

# Efficiency Classes for Low Voltage, Single-speed, Three-phase, Squirrel Cage Induction Motors

The new efficiency classes have a new nomenclature:

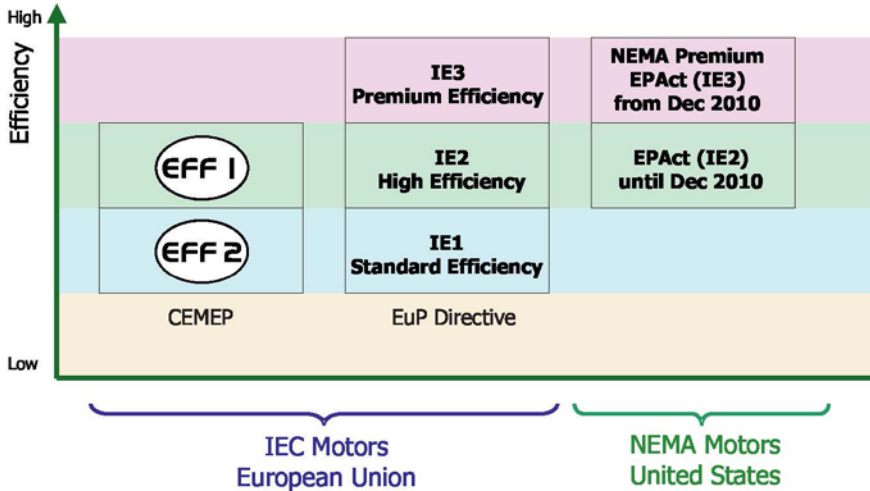
- **IE1** (Standard Efficiency) (what was **eff2**)
- **IE2** (High Efficiency) (what was **eff1**)
- **IE3** (Premium Efficiency)

**IE** stands for **I**nternational **E**fficiency



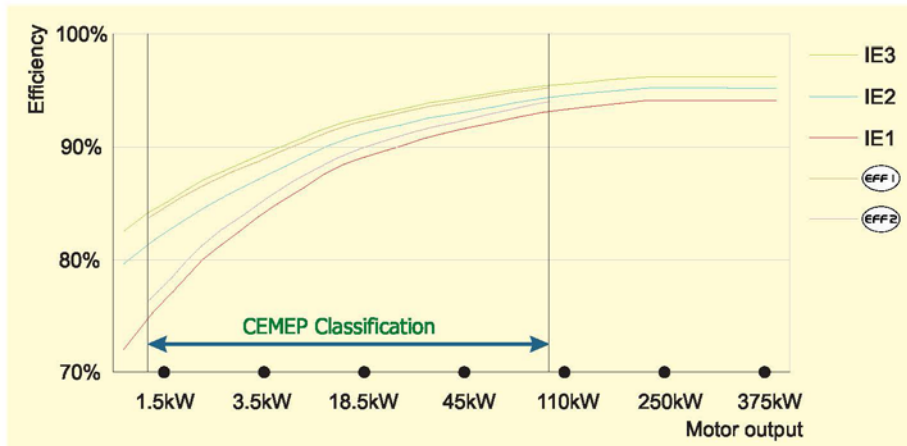
## New EuP Directive

Estimated saving is 135 Twh in the EU by 2020. This represents entire electricity consumption of Sweden.



From November 2010 the new IEC 60034-30 standard specifies that losses are to be measured using the new method described in EN 60034-2-1 standard. The additional losses used to be added as fixed percentages - Now need to be measured.

Efficiency Determination Test Method: Old standard IEC 60034-2 : 1996  $P_{LL} = 0.5 \% \text{ of } P$  was added  
 New standard IEC 60034-2-1 : 2007  $P_{LL} = \text{individual measurements}$   
 ( $P_{LL} = \text{Load-dependent additional losses}$ )



With the new testing methods the additional losses can no longer be assumed as fixed percentage values (0.5%) but need to be determined by carrying out the appropriate measurements to IEC 60034-2-1: 2007. For this reason the nominal efficiencies will often decrease although no changes have been implemented on the motors.

### IMPLEMENTATION DATES:

- **16 Jun 2011:** IE2 minimum efficiency for motors from 0.75 kW – 375 kW
- **01 Jan 2015:** IE3 minimum efficiency for motors from 7.5 kW – 375 kW (IE2 motors can be used with frequency inverters)
- **01 Jan 2017:** IE3 minimum efficiency for motors from 0.75 kW – 375 kW (IE2 motors can be used with frequency inverters)

### What is the difference between IEC 60034-30 Standard and EuP Directive ?

The IEC 60034-30 Standard defines the Efficiency Classes (IE1, IE2, IE3).

The EuP Directive 2005/32/EC defines the minimum efficiency class that low-voltage motors must have when introduced to the market in the European Union and makes it a law.

COMMISSION REGULATION (EC) No 640/2009 of 22 July 2009 implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to eco-design requirements for electric motors.

## New EuP Directive

### QUESTIONS ANSWERED:

**EuP** -stands for **E**nergy **u**sing **P**roducts

#### EuP Regulation does not apply to:

- (a) motors designed to operate wholly immersed in a liquid
- (b) motors completely integrated into a product (for example gear, pump, fan or compressor) of which the energy performance cannot be tested independently from the product
- (c) motors specifically designed to operate:
  - (i) at altitudes exceeding 1000 metres above sea-level
  - (ii) where ambient air temperatures exceed 40°C
  - (iii) in maximum operating temperature above 400°C
  - (iv) where ambient air temperatures are less than -15°C for any motor or less than 0°C for a motor with air cooling
  - (v) where the water coolant temperature at the inlet to a product is less than 5°C or exceeding 25°C
  - (vi) in potentially explosive atmospheres as defined in Directive 94/9/EC
- (d) brake motors
- (e) motors made solely for converter operation in accordance with IEC 60034-25



#### EuP Regulation applies to:

Single speed, three-phase 50Hz or 50/60Hz, squirrel cage induction motors that:

- have 2 to 6 poles
- have a rated voltage of  $U_n$  up to 1000 V
- have a rated output  $P_n$  between 0.75 kW and 375 kW
- are rated on the basis of S1 continuous duty operation

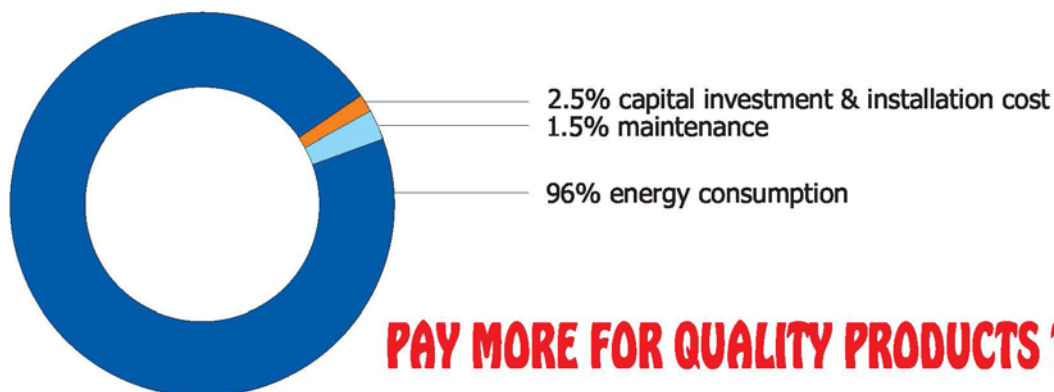
#### How will the EU police the EuP Directive implementation?

IE1 motors manufactured after 16th June 2011 will not have CE Mark displayed on the nameplate. No electrical products without CE Mark displayed on the nameplate can be sold in the EU !



**THERE IS NO TIME LIMITATION ON IE1 MOTORS MANUFACTURED BEFORE 16th JUNE 2011 WHICH BEAR CE MARK. THEY CAN BE SOLD AFTER 16th JUNE 2011 WITHOUT LIMITATION.**

## EXPENSES CONNECTED WITH THE PURCHASE AND OPERATION OF ELECTRIC MOTORS DURING THEIR LIFETIME



**PAY MORE FOR QUALITY PRODUCTS TO MAKE A SAVING !!!**