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Energy-Efficient Electric Motors

Project Title

Achieving Reduction in GHG Emissions through Advanced Energy Efficiency Technology in Electric Motors

Budget

Total: USD1.3 million
Global Environment Facility (GEF): USD250,000;
and Others: Over USD1 million

Duration

August 2008 – July 2011

Partners

Bureau of Energy Efficiency, Ministry of Power, Government of India; International Copper Promotion Council of India; International Copper Association; Non-Ferrous Technology Development Centre; and International Copper Study Group; and Common Fund for Commodities

Project Location

Hyderabad (Andhra Pradesh)

Challenges

India's energy consumption has been keeping pace with rapid economic growth. From 1980 to 2003, the actual per capita electricity consumption in the country has more than doubled, i.e., from 140 kilowatt (kW) to 500 kW and is expected to grow to around 800 kW by 2012. But supply is far behind demand. Already, India faces chronic electricity shortages – a shortfall of 10 percent on average going up to 20 percent in peak hours.

Electric motors, which are used mainly in industrial and agricultural sectors, account for a substantial 35 percent of the total electricity consumption in India. One of the ways to address the problem of energy shortage is to reduce demand, mainly by increasing end-use efficiency of appliances used.

As per manufacturers' feedback, sale of energy-efficient motors is approximately two percent of the total sales. The major reason identified for the low sales is the high initial cost. Hence, there is a need to develop technology that can reduce the initial cost of energy-efficient motors. According to motor design experts, using copper die-cast technology instead of aluminium die-cast for rotors is cost effective and will also reduce the size of the motors, without affecting the output.

Response

The Global Environment Facility and the United Nations Development Programme (UNDP) are supporting the Ministry of Power, Government of India, in its endeavour to address the information, technology, sector-specific and financial barriers to energy usage reforms, resulting

in these motors becoming more commercially viable. This would help to reduce the energy consumption.

A new technology for manufacture of Copper Motor Rotor (CMR) would be introduced to the motor manufacturers, in place of aluminium die-cast. This would reduce costs and result in better performance of the motors through lower operating temperature, increased insulation life and better reliability. The project will help manufacturers of copper cast rotor, electric motors and motor pumps to adopt CMR technology for copper die-casting.

Impact

The project would enhance energy efficiency of electric motors by five percent and subsequently reduce greenhouse gas emission. Carbon dioxide emissions could be reduced by 197,300 tonnes per year, thus, totalling 592,000 tonnes from now until 2011. If the market penetration reaches 65 percent, emissions of 32 million tonnes of carbon dioxide can be avoided within 10 years.

For more information, please write to info.in@undp.org

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