

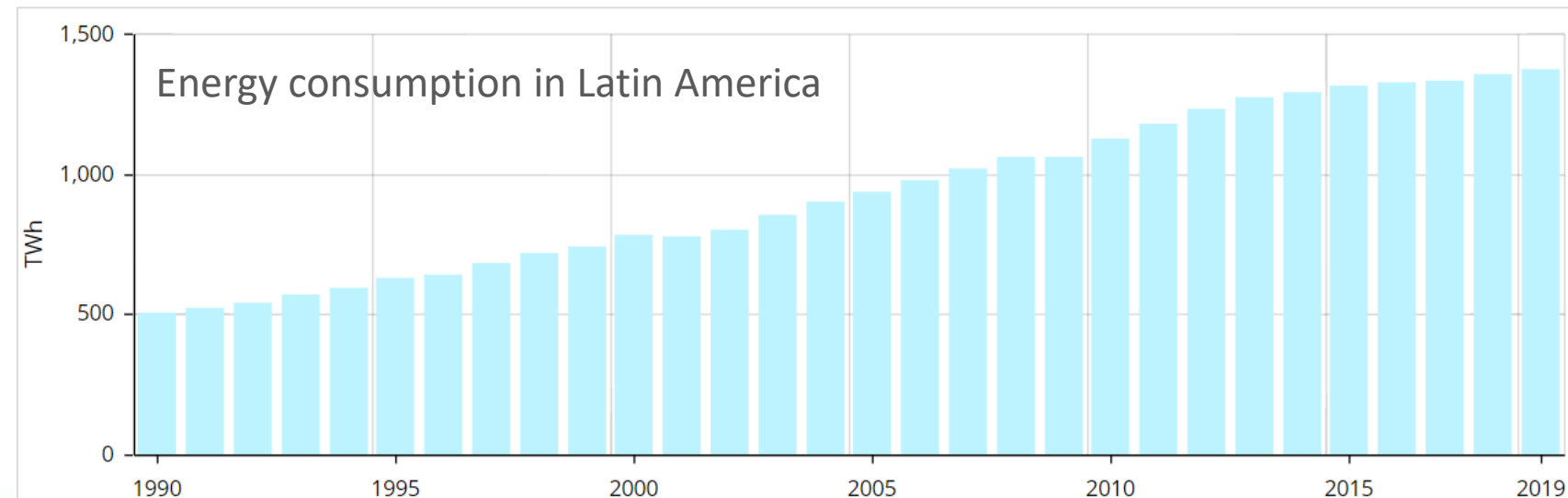
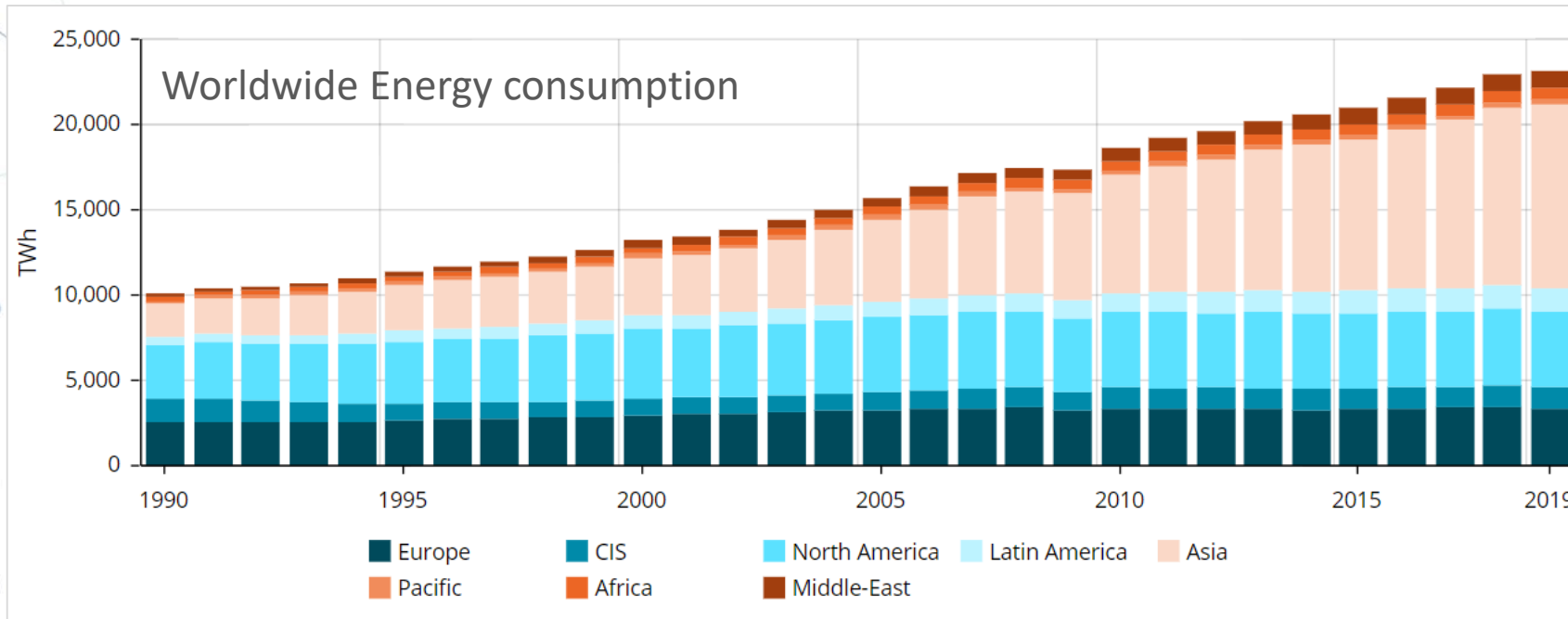
# Energy Efficiency in Electric Motors

SEAD Workshop for Latin America  
COP 26 Product Efficiency Call to Action

Rodrigo Fumo – Global Engineering Director  
WEG Motors & Energy



# ELECTRICAL ENERGY CONSUMPTION



Source:  
<https://yearbook.enerdata.net/electricity/electricity-domestic-consumption-data.html>



# ELECTRICAL ENERGY CONSUMPTION

The electrical energy used at the Industry represents



The electrical motors consumption at the industry represents

Globally, Electric Motors Account For Up To

**46%**

**~ 30%**

**~ 65%**

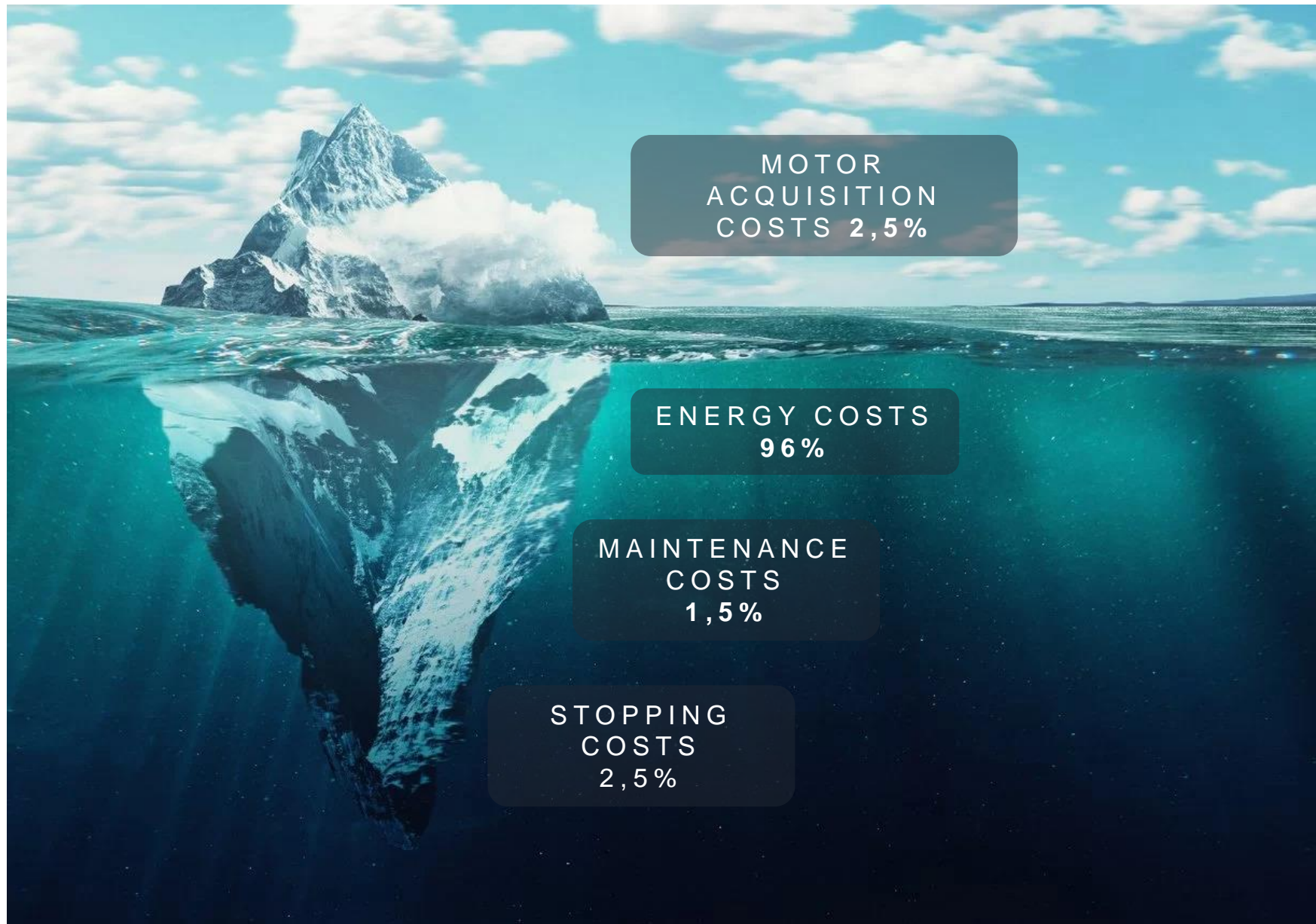
**300 Million motors installed at industry**  
**Industrial installation average age 17 years (Brazil)**  
**~ 40 Million industrial motors manufactured/year (IHS 2017)**

**Of All Electrical Consumption**

**10,500 TWh (World)**  
**644 TWh (Latin America)**

[1] P. Waide, C. U. Brunner, "Energy-Efficiency Policy Opportunities for Electric Motor-Driven Systems", International Energy Agency (IEA), 2011.

# ELECTRIC MOTOR LIFE CYCLE





# WORLD MEPS (MINIMUM ENERGY PERFORMANCE STANDARDS)

Lower Efficiency



Higher Efficiency

<b>IEC</b> 60034-30-1	IE1	IE2	IE3	IE4
<b>NEMA</b> MG1	Std	High	Premium	
<b>NZS</b> 1359.5		E2	E3	
<b>NBR</b> 17094-1		IR2	IR3	
<b>GB</b> 18613		GB3	GB2	GB1
<b>WEG</b>				

# WORLD EFFICIENCY LEVELS

Average energy saving  
per Efficiency level:

IE1 → IE2 = 6%

IE1 → IE3 = 8%

IE1 → IE4 = 10%

Manufactured motors in  
2019 per efficiency level\*:

IE1 = 37%

IE2 = 34%

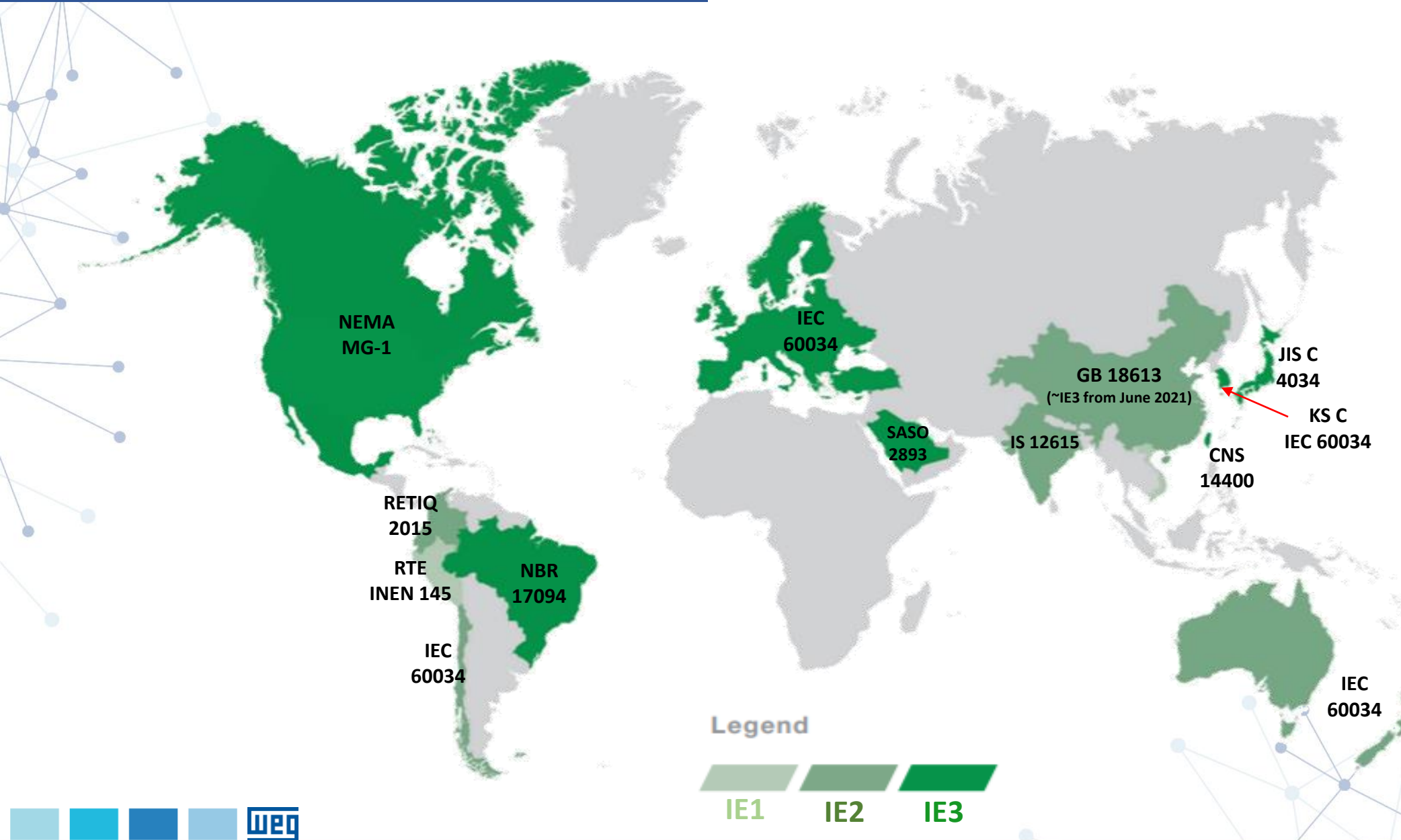
IE3 = 20%

IE4 = 15%

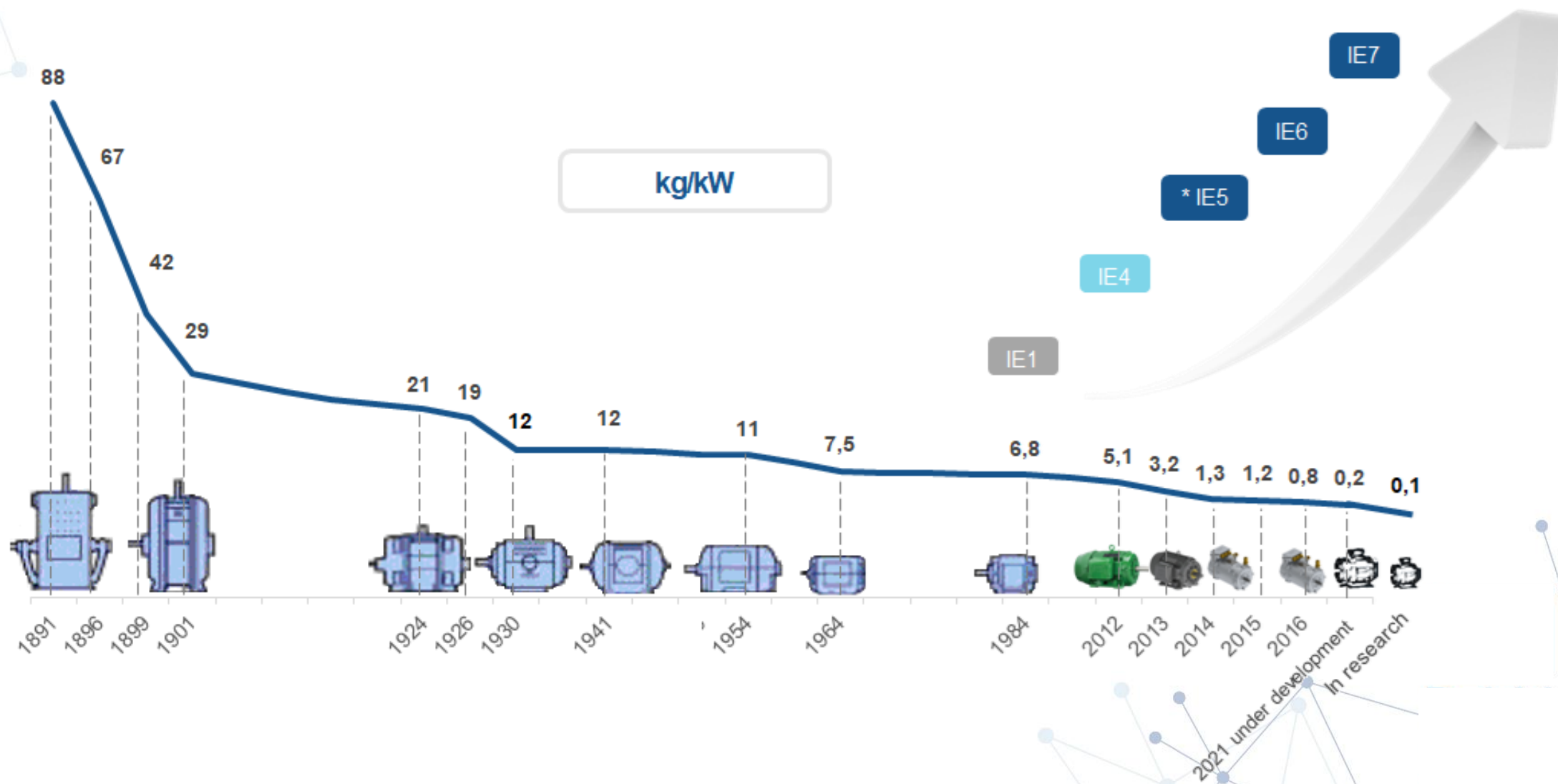
Non-classified = 8%

\*IHS report 2020

The majority of world  
installed motors are  
still low eff levels as IE1



# ELECTRIC MOTOR EVOLUTION



# ELECTRIC MOTOR: EFFICIENCY = ENERGY SAVINGS

	LEGACY EQUIPMENT	NEW EQUIPMENT
Supply Fan System	4 X 75KW	4X 55KW
Starting Method	DOL	VFD
Drive System	Multiple V-belts	Polychain
Efficiency	Approx. 89%	95%
Extract Fan System	8 X 18.5KW	8 X 15KW
Starting system	DOL	VFD
Drive system	Multiple V-belt	Polychain
Efficiency	Approx 86%	92.5%
Running hours / year	4000hrs @ Hi Speed	2000hrs @ Hi Speed 2000hrs @ Low Speed
<b>RESULTS</b>		
Energy savings 1st year	70%	
Total cost saving 1st year	30%	
ROI	9 months	
Estimated cost savings 2nd Year	40%	



# IMPROVING ENERGY EFFICIENCY LEVELS



- ✓ Optimize investments in energy generation and its infrastructure;
- ✓ Reduce CO<sub>2</sub> emissions;
- ✓ Consume less natural resource material;
- ✓ Reduce operational costs;
- ✓ Aim at optimize eff. Performance through technology and digitalization;
- ✓ Government incentive/rebate programs to renew the installed industrial base;

# THANK YOU!



Transforming energy into solutions. [www.weg.net](http://www.weg.net)

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