



# Impact of New Federal Efficiency Performance Standards on the Industrial Motor Marketplace

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# The American Council for an Energy-Efficient Economy (ACEEE)

Nonprofit 501(c)(3) dedicated to advancing energy efficiency through research, communications, and conferences.

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Focus on End-Use Efficiency in Industry, Buildings, Utilities, and Transportation; Economic Analysis & Human Behavior; and State & National Policy

Funding:

- Foundations (34%)
- Federal & State Grants (7%)
- Specific Contract work (21%)
- Conferences and Publications (34%)
- Contributions and Other (4%)

# History of Motor Efficiency Performance Standards (MEPS)

- 1980s NEMA included *Energy Efficient Motors* specification as part of MG-1
- Based on IEEE 112b test method
- Used by some Energy Efficiency programs for incentives
- Some programs began incentivizing at a higher level
- Some states and provinces began setting mandatory standards

# EPAct-92 Motor Standards

- NEMA and EE advocates came together in 1992 to support minimum standards as part of the *Energy Policy Act of 1992*
- Based on MG-1
- Canada followed suit a few years later harmonizing standards
- Standards have saved over 16 GWh in U.S. alone

# Implementation of EPA Act MEPS

- DOE rulemaking took over 6 years
- Set forward certification and labeling framework based on IEEE and NEMA consensus standards
- Created significant market confusion and misinformation
- Lead to the emergence of new “premium” efficiency levels for incentive programs

# ***NEMA Premium***

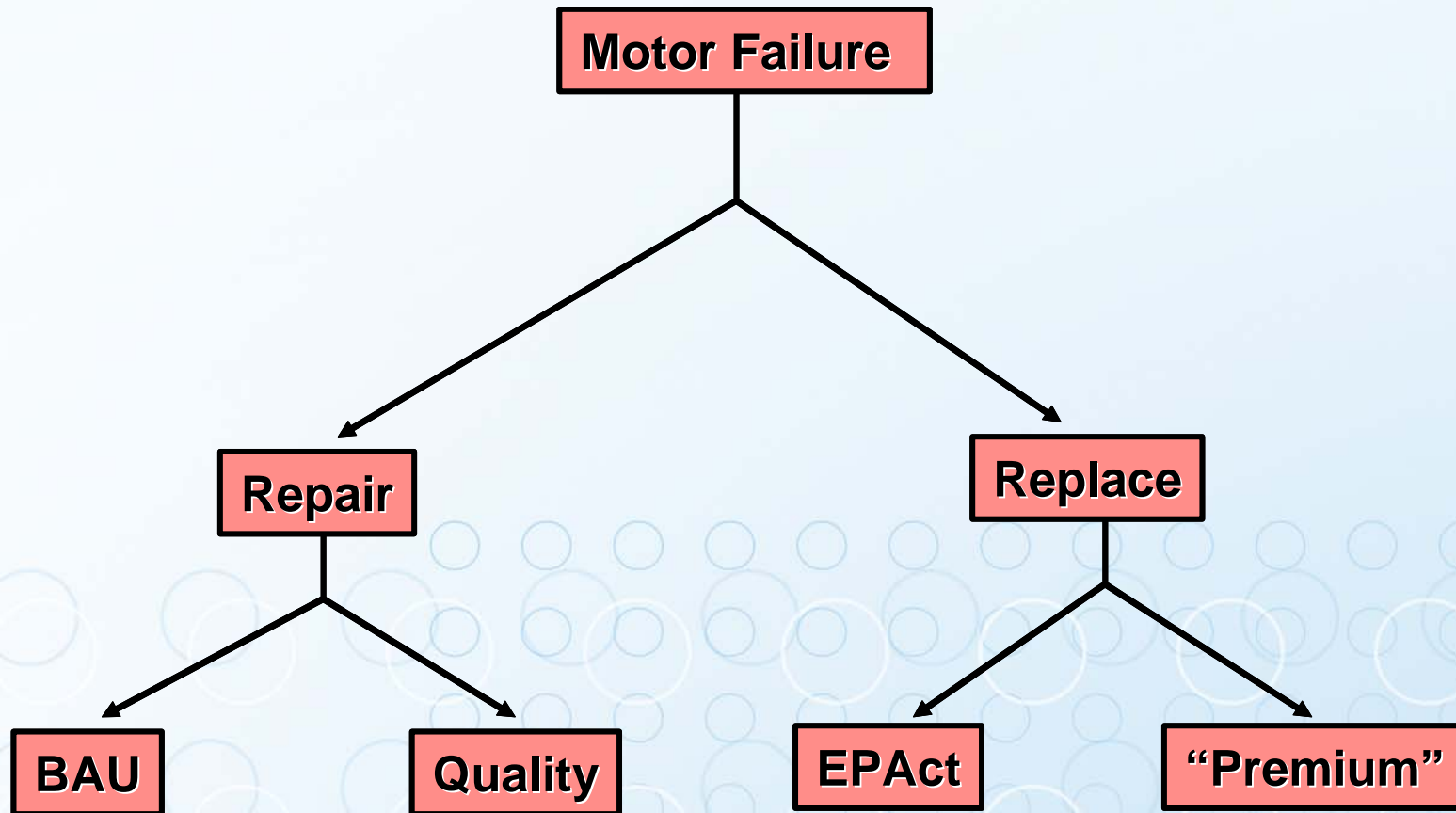
- CEE lead effort to develop a “standard” level for “premium efficiency”
- CEE supported NEMA in the development of a national consensus label – *NEMA Premium*
- Single label made identification of qualifying product simpler:
  - Helped reduced confusion
  - Reduced transaction cost of choosing products
  - Allowed manufacturers to develop new marketing strategies

# Motor Decisions Matter

NEMA and Motor Efficiency Programs came together in national educational initiative:

- Managed by CEE
- Built on *NEMA Premium* label
- Allowed for consistent message
- Focused on repair—replace decisions

# Motor Decision Tree



# Motor Programs in this Decade

- Programs effective in shifting a portion of motors to *NEMA Premium*
  - Large energy users shifted to lifecycle decisions
  - Other users continued with first-cost
  - Limited penetration in OEM markets
- Penetration plateaued
- Manufacturers came to ACEEE about raising the efficiency bar – negotiated agreement on new levels

# Energy Independence and Security Act of 2007 Motor Standards

Section 313 set new motor MEPS:

- Move all general purpose product to *NEMA Premium* levels (as defined in MG1 Table 12-12]
- Add six categories of motors not included in original EAct-92 at MG1 Table 12-11 efficiency levels
  - U-Frame Motors
  - Design C Motors
  - Close-coupled pump motors
  - Footless motors
  - Vertical solid shaft normal thrust (tested in a horizontal configuration)
  - 8-pole motors (~900 rpm)

# EISA Motor Standards (continued)

- Extend coverage to all poly-phase motors with voltages up to 600 volts — other than 230/460 volts — at MG1 Table 12-11 efficiency levels
- Extend coverage to 201-500 horse power, low-voltage general purpose design “B” motors at MG1 Table 12-11 efficiency levels.
- Standards go into effect December 2010 for motor manufactured or imported into the U.S.
- Canadians are following suit

# Impacts of New MEPS

- Manufacturers already incorporating into business plans
- Increased cost likely to shift some decisions back to repair from replace
- Economic slow-down likely to further shift to repair
- Many motor program phasing out or have not factored in changes to incentives

# Performance of New Motors

- Significantly more efficient
- As reliable as EPart motors
- Problems with starters not anticipated – changes in NEC already anticipate higher in-rush currents
- Major compatibility issue may be motor length due to greater stack length

# Appropriate Responses from Users

- Review motor management plans—no plan = bad decisions
- Reassess motor repair—replace decision criteria to reflect:
  - New motor costs
  - Uncertainty in projected electricity prices
- Remember that motors “live” for decades

# Appropriate Responses for Motor Programs

- Shift focus from encouraging “premium” to focusing on repair-replace decision
- Remember that motors above 200 HP are not moving to *NEMA Premium*—represents an opportunity for incentives
- Begin exploring motor system efficiency strategies—much greater efficiency opportunity in system approaches

# Complementary Federal Policies

## Senate Energy Bill

- Provision introduced by Sen. Lincoln (D-AR) and Sen. Pryor (D-AR)
- Would establish a crusher credit program
  - DOE to provide incentives to replace older motors with new NEMA Premium<sup>®</sup> motors
  - Grants would be available to provide:
    - \$25 per horsepower to the end user purchasing a replacement motor
    - \$5 per horsepower to the Vendor selling the replacement motor





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