



## LAHORE UNIVERSITY OF MANAGEMENT SCIENCES

### To Whom It May Concern

This is to acknowledge and appreciate the work done on evaluation and implementation of Energy Efficient Lighting at LUMS by the University Sustainability Office "SarSubz LUMS". It seems a straight forward exercise to replace existing lighting fixtures but the team had to overcome various challenges and had to come up with unique solutions along the way. SarSubz LUMS was initially charged with evaluation of different technologies to prepare a feasibility report for energy conservation and identify an initiative with the shortest breakeven period. The team took a methodical approach of benchmarking existing consumption patterns to identify areas of absolute and normalized high consumption. This highlighted the Library building, which also hosts the university Networks and Systems support department, as the highest consumer of electricity surpassing the Plant Room that houses the original HVAC system. An energy audit of the library building was then carried out for lighting fixtures, computing load and AHUs installed in the building. Usage policies were proposed for Computer labs and, in the absence of a Building Management System, timer based solution was proposed for the AHUs. For lighting load, a characterization lab was setup in collaboration with the Department of Electrical Engineering to evaluate electrical and photo characteristics of available fixtures in the market.

The tests carried out in collaboration with lighting vendors in Pakistan highlighted a major issue with power quality due to solutions being imported primarily from China in the absence of government regulations and official electrical standards. Many of these local vendors were initially resistant to design modification and it took many sessions for them to realize the competitive advantage of superior design in a market, with major reliance on captive generation, eager for well-designed energy efficient fixtures. The inclusion of vendors in the evaluation process and subsequent design improvement is a major accomplishment of this initiative.

The pilot project was started in November 2011 for library building where fluorescent light panels were replaced with LED light panels by April 2012. To manage this change in light sensitive environment of computer labs and library an overall replacement factor of 75% was planned with 100% replacement in corridors and common space lights and 50% replacement in reading intensive areas. A conservative estimate of payback period was 14 months and continuous monitoring of energy consumption has shown that breakeven was achieved in just over 10 months. This has led to a policy adoption of LED lights for all new buildings at LUMS and a phase-wise inclusion of existing buildings in this program.

A handwritten signature in black ink, appearing to read 'Nauman Ahmad Zaffar', is written in a cursive style.

Nauman Ahmad Zaffar  
Director, Energy and Power Systems Cluster  
Syed Babar Ali School of Science and Engineering