Technology Fact Sheet for Mitigation

Technology 2: **Efficient lighting (Compact Fluorescent Lighting, LED)** [i]

Subsector	Commercial, Residential Energy Consumption
Sector GHG emission (tCO_2-eq)	1,425,000 tCO_2-eq in 2006
Technology Name	**Efficient lighting (Compact Fluorescent Lighting, LED)**
Background/Notes, Short description of the technology option sourced from ClimateTechWiki, Seminars, etc	Compact Fluorescent Lamp (CFL) technology provides a low energy lighting service through the use of a compact fluorescent light bulb that replaces the normal Tungsten filament light bulb. Still, there is a whole range of different sorts of lamps from ordinary incandescent tungsten filament bulbs to Tungsten Halogen, Halogen infrared reflecting, Mercury vapor lamps, Compact fluorescent lamps, linear fluorescent, metal halide, compact metal halide, high pressure sodium (High Intensity Discharge lamp) and Light Emitting Diodes (LED). CFLs contribute to security of energy supply as they make a significant contribution to reducing electricity demand. The higher up-front cost could be a barrier for their implementation, but calculations show that CFLs pay back the initial investment within 900 hours of operation and also contribute to a reduction in the electricity bill over the lifetime of the bulb. The savings can be in the order of 10-20 times the initial cost over the life of the bulb. http://climatetechwiki.org/technology/cfl
Implementation assumptions, How the technology will be implemented and diffused across the subsector?	Incandescent bulbs are commonly used in Mongolia. Incandescent bulbs produce 10-15 lumen/W and last for 1,000-2,000 hours. Compact fluorescent lamps (CFLs) produce 50-60 lm/W and last for 10,000-15,000 hours. Moreover, Light-Emitting Diodes (LEDs) produce 100-130 lm/W and last for 35,000-50,000 hours. Usage of CFLs at household and service sector levels is low due to its relatively high price. The project can be implemented by promoting consumers to switch from ILs to more energy efficient lamps (CFLs and LEDs) by providing them with some incentives originated by the Certified Emission Reductions (CERs) revenue as a Clean Development Mechanism Project. The project will reduce greenhouse gas emissions by preventing CO_2 emissions from electricity generation by fossil fuel power plants that supply the Central Energy System of Mongolia. Most CER revenue acquired by this project activity can be designed to be returned to CFLs buyers in the form of the incentive.

	Currently, 30 % of household consumption of electricity is being used for lighting. When the technology is accomplished, 218 million kWh of energy will be saved per year (Mongolia Second National Communication, 2010)
Reduction in GHG emissions	Converting electricity consumption to CO_2 emissions it will be 240,000 tCO_2-eq (218,000 MWh x1.103tCO_2-eq /MWh). GHG emissions are expected to be reduced by about 240,000 tons CO_2/year.
Impact Statements - How this option impacts the country development priorities	
Social development priorities	Significant energy savings will help to free up energy resources that can be spent on other national, social and human development goals.
Economic development priorities	The lighting service improvement technology can reduce electricity generation in power plants and save a significant amount of fossil fuels for electricity generation and for transport of coal from coal mines to power plants.
Environmental development priorities	The lighting service improvement technology can reduce air pollution in big cities.
Other considerations and priorities such as market potential	The market potential is big
Costs	
Capital costs	Required investment cost will be about USD 16 million. The annualized capital cost will be USD3.2 million with efficient lighting life time of 15000 hours.
Operational and Maintenance costs	The cost of saved energy will be 6.9 million USD. The total operation and maintenance cost will be -3.7 million USD.
Cost of GHG reduction	Cost of GHG reductions is expected to be about US -15.4/tCO_2-eq

[i] **This fact sheet has been extracted from TNA Report – Technology Needs Assessment For Climate Change Mitigation– Mongolia. You can access the complete report from the TNA project website http://tech-action.org/**