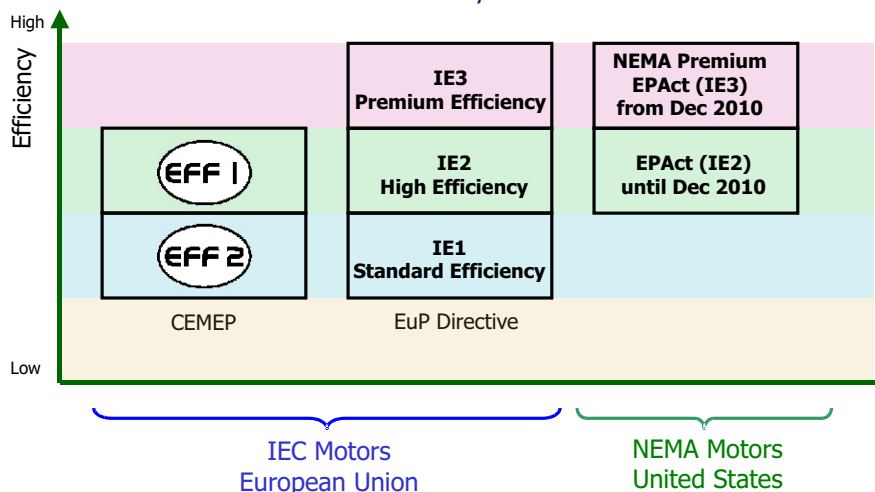


# Efficiency Classes for Low Voltage, Single-speed, Three-phase, Squirrel Cage Induction Motors

The new efficiency classes have a new nomenclature:

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

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



## New EuP Directive

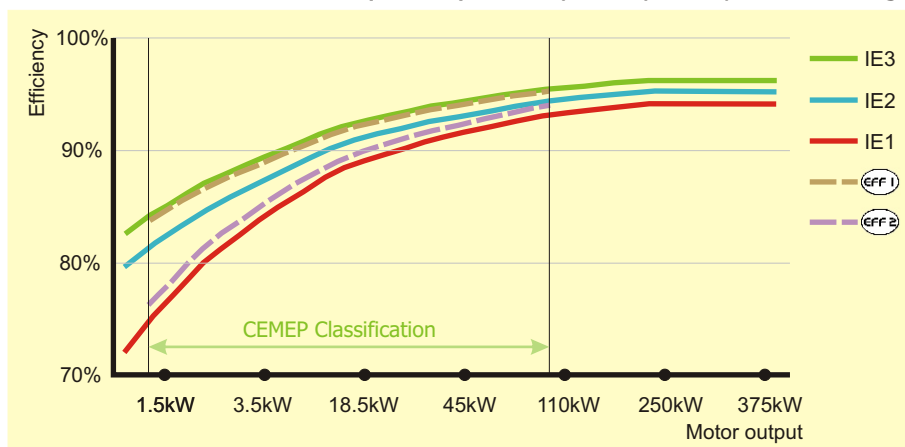
Estimated saving is 135 Twh in the EU by 2020. This represents entire electricity consumption of Sweden.

IEC 60034-30 (Rotating Electrical Machines – Part 30: Efficiency classes of single-speed, three-phase, cage-induction motors) has been drawn-up to provide a unified standard worldwide. This classifies low-voltage induction motors in new efficiency classes (valid from October 2008). The efficiencies as per IEC 60034-30 are based on measuring losses to IEC 60034-2-1. This has been valid since November 2007, and from November 2010 it replaces the old EN 60034-2 standards. The additional losses now need to be measured as they can no longer be added as a fixed percentages.

### The new EuP Directive

- will forbid placing IE1 motors on the market by 2011
- will allow placing only IE3 large sizes motors on the market after 2015
- will allow placing only IE3 motors (all sizes) on the market after 2017

It will be possible to install IE2 motors after 2015 (& 2017) but only if they are operated through frequency inverters.



### New testing methods

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 from EFF1 to IE2 and from EFF2 to IE1 although no technical or physical changes have been implemented on the motors.

Previously:  $P_{LL} = 0.5\% \text{ of } P$  was added

Newly:  $P_{LL} = \text{individual measurements}$  ( $P_{LL} = \text{Load-dependent additional losses}$ )

- Exclusion from EuP Directive: ATEX explosion-proof motors, brake motors, motors built-in machines, motors designed for: operation at altitudes above 1000m, operation above 40°C ambient.

### 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)