

June 27, 2012

**Response from IBRD to Comments from Germany on Approval by mail: Vietnam
Distribution Efficiency Project (IBRD)**

Dear Zhihong,

Please find attached our responses to UK and German comments.

Regards,

Gevorg

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CIF Admin Unit

Contact: RD Gottfried von Gemmingen

REF: 312 k8185-0045/002

Thank you for your comments on the Vietnam Distribution Efficiency Project proposed for CTF cofinancing. We would like to inform that the Prime Minister has approved the project detailed outline, which allows proceeding to negotiation once appraisal is completed.

This document provides clarifications and further information in response to your comments. The submitted PAD is a pre-appraisal stage document and responses to your comments will be reflected in the final appraisal document.

1. The actual impact of the approach of the IBRD programme is highly dependent on the sector context, including the physical structure of the network, demand and supply structure, and acceptance of the technology by customers. As stated in the proposal, losses in the distribution network as well as at larger customers are currently comparatively small in Vietnam. At the same time, we assume there is low redundancy in the distribution grid (i.e. very few degrees of freedom for “optimising system configuration”). This raises the question whether there is any room for loss reduction through AMI

implementation and whether it makes sense to prioritise this approach over other possible interventions

Response:

The project has been developed based on the approach for the CTF IBRD project included in the update to Vietnam CTF National Investment Plan, presented to and endorsed in concept by CTF Committee meeting on June 2011 in Cape Town, South Africa.

The project development objectives are to improve the performance of Vietnam's Power Corporations in providing quality and reliable electricity services, and to reduce greenhouse gas (GHG) emissions through demand side response and efficiency gains. The global objective is to reduce GHG emissions through avoided power generation by reducing electricity losses in PC distribution systems and reducing electricity consumption of large electricity consumers.

The main objective of the proposed CTF AMI project is to achieve savings in GHG emissions savings and the demonstration of the greater savings potential to create a transformation effect through replication country wide.

The AMI investments will contribute to overall GHG emission reduction through:

- Reduction of technical losses by monitoring load condition of critical network equipment, detection of overloads, and eventual network reconfiguration to eliminate them. The proposed Advanced Metering Infrastructure (AMI) project would cover metering and monitoring of loads in key points of the PC system (feeders and power transformers).
- Consumption reductions through demand response programs and better pricing of electricity enabled by two way communication and the systematic consumption recording and monitoring through the AMI system.

We would like to clarify that the main contribution to avoided GHG by the proposed CTF AMI project is expected from demand reductions. Accordingly, the proposed CTF indicators are to monitor and quantify AMI impact based only on demand reductions and associated avoided GHG emissions.

Additionally, the overall distribution efficiency project will monitor reduction in losses and quantify associated avoided GHG. These GHG reductions will be attributed to the combination of interventions in Component A (traditional distribution investments) plus Component B (smart grid with CTF cofinancing).

The transformational impact will be achieved through the replication enabled by the demonstration of cost-benefit to PCs of AMI investments, and scale up of demand

response programs through the dissemination of impacts and benefits for customers. This will lead to AMI investments being replicated and scaled up in all PCs. The technical assistance under Component C will contribute to assess and enhance the demand response programs to support the transformational impact in the scale up and broader replication of the programs.

2. Project-related emission savings are estimated at 2.37 - 4.75 Mtons CO₂ over the 10 year project life time; 2.76-5.54 Mtons taking into account the effect in Central PC area (financed by IBRD w/o CTF co-financing). The reductions cannot be achieved by the AMI implementation alone; they at least partly require significant behavioural change. **We note the uncertainty of these estimates and ask the CIF Admin Unit to seek further clarification about their underlying assumptions.**

Response:

In adopting demand reductions assumption and impact in avoided GHG due to avoided power generation, the project has pursued a conservative approach, in particular based on international experiences and studies (the low end of range of impact in consumption reductions).

Estimates on achievable demand reductions in the literature can vary, ranging from 1% to up to 15% depending of the case. More recent studies of the benefits of smart meters estimate the consumer response as a reduction of consumption in the range 1-3%. However, it is important to note that studies and experiences usually assess the demand reduction impact of AMI deployment, or impact of TOU and demand response programs, but in general not the impact of combining all together as in the proposed CTF project. Some examples are presented below:

- The study by Frontier Economics of the smart meter program for the British utility Centrica, UK (Frontier Economics, Smart Metering for Centrica, October 2007) assumed as likely reductions in consumption attributable to smart meters: 2% for domestic electricity credit customers, 1% for domestic pre-payment customers, and 0.25% for small business customers. It must be noted that this does not include reductions due to TOU tariffs. The proposed CTF project expects additional impacts from AMI investment leading to systematic load profiling and improvement in the pricing signals of TOU.
- A review of the smart meter programs of three North American utilities by the Indian Center for Study of Science, Technology and Policy (Center for Study of Science, Technology and Policy, Bangalore, Technology, Enabling the Transformation of Power Distribution, report to the Ministry of Power, Bangalore, 2008) shows that in those cases the AMI costs outweigh the benefits, unless the benefits of consumer demand response are included. Accordingly, the proposed AMI project is complemented by the AusAID grant to ensure effective awareness campaigns and demand response programs, incentives to attract participation and compensation to PCs on expected revenues from load reductions.

- In preparations for the roll-out of smart meters in the UK, the Report by the Comptroller and Auditor General, 30 June 2011, evaluated that if only retail and supplier benefits are considered, the costs exceed the benefits for residential consumers, but benefits are greater than costs for non-residential customers. This is consistent with the phased approach in Vietnam for AMI and the proposed CTF project will target large non-residential consumers.
- An international consultant contracted by the PCs considered that reasonable estimates for the reduction in consumption attributable solely to smart meters would be a 2% reduction in overall consumption for residential consumers, and 1.5% for commercial and industrial consumers. In addition, where there is a time-of-use tariff in place, the load shift can be calculated using an elasticity of substitution of 0.1.30 (Economic and Financial Analysis of Distribution Projects: Principles, Methodology, and Case Studies, 20 February 2012, Consultant report for PCs, Peter Meier). However, the consultant noted that these values are subject to uncertainties. The project has adopted a lower assumption, ranging between 0.5 and 1 % for large consumers.

The calculations of avoided power generation and associated avoided GHG emissions is based on energy sales, therefore not including the avoided generation due to losses. Although the difference is minor, technically each 1 MWh reduction in PC sales represents a slightly greater reduction in power generation (energy sales increased to take into consideration distribution and transmission losses).

Indicators and Monitoring Avoided GHG:

The proposed CTF indicators are to monitor and quantify GHG reductions based only on demand reductions, calculated as actual demand of AMI customers compared to business as usual. These impacts will be monitored and included in the annual reporting of the project.

It is proposed that AMI investments will be procured together by participating PCs. The full implementation of AMI investments is planned to be completed within a period around 24 months. The indicators in the project results framework for the AMI project (demand reductions and avoided GHG) have been calculated assuming 0.5% as from the year when AMI fully implemented, and lower the year when AMI starts implementation. The accumulated energy reductions and avoided GHG emission corresponds to the lower range in energy savings and avoided GHG shown in the Table at the beginning of the CTF Annex (Annex 7 in the PAD).

Additionally, through Component C technical assistance activities, the level of participation and specific impacts of demand response programs (and time of use tariffs) will be assessed in demand reductions and avoided GHG, and also included in the annual reporting of the project. This will provide additional information and tracking on impact of combining customers' access to more frequent information on their consumption through the AMI, with demand response programs enabled by the AMI.

Vietnam Context and Bank complementary intervention promoting energy efficiency:

The proposed CTF operation is in line and would support the reductions in energy consumption that the GoV is pursuing in their energy efficiency national program and climate change agenda.

Since 2006, the Vietnam Energy Efficiency Program (VNEEP) has established a set of activities to improve energy efficiency and conservation (EE&C) in all economic sectors in Vietnam and across society as a whole, coordinated by the Ministry of Industry and Trade (MOIT). Within a two phase approach, Phase 1 (2006-2010) achieved two major objectives by 2010: reduction of national total energy consumption by 3.4% compared to business as usual (BAU) scenario; and the enactment of the Law on Energy Efficiency and Conservation (EE&C Law). In 2011, the second phase was launched with an ambitious target of reducing energy consumption by 5% to 8% by 2015 prioritizing large energy consumers. Under current estimations, MOIT is pursuing 5.4% energy savings by 2015.

To achieve these targets, the EE&C Law and its Implementation and Sanctions Decrees impose obligations on large energy users. In April, 2012, the MOIT issued regulations for large energy consuming enterprises to submit annual and five-year energy efficiency plans, based on results of energy audits. Additionally, the MOIT is developing the monitoring and evaluation (M&E) framework that will include benchmarks and indicators per large energy customer type.

Supporting VNEEP targets in the power sector, the EE&C Law requires distribution companies to reduce losses and adopt efficiency measures.

The Bank is supporting these programs through complementary operations including the proposed CTF co-financed AML project:

- The Bank Vietnam Climate Change Development Policy Operation (CC DPO) programmatic series supports the implementation of the GoV's Support Program to Respond to Climate Change (SP-RCC). The Bank CC DPO includes a mitigation pillar with policy actions to tap the energy efficiency (EE) potential in industrial sectors. Enhancing industrial EE is expected to contribute to at least 50 percent of the GoV target energy savings by 2015.
- The Bank Power Sector Reform Development Policy Operation (Power DPO) programmatic series supports the implementation of the GoV power sector reform program, including a pillar supporting electricity tariff reform and a pillar supporting efficient use of electricity. The third operation (Power DPO3) includes as policy trigger launching demand response programs that promote and achieve efficient use of electricity.
- The GEF Clean Production and Energy Efficiency Project (CPEE) provides assistance for MOIT to develop recommended measures and investment to improve efficiency in key industrial sectors, including issuing regulations and piloting voluntary agreements between MOIT and industrial enterprises on agreed energy reductions.

3. The expected impact on the demand side depends strongly on the type and structure of the large customers, as well as their acceptance of demand side

management. The problem is stated, but it is not commented on for the Vietnamese context. **We would like to see some clarification.**

Response:

As described, large energy consumers are required to adopt measures to reduce energy consumption to contribute their share to VNEEP energy savings targets. Under CPEE, technical meetings have started with industrial enterprises on their interest to participate in voluntary agreement programs described in the reply to the previous comment.

Component C proposed AusAID grant will provide the complementary regulatory and supporting measures to achieve the impact in demand reductions. Some of those activities are summarized in the table below

Technical Assistance	Scope
Pilot demand response program	Based on regulations and previous TA to ERAV, design pilot for demand response (DR) program(s), including setting of baselines Support ERAV in addressing issues to ensure effective implementation and in monitoring of DR pilot (duration of pilot 12-18 months) Evaluation of results, successes and issues to be addressed
Final demand response programs for PCs	Assess impact of pilot, based on reports by consultant supporting pilot Regulations, based on pilot and addressing issues identified Draft procedures for regulations
Enhance load research activities and monitoring changes in demand consumption	Assess load research activities, and validate load profiling by PCs Evaluation of changes in load profile of selected representative customers (under enhanced TOU and/or DR pilot) Additional capacity building on load research procedures and tools
Implementing smart grid program	Advise and design for the implementation of first phase of smart grid roadmap, including advanced metering and automation in distribution Support ERAV in monitoring implementation of advanced metering
Surveys and disseminations of demand response and energy efficiency	Campaigns for participation in DR and benefits; surveys to enhance DR design; dissemination of DR results / benefits to scale up participation Public campaigns to build awareness on energy efficient electrical appliances, how to reduce electricity consumption
Incentives and harmonizing electricity	Assessing incentives for electricity consumers to participate in demand response (DR) regulations to be piloted by PCs

tariffs with implementation of demand response programs	Assessing impact of DR in PCs recovery of regulated revenue requirement, and compensation to promote PCs to actively pursue implementation and piloting of DR programs
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In Vietnam electricity tariffs are increasing under the tariff reform program. Improvements in the time of use (TOU) tariffs plus dissemination and awareness campaign (under the technical assistance in) will increase the signals or incentives toward managing more efficiently electricity consumption. In this context, the AMI will inform large electricity customers daily and hourly cost of their consumption, increasing awareness.

Participation in demand response programs will be encouraged through the dissemination campaigns and incentives for customers to enroll and respond with reductions. Additionally, customers with larger energy reductions and change in load profile will be assessed, to identify measures adopted and disseminate success stories.

Indicators and Monitoring Avoided GHG:

In addition to the CTF indicators described in the response to the previous comment (reductions in energy consumption and associated GHG reductions), Component C technical assistance activities will monitor the specific impacts of demand response programs (and time of use tariffs) in demand reductions and avoided GHG. This assessment will be included in the annual reporting, to provide additional information on impact of combining customers' access to more and more frequent information on their consumption through the AMI, with demand repose programs and pricing signals.

End of project assessment and lessons learned:

As described above, during project implementation impact of AMI in energy reductions and avoided GHG emissions will be monitored and reported annually, as well as impact of Component C activities measures in participation and results of demand response programs, and impact in representative load profiles of AMI customers. This will allow to asses overall changes and reductions achieved during the project, and the combined impact of Component B co-financed investments and Component C AusAID grant-financed complementary activities provide lessons learned for future replication. The results, assessment and lesson learned at the end of the project will be presented in assessment report, and incorporated to the Bank Implementation Completion Report (ICR) to be produced within 6 months of closing date of a project.

Additionally, discussions are underway with AusAID to prepare an assessment of the impact in achieving energy savings and lessons learned of the proposed project (Component A and B) combined with the other Bank operations related to energy

efficiency and climate change mitigations, including those listed in the response to comment 3. When completed, this assessment will also be disseminated.

4. According to the proposal, AMI – while proven elsewhere – is an innovative approach in Vietnam. We understand that a detailed feasibility study for Component B and specifically the CTF-AMI sub-component has not been undertaken. Consequently, the described impact of this component (in terms of power and emission savings) is highly assumption-based (taking into account the two above mentioned points). **We would like to learn to what extent the feasibility of the AMI approach in the Vietnamese context has so far been looked at.**

Response:

We would like to clarify that smart meters by PCs in selected large consumers to record consumption for billing purposes. The innovative approach of the proposed AMI project is to provide an integral and systematic approach for management of consumption of large customers and load of critical network equipment, by including in addition to the smart meter hardware (meters, communication modems, etc.) the software packages and organizational arrangements (implementation of Metering Control Centers (MCCs)) making possible to carry out consumption recording and monitoring activities on a systematic manner and to adopt consistent field action in operation and demand response.

Although the final feasibility studies have still to be completed, preliminary studies have been carried out during project preparation. We are attaching as clarification the report prepared by international consultant contracted by the PCs, which includes in Annex 1 (page 44) the initial economic and financial analysis for HCM City PC. This has been the basis of further work being done. Among others, this analysis resulted in deciding to target in the proposed project only customers with consumption above 2,000 kWh/month, instead of customers above 500 kWh/month as was being considered. Please note that assumptions on 0.5% demand reductions are considered in this initial analysis as having an associated cost (lost revenues). As shown in the table answering to the previous comment, the proposed regulatory approach is that PCs will receive a compensation for their demand response programs, and therefore the lost revenues would not be as high as in the analysis.

The work for the final feasibility studies is underway, starting with the detailed technical design of the proposed AMI project prepared with assistance of an international expert. (The approach is to establish standard technical specifications for AMI that will apply to future other AMI investments of PCs.) Once the feasibility studies are completed and

approved, disbursement is expected to be fast, with all funds committed and disbursed fast within estimated 24 months period.

5. The financing plans on p. 17 and p. 81 of the proposal are not consistent. The total cost of the IBRD programme seems to be USD 800 m. It is not clear what the total cost quoted in Annex 7 (CTF) incorporates, since the total cost of Component B is stated as USD 80 m. on page 17. This should be clarified?

Response:

We will update the Table in Annex CTF to clarify and address the comment. Currently it is showing the financing cost estimated at the time Vietnam CTF Investment Plan and the CTF IBRD project were updated in June 2011. The revised Table will show the actual financing costs for the full project (\$800million) and for Component B with CTF cofinancing.

As a background information, we would like to inform that German Development Cooperation (through KfW) is also engaged in upgrading and reinforcing the Vietnamese distribution network. If approved, both initiatives should be well coordinated.

Response:

We will coordinate the proposed project with KfW distribution project. We would like to let you know that under the Bank Rural Energy 2 and Rural Distribution projects, the Vietnam Energy Team is coordinating with KfW staff in Vietnam the implementation of KfW project to upgrade and reinforce the distribution network, and will continue to do under the new proposed project.