



# **Development of a New Extended Motor Product Label for Inclusion in Energy Efficiency Programs** *(ID 401)*

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Panel 3: Commercial Buildings: Technologies, Designs, Operations, performance, and Building Industry Trends

Session 1: Advances in Building Lighting Technology

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

- ACEEE is a nonprofit 501(c)(3) that acts as a catalyst to advance energy efficiency policies, programs, technologies, investments & behaviors.
- Nearly 50 staff based in Washington, D.C.
- Focus on end-use efficiency in industry, buildings, utilities & transportation
- Other research in economic analysis; behavior; national, state & local policy.
- Funding:
  - Foundation Grants (52%)
  - Contract Work & Gov. Grants (20%)
  - Conferences and Publications (20%)
  - Contributions and Other (8%)



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# Premise of the Extended Motor Product Label Initiative (EMPLI)

An *Extended Product* Label provides a bridge between component prescriptive incentives and custom incentives for system improvements.

- Labeled product can be attributed deemed savings—reduces evaluation costs

*Therefore:*

- Labeled product can receive prescriptive incentives—reduces administrative costs

# Outline

- Industrial Energy Efficiency Programs
  - Prescriptive programs
  - Custom programs
  - Market transformation
- Moving from Device to System Savings
- Extended Motor Product Label Initiative
  - Who, what, when, and why
  - Goals and progress to date

# Typology of IEEPs

Program Type	Strengths	Weakness
Prescriptive Incentive	Technology-specific	Limited ambition; not universally applicable
Custom / Process Efficiency	Facility-specific, flexible	Inconsistent assessment of data
Strategic Energy Management	Systemic	Long time frame. Can be difficult to mesh with program funding
Market Transformation	Scattered, small, amorphous	Supply-chain and vendor orientation
Self-direct Options	Flexible, conceptually popular with customers	Some questionable M&V. May overlook opportunities

# Prescriptive Rebate Programs

Provides a rebate for specific products that have been determined to be more efficient than industry average. The energy savings are “deemed” to be a certain amount based on industry norms.

Incentive could be fixed, or determined by size such as \$10/hp for high-efficiency motors or variable speed drives.

# Example: Prescriptive Rebates

## Example: NEMA Premium ®

- Label identifies highest efficiency motors
- Label is acceptable documentation for efficiency programs
- Incentive usually \$/hp
- Incentive assumes an average duty cycle and improvement over norm

# Custom Programs

Intended for non-routine and complex projects such as production line upgrades, heat recovery, combination gas & electric, and new Installations.

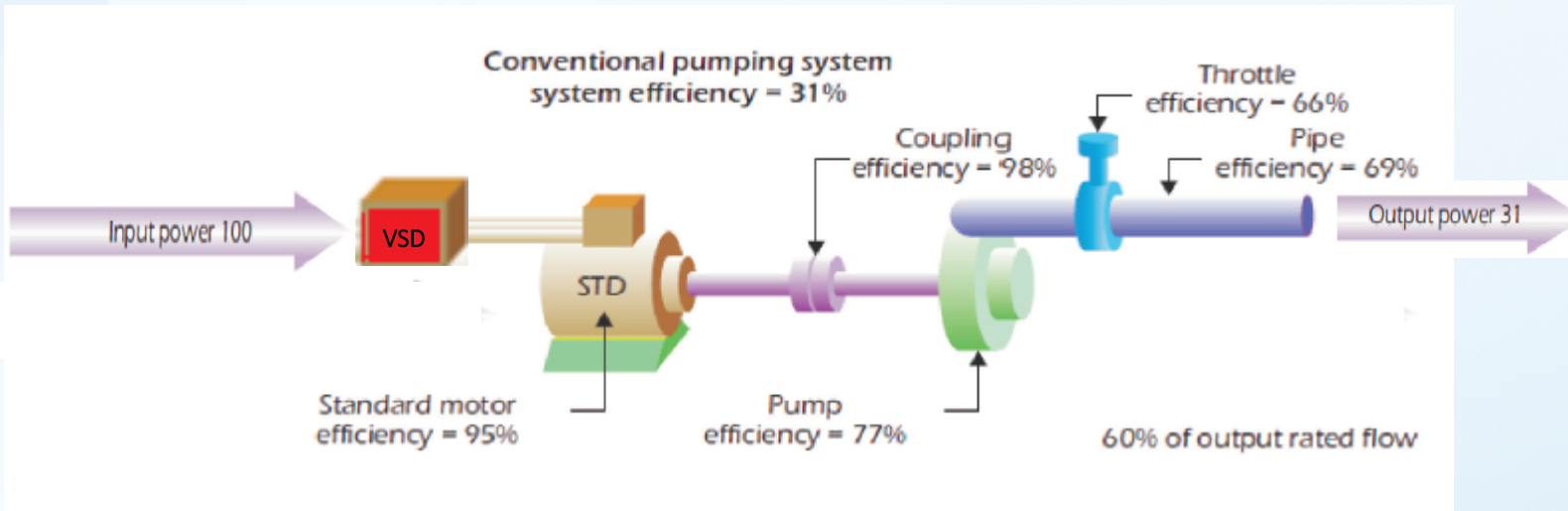
- Incentive of \$/kWh or \$/kW
- Requires upfront and post analysis
- The complexity of the analysis determines the degree of cost effectiveness



# Market Transformation

- Encouraging the market to make available more efficient products
  - Development of new products
  - Labeling programs
  - Working with supply chain
  - Vendor and customer education

# Moving from Device to System Savings



End Use Demands

Minimum Energy Performance Standards (MEPS)

Extended Product- Motor-Driven Package Label

Energy Efficiency of System Supply

Energy Efficient Engineering Practices & System Assessment Standards

# Energy Savings Program Options

Motor System Element	Sample % System EE Opportunity	How EE Opportunity Identified	Potential Program Response
Motor	2-5%	Label (MEPS, NEMA Premium)	Deemed Savings Eligible Product List
Drive	3 - 10%	Product class	Deemed Savings
Driven Equipment (Pump, Fan, Air Compressor)	10-25% for fans/ pumps/ compressors*	Stated performance (AMCA label, CAGI data sheets, HI performance curves)	Deemed Savings Eligible Product Type Custom Program
Extended Product: Motor-Driven Package	15-35%	Label (proposed)	Eligible Product Type Custom Program
System Supply	15 - 40%	Performance Indicator (e.g. CASE) System Assessment	Technical Assistance Custom Program
Entire System	20 – 50%+	System Assessment (standards)	Technical Assistance Custom Program

\* Compressor efficiency typically due to improved load control capabilities

# Motor Applications by HP

**Table 7.2.3 Distribution of Motors by Application for NEMA Design A and B Motors (in percent)**

Application	Horsepower (hp) range						all hp
	1-5	6-20	21-50	51-100	101-200	201-500	
Air Compressor	1.8	1.3	2.2	5.6	5.4	8.3	2.2
Fans	22.5	24.9	26.6	25.7	18.9	21.7	24.0
Pumps	22.3	31.6	33.0	34.2	36.0	25.5	28.5
Material Handling and Processing	12.0	9.4	6.8	10.6	7.8	7.6	10.0
Other	41.4	32.8	31.4	23.9	31.9	36.9	35.3
Fire Pumps	0.0	0.0	0.0	0.0	0.0	0.0	0.0

*50 million in connected horsepower sold every year*

# Pros and Cons of Targeting Systems Savings

- Opportunities for energy savings from motor systems are often greater than from components alone
- But are difficult to incorporate into an efficiency program because:
  - Difficult to measure
  - Difficult to verify
  - Savings dependent upon use

# New Opportunity

If you could develop a method to capture some of the savings attributable to system efficiency, then you would:

- Reduce M&V costs
- Reduce program administration costs
- Acquire energy savings at a lower cost

# Motivating Example: NEMA Premium®

The NEMA Premium® label helps efficiency programs and users.

- Procuring requires additional effort to seek out & specify more efficient products.
  - Labeling reduces the transaction cost of procuring efficient products which in turn reduces the cost of ownership
  - Procurement can be more than a third of lifecycle cost
- Label components proven success
  - Basis of many prescriptive rebate programs

# Extended Motor Product Label Initiative (EMPLI) – *a brief history*

- Emerged from standards engagement
- Three working groups are developing labels for compressors, fans and pumps
- Voluntary comparative performance metrics (label) for product differentiation & use in prescriptive or semi-prescriptive rebate programs
- Industrial partners: AMCA, CAGI, FSA, HI, NEMA
- Utility & EE partners: BPA, ConEd, ETO, National Grid, NEEA, PG&E, SCE, and Sempra
- Meetings in October, December, February & May



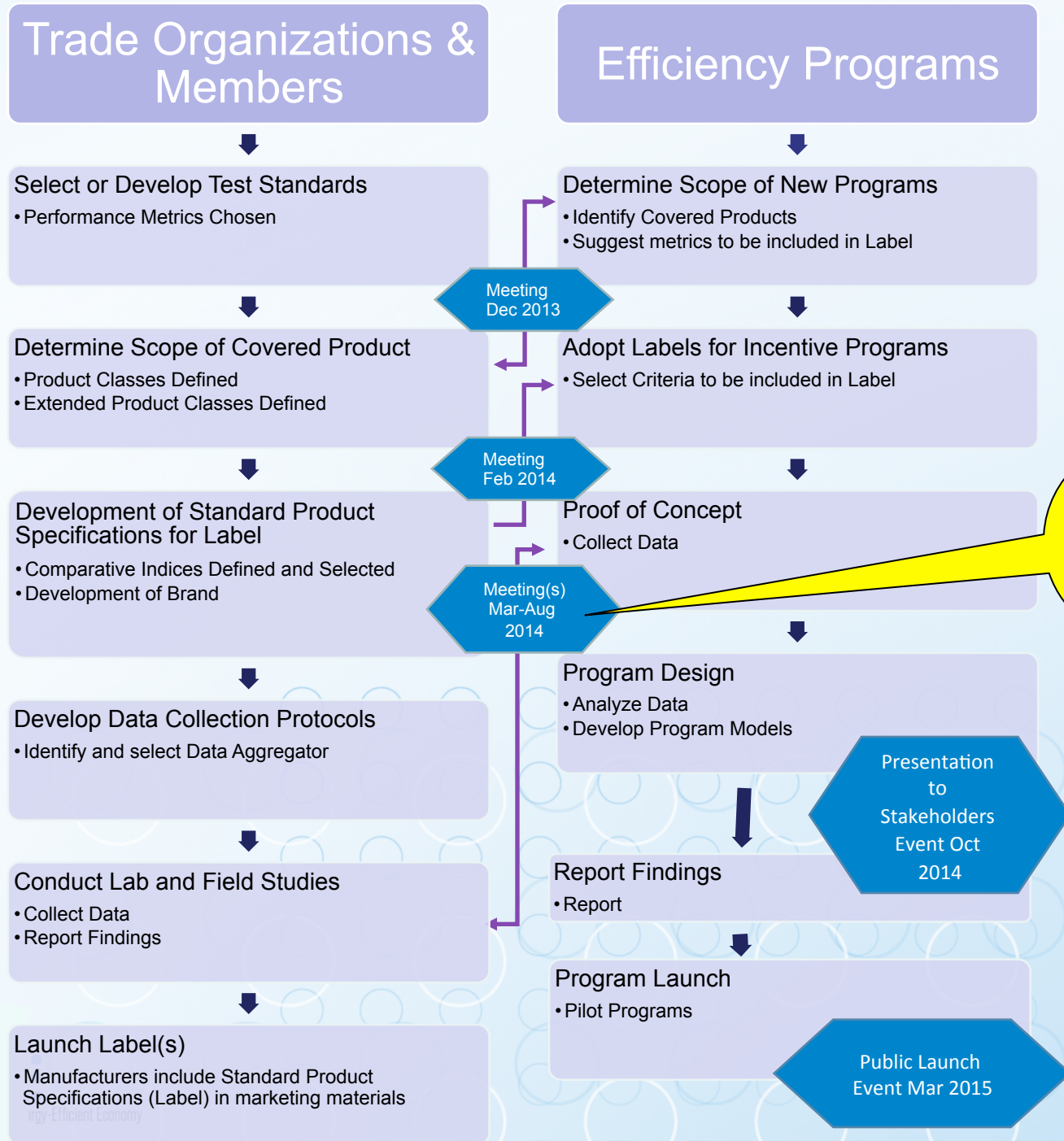
# Goals for Initiative

- Develop voluntary labels that establish *component* and/or *extended product* identification scheme that meets utility sector energy efficiency program requirements for incentives
- Each trade organization to develop a label(s)
- Describe products in a manner that can be readily understood in the respective markets
- Use existing or proposed trade association product testing and performance metrics
- Define necessary measurement and verification protocols

# How does the coalition work?

- Creates a vehicle for communication between power utilities and efficiency program managers with manufacturers of motor driven loads
- Gathers leading product experts with the incentive experts
- Identifies processes to accelerate creation of product efficiency performance metric and label for incorporation into a work paper
- Forms teams to identify and collect the information necessary to complete cost benefit analyses and working papers

# Extended Motor Product Label Initiative Schedule



# After the Initiative

- Trade associations will create the labels or marks identifying their respective highly efficient products
- Trade association may elect to include an MOU and license agreement for their respective labels
- Trade association will be responsible for any registration or trade mark of their label
- Co-branding with NEMA Premium may be an option
- Labeled efficiency performance products will be marketed to utilities/OEM's/states/other trade associations and End Users
- Product labels provide a performance identifier to support utility incentive programs

# Calendar

- Facilitation of working groups
  - December 2013 through December 2014
  - Next meeting: September 30, Seattle, WA
- Preparation of proposed extended-product label
- Presentation of proposed label and data needs to stakeholders and DOE
- Collection and analysis of field performance data and stakeholder review

- Preparation of final project report and dissemination to key target audiences including
  - NARUC, International Energy Program Evaluation Conference, individual utility regulators March 2015
  - EEMODS 2015 paper Helsinki
- National marketing campaign begins
  - Trade associations
  - ACEEE and other NGOs
  - State energy offices
  - DOE Advanced Manufacturing Office

# Conclusions

- Utility sector efficiency programs are a key market opportunity
- Program have a need and interest in an extended product performance label around which to build new programs
- Opportunity to differentiate products
- Label can become a purchasing spec.
- The EMPLI is on track to meet these needs → Energy Savings!

# Thank you!

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