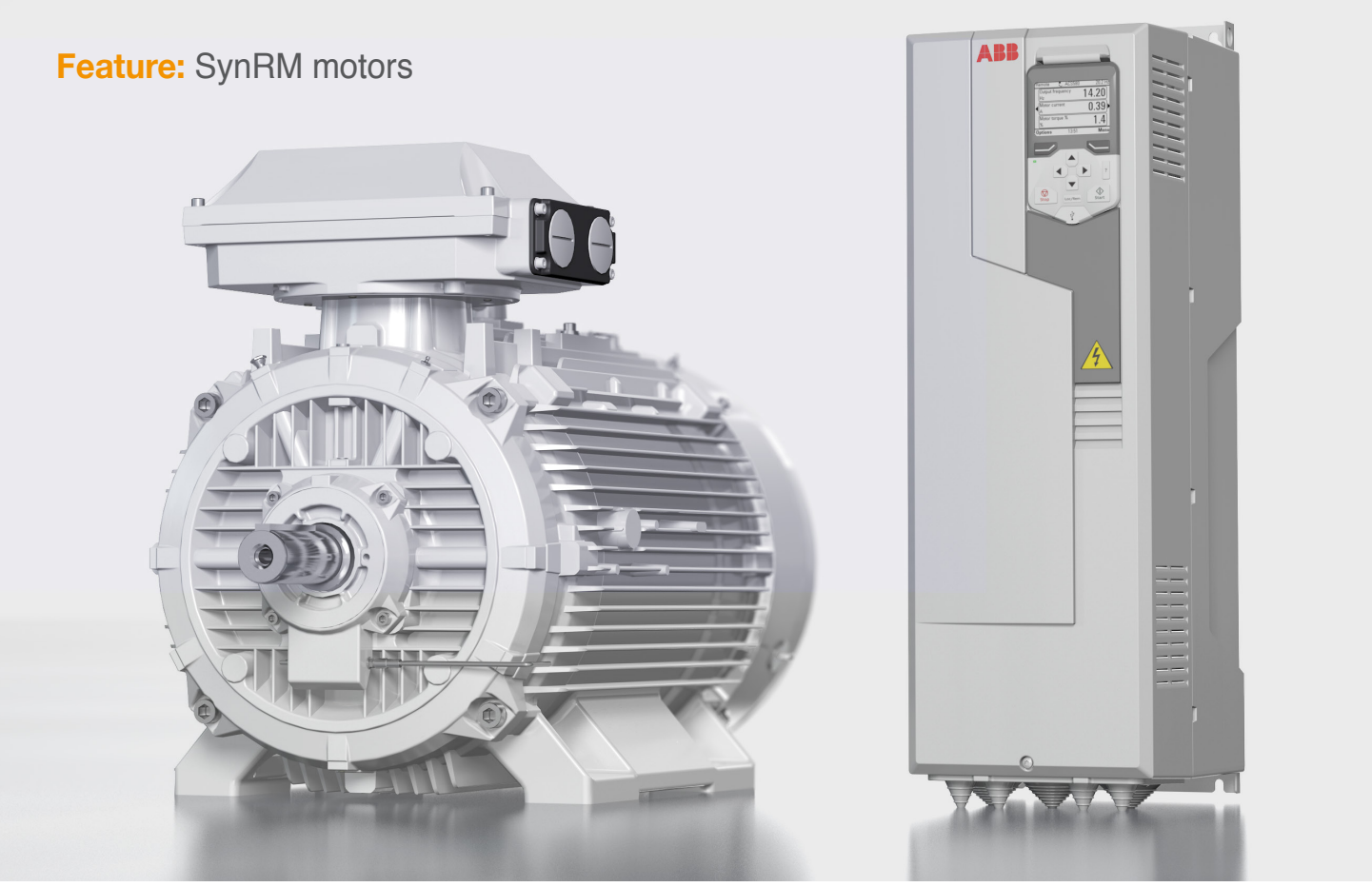

How high-efficiency SynRM motors enable long-term savings

Industrial businesses realise the critical importance of energy efficiency. It is an immediate step that facilities can take to improve their sustainability, contribute to reaching net zero, and boost profitability. Here, Ivor Vidjen, Business Development Manager of IEC Low Voltage Motors at ABB, breaks down how businesses can achieve these goals and ensure long-term savings.

Electric motors are a logical place to start, as they are responsible for powering all sorts of equipment – such as pumps, fans, conveyors, mixers, and more – across every industry. Worldwide, motors and the systems that they drive are responsible for approximately 45 percent of all electricity consumption.

Fortunately, modern motors, such as synchronous reluctance (SynRM) motors, are significantly more efficient than older technology. In many cases, the efficiency improvements are so great that it might make sense for a facility to replace a less efficient motor before it has reached the end of its useful lifetime – often over 20 years from the time it is installed. Variable speed drives (VSDs), meanwhile, can be paired with new or existing motors to achieve significant efficiency improvements.

Saving money, cutting carbon

Buyers are sometimes reluctant to invest in new motors and drives, due to the upfront cost. It is true that more efficient solutions are typically more expensive than inefficient alternatives. However, the upfront cost is just a small fraction of the overall total cost of ownership (TCO).

In reality, the most significant contributor to a motor's TCO is the cost of the electricity used to power the motor. For efficient motors, the upfront cost of the motor is just two percent of its TCO, while maintenance accounts for one percent, and the remaining 97 percent goes to electricity.

This means that more efficient motors pay for themselves through operational expenditure (OpEx) savings. Payback periods can be as short as a matter of months when energy prices are high. Once the motor has paid for itself, it continues to produce savings throughout its operational life.

Drives produce similar savings and can be fitted to existing motors to make them operate more efficiently. In pump, fan and compressor applications, for example, a drive can reduce power consumption by typically 25 percent or more.

In addition to reducing OpEx, using less electricity to run the motor also reduces the carbon emissions associated with a facility, if it is using power generated from non-renewable sources. Since sustainability is a key differentiator for consumers, this provides an additional selling point.

The advantages of SynRM technology

The most energy-efficient, low-voltage motors on the market today use SynRM technology, packaged with a VSD. This enables

them to achieve IE5 efficiency, according to the International Efficiency (IE) classes. An IE5 SynRM motor achieves energy losses 50 percent lower than an older IE2 motor, and 40 percent lower than the IE3 motors that are common in facilities today.

Upgrading from an older induction motor is straightforward, as IE5 SynRM motors are available in the same standard dimensions and output power classes. This means that they can be drop-in replacements in many cases.

About the author:

Ivor Vidjen *is the Business Development Manager of IEC Low Voltage Motors at ABB.*

In addition to the benefits achieved by greater energy efficiency, SynRM motors also have a lower environmental impact, as they are manufactured without the use of rare-earth elements (REEs), such as neodymium.

The use of a VSD enables precise control and means that the motor can adapt its output to match the requirements of the task exactly. SynRM motors also run cooler than traditional induction motors, which places them under less stress, increases their reliability, and reduces their maintenance needs.

Enabling efficiency at a Finnish sawmill

A Finnish sawmill operator has become the first business to adopt ABB IE5 SynRM motor-drive packages for timber drying. The operator is currently undertaking a €50 million upgrade, which includes adding a third green sorting line, a new sawmill intake, a packaging plant, a new saw line, and two new channel dryers – making this the ideal time to replace its motors.

The IE5 SynRM motors are paired with drives that enable regenerative braking, further increasing efficiency. The upgrades are estimated to produce six-figure energy savings within the first couple of years, and they will help increase the mill's annual output of sawn pine and spruce to 600,000m^3.

Efficient motors make common sense

Energy efficiency is a step that businesses can take today to move towards net zero, and it enables significant financial savings – a classic win-win. All operators need to do is understand that the price on the sticker is just a tiny fraction of the TCO – smart decisions today lead to savings tomorrow.

Learn more at **global.abb/topic/synrm-drive-package.**