TECHNOLOGY FACTSHEET

PASSIVE SOLAR ENERGY (HOT WATER) AND SOLAR PHOTOVOLTAIC (ELECTRICITY)

1) **Sector:** Commercial and residential sector

2) **Sub-sector:**

3) **Technology name:** High efficiency lighting systems

4) **Option name:**

5) **Scale:** Small-scale

6) **Availability:** Available

7) **Technology to be included in prioritization?** Yes

8) **Background/notes**

Lighting entails greenhouse gas emissions of 1 900 Mt of CO_2 per year, equivalent to 70% of the emissions from the world's light passenger vehicles. According to the IEA, lighting ranks among the major end-uses in global power demand. Lighting represents 650 mtoe of primary energy consumption and 2550 TWh of electricity consumption in 2005.This means that grid-based electric lighting is equivalent to 19% of total global electricity production. The statistics supplied by the IEA report (2006) shows that lighting requires as much electricity as is produced by all gas-fired generation or 1265 power plants. Of this amount the major consumption sector is commercial at 43% followed by residential at 31%, industrial (18%), and outdoor stationary sources at 8%.

9. **Advantages of the technology:**

It generates savings in energy costs over their lifetime and provide a reliable lighting service. They also generate jobs in manufacturing and retail. As electricity supply is still limited in many developing countries, reducing demand by more efficient lighting is a positive step for their economies. It also contributes to security of energy supply as they make a significant contribution to reduction in electricity demand.

10. **Disadvantages of the technology:**

Initial costs of the bulbs is high. But, due to savings it provided additional benefits in future. Consumers may need to be provided with awareness raising activities to understand this trend.

11. Implementation assumptions (How the technology will be implemented and diffused across the subsector)

Commercial and residential sector is the major part of consumer segment in electricity. Due to statistical numbers of 2010, total consumption of electric energy of residential sector is 5.075 million kWt/hours and of commercial sector – 3.478 million kWt/hours. The replacement of existing lamps with 20-25 W compact fluorescent ones will result in 7.800 million kW-hours or 73% of electric power economy.

12. Impact statements (How the options impact countries development priorities)

a) Countries social development priorities
   - increases livelihood of population by reducing energy costs
b) Countries economic development priorities
   - contributes to security of energy supply
   - generates new manufacturing sector leading to reviving of that economic sector
c) Countries environmental development priorities
   - contributes to government strategy to provide more environmentally friendly energy supply
d) Reduction in GHG emission over 30 years

   rough estimates of reduction of GHG is 90 MT

13. Costs

a) Capital costs over 10 years

Price of one bulb demands on quality and manufacturer. On average price of one bulb is about 2-3 US dollars. Total capital costs in the case of full replacement (312 million bulbs) will be 936 million USD

b) Operational & maintenance costs over 10 years

none

c) Cost of GHG reduction

0.087 USD per kg CO_2

d) Other costs

Additional costs may be need to increase awareness level of consumers to promote the application of high efficiency lighting system