

Promotion of Energy Efficient LED Lighting in Garment Industry

Background

The reliable and efficient provision of modern energy service is a key to sustainable economic growth. Bangladesh's rapidly growing economy is facing dual energy problems, one is the shortage of primary fuel and other is the growing demand for energy. Despite the challenges, Bangladesh has envisioned ensuring energy security and electricity for all with the aim of reaching the status of a middle income country by 2021.

The industrial sector, directly or indirectly consumes 40 percent of the country's energy (ADB, 2014). As the economic growth continues and industrial activities increase at an accelerated rate, the demand for energy is expected to rise significantly in the foreseeable future, putting further stress on the government utilities. Unless the energy problem is solved, the country would not be able to harness the full potential of industries. Likewise, the Readymade Garment (RMG) sector, which includes around 4,296 garments and is contributing 80% of the GDP, would continue to face energy shortage, affecting the economy.

While there are problems in the supply side, utilisation of energy is also inefficient in the RMG sector, resulting in wastage of precious fuels. One of the ways out of this persisting problem is to increase energy efficiency on the demand side and thereby reducing energy demand from the supply side. Efficient lighting, one of the energy efficiency interventions, can be implemented both fast and easily. It can also reduce energy demand significantly in the RMG sector as lighting consumes approximately 30 percent of total electrical energy used in Bangladesh.

Therefore, there is an urgency of undertaking lighting efficiency measures in the RMG sector to reduce the amount of energy required to provide service at a same or better level. This would eventually reduce energy costs and result in financial cost saving to the industry, offsetting the upfront investment in energy efficient lighting.

Challenges

Properly implemented energy efficiency projects can lead to quick recovery of investment costs through energy savings. Still projects with proven technologies and convincing economic returns remain unimplemented, as realizing the benefits of energy efficiency means solving multi-faceted problems. For example, arranging upfront investment, identifying appropriate service delivery mechanism such as Energy Service Company (ESCO), incorporating monitoring protocol are all issues that need to be resolved for successful implementation.

Our Approach

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), on behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ) is implementing the Renewable Energy and Energy Efficiency Programme (REEEP) with support from the Ministry of Power, Energy and Mineral Resources (MPEMR) of the Bangladesh Government. Together with the Sustainable and Renewable Energy Development Authority (SREDA), the programme has undertaken a pilot project on energy efficient LED tube lights in an RMG industry under ESCO model to demonstrate energy efficiency potential of LED tube lights and to showcase the viability of the model in Bangladesh context. In light of this, a baseline study has been conducted in selected garment industries while assessing energy saving potential of LEDs compared to traditional tube lights. Additionally, a standard for LED has been fixed to ensure the minimum lighting requirement for RMGs in Bangladesh. Based on the findings and design, the ESCO has supplied and installed standard LEDs at the factory and is providing performance guarantee to some extent. Notably, GIZ has also provided support to leverage finance for implementation of the pilot.



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The standard specifications developed through the project are as follows:

Parameter	Requirement
Efficacy (lm/watt)	> 90
Lumen	> 1700
CCT	5000-6500 K
CRI	> 80
R9	> 0
Power Factor	> 0.9
Driver Type	Isolated

Benefits of LED ESCO Project

The baseline study of the project has concluded that compared to T-8 and T-5 fluorescent lamps, LED tube lights are 57% and 33% more energy efficient respectively. Investment in LEDs under ESCO model is also financially viable as the simple payback is just one year.

Specifically, the study has revealed that if 4,400 inefficient lights of the partner industry are replaced with LED lights, the energy savings would be 1582 kWh/day. The estimated emission reduction of this lighting efficiency intervention is 318 ton of CO2 equivalent per annum. Monitoring data has shown that, the project saves approximately 17.2 MWh of electricity per month, reducing approximately 11.5 ton of CO2 at the same period.

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