WE MAKE ENERGY WORK

Midmarket Transformation: Experience and Lessons Learned in Compressed Air and Commercial HVAC Programs

ACEEE Market Transformation Symposium
March 26, 2002

Mitchell Rosenberg
Vice President

XENERGY® Kema Consulting

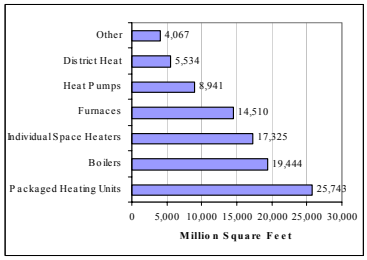
Overview of Presentation

- Nature and magnitude of efficiency opportunities
- Nature of challenges/barriers to delivering efficiency in generic systems
- Conceptual approach to midmarket programs
- Implementation: Compressed Air, HVAC
  - Program design
  - Progress to date
  - What has worked/not worked
- Lessons Learned

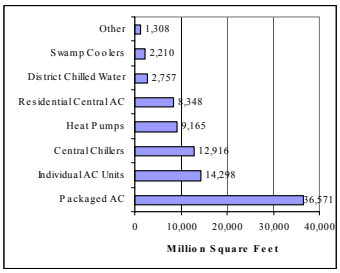
XENERGY® Kema Consulting

Commercial Packaged Heating & Cooling: Saturation

Saturation of Heating Equipment



Saturation of Cooling Equipment



Source: CBECS 1999

Packaged equipment accounts for roughly 40 – 60% of commercial cooling load and 30% of commercial heating load.

XENERGY Kema Consulting

Typical measures and savings opportunities for packaged cooling

Prototype System:

Conditioned Space: 4,000 sf

Size: 10 tons

Annual fan run time: 2,500 hours

Design Air Flow: 4,000 cfm

Measure	Approximate Applicability	Savings as % of baseline system use
Upgrade from baseline (EER 9) to Tier 2 Unit Efficiency (EER 11)	80%	12 – 18%
Fix leaks: ducts in return plenums	50%	3 – 4%
Fix leaks: ducts in outside/unconditioned spaces	25%	10%
Ensure proper economizer operation	75%	12 – 15%
Match compressor & thermostat stages	25%	3 – 5%
Avoid oversizing of unit	25%	10 – 13%

Paybacks: Typically in the 3 – 5 year range

XENERGY Kema Consulting

The Compressed Air Resource

- Compressors account for roughly 10% of all manufacturing electric use.
- 60 – 70% of compressor use is in plant air systems
- An attractive resource: results of CA industrial evaluation studies
  - Average verified demand reduction from 11 industrial projects: 145 KW or 40% of system baseline.
  - 21 CAC case studies: average of 23.5% system energy savings.
  - Good project economics: mean simple payback period from 7 projects in VT: 0.86 years with range of .3 to 3.3 years.
  - Often there are non-energy savings as well.

Technical Challenges in Achieving Savings in HVAC and Compressed Air

- Largest savings available from *system* improvements: interaction of loads and components.
- Identification of efficiency strategies requires substantial diagnostic work (especially for compressed air systems).
- Realization of savings requires conscientious maintenance, ongoing performance monitoring.
- Many solutions involve only modest equipment sales.

Distributor/Dealers as Efficiency Service Providers

- Pros
  - Extensive contact with customers
  - Basic knowledge of systems
  - Need new sources of revenue, hooks for customer retention
- Cons
  - Business model heavily oriented to equipment sales
  - Markets are highly cost competitive
  - Low familiarity with efficient technologies

XENERGY Kema Consulting

Program elements to overcome barriers

- Clarify value proposition
  - Vendor training: sales as well as technical orientation
  - Case studies: illustrate business case for vendors, not just energy savings
- Reduce cost of efficiency service sales
  - Audit and proposal preparation tools
  - Develop “standardized” kinds of products and services, or at least standard approaches
  - Link to existing incentive programs

XENERGY Kema Consulting

Program elements: continued

- Increase vendor technical capabilities
  - Training
  - Make project-oriented links to expert consultants
- Marketing Support
  - Customer training
  - Industry publications in key end-user segments
  - Trade publications
  - Internet
  - Templates for print, direct, and e-mail channels

NYSERDA Compressed Air Program

- Tool: Plant assessment method and report template
- Hands-on assistance in performing 1 – 2 plant assessments
- Assistance in proposal preparation
- Coordination with CAC Level 1 and Level 2 training
- Case studies
- Marketing piece for plant managers/CFOs stressing productivity and other non-energy benefits

Compressed Air Program Results

- 11 vendors recruited, sign MOUs
- 14 assessments completed
- Six projects implemented, 2 – 4 more likely without additional incentives
- Total savings for implemented projects: 500 MW demand reduction; 4,300 MWH; average payback < 1 year.
- Training
  - Fundamentals: 18 attendees
  - Advanced: 11 attendees
  - Mostly consultants

Key questions for evaluation of compressed air program

- Business model for delivering efficiency
- Use of the plant assessment guide and report template
- Efforts to upgrade staff technical capability or increase “pass through” use of consultants
- Perceptions of benefits: increased equipment sales, customer retention
- Perception of continuing market among customers

NYSERDA HVAC Program

- Technical and Sales Training
  - Efficiency-oriented maintenance
  - Spec and sell efficiency
- Tools
  - Honeywell Service Assistant: automated packaged unit performance measurement and assessment.
  - Efficiency project specification tool: efficiency upgrade, economizer, demand ventilation, programmable thermostat

XENERGY Kema Consulting

NYSERDA HVAC Program (cont.)

- Marketing Support
  - Hosted Websites
  - Case studies in trade media
  - Link to NYSERDA programs, websites
  - Print, direct, and e-mail templates
- Hands-on project development support
  - Custom designed for participating vendor
  - Links to incentive programs

XENERGY Kema Consulting

NYSERDA HVAC Program Results

- 75 contractors representing 54 firms attend efficiency-oriented maintenance training.
- ~30 sign MOU committing to use of methods, become eligible for hands-on assistance
- Sale and spec tool developed
- Little uptake on the hosted web-site offer
- Advance registrations for sale and spec training (mid-April) strong

Lessons Learned: General

- Guys love tools.
- Many vendors recognize the trap of price competition; need for product and service differentiation.
- Customers generally in the dark about compressed air and HVAC opportunities.
  - Big payoff for customer training and education.
  - Vendors not in a position to do it for themselves; they're looking to reduce cost of sales
- Earlier experience in other states → these kinds of programs produce 2 –3 early adopters. Next big issue is how to sustain and spread program influence.