

Lighter load

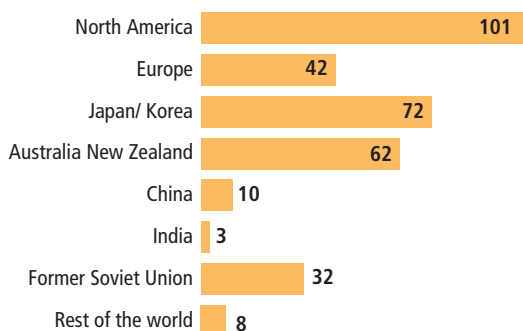
A global switch to efficient lighting will reduce electricity bills by one-tenth

■ Very few inventions last for more than 100 years without major modifications. But Thomas Edison's invention has been dominating the world market for about 125 years. However, incandescent light bulbs are highly inefficient by modern standards and convert only about 5 per cent of the energy they receive. Lighting consumes about 19 per cent of electricity generated globally

■ Commercial and public sector buildings account for 43 per cent of the electricity used for lighting, with fluorescent tubes dominating. The efficiency of tubelights vary between 15 to 60 per cent

■ Annual consumption of artificial light has increased from five kilo lumen-hours at the beginning of the 19th century to 60 mega lumen-hours now — a 12,000-fold increase

■ While an average North American consumes 101 mega lumen-hours each year, the average Indian uses only three mega lumen-hours



■ There has been a switch from incandescent bulbs to compact fluorescent lamps (CFLs), marketed as "energy-saving bulbs"

■ Besides energy, the carbon dioxide (CO₂) emissions saved by such a switch would dwarf cuts so far achieved by adopting wind and solar power

■ Electricity generation for lighting produces 1,900 tonnes of CO₂, which is 70 per cent of emissions from light passenger vehicles, and three times more than emissions from aviation

■ According to an estimate, the overall cost (buying and then using for 10,000 hours) of lighting from incandescent bulbs is 85 euros while for CFLs it is 25 euros

■ Light emitting diodes (LEDs), four times as efficient as incandescents, will be the light source for the future. However, even without LEDs, better building regulations and individual action to switch to efficient lamps will slash 38 per cent from the global electricity bill for lighting by 2030

■ A fully electrified India will have about 200 million residential consumers. If each of them were to replace a 60 W bulb with a 15 W CFL, the peak capacity would reduce by 10,000 MW, cutting the investment needed in the sector by Rs 60,000 crore

■ However, 70 per cent of the consumers in the existing situation paying a monthly bill of Rs 50-100 or even less than Rs 50 will not switch to the expensive CFL

■ But the poor not using CFLs will cost dear. If 140 million poor houses use two bulbs instead of two CFLs, the peak load will be 14,700 MW against 3,700 MW with CFLs, increasing annual subsidy by Rs 2,400 crore

IF

- 1 kilowatt (kW) saved at consumer end [20 per cent distribution loss]
- 1.25 kW energy distribution avoided by generation unit [8 per cent of auxiliary use at power station]
- 1.36 kW of energy generation avoided by generation unit

THEN

1 kilo of coal saved