



# CEE Efforts to Identify and Develop New Program Opportunities

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January 25, 2012  
San Diego, CA

# The Challenge: Ever Increasing Savings Targets

# Session Overview

- ▶ Highlights of CEE Work Across Sectors:
  - Enhancing existing initiatives
  - Incorporating novel approaches and innovative technologies
  - Utilizing market focused strategies
  - Exploring opportunities with transformative platforms
- ▶ Overview of the ET Collaboration Supplemental Project

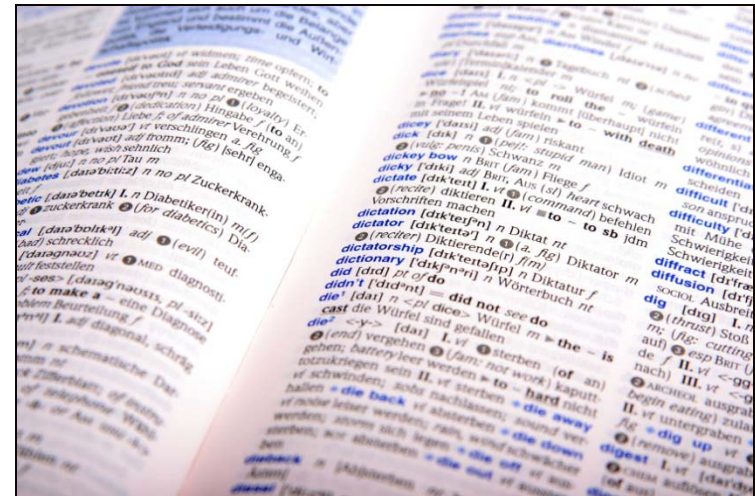
# History of the ET Collaboration

- ▶ Need identified by program administrator members conducting own ET assessments
- ▶ Come together to identify synergies and opportunities for collaboration

Goal: Enhance their own work and accelerate the adoption of emerging technologies into their programs

# Emerging Technology Assessments

- ▶ Commercialized or near market ready technologies, requiring further demonstration of
  - Energy savings
  - Product performance and reliability
- ▶ Also includes markets and programs



Source: Microsoft

Focus is on Determining Program Readiness

# Importance of Program Readiness



# Collaboration's Scope of Work

- ▶ Supporting collaboration on participant work
  - Sharing assessment plans and results
  - Discussion of common assessment needs
  - Development of common protocols
- ▶ CEE is not looking to set an agenda or manage large research projects

Facilitating collaboration to enable shared learning to advance their own assessment work

# Collaboration Participants

- ▶ BC Hydro
- ▶ Bonneville Power Administration
- ▶ Commonwealth Edison
- ▶ DTE Energy
- ▶ Duke Energy
- ▶ Northwest Energy Efficiency Alliance
- ▶ NYSERDA
- ▶ Pacific Gas & Electric
- ▶ Sacramento Municipal Utility District
- ▶ Sempra (SDG&E and SoCal Gas)
- ▶ Southern California Edison
- ▶ Tennessee Valley Authority
- ▶ Xcel Energy

# Composition of Collaboration

- ▶ Both electric and gas end uses
- ▶ Varying regulatory/program considerations
  - Heavy hydro, with low power costs
  - High power costs
  - Credit for climate benefits
- ▶ Differences in weather and humidity
- ▶ Bring different scopes and experience with ET assessments

# Collaboration Accomplishments

## Development of Enabling Framework

- ▶ Consistent definition
- ▶ Consistent approach



Providing a basis for efficient, effective collaboration



Source: Microsoft

# Two Key Framework Documents

## 1. Recognized Principles for Assessing for Program Readiness

Participants perspective on considerations for and qualities of ET assessments

## 2. Assessment Report Template

Identifies key information needs for transferability of results through increased consistency and definition

# Planning for 2012

Dedicating more time to the substance and collaboration on assessment challenges

- ▶ Discussing challenges that may benefit from broader collaboration
- ▶ Honing in on actionable opportunities for collaboration
- ▶ Parse out the relative readiness of a variety of opportunities

# Managing for A Broader Impact

- ▶ Hopeful the outcomes will have a broader impact:
  - Potentially inform CEE work planning
  - Provide insights into program ready opportunities

The perspective of this group provide a good starting place bringing vetted, considered outcomes with broader impact

**But Wait, There is More...  
Much More**

# Questions on the ET Collaboration?

# Contact

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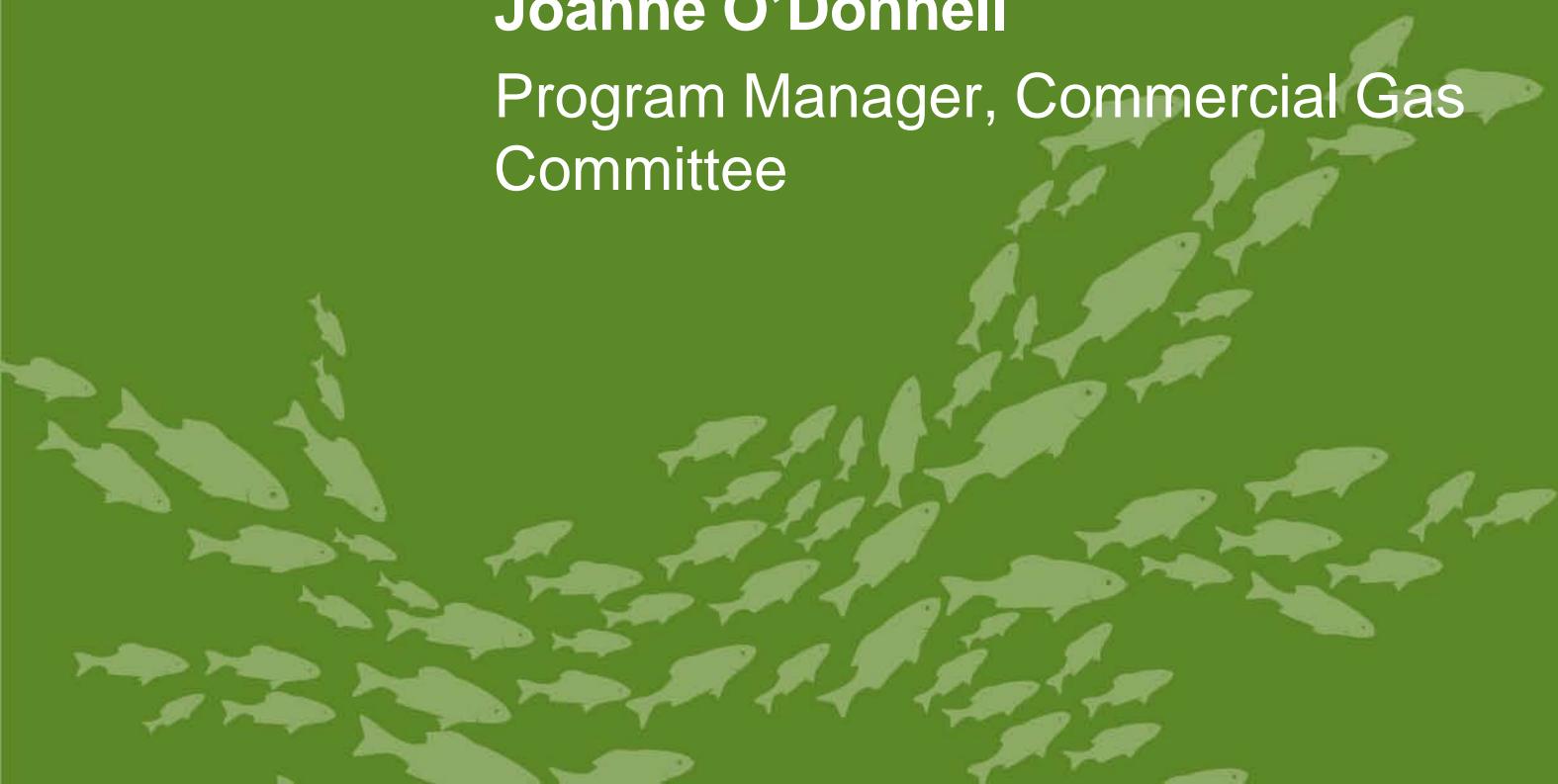
# CEE Program Committee Short Takes



# Commercial Boiler Systems and Commercial Water Heater Initiative Updates

**Joanne O'Donnell**

Program Manager, Commercial Gas  
Committee



# Two New Natural Gas Initiatives Adopted in 2011!

## ▼ High Efficiency Natural Gas Commercial Water Heating Initiative

- Effective June 24, 2011



Source: [www.hintonokc.com](http://www.hintonokc.com)

## ▼ High Efficiency Natural Gas Commercial Boilers System Initiative

- Effective June 1, 2011



Source: [www.energystar.gov](http://www.energystar.gov)

# Commercial Boiler Systems Initiative Approach

- ▶ Equipment and Functionality Specification
  - Specifies efficiency levels
  - **PLUS:** Identifies key boiler functionality that will help optimize the boiler regardless of application
- ▶ Quality Installation with a focus on **Rightsizing**
- ▶ Quality Operations and Maintenance

Incorporating each of these into a program will help to advance optimized boiler systems

# Next Steps in Support of the Boiler System Initiative

Looking to enhance member support in the three main initiative areas!

- ▶ Short-term guidance pieces:
  - Energy Efficient Tune-ups
  - Quality Installation with a focus on rightsizing
- ▶ Longer-term efforts:
  - Challenge of the efficiency metric
  - Other control requirements
  - Other O&M guidance

## ▶ Next Steps:

- Utilize the CEE Forum to develop guidance on QI and Q O&M
- Coordinate with Industry to Develop CEE Qualified Products List for Boiler Systems

# Commercial Water Heating Initiative

- ▶ Technology neutral specification tiers for commercial storage and tankless water heaters

## 1. Equipment Efficiency Specifications

Tier	Equipment Efficiency
1	90% thermal efficiency
2	94% thermal efficiency

- ## 2. Outreach and Awareness Building Activities with Supply Channel and Key Building Level Decision Makers

# Next Steps in Support of the Commercial Water Heating Initiative

- ▼ Foundation-building components:
  - Market Sector Analysis
  - Technology Selection Guidance

**Come to our breakout session today!**  
1:30 to 3:00 pm  
Congressional Room, Second Level

- ▼ Longer term efforts:
  - Data Collection from Field/Lab Studies
  - Guidance Resource or “toolkit” for working with installers, building owners, and other key decision makers
  - Efficiency System Design Configurations

# Contact

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# **C&E Distribution Transformer Initiative Update and Leveraging New Test Procedures to Achieve Greater Savings in Blowers**

**Jess Burgess**

Program Manager, Distribution Transformers and Water-Wastewater Committees



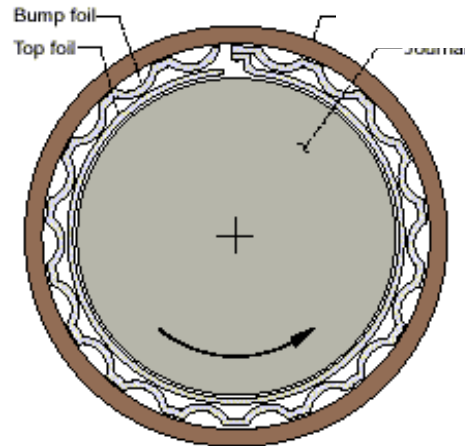
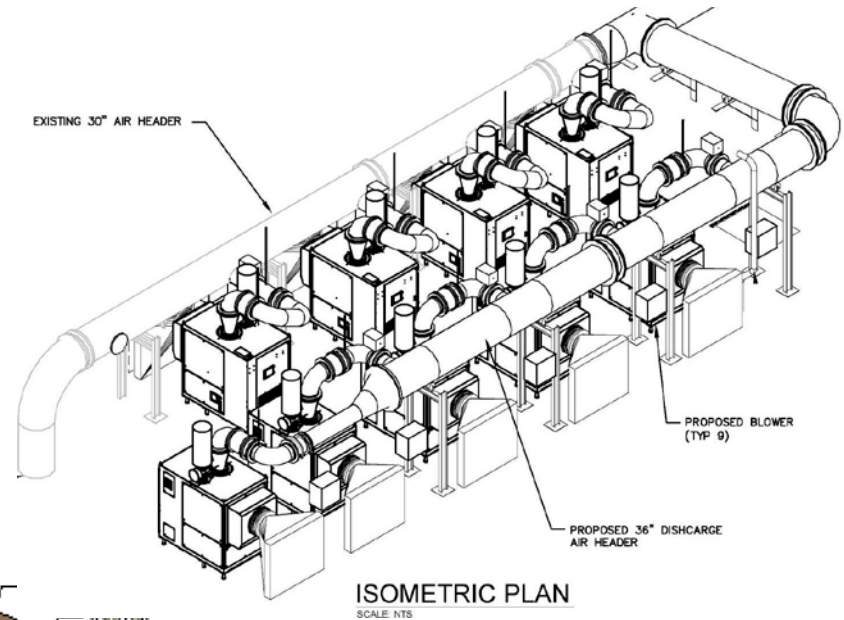
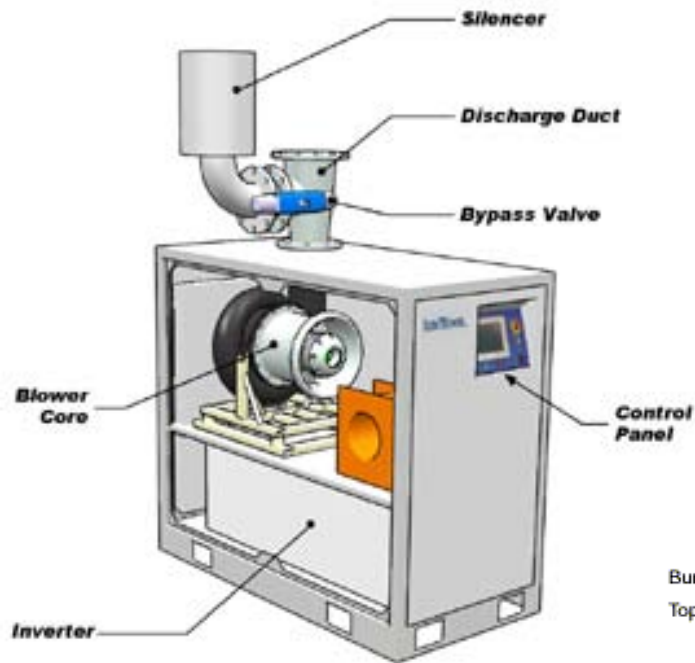
# C&I Distribution Transformers

## ◀ Updated initiative and specification

Single Phase Transformers Low Voltage			Three Phase Transformers Low Voltage			
Size (kVA)	Baseline <sup>2</sup>	CEE Tier 1	Size (kVA)	Baseline	CEE Tier 1 <sup>4</sup>	CEE Tier 2 <sup>3</sup>
15	97.7	98.39	15	97	97.9	98.40
25	98	98.6	30	97.5	98.25	98.65
37.5	98.2	98.74	45	97.7	98.39	98.78
50	98.3	98.81	75	98	98.6	98.93
75	98.5	98.95	112.5	98.2	98.74	99.03
100	98.6	99.02	150	98.3	98.81	99.10
167	98.7	99.09	225	98.5	98.95	99.40
250	98.8	99.16	300	98.6	99.02	99.44
333	98.9	99.23	500	98.7	99.09	99.51
			750	98.8	99.16	99.56
			1000	98.9	99.23	99.59

◀ Staff contact: [jburgess@cee1.org](mailto:jburgess@cee1.org)

# Breaking New Ground: Test Procedure Development for Blowers



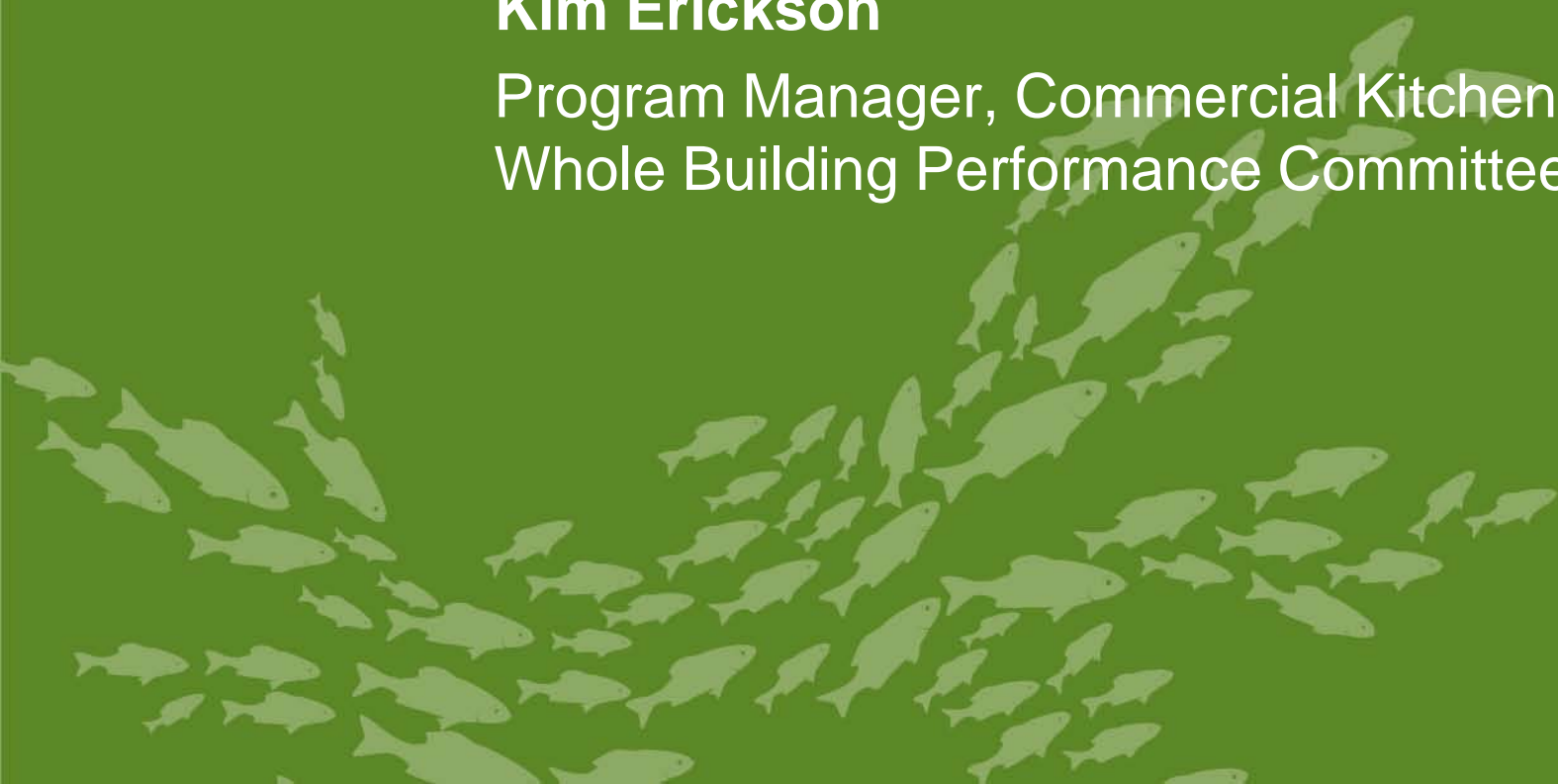
# Contact

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# **Commercial Kitchen Ventilation Field Testing: Demand Control Ventilation**

**Kim Erickson**

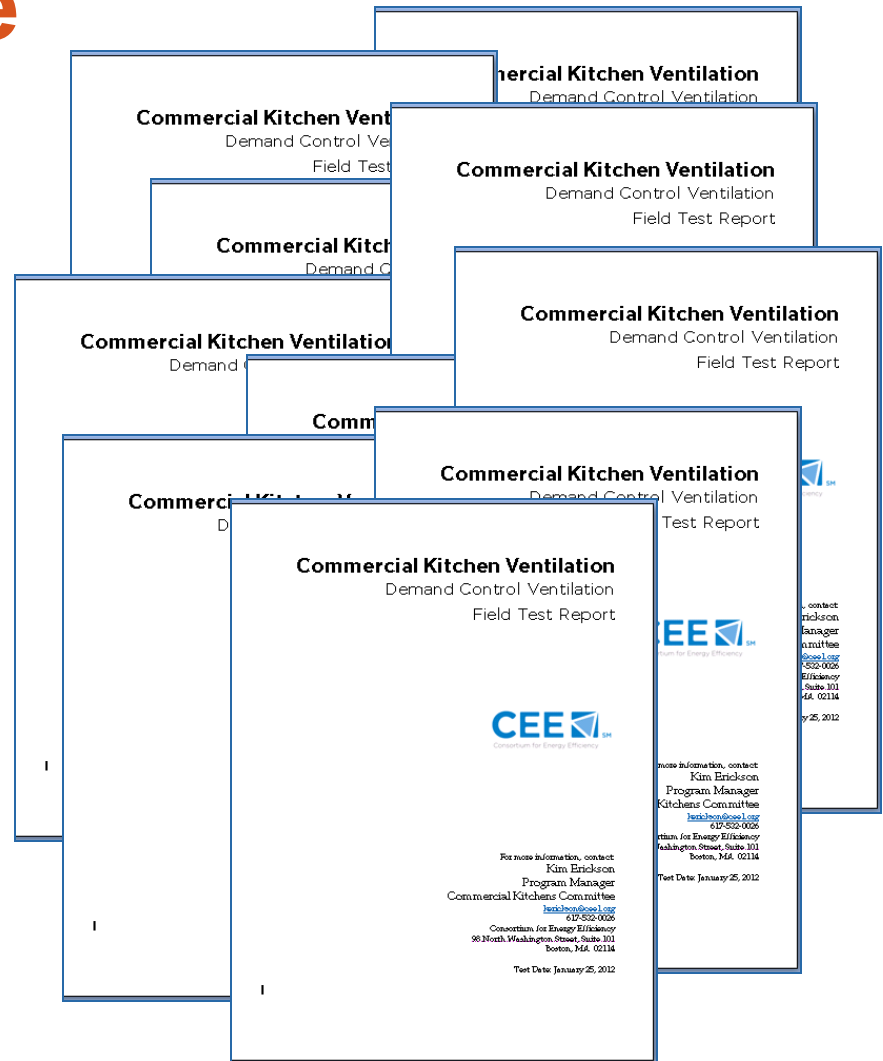
Program Manager, Commercial Kitchens and  
Whole Building Performance Committees



# CEE CKV DCV Field Test Protocol and Clearinghouse



Photo courtesy of Halton



# How to Contribute: Contact Kim



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# Efficient Commercial Lighting System Layouts for Defined Space Types

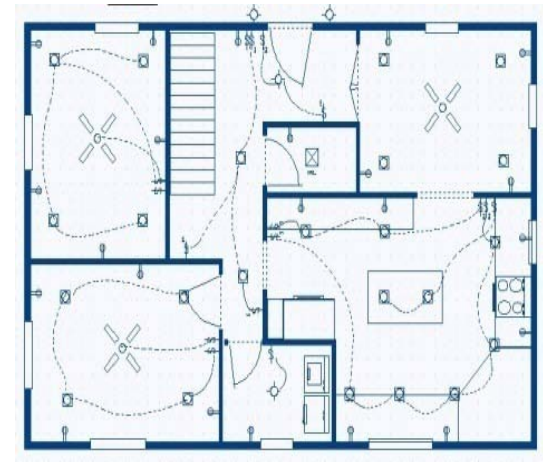
**Kate Baldacci**

Program Manager, Commercial Lighting  
Committee



# Commercial Lighting Design Templates

- ▼ Development of lighting templates for Warehouse, Schools and Small Office
  - Define efficient lighting systems/practices for warehouse space
  - Test solutions in the field
  - Improve based on experience



Warehouse templates currently underway

# Next Steps

- ▶ Review key components of warehouse templates
- ▶ Deliberate and provide input on deliverables
- ▶ Define demonstration phase requirements and success metrics

Next Meeting: February 8<sup>th</sup> at 2pm Eastern

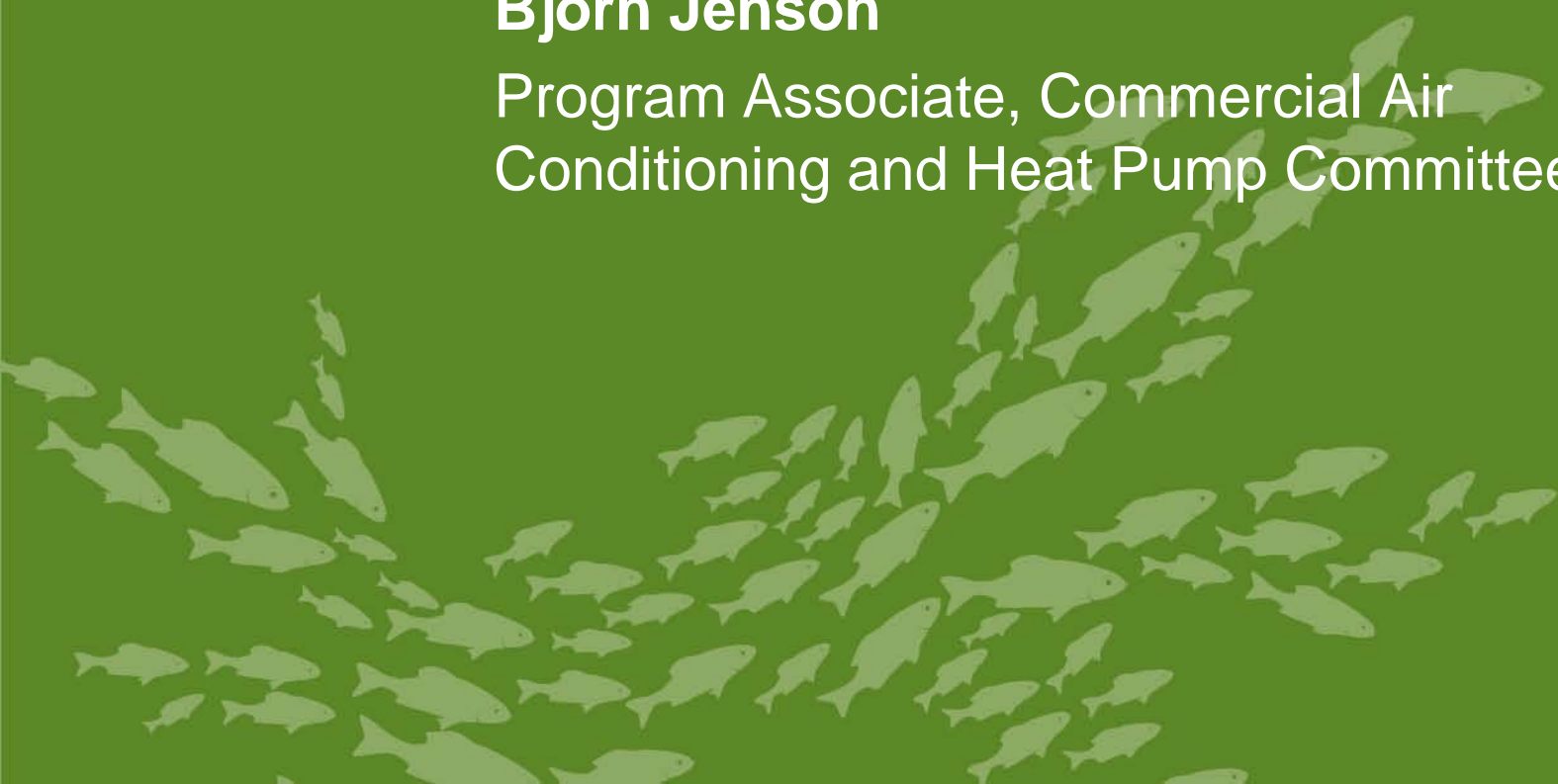
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# Commercial Air Conditioning and Heat Pump Specification Now with VRF

**Bjorn Jenson**

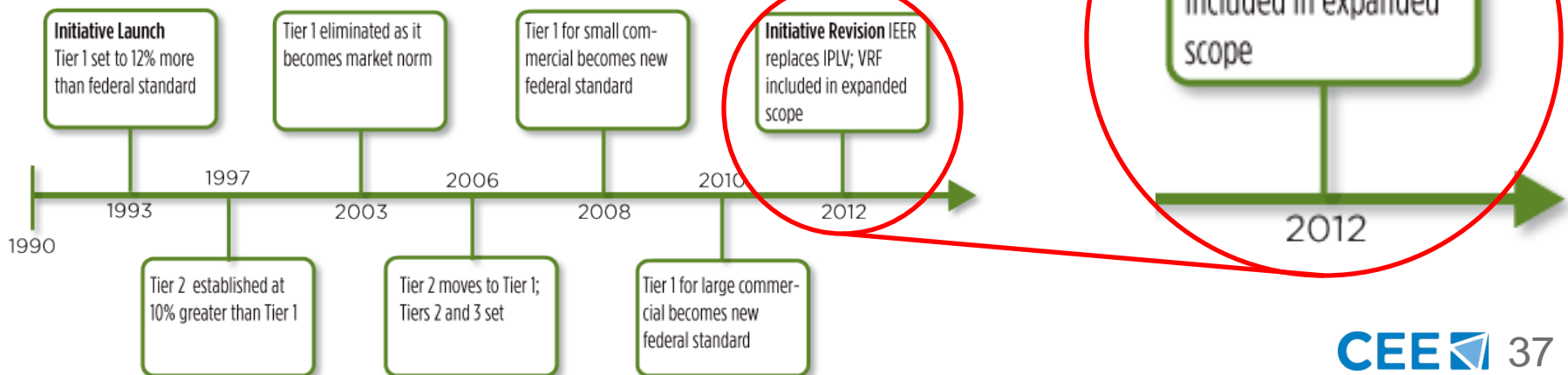
Program Associate, Commercial Air  
Conditioning and Heat Pump Committee



# HECAC Specification and Initiative Update Approved January 6, 2012

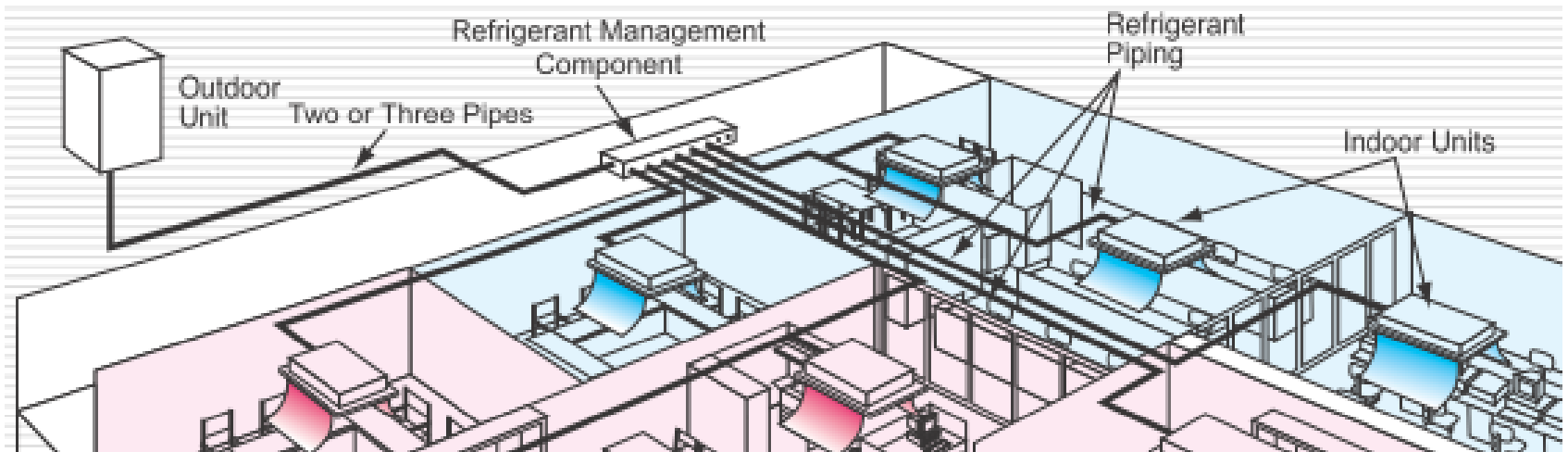
- ▶ Initiative description updated for the first time since 1996
- ▶ Incorporates criteria based on Integrated Energy Efficiency Ratio (IEER)
- ▶ Update includes separate specs for variable refrigerant flow (VRF) multisplit air conditioners and heat pumps

## HECAC Timeline



# VRF Spec Supports New Energy Savings Opportunity

- ▶ What is VRF technology?
  - Multiple indoor evaporator units connected to a single outdoor condensing unit.
  - Ductless products that transfer heat by circulating refrigerant
- ▶ Separate spec supports program administrator needs
- ▶ Stay tuned for 2012 Commercial HVAC Program Summary



*Image courtesy of Mitsubishi Electric*

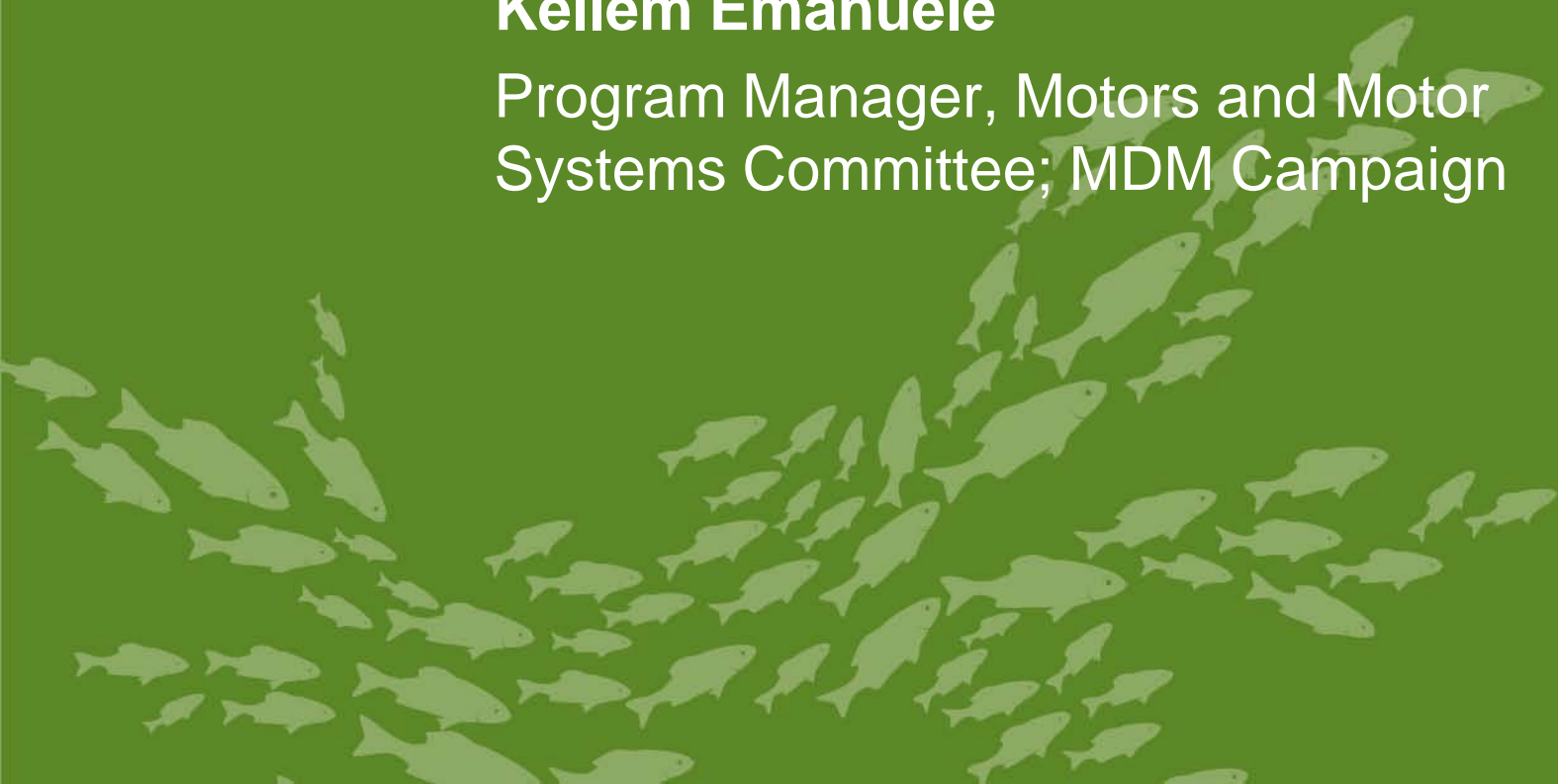
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# **New Resource Available from the MDM Campaign**

**Kellem Emanuele**

Program Manager, Motors and Motor  
Systems Committee; MDM Campaign



# New from Motor Decisions Matter<sup>SM</sup>

### Replacing Older Motors

Have you evaluated your older motors as candidates for replacement? The chart below illustrates potential cost savings by replacing older motors with NEMA Premium<sup>®</sup> motors.

Estimated Savings with NEMA Premium Motors

Annual Operating Hours	4,000	4,300	4,700
50	~\$1,000	~\$1,500	~\$2,000
75	~\$1,500	~\$2,500	~\$3,500
100	~\$2,000	~\$3,500	~\$5,000
250	~\$5,000	~\$8,500	~\$12,000
500	~\$10,000	~\$17,000	~\$24,000

Source: NEMA Motor Planning Kit 2.1. Calculations assume a 1800 rpm TSPC motor and \$0.075/kWh electric cost.

### Variable Frequency Drives

Consider evaluating your system as a candidate for a VFD. Good candidates include applications that operate frequently (~2000 hrs/yr) and have a variable load whose output is throttled or damped below full rated speed.

### Proof Positive

A small textile plant retrofitted several of its HVAC fan motors with VFDs, replacing inefficient variable inlet guide vanes and outlet dampers. A 59% reduction in total energy use was achieved, from 2.7GWh to 1.1GWh annually, translating to an annual cost savings of \$101,000. Project costs were recovered in 1.3 years.

Source: NRCAN, <http://www.nrcan.gc.ca/industrial/equipment/vfd-refpage-06.cfm>

**Motor Decisions Matter<sup>SM</sup>**

[www.motorsmatter.org](http://www.motorsmatter.org)

**Managing a plan is easier than managing a crisis.**

### Motor Management

Motor management starts with creating an inventory and assessing your system, tuning and retrofitting for optimal performance, regularly monitoring and testing your equipment, and implementing a plan when failure occurs. Sound motor management planning can reduce your operational costs.

### Resources

- MDM Tools: [www.motorsmatter.org/tools](http://www.motorsmatter.org/tools)
- US Department of Energy, Industrial Technologies Program: [www1.eere.energy.gov/industry/bestpractices/motors.html](http://www1.eere.energy.gov/industry/bestpractices/motors.html)
- US DOE ITP State Incentives and Resources Database: [www1.eere.energy.gov/industry/states/state\\_activities/incentive\\_search.aspx](http://www1.eere.energy.gov/industry/states/state_activities/incentive_search.aspx)
- ANSI/EASA AR100: Recommended Practice for the Repair of Rotating Electrical Apparatus: [www.easa.com/energy](http://www.easa.com/energy)

### Motor Decisions Matter<sup>SM</sup>

[www.motorsmatter.org](http://www.motorsmatter.org)

**Motor Decisions Matter<sup>SM</sup>**

**Improve your bottom line with motor management.**

Reduce your energy costs by making system decisions.

Electricity costs account for a motor's lifetime operating and maintenance costs. That means bottom line to select efficient motor driven system is running optimally.

### Lifetime Motor Costs

Electricity Costs: 95%

All Other Costs

A motor management plan can help you to:

- Make proactive repair-replace decisions
- Reduce unscheduled downtime
- Improve productivity and reliability
- Reduce operating costs

### What is a motor management plan?

A motor management plan can be simple or comprehensive, depending on your needs. At a minimum, a plan should include:

- An inventory of your current and spare motors
- Repair-replace decision guidelines
- Purchase and repair policies based on life cycle cost analysis
- Predictive and preventive maintenance plans
- Assessment of variable frequency drives (VFD) and other optimization opportunities

**Motor Management Plan**

```

graph TD
    A[Motor Management Plan] --> B{Motor Failure}
    A --> C{Scheduled Downtime}
    B --> D{Repair}
    B --> E{Replace}
    C --> E
    C --> F{Routine Maintenance}
    C --> G{System Analysis: VFD Retrofit}
    D --> H[Best Practice*]
    E --> I[NEMA Premium* Motor]
    F --> J[Routine Maintenance]
    G --> K[System Analysis: VFD Retrofit]
                    
```

### How can you build a plan that suits your company?

#### Call the Experts

Your motor service center/vendor and utility may be able to assist you in developing a motor management plan that is right for you.

#### Use Motor Decisions Matter<sup>SM</sup> Resources

The MDM web site, [www.motorsmatter.org](http://www.motorsmatter.org), provides easy-to-use tools for developing a motor management plan:

- 1\*2\*3 Approach – a spreadsheet tool that compares motor purchase and repair options using basic life cycle cost analysis
- Motor Planning Kit – a booklet that provides an overview of motor management concepts and strategies to get started
- Simple Savings Chart – a simple spreadsheet tool to estimate energy savings based on your electricity cost and hours of operation

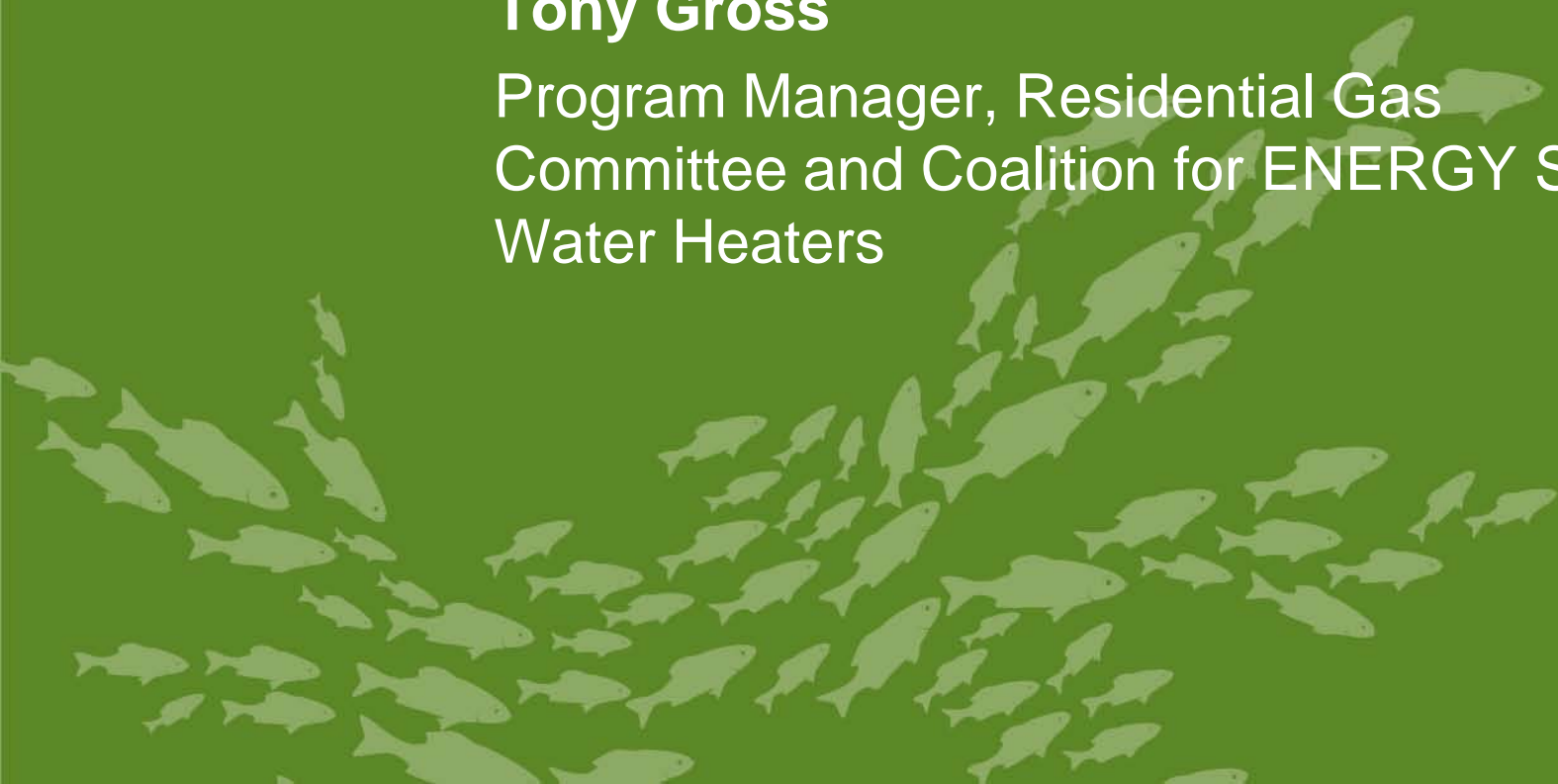
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# Coalition for ENERGY STAR Water Heaters: Accomplishments, Lessons, and What's Next

**Tony Gross**

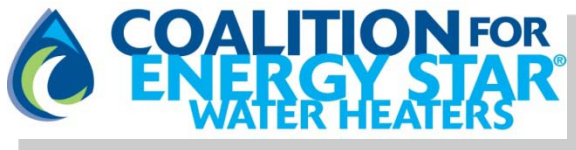
Program Manager, Residential Gas  
Committee and Coalition for ENERGY STAR  
Water Heaters



# The Coalition for ENERGY STAR Water Heaters: Transforming the Water Heater Market Since 2009

## Phase 1 Accomplishments

- ▶ 20 sponsors and partners
- ▶ Launched rebate finder website with promotional tools: [www.eswaterheaters.org](http://www.eswaterheaters.org)
- ▶ Published 10 articles
- ▶ YouTube videos and Radio P.S.A.
- ▶ Facebook site w/ articles and news
- ▶ 3 media tours & 3 trade shows
- ▶ Media kit, press releases and “e-blast” informational e-mails
- ▶ Brochure, banners, tote bag
- ▶ Flyers and utility “bill stuffers”
- ▶ Identity including brand and logo:



# Significant progress in market; New direction for Phase 2 (2012-2015)

## Then (2007-8)

- ▶ Only 7 gas storage units at CEE Tier 1 ( $\geq 0.67$  EF)
- ▶ ENERGY STAR had **no label program for water heaters**

## Today

- ▶ 263 gas storage water heaters at in Tier 1
- ▶ Nearly 20% of gas water heaters are ENERGY STAR

## Principles for Phase 2 Business Plan

- ▶ Targeted focus on concrete behavior change goals for specific links in the water heater distribution chain, particularly distributors, retailers, installers
- ▶ Greater alignment with marketing units and existing efforts
- ▶ Complementary collaboration with ENERGY STAR's new promotional efforts
- ▶ Emphasis on stakeholders in sponsors sphere of influence

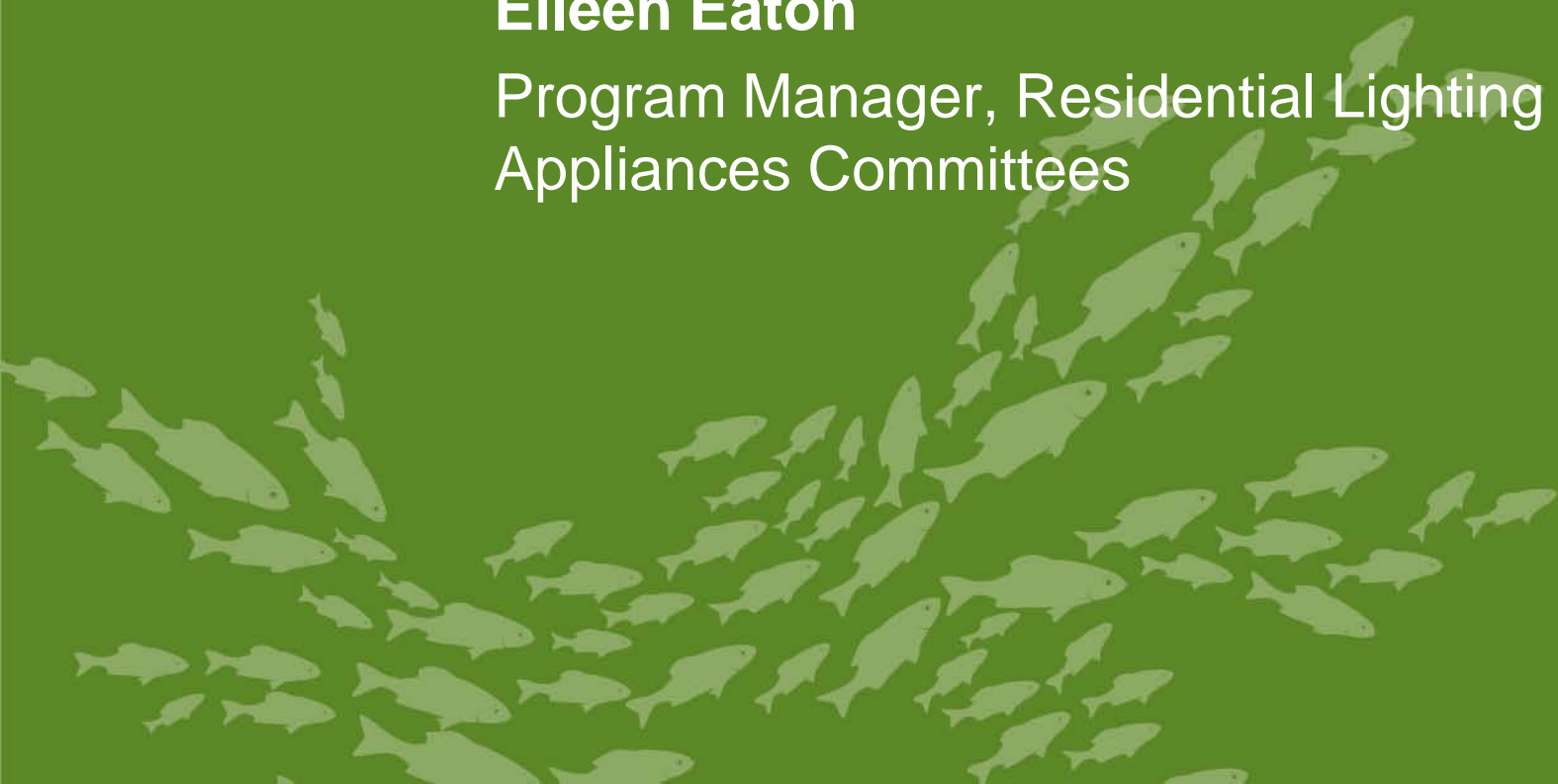
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# Expanding Lighting for Tomorrow in 2012-2014

**Eileen Eaton**

Program Manager, Residential Lighting and  
Appliances Committees



# Lighting for Tomorrow



- ▶ Residential design competition for energy efficient lighting products
- ▶ Co-organized by the American Lighting Association (ALA) and Underwriters Laboratories (UL)
- ▶ Designed to address the most significant market barriers and spur new technology developments



# 2012-2014 LFT Program Plan

- ▶ Greater market acceptance of SSL through spurring further development of these new technologies
- ▶ High visibility platform for identifying additional savings opportunities through lighting controls and design
- ▶ Includes four competitions over the next three years:
  1. **SSL Competition:** LED luminaires, replacement lamps and retrofit kits
  2. **Lighting Controls Competition:** stand-alone, system based and whole devices
  3. **Lighting for Seniors Competition:** lighting products designed for the growing senior population
  4. **Application Competition:** lighting design in bathrooms, kitchens, and living rooms

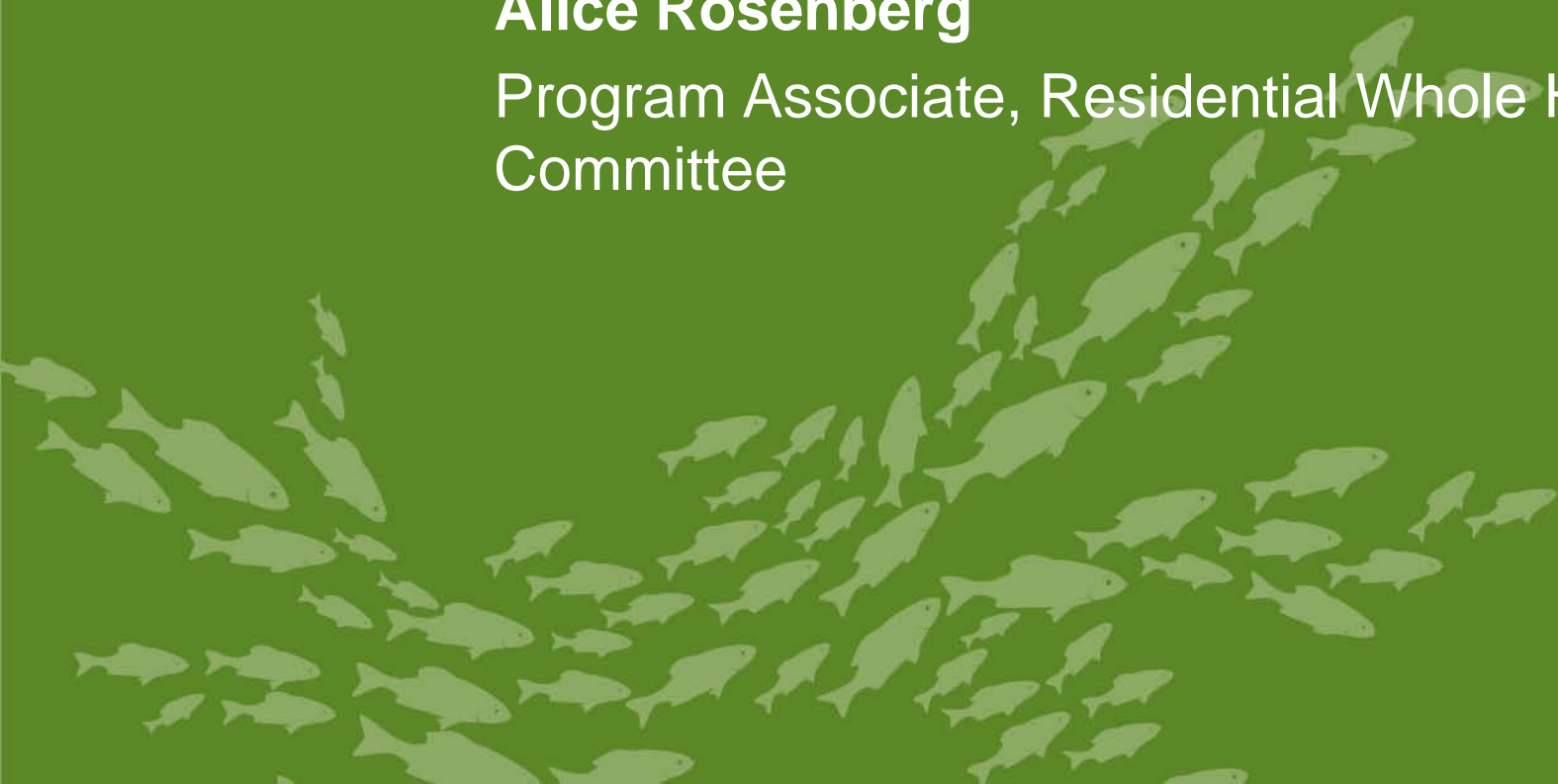
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# Continued Exploration into Leveraging Whole House Platforms in Programs

**Alice Rosenberg**

Program Associate, Residential Whole House  
Committee



# Committee Work in 2011

## ▼ Collaborate with Federal Voluntary Programs

- ENERGY STAR – New Homes, Windows, Home Performance w/ES
- DOE's Windows Volume Purchase Program
- DOE's Home Energy Score

## ▼ Exchange Program Information and Ideas

- Existing Homes Case Studies to support local program development
- Monthly new homes call to share updates and discuss current topics
- 2011 CEE New Homes Program Summary

## ▼ Strengthen Relationships with Industry

- Existing Homes Working Group organizations
- Windows manufacturers and trade associations



# Committee Opportunities in 2012

## ▼ Whole House Platforms

- Energy **scoring** / **performance** assessment
- Management **systems** / monitoring **devices** / home area **networks**
- Comparative feedback **reports** / efficiency **roadmaps**
- **Zero net** energy / **deep** energy retrofits / **comprehensive** programs

## ▼ Cross-cutting Approaches

- **Smart** devices / connectivity / **interoperability** / controls / **plug loads**
- Quality **installation** / maintenance / building **systems**
- Early **replacement** / **recycling** / turn-ins
- Consumer **education** / marketing / **behavior**



## ▼ Partnerships and Collaboration

- **Federal** and national programs / local utility **partnerships**
- Industry **stakeholders** / **working groups**

image source: <http://www.shutterstock.com>

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