

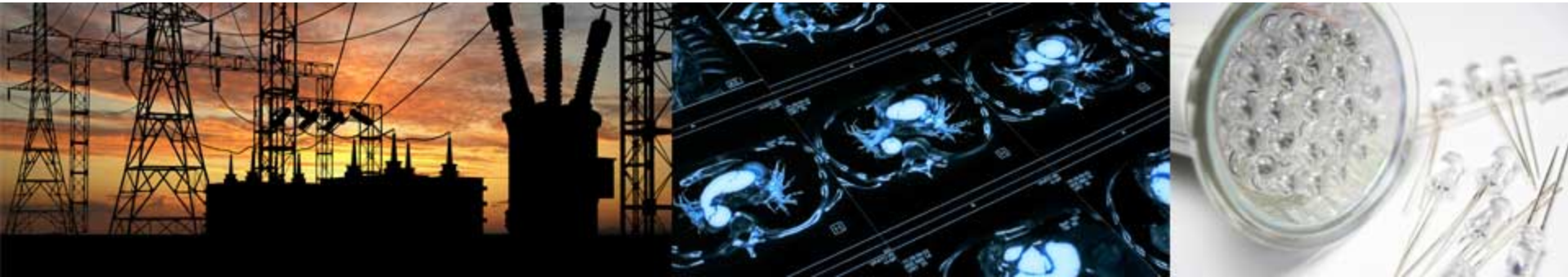
The US Industry Point of View

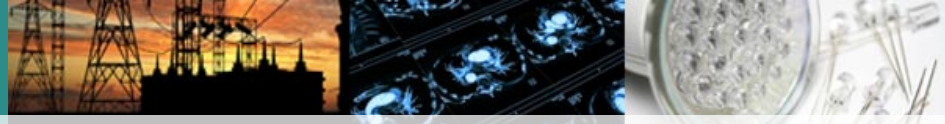
Kirk Anderson
NEMA

Motor Summit 2018 International
Zurich, Switzerland
15 November 2018



The Association of Electrical and Medical Imaging Equipment Manufacturers





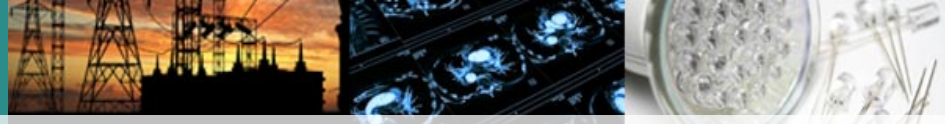
Who is NEMA?

The National Electrical Manufacturers Association (NEMA) represents nearly 350 electrical equipment and medical imaging manufacturers, across 55 product groups focused on making safe, reliable, and efficient products and systems.

Our combined industries account for 360,000 American jobs in more than 7,000 facilities covering every state.

Approximately 20 Motor and Drive manufacturers

Approximately 80% of Motor and Drive market



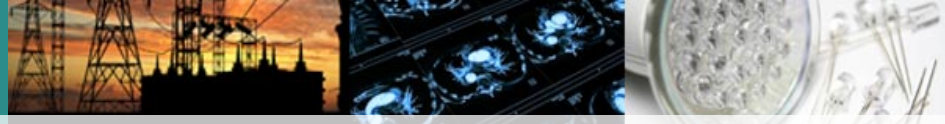
A brief review of our past

20+ years of electric motor energy efficiency regulations

Focused at the maximum operating point of motor

Focused on increasing efficiency, rather than energy savings

Limited resources and requirements related to enforcement



What have we learned along the way?

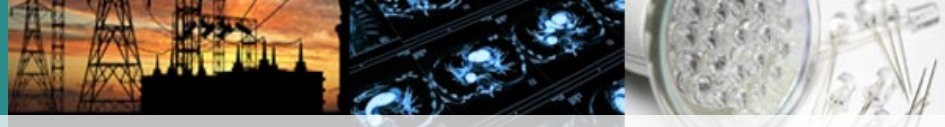
NEMA Members support advanced technology products

The Component approach has reached the limit for practicality

Having an achievable goal is critical

The next phase of work requires working together

More energy savings can be achieved with better compliance and by managing energy at the system level than by additional component regulation



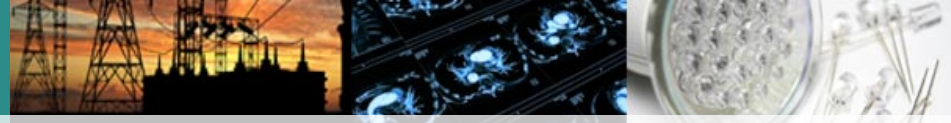
Choosing the right goal....

Is it efficiency?

Is it CO2 reduction?

Is it total energy consumption?

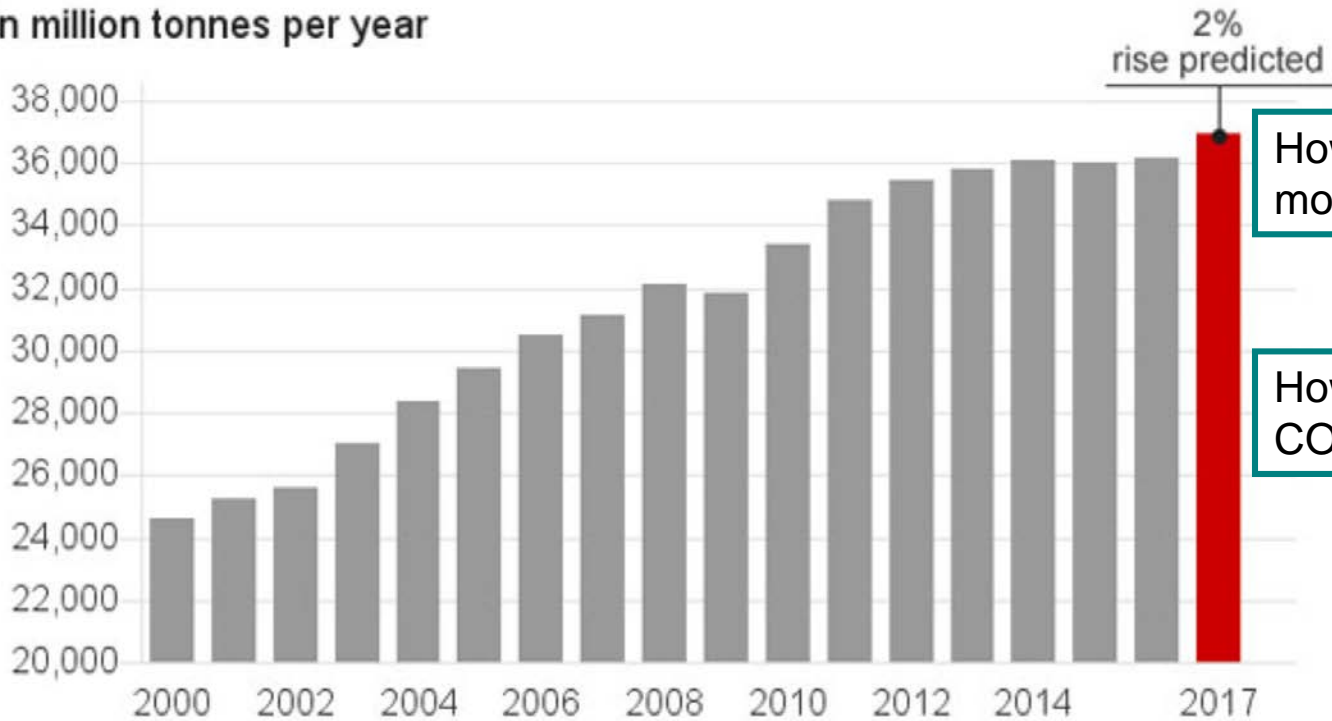
What else could we use?



How we measure affects what we do...

Global CO2 emissions, 2000 to 2017

In million tonnes per year



How much is from motors and motor operated equipment?

How will technology affect CO2 production?

Source: Global Carbon Project



According to the *Global Carbon Project*, carbon production have continued to rise despite regulations.

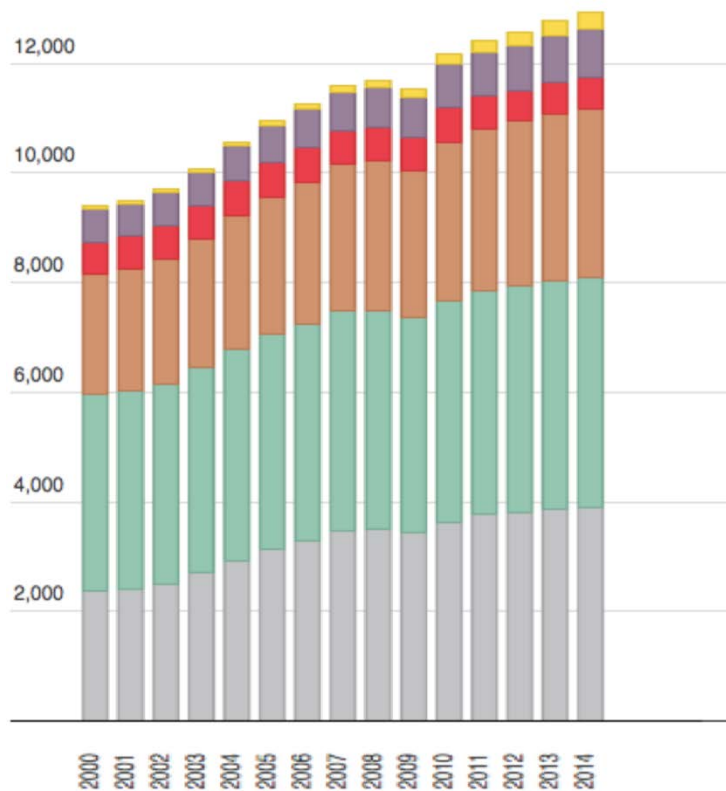


How we measure affects what we do...

Global energy use by source

In millions of tons of oil equivalent

■ Coal
 ■ Oil
 ■ Natural gas
 ■ Nuclear
 ■ Hydroelectricity
 ■ Other renewables



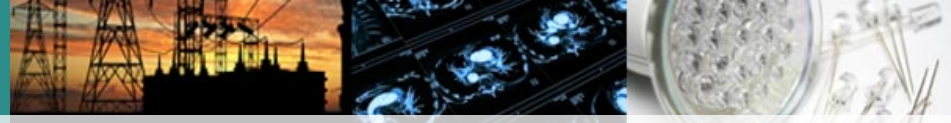
Source: BP Statistical Review of Energy 2015

What if we focus on energy use?

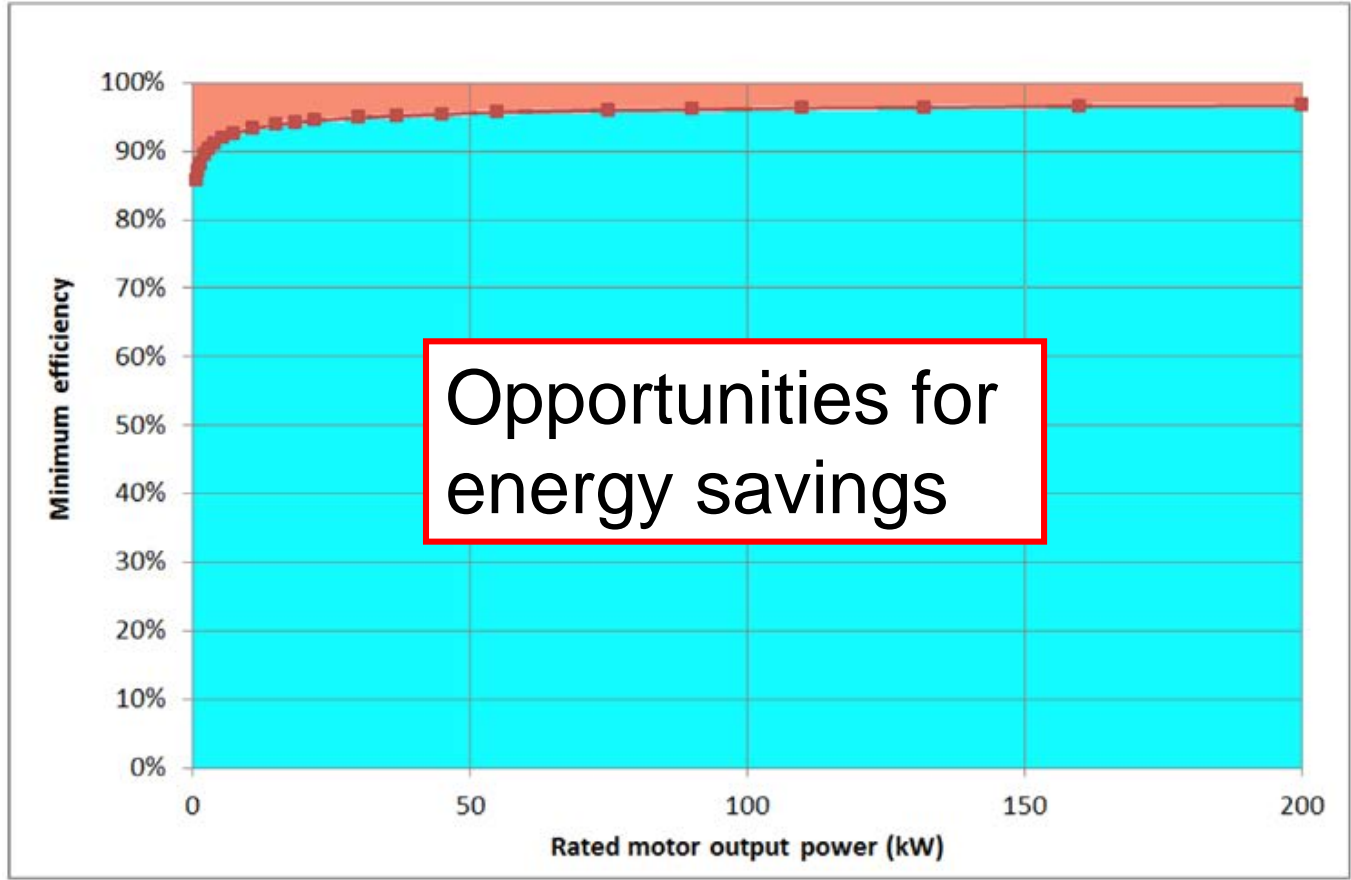
Not all energy affects our environment equally – hard to control

Energy use is based on both output and population – both are difficult to predict

Despite regulations energy demand continues to increase



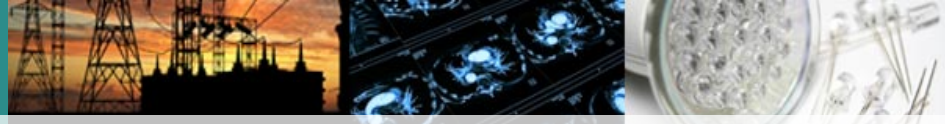
Shift goal to “Energy Management”



Power not converted by motor

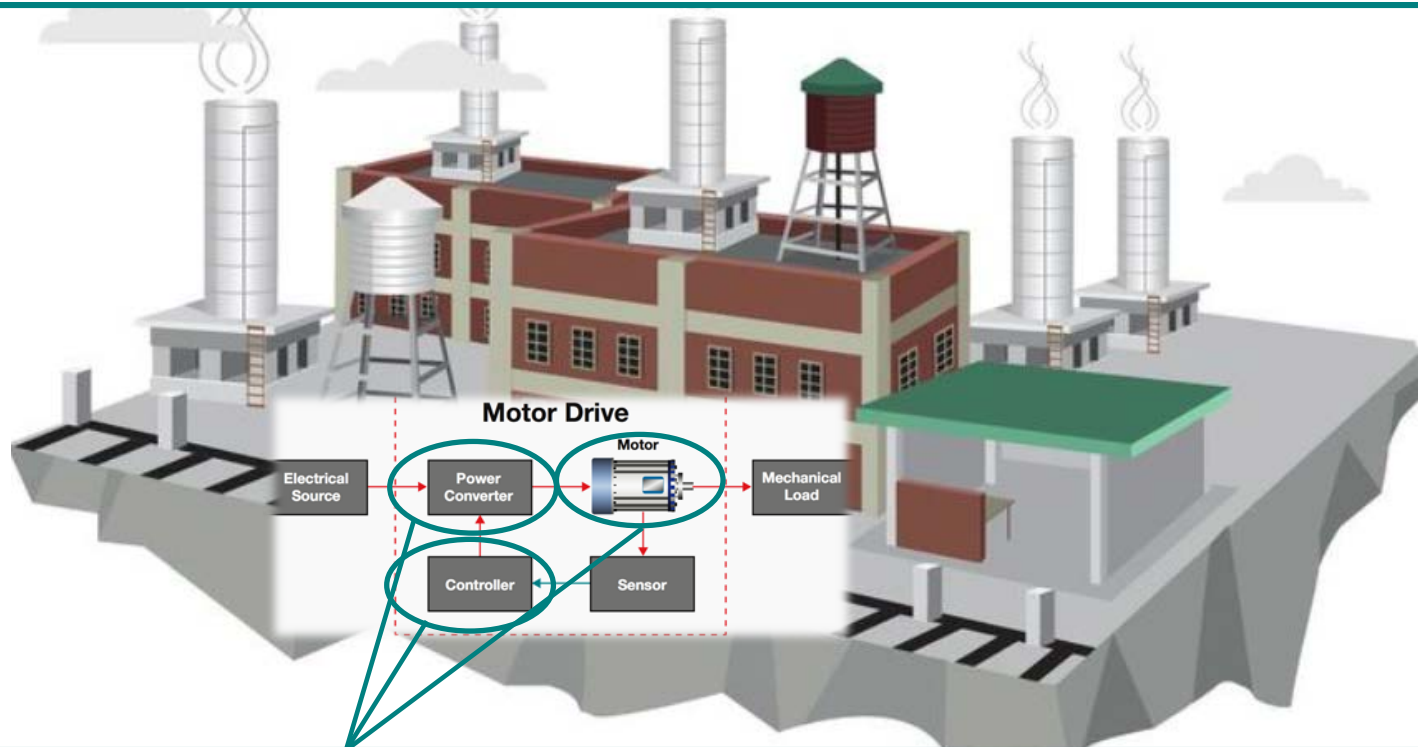


Power consumed from load

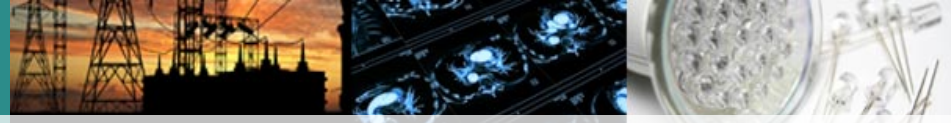


Scope – what should be our focus?

Challenge – while we know energy savings at the systems level is possible, it's much more complicated and requires more collaboration!



Components – Good starting point, but component regulation has reached the maximum reasonable level for regulation. There are other places to save more energy.

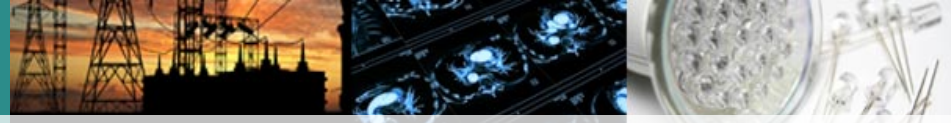


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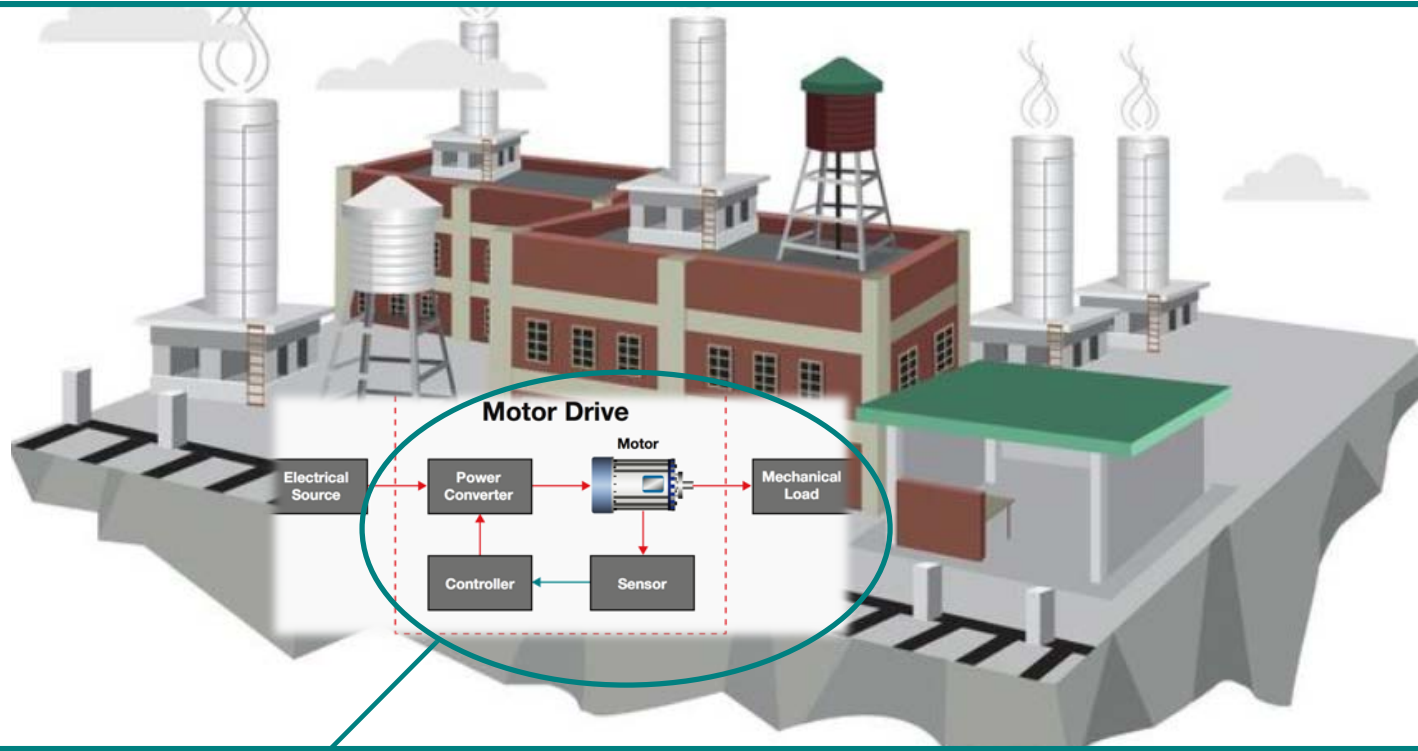


Building (or city) – Too broad since misses opportunities to save energy and can lead to incorrect conclusions

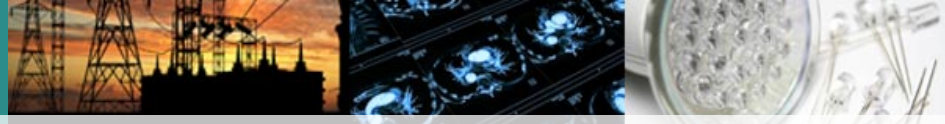


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Motor Driven Systems – While not perfect, it captures majority of energy savings opportunities. Motor Driven Systems would include pumps, compressors, fans (80%)



Motor versus Motor System?

Avoid “rebound” effects:

Poorly suited – Higher efficiency motors may have lower starting torque or higher base speeds, making the overall system run less effectively.

Increased costs to build – The cost to build an ultra-efficient product may exceed energy savings in a particular application.

End-product redesign – Higher efficiency motors may be larger, requiring significant redesign of end-use.

Combination – Higher costs, coupled with improper performance may incentivize sales of non-compliant product – hurting energy savings and legitimate manufacturers.



Standards – where are we?

We have published standards, now what?:

61800-9-1 General requirements for setting energy efficiency standards for power driven equipment

61800-9-2 Energy efficiency indicators for power drive systems and motor starters

60034-2-3 Specific test methods for determining losses and efficiency of converter-fed AC induction motors

Still have limited adoption/use from end-users – in some cases even between technical groups...

Next steps: Need more collaboration with key motor driven system manufacturer associations (Europump, Eurovent, Hydraulic Institute, AMCA, CAGI, IEC, ISO and others)....

NEMA Motor and drive (w/ CEMEP) 2019, IEC/ISO workshop at EEMods 2019



Compliance/Enforcement - What is it and why is it important?

What is meant by “compliance?”

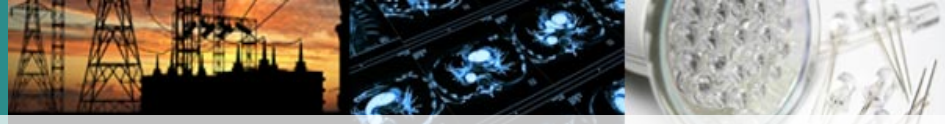
Compliance does not (necessarily) mean “market surveillance”

Compliance does not (necessarily) mean “certification”

Compliance/Enforcement consists of:

Assurance products meet current regulations, and

Having tools that provide ways to calculate energy savings in the final application (system)



Compliance/Enforcement - What is it and why is it important?

Up to 25% of potential energy efficiency program savings lost through poor compliance and lack of enforcement.

“In most markets...

- 20% of the regulated population will comply with any regulation
- 5% will attempt to evade it, and
- The remaining 75% will comply as long as they think that the 5% will be caught and punished.”



Essential tools NEMA can provide

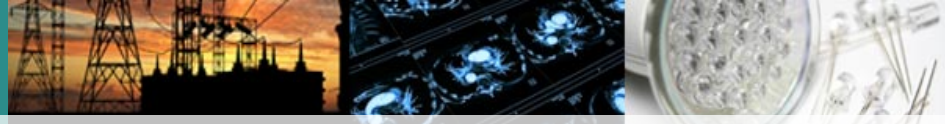
NEMA has previously provided tools to stakeholders through the introduction of the NEMA Premium® motor efficiency program.

Majority of motors sold in the US were NEMA Premium within two years of regulation going into effect.

Expand NEMA Premium® to include better access to global markets through GMEE

Expand NEMA Premium® to include Systems through EMPLI approach

NEMA Premium® is a proven approach for reasonable and effective compliance and enforcement



Final Thoughts

NEMA supports higher efficiency products when it benefits the application

Saving energy is complex and we need to identify the right goal – saving energy versus simply mandating higher efficiency levels on components

“Energy Savings” is a better term to use than energy efficiency.

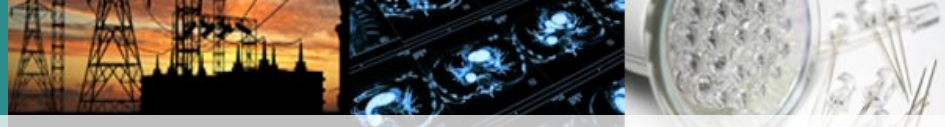
We have standards, now we need to partner with end-users.

Compliance/Enforcement is the key to move from calculated energy saving to true, realized energy savings.

NEMA Premium works. Expanding the program to include Global markets and Motor Systems provides the bridge to help end-users find compliant product.



The Association of Electrical and
Medical Imaging Equipment Manufacturers



Questions?

Email me at:

Kirk.Anderson@nema.org

