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MITIGATING BANGLADESH'S POWER CRISIS:**POSSIBLE RESPONSE OPTIONS*****A Briefing Note for the Ministry of Finance***

I. Current Situation—Bangladesh today is in the grips of a major power crisis. There are several dimensions to the crisis: operational, financial and relating to power generation.

(i) **Operational**—Supply of and demand for electricity are now seriously out-of-balance. The installed capacity of electric power in the country is about 4,350 MW, including 1,260 MW that is privately owned and operated. However, largely because of unreliable state-owned power plants, it has been difficult to generate more than 3,500 MW at any given time over the course of the last 18 months. Meanwhile, peak demand is estimated to be over 5,000 MW. The country is likely to see daily load shedding of 1,500 to 2,000 MW in the coming summer months.

(ii) **Financial**—The Bangladesh Power Development Board (BPDB) is in the midst of a significant cash crunch. Its weighted average cost of supply from its own generation and the IPPs¹, is about Tk 2.5 per kWh; but BPDB's bulk rate has averaged only Tk 1.9. The recently announced tariff increase would raise this to an average bulk selling rate of only Tk 2.13/unit—so BPDB will still lose, heavily, on each bulk sale unit. Losses in BPDB's bulk supply business have been running at about Tk 12 billion per year; the full impact of the recent tariff increase is likely to reduce this loss by about 5 billion over the course of an entire year.

(iii) **Generation**—Bangladesh has underinvested in generation and transmission, while expanding its distribution network in rural areas. The result has been an impressive increase in customers—now estimated at about 8,500,000 countrywide, for a household connection rate of about 38%—but the shortage of generation is now so severe that a moratorium has been placed on new connections in rural areas. Furthermore, the country has often not invested in the right kind of generation capacity—small gas-fired plants like Tongi, or small coal-burning units as at Barapukuria, have been built for very high prices per installed kilowatt (Tongi, for example, cost twice what it should have, when compared with global equivalents, and does not actually work).

II. Past Responses—Load shedding has increased dramatically, having doubled each year for three years running, and now exceeds the high levels that characterized the power crisis in the mid-1990s. Government responses have proven ineffective, partly because they have been unfocused. For example, attempts were made: to buy power from small, privately financed power plants; to enter into lease and rental agreements for additional capacity; to buy from captive generators; to enter into new supplier credit-financed deals; and to negotiate directly new IPP deals. None of these deals have actually come to fruition, despite the time and expense of working on them; none would have been least-cost; and all would have had long-term financial implications for BPDB and government.

BPDB also made an attempt to undertake a crash renovation program on their power generation units. This initiative encountered a variety of problems, including a lack of expert consulting input, and the pressure on BPDB managers to defer maintenance and renovation in favor of running all plants in an attempt to keep pace with demand. But about one-third of the 64

¹ Independent Power Producers.

individual generating units in the power sector have been consistently down or very unreliable over the course of the last year; the tactic of deferring maintenance made the situation worse.

III. What can be done to mitigate the crisis?—Concerted efforts extending into the medium and long term are needed. The most important aspect of any response is the assignment of priorities, and then adherence to these priorities over time. GOB, first and foremost, needs to recognize the severity of the crisis, and plan for addressing it over the medium-term. This does not mean not taking some actions designed for impact in the short-run, but it does mean putting relatively more of the focus on actions that can really address the crisis, though the results will only be seen in the medium-term. For example, a single, well-managed IPP process can add more capacity at half the cost per unit of output than can all of the small power, captive, lease, and rental schemes that have been discussed—none of which have come to fruition.

A. Recommended Short-term Priority Actions

1. **Ensure that load shedding is as well-managed as it can be**—Load shedding will be a part of the operational reality in Bangladesh for some years to come; so an immediate concern will be to ensure that load shedding procedures are effective. BPDB, PGCB, and the IPPs need to discuss current operational issues including the load shedding protocol. Solutions that can promote grid stability even in the face of continued supply constraints should be sought and implemented. Better load management would also help, involving short-term steps to reduce overall load, and to shift load, where possible, from peak to non-peak hours.
2. **Conduct rapid assessment of BPDB generation operations, maintenance and rehabilitation issues**—Options for a sustained turn-around in performance, focusing both on technical solutions (rehabilitation, operating procedures) and institutional ones (O&M contracts, public-private partnerships, etc.) should be considered.
3. **Increase collections and prevent electricity and gas theft**—The ongoing drive to increase collections should be expanded and illegal connections should be disconnected.
4. **Improve BPDB's financial position**—Implement the tariff increase, and provide immediate financial support to BPDB so that it can clear its arrears with the IPPs. This support could be in the form of a loan or a budget-financed subsidy allocation. It will be essential in restoring power generation investor confidence—critical both for existing operators and future ones.
5. **Ensure that BPDB and all GOB agencies are appropriately focused on ensuring smooth preparation and implementation of the ADB, JBIC, and World Bank Group generation investments**, as this will deliver 1,200 MW of publicly financed plant by early next decade. All of this capacity in terms of location and technology is justified in the least-cost plan.
6. **Ensure that the IPP process (with IFC as advisor) is prioritized**, as it is uniquely positioned to deliver a financeable deal for new baseload capacity. Strongly consider, in consultation with IFC, either a larger plant than the 450 MW that is the minimum envisioned, or the possibility of developing two such plants, at different locations, in parallel, with IFC.
7. **Consider possibilities for fast-track import of power from India** – USAID has discussed financing a transmission interconnection study, to look at prospects for importing power from India. If such a connection was in place today, Bangladesh would be able to import considerable amounts of energy from India's eastern region, which has a power surplus. The Bank would consider financing infrastructure related to linking national systems.

B. Medium-term Policy Priorities

In the longer term, three inter-related issues lie at the heart of addressing the current supply gap: First, adherence to the least-cost plan in terms of site and technology selection; second, strategic focus on a long-term financing strategy for the power generation sub-sector; and third, acceleration of natural gas exploration and production.

- **Least-cost generation plan**—completed in 2005, the Power Sector Master Plan clearly shows that gas-fired, combined cycle technology provides Bangladesh with an efficient, proven technology for capacity expansion. This advantage is also clearly reflected in offers that private companies have made to GOB—Tata, for example, proposes to sell gas-fired power to BPDB at Tk 1.97/kWh (with gas into the plant priced at \$1.23/mmBtu), and coal-fired power at Tk 3.84/kWh (with coal priced at \$55/tonne).² Furthermore, a utility scale gas-fired plant can be transacted and built in 36 months, while a coal plant using domestic coal would take 72 months at least to come on-line. Combined-cycle plants have significant cost advantages against even other gas-fired technologies, such as gas steam. So an immediate starting point for GOB is renewed commitment to the Power Sector Master Plan and its core recommendation of building gas-fired combined cycle plants, and an occasional gas turbine for peaking purposes, over the next ten years. All other proposed power plants should be reconsidered.
- **Generation capacity financing strategy**—the country has, this decade, been building non-least cost plants, including small gas steam, gas turbine, and coal plants, using supplier credits as the primary financing vehicle. This has resulted in expensive, debt-laden plants with high unit costs. Indeed, Bangladesh pays an average of Tk 2.65 for power generated in state-owned plants; while the more efficient IPPs charge an average of Tk 2.35/kWh (even taking into account the expensive, oil-fired Khulna plant). And the very successful Globeleq-owned, combined-cycle plants at Haripur (Tk 1.3/unit) and Meghnaghat (Tk 1.6/unit) constitute the country's most reliable and cheapest power. GOB should match the technical least-cost strategy of the PSMP with a financial approach to attract capital while managing public sector risk. In practice this will mean working closely with international financial institutions which can offer risk mitigation instruments that can give comfort to potential equity investors and their lenders.
- **Natural gas exploration and production**—with the large Chevron-operated Bibiana field coming on-stream in March 2007, the country's gas supply constraints will ease, for a time. Bibiana contains sufficient, proven reserves to supply at least 3,000 MW of efficient, gas-fired capacity. But Bangladesh needs 2,000 MW (a mix of baseload and peaking plant) just to catch up to current demand, and needs 500 to 1,000 MW per year in addition, to keep up with projected demand. So more gas exploration is needed, so that GOB can confidently implement the PSMP over time; GOB should therefore prioritize the revision of gas exploration and production terms, so that a third licensing round can be successfully marketed and executed. This issue also underscores the cumbersome nature of communication and coordination between the energy (i.e. gas) and power divisions. As a short-term step, putting in place more formal integration between gas and power is needed; and this should be followed, over the medium-term, by an effort to update and integrate the power and gas master plans.

² Gas-fired combined cycle plants would still retain a significant price advantage over competing technologies even if gas were priced at its economic value of at least \$3/mmBtu.

IV. Issues Requiring Attention for the Fourth Development Support Credit (DSC 4)

As agreed with the previous government, the following steps are needed to move forward the reform process:

- **Transaction Strategy for a New Privately-financed Power Plant.** GOB to continue working with IFC on procurement of one, new, baseload, gas-fired combined-cycle power plant (IFC's team is mobilized and in Bangladesh as of Feb. 11; Once IFC submits its Strategy and Due Diligence Report--expected by early April—GOB should evaluate it and take action on site selection and other issues.)
- **Generation Financing Strategy.** GOB to expedite hiring of expert consultants for formulation of the Generation Financing Strategy (proposals have been submitted and the evaluation, selection, and contracting process now needs to be completed).
- **Power Sector Financial Restructuring Plan.** GOB to approve the Power Sector Financial Restructuring Plan (now under consideration by Finance Division). This plan has been prepared by Power Division, based on inputs from the consulting firm Fichtner. Part of this plan is an immediate set of actions (the Immediate Action Plan) that are needed to set the stage for full implementation of the financial restructuring. GOB needs to expedite the hiring of financial experts for execution of the Immediate Action Plan (this item is under discussion between the World Bank and Power Cell).