July 12, 2013

Response from ADB on Approval by Mail: India : Rajasthan Renewable Energy Transmission Investment Program (ADB)

Dear Patricia and Zhihong,

Further to the email from Germany, I am sending you the responses we had provided to Germany for their preliminary questions on the proposal. I am happy to note that Germany is happy with our responses and we are grateful for the support from Germany. Please kindly use the attachments for sharing with others as appropriate as indicated by Germany.

Regards,
Jiwan Acharya

----- Original Message -----
From: Jiwan Acharya
Sent: 07/10/2013 06:04 PM ZE8
To: "Annette Windmeisser"
Cc: Jiwan Acharya; Len George; "Achim Neumann"; "Jan Kappen"
Subject: Fw: Responses to Queries

Dear Annette,

Thank you so much for reviewing and giving us opportunity to provide responses to your queries in advance.

Please find below our responses and if you need more information or have further queries, please let us know. We could even organize a short call tomorrow, Thursday, if needed.

I hope these responses will satisfy your concerns and look forward to receiving your support to this project.

Regards,
Jiwan Acharya

Dear Jiwan,

very helpful - thank you very much:

old find attached our preliminary comments, which we are happy to discuss. Possibly there is a chance to provide answers before the end of the deadline.

All the best
Dr. Annette Windmeisser

Rajasthan Renewable Energy Transmission Investment Program - Comments GER

General comments

- **GER welcomes the proposal as it addresses crucial transmission system bottlenecks of the Indian RE expansion plan in a provident and strategic manner "ex-ante" rather than in a reactive way.**

- **However, given a number of gaps in the information provided on the project, GER does not see itself in a position to approve the proposal before a number of important questions have been clarified.**

(a) Potential for GHG Emissions Savings

- **GHG calculations are mixing the overall GHG emission reductions of the RE project as a whole with the transmission grid component only. While we agree that the investments in RE generation capacity and those in the necessary transmission grid upgrade should be seen as a whole, we feel it makes little sense to pretend that the transmission grid investment part can claim the totality of GHG emission reduction to be achieved over the next 25 years. A good proxy could be to claim the portion of GHG emission reductions that would correspond to the ration of transmission investments vs. total RE investments (incl. the planned 4,300 MW of new RE generation capacity).**

  ADB Response: The GHG reduction estimates are consistent with the Egypt Wind Power Transmission Project approved by the CTF TFC in 2010, and subsequently approved by the World Bank's Board. That transmission project was designed to evacuate power from a 250 MW wind farm (IPP / BOO investment), but the GHG reductions were estimated at 7 million tons CO2e/year based on 2500 MW total RE capacity – that is, the GHG estimates (and cost effectiveness) included the replication and scale up potential. By comparison, the GHG estimates for the Rajasthan program are based on the 4300 MW of RE capacity that would be directly supported by ADB and CTF funds; the scale-up and replication potential is much higher.

- **Given current and future transmission bottlenecks, and the grid reaching its capacity limit this year, we assume that transmission losses are already significant. Hence, apart from evacuating RE power, the new transmission lines will likely also contribute to a reduction of transmission losses and an improvement of system stability. The GHG effect through the reduction of technical losses and operation of backup diesel gensets is likely to be very significant and should be included into GHG estimates.**

  ADB Response: Average losses in Rajasthan are 4.16% in 2012-13 over the existing transmission network, considered typical for these voltage levels.

(b) Cost-effectiveness

- **Unlike domestic coal and contrary to the statement in the draft proposal, solar energy is not "where is - as is". Instead, decentralized availability is one of the key advantages of solar PV. Consequently, while there might be some economies of scale and ease of processing/permitting when concentrating RE generation capacity in a single place, there are also major trade offs. For example, from the proposal, the**

highly centralized/concentrated design of the Rajasthan Solar Devmt Plan appears as the main reason for the tremendous need in transmission infrastructure whose capacity utilization will likely remain very low.

ADB Response: Given the scale of the solar program in India, there is a requirement for grid connected utility scale solar power (centralized and de-centralized projects), distribution rooftop and small scale projects and off-grid solutions. This is recognized in the government's policy documents including the JNNSM and follows through in state government policies and regulatory frameworks.

The point about widespread availability of solar resources is well-taken, but it is important to keep in view that the proposed program supports CSP and wind (where site selection would be primarily driven by resource availability) along with PV based renewable energy.

The maps included in the Supplementary Appendix clearly show that solar resources are best in Rajasthan versus the urban load centers of say Delhi, Mumbai and Kolkata. Rajasthan is attractive for solar development based on irradiance levels, rainfall patterns, competing usage for land, price of land etc. and projects free to choose their location will tend to congregate to this area as observed under the bidding conducted under the JNNSM (a similar case exists for solar development in the adjacent state of Gujarat).

The Rajasthan solar development program is designed around this resource base and comprises several solar projects planned in different parts of the state. It is "centralized" in the sense that large land areas are available for a solar park development approach. All the 4300 MW to be supported by the ADB and CTF funding is not on a "single" site, and this is less than the planned near-term capacity addition (more than 5000 MW) and the longer-term potential (greater than 10,000 MW). The solar park site in Bhadla is expected to host a little over 1,000 MW of solar power by the end of the Investment Program. For perspective, the 4 districts of Western Rajasthan cover an area of about 117,000 square kilometres. RE developers are free to choose alternate sites and permitted to seek connectivity with RRVPNL or Power Grid Corporation of India Limited but this will increase costs.

This large-scale approach to solar development in Rajasthan complements opportunities for other large-scale renewable energy park approaches in Maharashtra (MahaGenco with kfW support), Gujarat (private sector), Tamil Nadu (private sector) and other Indian states under the Green Corridor program allowing renewable energy deployment in multiple geographies.

There are challenges with de-centralized rooftop approaches as well that need to be addressed for that model to be successful in the Indian context. While allowed under the prevailing regulatory framework, momentum has been slow due to challenges including the current status of the distribution system, distribution network security issues, tariff structures and the impact on distribution utility financials (for net metering). We would like to mention that ADB is considering a mini-grid based RE concept for the CTF Global Private Sector Program which will include India.

- **Hence regarding cost effectiveness, a more decentralized design might significantly reduce cost, improve capacity utilization and have much greater co-benefits in terms of resolving bottlenecks and improving system stability in other parts of Rajasthan as well. Another benefit of a more decentralized design would be a significant reduction of the risk that the RE generation expansion will not materialize as planned with new transmission lines ending up as a costly "white elephant". From the project document, it is not clear whether this analysis has been undertaken.**

ADB Response: This is an excellent point. Such analysis has been undertaken firstly by central and state government agencies in charge of renewable energy resource development, and the large-scale RE development program has been formulated accordingly. As noted above, this large-scale solar and wind development covers multiple sites and the 4300 MW is not being developed on a single site as is perceived. A map of the proposed network is attached to provide information on the transmission network being supported under the MFF. The MFF mode proposed by ADB is particularly relevant to a phased approach to transmission network expansion linked to developments on the generation front to mitigate the risk of transmission development not being coordinated with RE generation plans.

[We would like to note that at this stage of the project development cycle, it is unrealistic to re-design the Rajasthan proposal as suggested, and doing so would be inconsistent with CTF principles: endorsement of country investment plans provides the respective governments and multi-lateral development banks (MDBs) with the "license" to develop and process the project concepts presented.[1]]

(c) Demonstration Potential at Scale

- **Given the current tariff policy, i.e. with the power transmission business remaining "sub-commercial" for years to come, CTF concessional funds will first and foremost help the state transmission utility stay afloat by increasing sales and assets at little cost. We are therefore not sure whether the project can be presented as transformational in the absence of additional provisions and a firm commitment/roadmap to improve cost coverage of tariffs in the medium to long term. We feel that otherwise, rather than achieving a transformational impact, the CTF would contribute to perpetuating the most important driver of transmission and distribution gridlock.**

  ADB Response: Under the current electricity regulatory regime in Rajasthan, RRVPNL is entitled to earn return on equity (ROE) in addition to recovering its costs. While costs are examined and allowed as a pass-through in tariffs by the regulator, public sector electric utilities forego the allowed return on equity. The state of Rajasthan has signed up to a central government restructuring scheme to turn around distribution utility financials in a time bound manner with performance linked to central government and state government financial transfers. A transmission utility plan to improve its financials by addressing legacy issues from the sector restructuring period, receivables from the distribution companies and pension payments and a phased approach to claiming return on equity has been prepared during the processing of the Investment Program and submitted to the Finance Ministry by the utilities board. This will be reviewed over the implementation period of the MFF and form part of the loan agreement.

  Regarding renewable energy generation, there has been steady progress on increasing renewable procurement obligations on utilities and the renewable energy certificate schemes. Such mechanisms that allow project developers to compete on their cost structures will allow renewable energy investments in Rajasthan to be competitively placed with other projects being developed nationally.

- **While the proposal mentions a number of possible system improvements, we feel that the proposed investments and physical outputs should address current technological bottlenecks such as the lack of system automation more clearly. Many of these complementary hard- and software investments (e.g. in SCADA systems, VAR**

[1] See paragraph 18 of the Clean Technology Fund, Guidelines for Investment Plans, dated August 6, 2009.

compensation and EMS functions) are "low hanging fruit" in terms of their potential to significantly enhance the overall efficiency of the project.

ADB Response: We would like to note with appreciation that Germany has signed a bilateral "Joint Declaration of Intent" for the establishment of Green Energy Corridors (including smart grids) with a total of 1 billion €. Coordinated interventions are expected to be carried out at the national, regional and state level. The plan and timeframe for interventions required at the state level including SCADA enhancements, VAR compensation, communication systems, forecasting systems will be confirmed during Project 1 after studies and investments required in the near term at the state level would be coordinated with relevant agencies as required in subsequent stages of the MFF.

(d) Development Impact

- **Given that the proposed investments in transmission infrastructure will not go beyond the 132kV level, any impact in terms of enhanced access will depend on (i) whether investment in "downstream" distribution infrastructure will be able to keep up, and (ii) whether the investment will improve overall system stability. Only the second factor can be attributed to the proposed project. Moreover, given the location and highly concentrated "park" design of new RE generation capacity, the necessary infrastructure for power evacuation is unlikely to ease existing bottlenecks and demand growth, also illustrated by the anticipated low capacity utilization rate. Consequently, the project in its current design is unlikely to improve system stability in the region, and the overall effect on enhanced energy access is likely to be negligible.**

  ADB Response: Kindly refer to earlier clarifications on the Program. Indeed the downstream distribution upgrades are beyond the scope of the ADB-supported program. Large-scale distribution programs in Rajasthan and other states where the power will be wheeled too are being supported by other agencies including access related initiatives such as the Rajiv Gandhi Grameen scheme. The transmission system expansion to be supported by ADB and CTF is part of a significantly larger network development plan being coordinated at the central level, regional level and state level to support improved system stability.

- **The section on complementary water supply and treatment programs does not appear sufficient to allow any major claims on gender- and local community benefits. Hence we would appreciate this part to be further substantiated or taken out.**
- **Given India's energy matrix and prevalence of domestic coal, we suspect that the "natural hedge"-effect of the proposed RE scale-up is rather limited.**
- **We would appreciate if the mentioned positive impact on job creation could be quantified at least by means of a rough estimate.**

  ADB Response: The community development related elements are part of an effort by the Rajasthan Renewable Energy Corporation to support livelihood and access to infrastructure in areas adjacent to the solar park. Certain share of the development fees collected from private developers is planned to be retained to support such initiatives through a community development fund that will be set up by RREC. Support for drinking water initiatives for local communities is part of this initiative to be tested in Bhadla and can be scaled up to other projects.

  Solar and wind power are not expected to replace domestic coal power in the near future. Solar power is targeted to reach 3% of the power mix by 2022. The comparison of the

natural hedge is more apt with imported coal and marginal projects based on imported gas / diesel.

Job creation in solar and wind energy would depend on the nature of functions – manufacturing, installations and O&M. Based on Ministry of New and Renewable Energy estimates conducted with industry bodies, the solar on-grid sector in India is expected to employ about 150,000 people by 2020 to meet the JNNSM requirements of 20000 MW of solar power. In the wind sector, a range of 46,000-160,000 jobs is indicated nationally.

(e) Implementation Potential

- **As indicated above, we feel that the current tariff policies of the subsector are a clear risk and impediment to the successful implementation of the project. We would therefore appreciate provisions to ensure CTF funds will also have a transformational impact on the necessary policies and tariffs that will enable the needed paradigm shift for successful replication and scale up of RE in the medium to long term.**

  ADB Response: As noted above in (c), the transmission tariff and cost recovery issue is being actively addressed. RREC – the state nodal agency for renewable energy will be closely involved in the roll out of the Program. The MFF mode proposed by ADB is particularly relevant to a phased approach to transmission network expansion linked to developments on the generation front. Periodic planning upgrades of transmission investments in response to generation requirements are and will continue to take place. Appropriate assurances will be included in the loan and project agreements to ensure the transformational goals are not compromised. These include undertaking the procurement process for annual planned targets for renewable energy generation capacity addition.

- **Given that the proposed PPP scheme limits private investment to the RE generation component of the IP, we would assume that there will be no private sector leverage in transmission component. In some parts of the proposal, this understanding does not appear to be in line with the assumed leverage ratios.**

  ADB Response: Rajasthan policy does not preclude private investment in transmission. In fact, under national policy, transmission projects need to be tendered out competitively. However, little interest is currently noticed on part of private investors to enter into state-level transmission business to set up transmission highways particularly for renewable energy evacuation. Power Grid Corporation of India, Ltd., a commercially operated utility (with majority state ownership) will be responsible for the inter-state grid development including key corridors for RE evacuation. In the long-term, there is scope for private investment in transmission.

  The leverage ratios noted are based on the financing plan and sources of financing as noted in the draft RRP; the leverage for “transmission only” is 1:4 while the leverage for the overall RE + transmission development program is much higher.

- **Another factor playing against wider replication is the significant financial stress and level of indebtedness of Indian PV and Wind companies with 90% of domestic PV manufacturing having closed or filed for debt restructuring. Against this background, we would appreciate a more detailed picture regarding the assumed leverage from private sector incl. a basic differentiation between the different types of (domestic and international) investors.**

ADB Response: Over 2000 MW of wind power in Rajasthan and over 1000 MW of solar power in Western India (Rajasthan and Gujarat) have been set up in the last few years. The MFF is the appropriate modality to handle the potential negative consequences of financially stressed RE project developers, i.e., subsequent tranches will be reviewed and implemented in accordance with the generation build-out. We would note that in this context, differentiation between domestic and international manufacturers is not a major issue, as PV, wind and CSP systems can be readily sourced on international markets; in fact, Rajasthan policy does not include any domestic content requirements or other set-asides.

For both solar and wind projects, the private sector is establishing projects based on bid processes for sale of power to distribution utilities. Also, different models co-exist including where the private sector voluntarily establishes capacity and sells power to consumers through open access. Due diligence is undertaken by banks and financial intermediaries lending to such projects. Successful projects have seen partnerships between domestic and international entities as sponsors, financiers and suppliers. Distinguishing between domestic versus international investors is not as important as determining the need for external versus domestic financing: market analysis by UBS in 2012 noted that financial viability for some projects depends on the source of financing [UBS, Can money be made from the Indian sun? April 2012.

- **While the investment in the transmission component is a necessary precondition, it will not yield 100% of private investment leveraged during later investment in RE generation capacity and long-term replication. Similar to our remarks regarding GHG emission reduction estimates, we therefore deem it necessary to more clearly differentiate between the leverage achieved at the project and sub-project levels and investment stages.**

  ADB Response: The proposal clearly states that ADB and CTF will support part of a very large, long-term RE development program. As noted in the draft RRP and Supplementary Appendix, the required leverage of 1:4 will be achieved at the project level. We would also note that CTF guidance does not require demonstration of leverage at the sub-project or component level.

- **Given that India drastically reduced incentives for wind and solar power in 2012 (including suspending the accelerated depreciation tax incentive and discontinuing the generation based incentive), and uncertainty continues to strongly affect investment decisions and market growth, the proposal should more explicitly account for regulatory uncertainties incl. potential complementary means to mitigate these (e.g. political risk insurance).**

  ADB Response: This is an excellent point that should be viewed in the context of rapidly falling costs for solar and wind systems and the pricing / availability issues for fossil fuel based power recently observed in the Indian context. Also, such changes impact new capacity addition and not existing projects.

  Political risk and similar instruments may be applicable to specific generation projects but based on policy dialogue with Rajasthan and Government of India, ADB has not identified the need for political risk insurance; rather, appropriate assurances and conditions will be incorporated into loan and project agreements to address those issues which are within the scope of proposed interventions. As noted above, the MFF approach is the appropriate modality to handle the potential negative consequences of regulatory and financial uncertainties.

(f) Additional Costs and Risk Premium

- **In our view, the need for concessional finance is not only a result of macroeconomic need and lack of interest of private actors in transmission infrastructure, but also of**

  (i) the fact that transmission tariffs do not cover cost;
  (ii) the uncertainty of the prevailing regulatory environment;
  (iii) the highly concentrated "park" design of the RE expansion plan;
  (iv) the uncertainty whether the RE generation expansion will materialize as planned.

  In order to both reduce the need for concessional funds and maximize the transformational impact of the proposal, all of the above factors should be more explicitly addressed in the proposal.

  ADB Response: Regarding points (i) and (ii): as noted in the draft RRP and other documents, the regulatory framework for transmission licensees allows them to recover costs and also return on equity. Retail tariff increases of about 20% were observed in 2011 and 2012. As indicated earlier, a roadmap has been agreed between central and state governments on the turn-around for the Rajasthan distribution utilities and a proposal for the transmission utility is under consideration.

  Regarding points (iii) and (iv): the solar park design has been successful in mobilizing large-scale private sector investment in new RE projects under the aegis of the National Solar Mission and state policies for e.g. of Gujarat and Rajasthan and has been more successful in terms of new solar development than the experience in North Africa and the Middle East. This commercial investment in RE is expected to continue, but could be compromised or stalled if the transmission system is not built out in synch with new generation capacity given the relative development timeframes for transmission and RE generation. As noted above, the MFF approach is the appropriate modality to handle the potential consequences of non-materialization of RE investments as planned.

  We would also note that the solar park design principles were clearly outlined in the CTF country Investment Plan that was endorsed by CTF in 2011.

  We would appreciate a confirmation whether the proposed concessional loan terms are in line with basic CTF principles (i.e. "loan terms no more concessional than the terms of contributions").

  ADB Response: ADB confirms that the proposed loan terms are in line with CTF principles, with the specific guidance criteria highlighted in the Supplementary Appendix.