



By
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Revolutionising energy efficiency

Effective electric motor rewinding practices are vital for enhancing energy efficiency and mitigating carbon emissions.

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At the recently concluded COP28, climate finance took the centre stage with a commitment to mobilise over \$57 billion and setting the pace for a new era in climate action. The amount of cash needed for the energy transition, climate adaptation and disaster relief are overwhelming and estimated that emerging markets and developing countries will need \$2.4 trillion a year in investment to cap emissions and adapt to the challenges posed by climate change.

While the need for finance has been talked much as much needed resource to accelerate the pace of decarbonisation, many of the low hanging fruits still need to be explored and implemented. Ensuring energy efficiency of electric motors through proper rewinding is one such example that promises impactful results without the need for developing any new cutting-edge technology. Instead, it requires a shift in focus towards skill development and service enhancement to make the process more efficient. It is a simple yet effective solution that holds the potential to yield substantial reductions in energy consumption and,

consequently, carbon emissions.

Electric motors and motor driven systems account for approximately 70% of the electricity consumed by industries and industry accounts for approximately 42% of total electricity consumption in India. Hence, efficiency of electric motors should not be overlooked.

In FY22, India produced around 4.37 million units of industrial LT motors, with a total installed base of 39 million units. However, the average lifespan of these motors varies from 13 to 22 years, depending on the end-user industry. Approximately 12 million LT induction motors were rewound in FY22, constituting 30% of the installed base.

In India, rewinding of damaged or burnt-out motors is a common practice across various applications, including industrial, agricultural, and residential sectors. While rewinding is a cost-effective alternative to purchasing new motors, it can significantly impact motor efficiency, leading to higher operational costs.

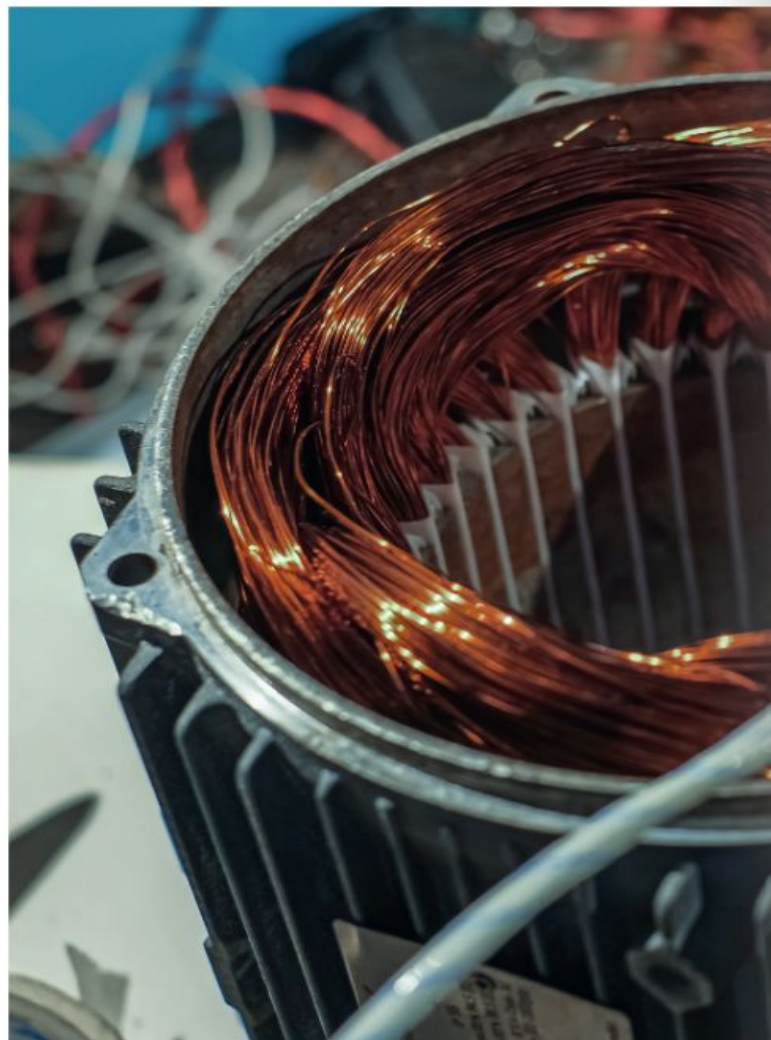
The frequent rewinding of electric motors, often

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carried out using improper practices, degrades motor efficiency, leading to higher electricity consumption. Each unit of extra power consumed results in the emission of 0.9 kg of greenhouse gases. According to a report by Bureau of Energy Efficiency (BEE), the efficiency drop in a rewind motor ranges from 0.8% to 3%, with an average drop of 1.03% every time a motor undergoes rewinding.

To address this issue, it is essential to understand the root causes of motor failure and adopt best practices in motor repair centers to ensure that rewind motors do not experience an efficiency loss. Furthermore, it is crucial to discourage the continued use of motors that have been rewind more than 2-3 times. However, this is often hindered by the lack of records regarding motor failure history, the number of times a motor is rewind at the user end, and similar data when the motor reaches a rewinding workshop. This is a significant barrier to achieving higher energy efficiency through the adoption of more efficient motors at a national level.

At present, there is no voluntary or regulatory system in place to ensure the standardisation of the rewinding process and relative comparison of quality of rewinders, motor history, and number of rewinding done. As a result, there's a risk of motor efficiency declining below acceptable levels, and these motors see continued use even after



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To address this pressing issue, it is imperative that India adopts best motor rewinding practices. Doing so could lead to substantial savings in energy costs, including an estimated energy saving of 23.81 billion units and INR 15,478 crores. Additionally, this could result in a reduction of 21.43 million tonnes of carbon emissions and can help industry to reduce their Scope 2 and Scope 1 emissions for user and power generating companies respectively. And this could be achieved at significantly very low investment, with a payback period of less than even 3 months.

With an objective to address this issue, Confederation of Indian Industry through its CII – Centre of Excellence for Competitiveness for SMEs jointly with International Copper Association India (ICA India) as a knowledge partner, have developed a framework for the Assessment & Certification of Motor Repair Centers in India. This Motor Rewinder Certification

System offers a holistic framework for enhancing competitiveness, creating awareness, and fostering energy-efficient rewinding practices.

The framework for assessing and certifying Indian motor rewinders ensures a comprehensive health check of motor rewinders in key technical, system, and process aspects. This approach guarantees that the energy efficiency of rewound motors is maintained and does not deteriorate below a specified baseline. By implementing this assessment and certification process, India can align with its priority of achieving higher energy efficiency and mitigating the impact of climate change. This initiative supports the targets set in the Paris Agreement and helps generate employment while fostering skill development in the motor rewinding sector.

Supporting the initiative, Bureau of Energy Efficiency through Haryana Renewable Energy Development Agency has suggested implementing a pilot project to undertake the motor rewinders certification system in the state of Haryana.

Addressing the challenge of motor rewinding in India is not only essential for energy efficiency but also for creating skilled rewinders, business growth of rewinding centres and reducing carbon emissions. By adopting best practices and implementing certification processes, India can set an example of achieving energy efficiency at very low investment. ■