

May 4, 2012

Response to United Kingdom from ADB on the Approval by Mail: Thailand Private Sector Renewable Energy Program [the Program]

ADB Replies to Query from UK on Thailand are shown below in red (for ease of reading).

- Could we please have more detail on the pipeline of projects, including on the nature, technology and size of projects, as well as further information about the stages that each of the projects is at.

Given the sensitive nature and status of current project development and negotiations, ADB is not at liberty to publicly disclose details on the project pipeline at this time.

- Demonstration potential at scale – A replication potential of 10:1 is mentioned. How is this figure justified? Please can we have an explanation as to how this figure is derived?

The 10:1 replication and scale up potential has been presented in Table 5 and explained in Appendix 1 of the CTF Investment Plan Update for Thailand (CIP-U). The estimation of the potential has been based on the GHG reductions resulting from the balance between the added capacity provided by the installation of RE based generating units and GoT RE targets contained in the Alternative Energy Development Plan (AEDP) 2008-2022. In addition, the estimated 10:1 potential may still be considered conservative in the sense that only 10% of the total 50,000MW resource potential quoted by the GoT was included in the estimation, resulting to a replication and scale up amounting to 6,500MW. [This question was addressed in the replies to queries on the CIP-U.]

The GHG reductions estimated in the CIP-U and the proposed Program remain comparable to the original CTF investment plan (CIP) as shown by the projections of IBRD concerning the replication and scale up potential of investments conducted through Specialized Financial Institutions. IBRD projected the GHG reductions to reach 1.6 MtCO₂e/year by 2022, and noted the replication and scale up from 700 MW to 4,908 MW (about 7:1) of the GoT target of 5,608MW.

- On development impacts, could we please have further information on how poor households will benefit? Will there be any emphasis on connecting poor household to the grid? How can this be ensured? There are no developmental indicators or baselines mentioned. Please can we have a list of such indicators.

Poor households will benefit mainly -- and indirectly -- from reduced air pollution associated with fossil power generation. The Electricity Generating Authority of Thailand (EGAT) and Provincial Electricity Authority (PEA) are responsible for grid connections, not the private sector generation plants. The list of indicators included in the funding proposal (shown below) includes several development indicators from which ADB will draw in developing the results framework for each project supported under the program.

The performance indicators outlined below are derived from the CTF Results Measurement Framework and Thailand's CIP and CIP-U. These indicators will be tracked at least annually.

1) CTF Related Performance Indicators

Program Indicator	Baseline	Anticipated Results by December 2017 (5 years)
GHG emissions avoided by the Program (including replication and scale up)	N/A	1 MtCO ₂ e/year at the end of the five-year period 2012 to 2017 as direct result of ADB/CTF resources ¹
CTF financial leverage for the Program	N/A	1 : 5 (CTF loans \$ 100 million: ADB loans \$250 million; other cofinancing and sponsor's equity \$500 million)
CTF cost effectiveness for the Program	N/A	<p>Replication and scale up achieves 5 MtCO₂e/year at the end of the 15-year operation period through 2027.</p> <p>Total emissions for the 20 years of the Program is estimated at 85 MtCO₂e²</p> <p>Direct reductions => CTF\$5 / ton CO₂e decreasing to CTF\$1.18 / ton CO₂e</p> <p>Or</p> <p>0.2 t CO₂e ton CO₂e /CTF\$ invested, increasing to 0.85 ton CO₂e /CTF\$ invested with replication and scale up</p>

NOTE: Other performance targets and indicators quantifying developmental impacts of each individual project will be determined during the preparatory stages of implementation. Performance targets and indicators include among others:

- (i) Annual contribution to government revenue from payment of income tax throughout the term of the debt facility
- (ii) Average energy output (MWh) delivered to off-takers per year of each RE and/or WTE generation facility
- (iii) Number of people employed temporarily during construction and initial operation of generation facility/facilities and permanently during full operation of generation

¹ This estimate assumes that 520 MW of capacity is operating with emissions reductions as estimated in the table above.

² This assumes that RE capacity is built out with GHG reductions of 1 Mt/y for years 1 – 5 [5 million tons total], 5 Mt/y for years 6 – 15 [50 million tons], then 6 Mt/y for years 16-20 [30 million tons]; total is 85 million tons over 20 years.

facility/facilities

- Why is CTF financing needed for solar if the ADB have recently closed financing on two utility scale solar projects? Will these large scale projects not provide a sufficient track record for private sector investors by reducing the perceived risks of deploying the technology at scale in the country? Are these projects using private sector co-financing and who is providing the “grants resources from other fund sources”?

Due to limited sources of long-term Baht funds from local banks (12 years), longer tenors are required from ADB and CTF to help improve cash flow projections in the financing and avoid potential events of defaults as the technologies are deployed in utility scale projects. Also, longer tenors are required for renewable energy projects due to the lack of crucial operational data (e.g., wind resources and solar insolation data, as well as available data on utility scale O&M costs in Thailand; O&M data from other countries will only be illustrative). Wind power projects, for example, have regular underperformance issues relative to projected wind speeds. This has led to lower revenue generation as against baseline projections (which stresses coverage ratios for debt service, a typical event of default covenant). Therefore, longer tenors are required to provide additional comfort for debt servicing (e.g., Improving values of DSCRs for power generation projects with less uncertainty on revenue generation).

Only one of the ADB-supported projects has been executed through project financing, which does not as yet provide a sufficient track record nor serve as a model in facilitating the transformation of the local RE market. Only after a large number of RE projects has been successfully implemented on a project finance basis with participation of local banks, will the banks risk management units be sufficiently experienced and confident to invest in RE projects without additional financial incentives, particularly for wind and solar projects.

One of the two ADB utility scale solar projects that have recently closed financing used grant funding to enhance the overall financing package, in order to make these more attractive to project sponsors and other proponents: a \$2 million grant from ADB’s Clean Energy Financing Partnership Facility (CEFPF) was used to cover part of the construction contingency funding requirement, which represented less than 2% of total project costs. The other ADB solar project, although executed using project financing, will avail of ADB’s in-house grant resources to support the project sponsor’s zero-carbon program. [We would like to note that these funding arrangements have been publicized on ADB’s website³.]

In terms of financial incentives, existing tariff adders (feed-in tariffs / FITs) may be attractive conceptually, but – like CER revenue – the FITs are not being readily monetized by many project proponents to finance the implementation or enhance the feasibility of the project; otherwise there would be no need for concessional financing for private sector RE. Further, we would like to note that tariff adders from the Government have been revised downwards, which has reinstated some of the investment barriers from the private sector perspective.

³ E.g., see press releases at: <http://www.adb.org/news/adb-signs-loan-agreement-build-two-solar-power-plants-thailand>, and <http://www.adb.org/news/adb-loan-solar-plant-support-thailands-renewable-energy-target>

- If the programme is seeking to “establish a track record of completed projects and investments”, what evidence does ADB have to support the assertion that a “sustainable scale” for these technologies is in the order of 350MW for wind, 50MW for WTE and 120MW for solar? In addition, why is the technology focus orientated to wind technologies when this is a technology with “lesser perceived risks” for installation and technologies and given the fact that there is less technical potential than solar (i.e. 1,600MW compared to 50,000MW)? Has the GoT assigned particular targets to different RE technologies in light of this technical potential?

The GoT specified the generation capacity targets for the different RE technologies in the AEDP 2008-2022, as outlined in the CIP and the CIP-U. Based on the targets from the AEDP2008-2022, as presented in Table B below, wind continues to lag behind solar and WTE in terms of market penetration and development, considering the high final and periodic targets prescribed by the GoT for the resource. In the opinion of ADB, the limited level of development at scale provides a clear indication that the wind sector in Thailand has remained in a nascent development stage and requires additional assistance (from CTF or other concessional financing) to further accelerate the growth of the sector.

Large-scale wind suffers more risk from the intermittency and location-specific nature of the resource rather than the technological potential (i.e. efficiency, level of availability, and plant capacity factor). As such, in terms of technological potential, large-scale wind may be perceived to have lower risks compared to solar.

In addition, ADB does not assert that the 520 MW RE capacity addition denotes the exact “sustainable” scale of projects for solar, wind, and WTE. The “sustainable” scale of projects will always be a subjective discussion. In any specific country context, a multiple of projects will need to be constructed by different investors, leveraging different sets of lenders to build experience, located in different locations (e.g., to record insolation or wind resources) and with different technologies to develop a baseline of operating data, construction experience and O&M experience. Only from such a baseline of projects will the private sector be able to discern investment going forward without additional support. The 350 MW of wind represents about 20% of the AEDP targets, and ADB believes this scale is necessary to facilitate rapid market growth.

- What is the existing capacity for solar, wind and WTE projects by technology in Thailand (in terms of number of completed projects and MW installed) prior to the CTF intervention?

Prior to CTF, as shown in Table 2 of the original CIP, there was 32 MW solar, 1 MW wind, and 5 MW WTE projects. Table B summarizes the current status of RE development, which shows that the realized RE capacity is far below potential and far below the AEDP targets [which was discussed in the CIP-U].

Table B: RE Based Generation Capacity Additions and Targets (MW)

Resource	Resource Potential	Existing as of July 2009	Existing as of January 2010	Target for 2011	Expected for 2011-2012	Target for 2022
Solar	50,000	32	38.6	55	145	500
Wind	1,600	1	5.13	115	200-300	800
WTE	400	5	5.6	78	77.5	160

Source: S. Tongsovit and C. Greacen. 2012. Thailand's Renewable Energy Policy: FITs and Opportunities for International Support. Presentation made to the WRI-ADB Workshop on Feed In Tariffs. Manila. Accessed on 24 April 2012. http://pdf.wri.org/wri_fair_fit_workshop_presentation_thailand_tongsovit_greacen.pdf

- From the perspective of environmental integrity, we understand that the project owners will own the CERs and will make decisions on the disposition of the CERs. We assume that these are likely to be sold to Annex I countries as part of meeting their emission reduction targets. Have the expected carbon savings figures been adjusted to account for the sale of CERs to Annex I countries? Taken to an extreme, if all direct carbon savings from these wind, solar and WTE projects generate CERs which are then sold to Annex I countries, the direct carbon savings on a net basis associated with the project would be zero.

Net GHG emission reductions will derive from displacement of fossil power in the grid, with direct reductions estimated at 1 MtCO₂e per year as noted above. With respect to environmental integrity, ADB assumes that any CDM transaction conducted during the implementation of the program will be compliant to accepted international systems that account for the sales of CERs. While accounting for the sales of CERs to Annex I countries goes beyond the scope of CTF guidelines, ADB will take note of the potential effects that may result from the sale of CERs to Annex I countries. ADB would be happy to further discuss and explain our position by telephone.

- We realise that the CERs may not be considered bankable by project owners but how will you control for the risk of a windfall return if these are sold? Would you address this in financial structuring of support to minimise economic rents?

Financial projections made going into a project financing are always that – projections. Cash flow may be greater or less than such projections, and controls on “windfall” returns are not possible to enforce nor in line with market practice for infrastructure projects. Given this market reality, the CTF guidance does not attempt to address the notion of CER windfall returns [nor do ADB's operational procedures]. Because upfront capital costs are a significant barrier to investment in renewable energy, and form a substantial portion of the full project costs, little plant optimization is possible to increase project revenues and profit after the project is commissioned.

Carbon credits from the sale of CERs belong to the project proponents along with the right to decide on the manner of disposition of such credits. ADB has no control over the occurrence of a hypothetical situation where there may be “windfall” CER revenue. Further, given the

uncertainties of carbon markets in general this type of assessment is not required under CTF guidance.⁴

- Can we have further details on the debt structuring? The proposal mentions that CTF would investing pari passu with ADB and other lenders; does this include all lenders?

CTF would rank pari passu with all senior lenders to a project. This does not preclude any subordinate debt to the transaction, which would rank behind the senior lenders in terms of debt servicing and enforcement of security. Given the sensitive nature and status of current project development and negotiations, ADB is not at liberty to publicly disclose further details on debt structuring at this time.

- Page 10 sets out that there is “*still limited private sector investment in the RE market at present*”. Please can you quantify the current level of private sector investment in the RE market?

Table B above summarizes the current status of RE market development. As noted in the CIP-U, the installed RE capacities are below that envisioned in the AEDP. ADB would like to note that most of the RE projects to date have been small-scale (a few MW per project) due to risks present in the market. Such small projects have relatively high transaction costs and cannot reap economies of scale necessary for market transformation.

- Could you please clarify the leveraging figures and effective utilisation of concessional finance? Is the 20% figure assumed on page 10 an average across projects? How will the total cost of the projects (\$1bn) be met if the CTF leverage rate is 5:1?

The \$1 Billion is clearly stated as the total estimated cost of the 520 MW pipeline, and – as is the case with regular ADB PSOD operations - there is no guarantee that all of these projects will come to financial closure. As noted in the funding proposal CTF cofinancing will be limited to a maximum of 20% of total project costs per project; ADB will maximize the leverage to the extent possible and the CTF amount may vary from project to project as the principal of minimum concessionality is applied.

- Please can you quantify approximately what you envisage the additional risk premium and costs to be for these projects? Will you reduce the level of concessionality for projects throughout the life of this project as these technologies become increasingly proven? What is the comparable risk premium and costs for fossil fuel based generation investments in Thailand and first of a kind solar, WTE and wind projects in Thailand?

Minimum concessionality must be determined on a case by case basis. It is not possible at this time to predict a fixed reduction of concessionality which could be progressively introduced. Risk premiums cannot be distilled to a single factor such as project type – risk premiums from lenders take into consideration sponsor experience and credit, tenor of lending, amount of equity contributed, strength of EPC contractors, strength of contracts (and any sponsor support), etc.

⁴ By analogy, this argument on potential windfall returns could be applied to fossil-fired power plants which might benefit from CER revenues as well as reductions in coal and/or natural gas prices.

Fossil power projects are relatively low risk, but the risk premium can not be readily quantified as forecasting fuel supply risks, social opposition, etc., is not an exact science [because of these market realities, CTF guidance does not require comparison of RE and fossil fuel risk premiums which would obviously be “apples vs. oranges.”].