



**Iowa Center for Industrial
Research and Service**

www.ciras.iastate.edu

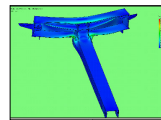
Alex Kisslinger



IOWA STATE UNIVERSITY
University Extension

Mission

To enhance the performance of Iowa industry through education and technology-based services.



**Technical
Assistance**



Research



Education

IOWA STATE UNIVERSITY
University Extension

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Acknowledgements

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Study Structure

- Preliminary analysis
- Survey
 - Customers
 - Distributors
- Conclusions

Preliminary Analysis

- Based on DOE Study
 - *U.S. Industrial Motor Systems Market Opportunities Assessment*
- Accounted upgrades only
 - Standard → EPAAct
 - Standard → PEM

How It Was Done

- Calculations for 2-digit SIC
- Based on percent savings
 - National
 - Motor systems
 - Net electricity

Preliminary Results

Motor System Usage, GWh/yr	Savings from Standard to:		
	EPAct, GWh/yr	PEM, GWh/yr	Range, GWh/yr
3,365	71	108	36 to 108

Survey

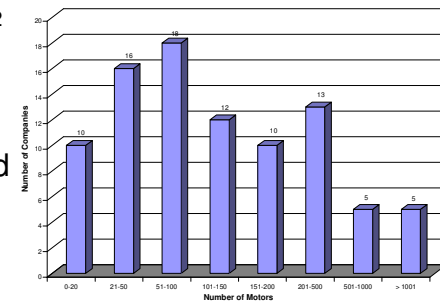
- Based on DOE study
- Focus areas
 - Facility information
 - Replacement patterns
 - Rewind/replace decision
 - Motor purchasing practices
 - Motor maintenance practices
 - Pumps, fans, and air compressors practices
- Customers vs. Distributors

Survey Participants

- Customers → 2000 < SIC < 3999
 - 419 accounts
 - 279 companies
- Distributors
 - 52 distributors
 - 20% business in IA + work with motors > 1hp

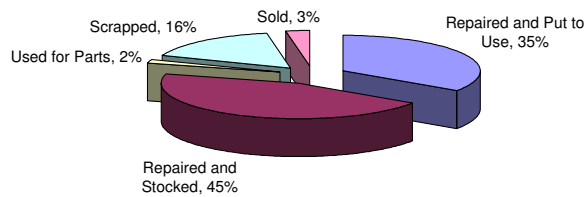
Survey Respondents

- Customers
 - 34% response
 - Avg. of 97,000 ft²
- Distributors
 - 73% response
 - Evenly distributed across sizes



Replacement Pattern

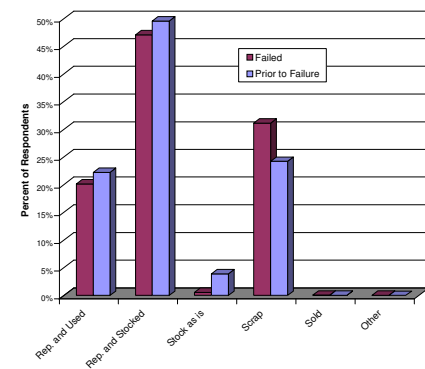
- Failure of 4% per year
 - 25 yrs vs. 7-10
- Prior to failure replacement of 7% per year
 - 14 yrs.



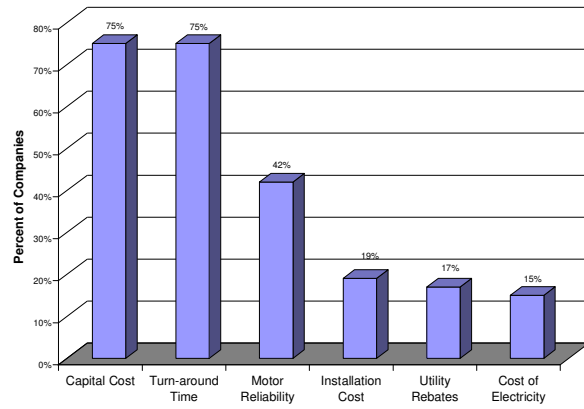
Motor Placement When Replaced Prior to Failure

Rewind vs. Replace

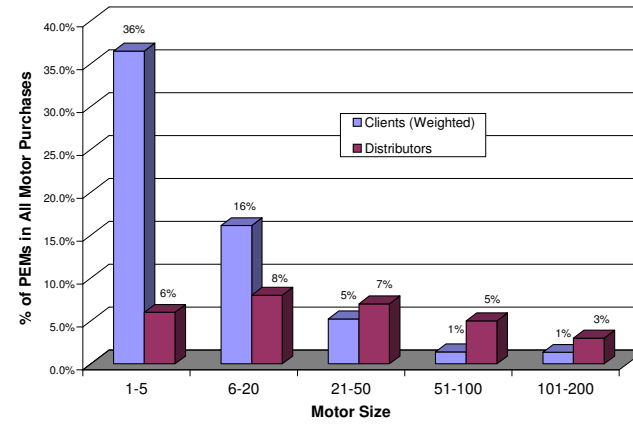
- Type and motor hp
- More rewinds for large motors



Cost



PEM Purchase Rates



Conclusions

- Savings likely near the 108 GWh/yr estimate
- No motor procurement strategy
- Decisions made in short-term benefits
- Simply using PEMs when replacing motors would save about 7 GWh/yr

Recommendations

- Develop and implement a PEM educational program
- Business case must be examined
- Conduct research on lack of PEM availability

Contact

Alex Kisslinger

(515) 294-1588

alexkr@iastate.edu

www.ciras.iastate.edu

