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**REPORT OF THE
ENERGY EFFICIENCY INITIATIVE
- Executive Summary
of the Draft Circulated for the Informal Board Seminar**

Asian Development Bank

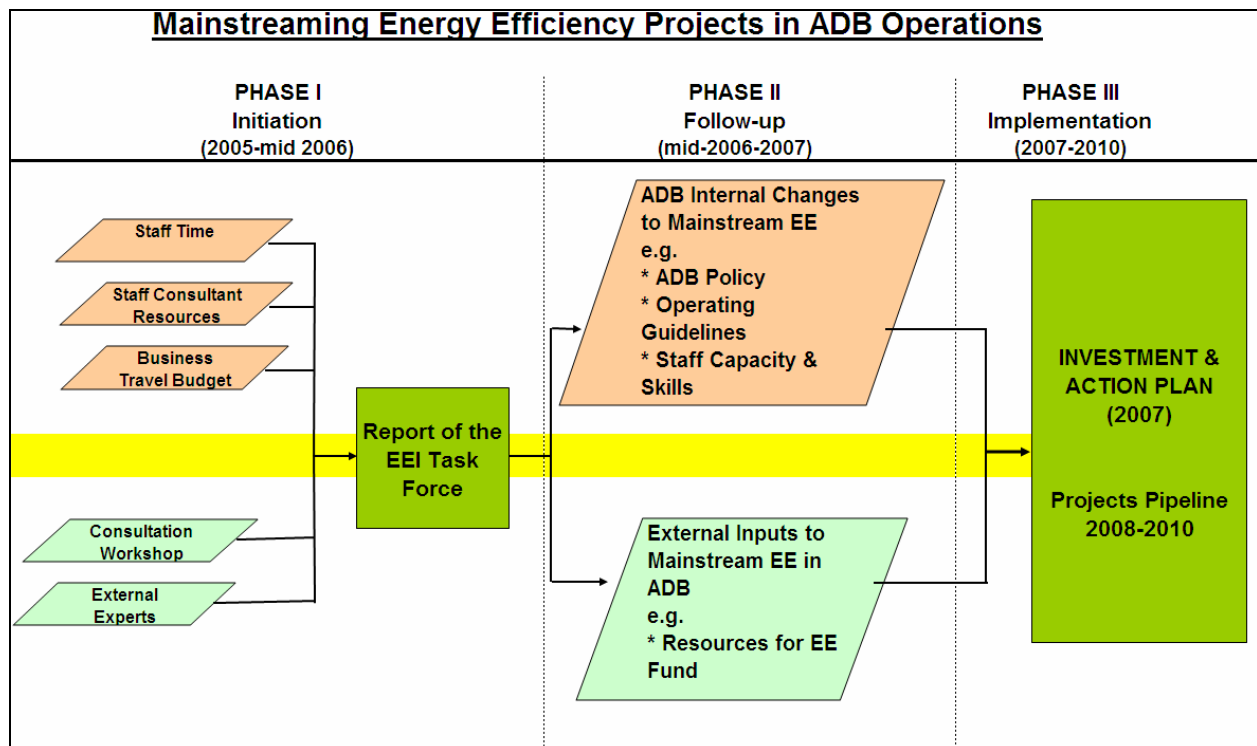
ENERGY EFFICIENCY INITIATIVE EXECUTIVE SUMMARY

Background

The Asian Development Bank (ADB) has been seeking an approach to assist its developing member countries (DMCs) in achieving significant measurable change in their energy patterns and securing a low-carbon sustainable energy future. To this end, ADB launched the Energy Efficiency Initiative (EEI) on 29 July 2005. The core objective of EEI is to expand ADB's investments in energy efficiency (EE) projects. In doing so, ADB will necessarily work closely with DMCs to identify specific market segments that (i) have a high priority for intervention, (ii) are suitable to ADB's role and strengths, and (iii) have replication and scale-up potential.

This EEI report represents the completion of Phase I and aims to firmly establish the rationale for expanded and sustained ADB action and EE investment, define the general principles of the EE investment and action plan, and provide priorities and a framework for next steps. The operational details will be prepared in Phase II (now through December 2007) and implemented in Phase III (2007–2010). Immediate EE investment opportunities will be pursued even during Phase II. The Management has reviewed the draft EEI report and endorsed the rationale and proposed phasing of activities. Donor assistance is being sought to finance the consulting services needed to implement the Phase II activities. The phasing of the EEI is given in Figure 1.

Figure 1. Phases of the Energy Efficiency Initiative



Rationale for Increased Energy Efficiency Investment

Energy use in ADB's DMCs is rapidly increasing to support the economic growth necessary for raising the living standards of large populations. The current energy path, which relies heavily on expanding fossil fuel supplies, is neither environmentally nor economically sustainable. Increasing EE will yield more service value from each primary energy unit consumed. EE is defined as economic investments in energy equipment and infrastructure that deliver higher useful energy outputs or services. It results in both lower energy consumption and reduced emissions of greenhouse gases (GHGs).

Asia-Pacific is consuming a growing share of the world's total primary energy supply (TPES). In 1973, its share of the world's TPES was 13.3%, a number that increased to 25% by 2003. During this period, Asia-Pacific's energy consumption rose 230%, while the world's increased only 75%.¹ It is estimated that energy use will increase another 89% by 2030, at which time Asia-Pacific will account for 30% of total world consumption.

Energy use in Asia-Pacific is now mainly driven by strong manufacturing growth and rural-to-urban migration. The region is dependent on fossil fuels, with coal, oil, and natural gas accounting for 41%, 25%, and 7%, respectively, of TPES. The reliance on fossil fuels, coupled with the increase in overall energy use, has led to a corresponding growth in Asia-Pacific's share of worldwide GHG emissions. In 1973, Asia-Pacific accounted for only 8.7% of all GHG emissions in the world. By 2003 its contribution had increased to 24.4% and it is estimated that it will be responsible for 30.4% of worldwide emissions by 2030.

It is well established that anthropogenic or human-induced activities have increased

atmospheric concentrations of carbon dioxide (CO₂). Scientists have determined that pre-industrial levels of atmospheric CO₂ were approximately 260 parts per million (ppm). Present-day levels are over 385 ppm and rising fast. By 2050, atmospheric CO₂ is expected to exceed 500 ppm, and unless measures are implemented now and sustained through the next several decades, atmospheric CO₂ could reach as high as 650 ppm by 2100. Climate models predict that the increased CO₂ concentration will warm the earth's surface temperature by 1.5–5.8°C, which will have a large impact on overall climate balances. Based on recent observations of melting Polar ice caps and other glaciers, the fact that Greenland's ice is melting twice as fast as in 1996, and the thawing of Siberian permafrost, there is mounting concern that earth is reaching a threshold where positive feedback loops may accelerate the warming. Climate change will impose significant costs in damages, response, and adaptation, whereas the costs of emissions reductions through EE will be considerably lower.

Macroeconomic health requires reliable energy supplies. Energy and power shortages cause industrial shutdowns, lost production and revenue, lower productivity, and other problems. According to the International Energy Agency (IEA), the world will require up to \$16 trillion in energy capital infrastructure investments through 2030. Given that Asia-Pacific accounts for about 30% of world TPES, the region will require energy investments of up to \$5 trillion. Like the rest of the world, Asia-Pacific needs to ensure that such infrastructure uses the best EE technologies to avoid locking in to high carbon-emitting equipment that will last for several decades.

DMCs depend on oil, which provides approximately one-third of commercial energy and nearly all transport fuel. Rising household incomes and larger GDPs have resulted in a higher oil demand in Asia-Pacific, which has put upward pressure on international oil prices. The price volatility

¹ International Energy Agency (IEA). 2005. *Key World Energy Statistics*.

due to supply constraints has been exacerbated by the upward trend caused by higher production costs from marginal production fields. Together, they have resulted in growing energy security concerns for all oil importing countries, including industrialized ones. EE will reduce marginal oil demand and greater use of renewable and new alternative energy sources will improve energy security for all countries.

ADB's Medium Term Strategy II (2006–2008) seeks more directly to help DMCs acquire low-carbon technologies, and to implement EE and renewable energy (RE) projects on a “no regrets” basis to enable Asia's technology leap. The review of the energy policy in 2006 is expected to recommend greater focus on EE.

Energy Efficiency Market Segments

Non-lending EE projects will include assistance for DMCs in establishing market-based incentives for EE, such as appropriate government policies (tax rebates, efficiency standards and labels for appliances); monitoring and evaluation; enforcement of standards; and community awareness.

The lending EE projects will include improvement of supply- and use-side efficiency, and RE.

Examples of supply-side EE projects include (i) improvements in energy conversion processes; (ii) the adoption of state-of-the-art technologies for power generation and machines that have higher operating efficiencies; (iii) transmission and distribution system improvements to minimize delivery losses for electricity, gas and district heat; and (iv) the production, capture and use of coal bed methane, which is both a safety hazard and a powerful GHG.

Improvements in energy use-side efficiency are required across all sectors: commercial, industrial, governmental, agricultural,

residential, and transport. Available technologies provide the economic potential to save 20%–40% of energy use with cost-effective investments in a broad range of applications, such as in motors, heating and air conditioning, process controls, water supply, lighting, and efficient combustion systems.

The RE segment includes solar, wind, small hydropower plants, biomass, biogas and bio-fuels, waves and tides, and geothermal energy sources. The costs of many RE technologies have declined with new research and greater economies of scale in production. Grid-connected RE projects vary in size and can include both stand-alone projects and portfolios of smaller projects. Off-grid and rural community RE projects face challenges in finding ways to aggregate sufficiently large investment opportunities.

The EE market presents several distinct challenges for investment, particularly for ADB. Some EE projects may be sufficiently large to be prepared singularly, e.g., large grid-connected RE, or large industrial and utility power plant retrofit programs. In such cases, ADB can facilitate the transfer of better technology at competitive costs and design suitable financing instruments in partnership with local banks.

In most EE markets there will be a large number of relatively small projects. In such cases, ADB can assist with (i) aggregation strategies; (ii) investment through financial intermediaries specifically targeted towards EE; and (iii) managing transaction costs. Suitable templates may be designed for preparing loan proposals that will assist small project developers. ADB would also mobilize available domestic funds in effective instruments and investment programs, and, in some cases, provide long-term funds.

An estimate of the EE market size for DMCs was prepared based on conservative assumptions about technical and economic

potential. Assuming that 15% of current energy consumption can be saved and 4% of current energy supply can be replaced by new RE, the total EE market size for DMCs would be over \$24 billion per year. An indicative target for ADB to expand its EE investments to \$1 billion annually by 2008 has been proposed in the EEI report.

Phase II - Next Steps

ADB's in-depth knowledge of DMCs and their energy sectors, existing and historic relationships with governments and prospective executing agencies, and financial strength provide it with the comparative advantage needed for a successful EE investment program.

During Phase II of EEI, the Regional Departments will carry out further research of country-level EE potential, policies and specific investment market segments; consult with DMC governments and the main stakeholders in target countries; select priority market segments and define appropriate ADB investment instruments to reach these sectors; refine ADB's EE investment target for the near- and medium-terms; complete research on technical assistance programs that can complement EE investments; and prepare their EE investment and action plan.

The Regional Departments will (i) be demand-driven and client oriented, and respond to the needs of DMCs; (ii) target investments with compelling economics; (iii) seek investment models that have replication and scale-up potential; (iv) leverage existing strong ADB relationships; (v) base investment models on a complete analysis of all project functions and risks; and (vi) harmonize EE investment models with existing ADB policies and sound banking principles.

Phase II will result in an EE investment and action plan that will include: (i) a portfolio of investment instruments and (ii) an identification of EE projects in the ADB

pipeline on which investment models can be tested. The plan will also address the sharing of EE investment best practices among DMCs, the need to proactively seek quality sponsors for projects, and the fact that climate change requires both near-term and long-term strategies and actions.

Three types of regional EE funds have been presently proposed by ADB: (i) the Regional Sustainable Development Department's Carbon Market Initiative; (ii) Private Sector Operations Department's Regional Renewable Energy and GHG Abatement Equity Investment Fund; and (iii) a bank-wide Asia-Pacific Fund for Energy Efficiency (APFEE). The funds are complementary and serve distinct purposes and investment needs. During Phase II, detailed proposals for these funds will be prepared, including the information memorandums for seeking donor support for various categories of assistance to be extended by these funds.

In preparing the regional EE investment and action plan during Phase II, additional staff time and consulting resources will be required. This should be addressed in two ways: (i) by filling existing energy and infrastructure-related vacancies with staff having EE expertise, and (ii) allocating international consultancy resources of 15 person-years, funded by ADB or through donor-supported funds.

Conclusion

Management has endorsed the EEI Report and advised that the Phase II activities it outlines should commence. The EE investment and action plan developed in Phase II will be submitted to Management for approval by mid-2007.