lease,agreement and construction by Transelec
3	Implementation of Stakeholder Engagement Plan	1 SEP delivered & distributed	0		1	Participation by community, municipal and other stakeholders
4.	Completed gender Mainstreaming	Policy developed, and report on liaison with relevant staleholders	0		1 annual report	Participation by key stakeholders

5	Developed capacity	MOUs, list of trained participants	0		3 MOUs. List of 20 trained	Participation by academic and other partners, applicants for training
6	Implemented local hiring and procurement	Document adverts and outreach	0		Summary report, % of local staff & % of value of local procurement	Presence of qualified, interested and competitively priced local applicants, and suppliers of goods and services
<b>Activities</b>	<b>Description</b>		<b>Inputs</b>		<b>Description</b>	
1.1.	Completed BOOT agreement with Transelec,		1.1.1.		Negotiated agreements	
1.2.	Developed, constructed, connected AS PV Plant to Lagunas Substation		1..2. 1.		Detailed engineering, procurement, and construction by Transelec	
2.1.	Completed Solar PV Plant		2.1.1.		Detailed engineering, procurement and construction, Commissioning and testing, Final Completion	
3.1	Stakeholder engagement		3.1.1		Quarterly meetings and related activities	
4.1	Implemented a non-discrimination policy.		4.1.1		Distributed policy, nominated women champion; conducted related meetings with EPC, municipality and other stakeholders; generated list of women-owned enterprises and/or associations	
5.1	Developed MOUs and generated 20 trained & qualified graduates within construction period		5.1.1		Completed training and workshops with or through vocation and academic centers or civil society for target of 20 trainee	
6.1	Posted adverts via appropriate channels		6.1.1		Outreach to local municipalities for vacancy and procurement announcements; identified and collated register of qualified job seekers and enterprises/associations which can be trained or used to	

			serve project needs to simplify local hiring and procurement by EPC/O&M contractor;
--	--	--	---

## H.2. Arrangements for Monitoring, Reporting and Evaluation

*Besides the arrangements (e.g. semi-annual performance reports) laid out in AMA, please provide project/programme specific institutional setting and implementation arrangements for monitoring and reporting and evaluation. Please indicate how the interim/mid-term and final evaluations will be organized, including the timing.*

*Please provide methodologies for monitoring and reporting of the key outcomes of the project/programme.*

It is noted that the GCF is still in the process of reviewing and fine-tuning its development indicators and its overall performance measurement framework (see also GCF web-published Compilation of Submission: Further development of indicators in the performance measurement frameworks, dated 20 April 2016, 181 pages).

Financial management, procurement, and other accounting, administrative and asset management services, including non-financial performance reporting, will be provided to Atacama Solar via an administrative services agreement with a Sonnedix affiliate in Chile. Those services will be further enhanced by a support agreement with Sonnedix UK Services Limited in London where a centralized team of experts for the Sonnedix Group provides additional accounting and asset management services.

## I. Supporting Documents for Funding Proposal

- NDA No-objection Letter
- Feasibility Study
- Integrated Financial Model that provides sensitivity analysis of critical elements (xls format, if applicable) and Projected Financial Statements
- Confirmation letter or letter of commitment for co-financing commitment (If applicable)
- Project/Programme Confirmation/Term Sheet (including cost/budget breakdown, disbursement schedule, etc.) – see *the Accreditation Master Agreement, Annex I*
- Environmental and Social Impact Assessment (ESIA) or Environmental and Social Management Plan
  
- Project Gender Assessment
- Project Stakeholder Engagement Plan
- Appraisal Report or Due Diligence Report with recommendations (If applicable)
- Evaluation Report of the baseline project (If applicable)
- Map indicating the location of the project/programme
- Chilean Electricity Market Report
- CAF's Project Finance Experience – Energy Sector Credentials

*\* Please note that a funding proposal will be considered complete only upon receipt of all the applicable supporting documents.*

Template no objection letter

Chile, 16 May 2016

To: The Green Climate Fund (“GCF”)

Re: Funding proposal for the GCF by Ministry of Finance regarding “Programa de Acción Climática y Desarrollo Solar en la region de Tarapacá”.

Dear Madam, Sir,

We refer to the programme “Programa de Acción Climática y Desarrollo Solar en la región de Tarapacá” in Chile as included in the funding proposal developed by CAF – Banco de Desarrollo de América Latina between November 2015 and May 2016.

The undersigned is the duly authorized representative of Ministry of Finance, the National Designated Authority of Chile.

Pursuant to GCF decision B.08/10, the content of which we acknowledge to have reviewed, we hereby communicate our no-objection to the programme as included in the funding proposal.

By communicating our no-objection, it is implied that:

- (a) The government of Chile has no-objection to the programme as included in the funding proposal;
- (b) The programme as included in the funding proposal is in conformity with Chile’s national priorities, strategies and plans;
- (c) In accordance with the GCF’s environmental and social safeguards, the programme as included in the funding proposal is in conformity with relevant national laws and regulations.

We also confirm that our national process for ascertaining no-objection to the programme as included in the funding proposal has been duly followed.

We also confirm that our no-objection applies to all projects or activities to be implemented within the scope of the programme.

We acknowledge that this letter will be made publicly available on the GCF website.

King regards,



Alejandro Mico Aguayo

Under Secretary of Ministry of Finance



## Environmental and social report(s) disclosure

Basic project/programme information	
Project/programme title	Climate Action and Solar Energy Development Programme in the Tarapacá Region in Chile
Accredited entity	CAF – Banco de Desarrollo de América Latina
Environmental and social safeguards (ESS) category	Category B

Environmental and Social Management System (ESMS) (if applicable)	
Date of disclosure on accredited entity's website	2016-05-27
Language(s) of disclosure	English and Spanish
Link to disclosure	<a href="https://www.caf.com/es/sobre-caf/que-hacemos/acceso-a-la-informacion/proyectos-caf-gcf/">https://www.caf.com/es/sobre-caf/que-hacemos/acceso-a-la-informacion/proyectos-caf-gcf/</a>
Other link(s)	<a href="http://">http://</a>