



Smart Tips for Maximising ELECTRIC MOTORS EFFICIENCY

Save Energy, Save Money!



Simple Actions. Big Impact.

Boost Efficiency - Cut Costs - Reduce Carbon Footprint



ELECTRIC MOTORS *SMALL CHANGES. BIG SAVINGS.*

Electric motors power industries, but inefficiency wastes energy and money. By making simple, smart adjustments, you can increase efficiency, extend motor lifespan, and reduce costs.

KEY ACTIONS FOR EFFICIENCY



Regular Maintenance

Keep motors clean and lubricated.



Proper Sizing

Avoid oversized or undersized motors to prevent energy waste.



Use Variable Speed Drives (VSDs)

Adjust motor speed to match load requirements.



Upgrade to High-Efficiency Motors (IE3 or IE4)

Cut energy use and long-term costs.



PROPER MOTOR SIZING

The Rule of Thumb

Using the right-sized motor ensures efficiency and prevents overloading.

- ✓ **Power Supply**
Match motor voltage to your electrical system (230V single-phase or 400V three-phase).
- ✓ **Service Factor**
Select a motor that can handle load variations (1.0–1.15 SF recommended).
- ✓ **Torque Requirements**
Ensure the motor provides enough torque to handle startup and running conditions.

FORMULA

■ **Torque of Motor = Load Torque × Service Factor**

Example: If load torque = 50 Nm and Service Factor = 1.15, motor torque should be **57.5 Nm** (50×1.15).

✓ **Motor Speed**

The motor RPM should be selected so that it can achieve the required load RPM.

MOTOR STARTING SYSTEMS

Choosing the Right Method

A motor starter ensures the safe start and stop of a motor while providing protection against low voltage and over-current conditions.

- ✓ **Direct-On-Line (DOL)**
Simple and cost-effective for small motors.
- ✓ **Star-Delta Starter**
Reduces startup current for large motors.
- ✓ **Autotransformer Starter**
Limits voltage at startup. Ideal for high-power industrial applications.
- ✓ **Soft Starter**
Provides smooth acceleration, minimising mechanical wear.
- ✓ **Variable Speed Drive (VSD)**
Optimises motor speed & reduces energy waste.



Use VSDs for the highest energy savings and precise control!

BENEFITS OF USING VARIABLE SPEED DRIVES (VSDS)



Save up to 40% of motor energy consumption!

- ✓ **Adjust Motor Speed Based on Demand**
No more running at full speed unnecessarily.
- ✓ **Reduce Wear & Tear**
Smooth starts and stops extend motor lifespan.
- ✓ **Improve Process Control**
Precise control of processes such as pumping, cooling and ventilation.

Best practice: Install VSDs for **pumps, fans, conveyors, and HVAC systems** to cut energy waste!

THE BIGGER IMPACT

- **Save Energy**
Consume less electricity for the same output.
- **Cut Costs**
Lower operational expenses and improve profitability.
- **Reduce Carbon Emissions**
Support Mauritius' 10% energy efficiency target under the 2021 NDC goals.

Motor Efficiency: Rewinding & System Care

When a motor fails, it can be rewound or replaced. Rewinding is often more cost-effective but each rewind can reduce efficiency by 1–2%. If a motor has been rewound several times, it may be better to replace it and review the setup to prevent further issues.

Enhancing Motor System Efficiency

Motor system efficiency also depends on other factors:

- **Belt Drives**

Switching to high-efficiency belts can improve performance by 2–4%.

- **Lubrication**

Synthetic lubricants reduce friction in motor-driven equipment, offering 1–2% energy savings, sometimes more, depending on the application.

- **Maintenance**

Regular checks on motor temperature, mechanical wear and electrical condition are essential. Even minor issues such as dust accumulation can cause overheating, reduce efficiency and shorten motor life.

Regular maintenance, proper sizing, VSDs, and high-efficiency motors can drive huge savings!



Upgrade Today & Power a Greener Tomorrow!

Energy Efficiency Management Office

Level 4, The Celicourt Tower,
6, Sir Celicourt Antelme Street, Port Louis 11302, Mauritius



206 8070



212 1109



eeemo@govmu.org



EEMO