Title:	**Pakistan - Energy Efficient Lighting in Residential, Commercial, Industrial and Outdoors Sectors**
Sponsoring Country:	**Pakistan**
Sponsoring Agencies:	**Ministry of Climate Change**
Main Contacts:	**Syed Mujtaba Hussain** Deputy Secretary, Climate Change, Ministry of Climate Change hussainmujtaba@hotmail.com; mujtaba.gov@gmail.com; +92519245529

Executive Summary

Pakistan is presently facing multiple challenges to its economic growth that are also compounded by the worsening energy crisis. The country has a deficit of 5000 MW in the system during peak summer season that results in load shedding of up to 12 hours a day in urban areas and 18-20 hours in the rural areas. The total power generation capacity of the country as of June 2012 was 23,538 MW of which 16,035 MW (68.12%) was thermal, 6,716 MW (28.53%) was hydroelectric and 787 MW (3.34%) was nuclear. Pakistan's growing population of 180 million is forecast to increase demand for power to 306,797 GWh by 2020, and 889,583 GWh by 2035, most of which is likely to be sourced from the country's vast coal reserves. Pakistan also has one of the highest rates of transmission and distribution losses in the world while the non-productive residential sector is responsible for the largest share of electricity consumption (42.15%) as compared to the industrial (23.92%) and agricultural (14.03%) sectors.

In 2008, Pakistan's total GHG emissions were 310 $MtCO_2e$. In terms of sectoral distribution, the energy sector is the most significant contributor to GHG emissions in Pakistan, totaling 157 $MtCO_2e$ in 2007-08, or over 51% of the country's total emissions (0.45 % of world's total). By 2050, energy related emissions are expected to increase to 2,730 $MtCO_2e$, equal to 64% of total emissions that year – evidence that the energy sector in Pakistan will become increasingly carbon-intensive without intervention.

Reducing emissions through energy efficient lighting

To some degree, the energy crisis in Pakistan can be managed by implementing cost-effective, energy efficiency measures to technologies such as lighting in the residential, commercial, industrial sectors and outdoor/street lighting. Accordingly, the following activities are proposed for implementation under the NAMA:

(i) Development of a National Energy Efficient Lighting Strategy, national energy codes, standards for appliances, labeling, energy reporting, and development/enforcement of Minimum Energy Performance Standards (MEPS).

(ii) Development of a Measurable, Reportable and Verifiable (MRV) system for GHG emission reductions resulting from deployment of Energy Efficient (EE) lighting projects/programmes.

(iii) Design and deployment of an integrated waste management system for destruction of Incandescent Lamps (ICLs) and recycling of Compact Fluorescent Lamps (CFLs) bulbs.

(iv) Establishment of a Revolving Loan Fund (RLF) and its linkage with the active Energy Conservation Fund of the National Energy Conservation Centre (ENERCON) to develop EE lighting projects/programmes.

(v) National launch of a public awareness campaign on transitioning to EE lighting to educate people from all walks of life regarding the benefits of adopting timely actions relating to energy conservation and efficiency.

The proposed measures are in conformity with the National Climate Change Policy 2012, National Energy Conservation Policy 2007 and Renewable Energy Policy 2006. Implementation of this NAMA will be led by ENERCON of the Ministry of Water and Power and will be technically back stopped by the Clean Development Mechanism (CDM) Cell of the Ministry of Climate Change, Energy Conservation Fund (ECF); Pakistan Standards and Quality Control Authority (PSQCA); Pakistan Council for Scientific and Industrial Research (PCSIR); Engineering Development Board of the Ministry of Industries and UNEP/GEF en.lighten initiative.

By implementing the above-mentioned actions, this NAMA will reduce 1.97 $MtCO_2e$, and produce energy savings equal to 5.5% of total national electricity consumption or 35.1% of electricity consumption from the lighting sector per year. This in turn will create annual savings of approximately US$ 408 million. Over 10 years, this equals approximately US$ 4 billion, corresponding to 3% of GDP. Increasing access to EE lighting will promote sustainable development by transforming the lighting sector and helping to shift Pakistan onto a low-carbon trajectory. The expected two-fold increase in the use of CFLs by low-income and lifeline consumers (consumers having consumption up to 100 kwh per month) will lower monthly electricity bills over the 10-year lamp lifetime, reduce peak demand for electricity and create jobs. Finally, the NAMA will help Pakistan meet its international obligations under the UNFCCC.

Revolving Loan Fund

Since 2002, Pakistan has demonstrated the technical capacity and experience to effectively manage ECF that received 3 million USD in seed funding, which has grown over time as a result of good fund management by ENERCON. The ECF is an active revolving fund governed by a board of public and private sector entities. However, as per memorandum and articles of association of ECF, the company can create a separate funding window for other sectors as well.

The existing staff of ECF can effectively handle the RLF for transition towards Efficient Lighting in Pakistan. The frequent requests for EE lighting financing through the ECF (currently outside the scope of the fund) indicates growing trend for financing of EE lighting projects/programmes that is not met by private lenders so far.

The proposed RLF will be a separate funding window under the existing ECF specifically for the financing of EE lighting. The loan structure under this fund will be similar to the ECF, providing below market rates for lease finance facilities for EE lighting projects. The rates have been proposed at 3-10% per annum but would be finalized after stakeholder consultations. Obtaining additional collateral may cover the proposed exposure/credit risk against the prospective client. If the same mechanism is adopted for financing of EE lighting projects/programmes, then the leasing company will determine the quantum of equity participation by the customer/client/lessee as it deemed fit. The customer/client/lessee shall bear all pertinent costs including inter alia installation and insurance of energy efficient equipment. Per part financing limit (restrictions on the size of the entity) would be US$ 30,000 to 50,000.

The RLF will be implemented in two phases. The first phase will allow the public, industrial and commercial sectors to access financing through this window. These sectors are prioritized because they will have the greatest reach and immediate impact. The second phase will provide access to the residential sector. In addition to capitalizing the fund, NAMA support will be used to develop guidelines for implementation, especially for disbursing funds to households.

An estimated amount of US$ 7 Million as financial support is required for realizing various activities in the proposed NAMA. Out of the total requested amount, US$ 3 million will be allocated specifically for RLF scheme whereas remaining US$ 4 million will be required for technology and capacity support needed for the implementation of other actions mentioned above. The host country will only facilitate the implementation of NAMA activities and will not be able to contribute financially. However, the Government of Pakistan has taken various policy and strategic initiatives in the form of duty exemptions on renewable/energy efficiency equipment.

The objective of RLF will be to provide access to financing for the private sector to retrofit or purchase EE lighting that is otherwise not available. Demonstration projects and the RLF will help build confidence in Energy Service Company (ESCO) models - an idea of self-revenue generation to encourage private sector and household participation. The RLF will also help in addressing the high cost of transitioning to EE lighting. MEPS and other policies are intended to increase demand for EE lighting. Few energy efficient lighting pilot projects under ESCOs principle were developed which recovered their investment cost through the savings. This arrangement can also be replicated through support to energy efficient lighting sector.

It is envisaged that with the successful implementation of the proposed NAMA, the country will benefit from replicating energy efficient measures in other major electricity consuming devices such as electric fans, water pumps, motors, refrigerators and air-conditioners.