

Cover Story**Copper - The Reliable Choice Over Aluminium for Transformer Durability**

India's distribution transformers (DTs) are experiencing a **high failure rate of 11-14%**, particularly in rural areas using lower ratings. This issue is primarily driven by the use of **aluminium windings**, which are prone to creep under overloading stress and high temperatures. The elongation of windings leads to loose connections, increasing the risk of premature transformer failures and substantial repair replacement costs. Technical studies by **IIT Roorkee and field intelligence gathered by International Copper Association India** shows that **aluminium windings being cheaper, widely used by public utilities. But they incur higher long-term costs due to frequent repairs and replacements.**



## Key Challenges

- **Frequent Failures** - High failure rates due to poor copycat design and substandard materials.
- **Creep in Aluminium Windings** - Leads to elongation, joint failures & loose connections, causing premature failures.
- **Cost Implications** - Aluminium winding transformers, though initially cheaper, becomes much costly during lifetime for repeated repair or replacement.

## Proposed Solutions

- **Use Copper Windings** - Choose Copper with lower contact resistance and higher strength, offering greater reliability and longer service life.
- **Improve Design and Materials** - Enhance design standards considering creep behaviour and use better quality materials to reduce failure rates.

By transitioning to **copper windings** and improving design practices, India can significantly **reduce transformer failures** and ensure a more reliable power distribution network.

### In Focus

## ICA India's Copper Stock and Flow Model

**The International Copper Association India (ICA India) launched the Copper Stock and Flow Model to track copper usage and recycling.** The model reveals that **38% of India's copper demand** is met through scrap, but nearly all is remelted rather than refined. In FY 2021, India generated **350 KT of copper scrap and imported 80 KT, with only 1% undergoing proper refining**, lagging behind global practices. Mr. Shreegopal Kabra of RR Global highlighted the safety risks due to poor-quality scrap processing, calling for stricter regulations and improved practices to enhance copper product standards in India

[Copper Stock and Flow Model](#)

## Copper Mentions

### Copper's Crucial Role and Economic Impact in India's Growth

In the latest **IEEMA Journal**, **Mayur Karmarkar** highlights copper's crucial role in India's **growth**, especially in the electrical sector, which accounted for 70% of **FY2023 sales**. Despite heavy import reliance, the government is enhancing local processing. **Copper is key for renewable energy and critical mineral initiatives**, with companies like **Adani and Hindalco** investing in processing to reduce import dependence.

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## ICA India Events



**On May 30, 2024, International Copper Association India (ICA India) and CREDAI Hyderabad** emphasized electrical safety standards and the use of 100% copper in buildings to prevent accidents and ensure compliance.

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**On May 3, 2024, ICA India and CREDAI Lucknow highlighted the importance of adhering to national electrical standards set by the Bureau of Indian Standards (BIS) and regulations by the Central Electricity Authority (CEA), promoting 100% copper usage for safety.**

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**On March 7, 2024, ICA India and the Airports Authority of India (AAI) held a session in Kolkata focusing on Read More through safe installation practices and copper usage.**

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**At the Critical Minerals Summit, Mayur Karmarkar, MD of ICA India, discussed investing in India's mineral processing and ESG.**

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**On February 28, 2024, ICA India highlighted copper cables' role in safety and compliance at the ECAMEX-24 exhibition.**

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