

April 29, 2013

## **Response of IFC and IDB on Approval by Mail: Chile Large-Scale Photo-Voltaic Program (IDB/IFC)**

Dear Zhihong

I am writing to submit on behalf of IDB and IFC our responses to comments and questions from CTF TFC members and observers on the Chile Large-Scale Photovoltaic Program (LSPVP) Proposal.

Best regards

Claudio Alatorre  
IDB

## **Responses to Comments and Questions from CTF TFC Members and Observers on the Chile Large-Scale Photovoltaic Program (LSPVP) Proposal**

*Prepared by the International Finance Corporation and the Inter-American Development Bank (IDB)*

April 25, 2012

We would like to thank the governments of the United Kingdom, Germany, and the United States, as well as the World Resources Institute, for their written comments and questions. Please find below our responses.

### **Germany's questions**

#### Investment criteria:

***Potential GHG Emissions Savings.- GHG/ indirect demonstration impact: The proposal claims assuming a 5x multiple but calculates 44.3 Mt / 7.4 Mt, is hence based on the assumption of a more optimistic multiple of 6x.***

The 5x multiple means that for every MW installed with the direct support of the program, 5MW will be installed as an indirect impact. This is why the total impact is 1+5=6 times the direct impact.

***Development Impact.- Local content/manufacturing: We assume that with the large and persistent worldwide surplus capacity of PV module production lines, the potential of local manufacturing for this component will be very limited in the short and medium term.***

We agree with your comment regarding PV modules. But we also think lower equipment prices can be enabled through local participation in the rest of the supply chain.

***Implementation Potential.- Cost assumptions for different plant sizes: Pls specify the rationale for assuming that the price for 70 MW and 90 MW project will be the same.***

In general, a cost per MW between USD 2 and 3 million is within a reasonable range for solar PV projects. There are a number of factors that impact this range, including the technology selected, the developer's ability to negotiate a lower price given the dynamic nature of the current module supply market, the technology selected, particularly the decision to use no trackers, single access trackers or double-access trackers, and variation in levels of solar radiation, which ultimately determines the number of panels needed to reach a certain level of production and therefore translates directly into higher or lower CapEx costs.

***Effective utilization of concessional finance.- Appropriate level of concessionality: Given the planned large scale investments by private corporations, continuous decrease of technology cost and high irradiation of Northern Chile, some market actors claim that grid-parity might be achievable in the medium rather than long term. Since you are proposing senior debt to be priced as low as 75 bps, we would appreciate if you could further elaborate on your assumptions regarding long-term cost reductions.***

See the response above. We expect that less than USD 2 million per MW is achievable in the medium-term for solar PV, but also identify a number of factors that can lead to variability in price-per-MW among projects.

***Mitigation of Market Distortions.- Project selection: Apart from concessionality of financing terms, project selection will be key to avoiding market distortions, pls specify which criteria were / will be used.***

Other criteria considered when selecting projects include:

- financial and technical capacity of the Sponsor;
- environmental and social considerations;
- status of the required permits and approvals;
- location (particularly important for projects with merchant risk);
- credit quality of the off-taker, and
- no integrity concerns.

***Mitigation of Market Distortions.- Local FIs: What is the current risk appetite of local banks for the more mature Solar PV projects? In which ways (apart from demonstration effect) will the local banking sector be encouraged to take risk in future solar PV projects?***

Local FIs appear to have appetite for solar PV projects, but generally with a tenor of 15 years or less, and with a strong preference for a PPA. Loans from local FIs can be included in the financial plan, with the use of CTF resources with longer or back-ended repayment profiles to offset the impact on the average life of the debt caused by the shorter tenor of the local debt. CTF resources can also be used in a subordinated position to offset any merchant risk associated with a PPA that covers less than 100% of the energy produced by the project or

whose tenor is shorter than that of the debt. Beyond the demonstration effect, these structuring options allowed through the use of CTF financing may encourage local banks to participate in the sector.

***Financial sustainability.- Long-term Power Purchase Agreements: Is there a mechanism in place to secure long-term PPAs for CTF funded solar PV projects.***

No. The market in Chile for PPAs is based on bilateral negotiations among generators and off-takers, the very large majority of which are privately held and operated.

***Financial sustainability.- Competitiveness vs. coal-fired electricity: Since Chilean Law generally regulates power dispatch as economic dispatch, future competitiveness of solar PV vs. coal-fired power will be key. What are your assumptions regarding this challenge and/or relevant future regulation?***

Looking at competitiveness one has to consider that Chilean regulation differentiates between energy payments (marginal cost; OPEX) and capacity payments (covering CAPEX). Since dispatch is based on marginal cost of energy production only, Solar PV is always dispatched before coal but Solar PV does not receive any capacity payments and therefore only depends on energy/marginal cost payments.

Integration of the SIC and SING grids will be key for the deployment of PV (and other non-conventional renewable energy technologies), since it will allow a higher penetration.

No change on market regulations is expected in the foreseeable future.

### Program Summary

***Merchant commercial strategy / sale of energy at spot market tariffs: What are the expected prices on this market and / or will there be any incentive/payment for NCRE in addition to the market price? ...***

We do not have data on serious spot price forecasts. It's highly unlikely there will be a government supported incentive payment for non-conventional renewable energy (NCRE) technologies on top of the spot market price. Some private sector actors are however developing price stabilization instruments.

***... In case price forecasts are available, do these factor in the potentially very significant (price) effect of the SING - SIC interconnection (incl. the integration of the 2 existing dispatch centers) on the development of the Chilean power market? Is there a law/regulation that guarantees interconnection and dispatch of solar PV-generated power?***

Dispatch is based on marginal cost of energy production only, resulting in NCRE always being dispatched first. There is no law/regulation in place guaranteeing interconnection or dispatch.

**Potential investment terms: The “Investment period” of 12 – 24 months seems very short. This would require that for the projects selected almost all rights and permits are already in place or at least applications issued. The same applies to grid connection rights and infrastructure (see also below question on risks).**

As background, in Chile, there are many local and international companies that are successfully developing projects to the extent of obtaining permits, land, grid connection, etc. The projects don't move forward largely due to a lack of financial resources or a lack of an off-taker, which is currently required to obtain financing from most commercial banks. We would expect the selected projects to have most significant permits in place, or at least applications in place.

**Risks: With the given time frame of 12 – 24 month, grid connection rights and infrastructure should already be in place for the project selected. Pls specify whether this is the case and if not how permitting will be fast tracked to avoid delays.**

Grid infrastructure is usually in place. There is no permitting process in place and grid connection rights are therefore based on bilateral agreements.

### Performance Indicators

**Replication factor: According to the numbers given in the overview table, the factor is much closer to 6x rather than the indicated 5x. Pls correct accordingly.**

Please see above. The 5x indirect impact factor means that total impact is 6x larger.

**Job creation: Pls distinguish b/w permanent jobs and jobs limited to the construction phase only. Moreover, we feel the factor used for indirect impact of indirect job creations seems rather ambitious and would appreciate if you could explain how these were calculated and/or on which assumptions these are based.**

Large-scale solar PV jobs differ across countries according to its supply chain, industrial and labor policies, and skill levels. The existing data on large-scale solar PV is weak and extrapolation is complicated because models are highly sensitive to assumptions. Most models are derived from countries with large-scale deployment and may not be comparable for all countries. For example, the JEDI model<sup>1</sup> was developed by the USA National Renewable Energy Laboratory (NREL), based on the USA experience. By using this model,<sup>2</sup> we reach the following job creation data:

|  |                             |                                |
|--|-----------------------------|--------------------------------|
|  | Direct<br>Impact<br>(313MW) | Indirect<br>Impact<br>(1753MW) |
|--|-----------------------------|--------------------------------|

<sup>1</sup> See <https://jedi.nrel.gov/model.php>

<sup>2</sup> Calculations were made based on the following assumptions: Crystalline silicon, single axis tracking project, located in California. For the direct impact calculations, 4 projects (with a total capacity of 313MW), and for the indirect impact calculations 27 projects (with a total capacity of 1753MW).

|                          |       |        |
|--------------------------|-------|--------|
| Permanent jobs           | 60    | 324    |
| Construction phase jobs* | 2,100 | 12,000 |
| Indirect jobs**          | 3,700 | 21,000 |

\* Direct jobs correspond to construction and installation.

\*\* Indirect jobs correspond to construction-related services, such as engineering, design, and other professional services, as well as administration and services (e.g., sales, marketing, accounting, etc.) related to project development.

These figures are actually higher than the very conservative figures included in the proposal document.

## United Kingdom's questions

*The project proposal gives a satisfying level of detail with respect to the assumptions for potential GHG emission savings. However, if the photovoltaic projects will largely satisfy unmet demand rather than replacing other sources of energy, actual emission savings could turn out to be lower (while potentially having other positive effects such as improved access to energy and energy security). More detail on what level of additionality is assumed and if there is any evidence for the assumption would be desirable.*

As mentioned in the proposals the total estimated annual demand growth is between 600-700 MW. According to CDEC-SING new capacity additions for SING (2012-2021) will be 70% coal, 10% wind, 10% solar, and 10% geothermal.

*In addition, the project proposal doesn't say whether there is an intention to seek carbon credits. The CDM currently has a 30MW PV plant in Northern Chile, i.e. considerably lower in scale. However, to emphasise the project's additionality to the existing 30MW PV project under the CDM (apart from the increase in scale) a clearer illustration of how institutional learning (both by the IFC and the IDB) will be achieved in order to facilitate replication would be desirable.*

Since the projects will be carried out by private companies (project developers or energy consumers), they would be free to seek additional resources from the CDM or other carbon markets. However, with the current prices of CERs or equivalent instruments, we do not foresee that the corresponding income would be significant.

## WRI questions

### Addressing Structural Barriers

*The program identifies several financial and institutional barriers for solar projects in Chile but it only addresses financial barriers without clarify how the institutional barriers, which are important for replication and longer term sustainability, will be addressed*

*Descriptions of support for advisory services and knowledge management initiatives targeting local financing institutions or capacity building of project sponsors could demonstrate how such structural, institutional barriers are addressed<sup>3</sup>*

*While it is not necessary for the LSPVP program to address these technical and capacity building elements within the program itself, it needs to clarify whether these barriers are being adequately addressed elsewhere to demonstrate longer-term sustainability and reduced need for subsidies*

The Concentrated Solar Power Project (CSPP) of the CTF Investment Plan includes a knowledge management component that will address solar energy in general, including PV.

Capacity building activities aimed at local banks will be undertaken within the preparatory activities for the Renewable Energy Self Supply and Energy Efficiency (RESSEE) Program, using the preparatory grant resources approved by the TFC (and will be implemented by IFC).

### Development Impact

*The program does not demonstrate how the proposed interventions will help accelerate access to energy services, specifically for the poorest and most vulnerable sections of society<sup>4</sup>*

The interventions will help reduce technical and financial barriers related to large-scale solar energy projects. Although through spillover to small-scale projects the poorest in non-connected areas might benefit from the program, the most important development benefits are not in terms of access to energy services, but rather in terms of macroeconomic impacts or job creation.

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<sup>3</sup> Point (iii) under paragraph 10, page 3 of the [CTF Private Sector Operations Guidelines](#) requires that such information is included; Paragraph 3 of Annex C - Principles of Using Concessional Funding of the Clean Technology Fund of the Operational Guidelines states that project-related technical assistance is often the most effective and least distortionary way of removing institutional barriers to projects and reduce the need for investment subsidies.

<sup>4</sup> Paragraph 20, page 8 of the [CTF Investment Criteria for Public Sector Operations](#) – to which the Private Sector Operational Guidelines refer on Development Impact.

## Performance Indicators

*It remains unclear which performance indicators in the CTF Results Framework will be tracked particularly outcome indicators: (B1) avoided GHG emissions and (B2) increased finance for low carbon development mobilized that are required for all projects and programs<sup>5</sup>*

Both indicators (B1 and B2) will be tracked. Moreover, installed MW and GWh generated will also be tracked and reported.

## USA Comment

*The United States supports this project as a means to launch the PV sector in Chile. However, we strongly encourage that CTF funds be used in as efficient a manner as possible with discipline on the use of subsidy and encouragement of as much co-financing as possible. We ask that IFC and IADB report to the TFC partway through the project (once there is a PPA in place that could serve as a model for others) about private sector developer interest in large-scale PV in Chile in order to determine whether the subsidy element can be scaled back.*

As we have done in projects using CTF resources in other countries, IDB and IFC will apply CTF funds in the most efficient manner possible and encourage co-financing. Moreover, the MDBs strive to provide concessional financing on a sliding basis – i.e. ‘first movers’ get the highest level of concessionality, and projects that follow typically get a lower subsidy for a similar project.

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<sup>5</sup> Point (xii) of the CTF Private Sector Operational Guidelines.