



## **Advanced Automated HVAC Fault Detection and Diagnostics Commercialization Program**

**California Energy Commission  
Contract # 500-03-030**

### ***D5.3c – Final Marketing Study Report***

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# Honeywell

## 2004 Honeywell Advanced A/C Portable and Embedded Diagnostics Study

Final Report

August 2004

**sms**

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# *Executive Summary*

## **Background**

Honeywell currently has a portable instrument that can rapidly determine A/C system efficiency and capacity. Honeywell thinks it makes sense to consider embedding this performance assessment and diagnostic capability into control systems. Therefore, Honeywell commissioned SMS (Satisfaction Management Systems) to conduct a study to test the interest and viability in the market for this system

## Study Objectives

- Identify critical business issues that embedded advanced HVAC diagnostics can detect and solve.
- Identify how these organizations make purchase decisions for HVAC system maintenance and control systems.
- Assess readiness to purchase.
- Identify specific highly sought benefits and measure degree of demand that will compel Honeywell to commit resources to design and develop winning products and services.

## Research Summary

### Database Development

- Honeywell delivered 3 separate databases. The 2 initial databases listed compiled from Honeywell customers with specific contact names. The third database was a market database. For specifics on the databases' performance see Data Collection below.

### Survey Development

- Honeywell and SMS jointly developed the survey. The survey was mostly qualitative in nature and covered such topics as:
  - ◆ Critical business issues
  - ◆ Budget information for HVAC maintenance and repairs
  - ◆ Description of how decisions are made
  - ◆ Energy conservation goals
  - ◆ Facility operations issues
  - ◆ Importance -- heating and cooling system operations topics
  - ◆ HVAC maintenance deliver – internal/external
  - ◆ Approach to HVAC maintenance
  - ◆ Equipment failure insurance
  - ◆ Current service approach and satisfaction
  - ◆ Service provider provides measure of HVAC equipment performance
  - ◆ Interest level for cost reductions with an HVAC equipment maintenance program
  - ◆ Current analysis of building performance and efficiency
  - ◆ Interest level for in-depth analysis of cost of operation and energy expenses
  - ◆ Interest level in future discussions with Honeywell

## Research Summary (Cont.)

### Data Collection

- Data collection began in early March.
- As of the end of July 2004 there are interviews completed, representing 19 companies. The responses to those interviews are the contents of this report.
- During that time a total of about 1030 calls were made. The table below represents the total call disposition:

Databases Supplied	Total Companies	Completes	Refused	Unsuccessful Contacts	Duplicates	Wrong #'s	Disconnected Bankruptcy
#1 Customers	12	5	5	2	0	0	0
#2 Chainstores	45	7	16	24	0	0	0
#3 Chainstores 2	167	7	51	92	17	7	9
Other (Major Big Box Retail Chain)	1	1	0	0	0	0	0
Total	225	15	72	118	17	7	9

## Research Summary (Cont.)

### *List of Companies/Respondents Interviewed*

<i>Organization</i>	<i>Title</i>	<i>Name</i>
Restaurant	HVAC Specialist	
Auto Parts Chain	Energy Director	
Auto Parts Chain	Facilities Manager	
Restaurant Holding Company	VP Facilities Management	
Fitness Chain	National Director of Energy	
Big Box Retail Chain #1	Manager Utility & Energy Management	
Imports Chain	Facilities Manager	
Cafeteria Restaurant Chain	Dir of Facility Maintenance	
Clothing Retail Chain	HVAC Store Facilities Coordinator	
Major Department Store Chain	Director of Store Design and Construction	
Specialty Retail Chain	Facilities Manager	
Specialty Retail Chain #2	Maintenance Manager	
Restaurant Chain	Construction/Maintenance Dept	
Sporting Goods Chain	VP of Construction & Property Mgt	
Office Supply Chain	Energy Analyst	
Specialty Shoe Retail Chain	Facilities Manager	
Quick Service Restaurant Chain	Facilities Management	
Big Box Retail Chain #2	Manager of Building Services Operations	
Games Retail Chain	Dir of Store Planning & Construction	
Restaurant Holding Comp. #2	Sr. Director Resource Services	

## Key Findings

- Some of the main critical business issues mentioned that organizations face in the next 1 to 3 years were:
  - ◆ Operational and other costs and expenses
  - ◆ Sales and profits
  - ◆ Energy efficiency/conservation
  - ◆ Growth of new stores/facilities
  - ◆ Replacing/upgrading equipment
  - ◆ Training technicians
- More than half of respondents don't know average cost (budget) per square foot for HVAC service and maintenance or lighting, or they don't track costs by square foot.
  - ◆ For those who know their HVAC costs by square feet responses ranged from 11 cents to 3 dollar per square foot. For lighting the range was 7 cents to 14 cents per square foot.
- HVAC equipment and control system investment decisions are usually made centrally, however it seems there is input from many sources including facility- or site-specific information. Only one respondent said he makes all the decisions without any other input.
- For respondents who have either long- or short-range energy conservation goals, they usually link energy conservation to a reduction in costs. Six respondents say they are just beginning to work on conservation initiatives.
- The issues mentioned most often as most serious issues related to facility operations were:
  - ◆ Equipment or site – upgrading, maintenance, repair, performance
  - ◆ Equipment efficiency or fuel costs in general
- Other issues related to facility operations mentioned were: labor, justifying costs, security issues, re-imaging, asset management maintenance software, and finding trustworthy AC maintenance people.

## Key Findings (Continued)

- Respondents were read a list of heating and cooling system operations topics and asked to say how important they were to them on a scale of 1 (low concern) to 10 (high concern). Overall respondents rated all the topics high, none of the topics received a mean importance score lower than 7. The 3 most important topics based on their mean score were:
  - ◆ Performance of your maintenance staff or outsourced service provider – 9.4 mean importance.
  - ◆ Response time for required equipment repairs – 9.3 mean importance.
  - ◆ Provide comfortable customer space conditions – 9.3 mean importance.
- When asked to choose the top 4 heating and cooling system operation topics, respondents chose the following most often:
  - ◆ Provide comfortable customer space conditions – 75%
  - ◆ Cost of unanticipated equipment failure and repair/replacements – 45%
  - ◆ Response time for required equipment repairs – 35%
  - ◆ Total cost for HVAC system maintenance – 35%
- 68% of the respondents said that the most important heating and cooling system operations topic was: *Provide comfortable customer space conditions*.
- Only 4 respondents said they deliver HVAC system maintenance via company staff, 15 respondents said they outsourced to independent contractors and 9 said they used a broker.
- Most respondents use either a seasonal inspection approach (8) or a scheduled maintenance procedures approach (11) when it comes to HVAC system maintenance. No one said they ignored maintenance and 3 respondents mentioned a full-service maintenance agreement. Seasonal inspections are done 2 to 4 times per year and costs mentioned were \$500 and \$800 per year. For the scheduled maintenance procedures who was responsible varied by whether they own the building or not, costs mentioned were \$1500, \$4000/year, \$180 x 6/year.
- None of the respondents carry major equipment failure insurance.

## Key Findings (Continued)

- The most often mentioned ways that respondents evaluate their current service or service provider were:
  - ◆ Response time, a few respondents mentioned that a good response time should be within a few hours.
  - ◆ Tracking costs and number of callbacks.
  - ◆ Quality of repairs/maintenance – is it fixed it right the first time, what is the failure rate.
  - ◆ Track complaints or gather feedback from store managers and others.
- Overall, respondents are neutral on their level of satisfaction with their current approach for evaluating their service provider (external or internal) – 6.3 average score from a scale of 1 to 10 where 10 means high satisfaction and 1 means low satisfaction.
- Some suggestions on what respondents would change in their current approach to maintenance and service were:
  - ◆ Would like more data, diagnostics, information and follow-up
  - ◆ Would like more control over the process
  - ◆ Save costs by doing it themselves – hiring more staff
  - ◆ Improve the preventive maintenance process
- There were 8 respondents who said they used a broker for HVAC service and maintenance; some benefits mentioned in using a broker were:
  - ◆ Able to service stores in rural areas
  - ◆ Provide cost control
  - ◆ Convenience
  - ◆ They manage the process
- The most often mentioned criteria used in selecting a service contractor were:
  - ◆ Price
  - ◆ Reputation/references or word of mouth
  - ◆ Capabilities – can perform as needed

## Key Findings (Continued)

- About half of respondents (9 out of 15) said they received some type of HVAC report. However, no one mentioned that they receive measurements on actual efficiencies.
- Interest in an HVAC equipment maintenance program that would reduce their overall **cost of operation** averages 7.6 (on a 10-point scale) if the savings are 5%; at 10% the interest level average is 8.5 and for 15% or higher, interest is 9.5 or higher.
- If the program were to reduce HVAC energy related expenses by similar amounts, interest level would be equally high.
- Most respondents said their organization analyzed building performance and efficiency at the enterprise and region levels. 10 respondents said they did no analysis.
- 13 respondents said they do payback analysis – 12 said the type is years or both years and ROI percent.
- 17 respondents out of 20 said they would be interested in diagnostic units that directly related to reducing the cost of operation and energy expenses.
- 18 said they were interested enough in the concept discussed in the survey to be open to further discussions with Honeywell as the product concept is further refined.

## **Conclusions and Recommendations**

### **Conclusions**

- The respondents in this survey reported strong interest in the embedded diagnostics concept.
- If the product can be shown to provide operations or energy savings of 5% or more, these individuals are interested in it.
- A discussion of payback analysis in terms of years is something Honeywell should consider when marketing this concept.

### **Recommendation**

- On the basis of the 20 respondents reported here, there is considerable interest in the embedded diagnostics concept and therefore the market potential of this offering is worth further development by Honeywell.

# *Survey Results*

**To begin, first, I'd like to better understand what you consider the three most critical business issues your organization faces IN THE NEXT 1-3 YEARS? [q1]**

Name	Title	Organization	Q1 Critical Business
	Construction/Maintenance Dept	Quick Service Restaurant	Sales, profit, customer service, increase, every guest is satisfied with their experience, service, meal, quality, price
	Maintenance Manager	Specialty Retail	Growth - if taking over existing building, quality of the building
	National Director of Energy	Fitness Chain	Lowering operational costs, utility, updating infrastructure
	Energy Director	Auto Parts Retail Chain	What type of equipment, size of the equipment, energy efficiency, outdated in 10 years, reliability
	Facilities Management	Quick Service Chain	Energy management, conservation and controls
	Facilities Manager	Import Specialty Retail Chain	New Stores, getting them right on the front side, so will be in good shape in 9 years, stay on top of them from turn key moment - redo stores, evolving the look, try things that may or may not work, not really cookie cutter. Aesthetics, flooring issues, lighting
	Energy Analyst	Office Supply Chain	HVAC Increased electric and natural gas costs, learning how to control consumption and ability to monitor consumption
	Facilities Manager	Auto Parts Retail Chain	Controlling growth, have gone from 500 to 2500 stores in last couple of years keeping up that growth is a full time concern, controlling expenses, get the best bang for the buck, develop a program and plan for capital equipment replacement - no plan right now, in the process of establishing long term vendor partnerships
	Facilities Manager	Retail Clothing Chain	HVAC - refrigeration, energy savings and possible equipment upgrading needs
	Sr. Director Resource Services	RESTAURANT CHAIN HOLDING COMPANY	Sales, labor - finding good people, environmental, special interests (peta, Chicken virus', etc.) effect their perception in the marketplace
	Manager Utility & Energy Management	Electronics Big Box Retail Chain	Deregulation of energy, nat'l energy policy and cost of energy
	VP of Construction & Property Mgt	Sporting Goods Chain	Rapidly expanding growth mode, keeping up with the growth 65 stores a year in the next 3 years. Increase store count 30-40% trying to maintain those stores, AC, plumbing, locks on doors, hardware, etc.
	Dir of Store Planning & Construction	Game Store Chain	Competition, profit margin, SG&A - sales and general administrative - as relates to expenses
	Facilities Manager	Retail Shoe Store Chain	Sales, cutting administrative costs, increasing bottom line, more profits
	VP Facilities Management	Restaurant Chain HQ	Sales; controllable costs - electric, gas bills, preventive maintenance, grease traps; food costs
	Manager of Building Services Operations	Major Big Box Retail Chain	Energy costs, challenge of outsourcing of his position/dept., continue to move forward in new technology in building maintenance.

Name	Title	Organization	Q1 Critical Business
	HVAC Specialist	Quick Service Restaurant Chain	Rising cost of utilities, Finding good contractors in new locations, building 12 restaurant, profitability
	Dir of Facility Maintenance	Cafeteria Restaurant Chain	Asset Management Software Maintenance - Monitor the service calls and how they address them and history of the asset, Guest Counts - Growth in restaurant volume
	Director of Store Design and Construction	Major Department Store Chain	Cost, most expensive thing is power, other part is what takes the most part, HVAC and electric to determine whether can make a profit, fixtures and materials are secondary as they have more control over quality of fixtures
	HVAC Store Facilities Coordinator	Specialty Clothing Retail Chain	Energy management, service capability of technicians (on-going training to handle sophisticated machines) and labor market - older are retiring and younger don't want to work

**What is your best estimate of average cost (budget) per square foot for HVAC service and maintenance? What's your best estimate of the cost per sq ft for interior lighting? [q2]**

Name	Title	Organization	Q2 Avg HVAC Cost
	Construction/Maintenance Dept	Quick Service Restaurant	Don't Know
	Maintainance Manager	Specialty Retail	\$750 Per Ton, 16000-18000 sq. ft. - changing a lot of light bulbs to increase energy efficiency \$15000- per building
	National Director of Energy	Fitness Chain	No idea on HVAC or on interior lighting
	Energy Director	Auto Parts Retail Chain	.11 cents per sq ft for service/maintenance, 14 cents per sq ft for lighting
	Facilities Management	Quick Service Chain	\$3 on maintenance per sq ft, don't know off top of head on lighting
	Facilities Manager	Import Specialty Retail Chain	Don't know off hand
	Energy Analyst	Office Supply Chain	Not sure on HVAC, lighting - 7 cents per sq ft
	Facilities Manager	Auto Parts Retail Chain	17.2 cents per sq. repairs maintenance & replacement, 13 cents per square ft for lighting
	Facilities Manager	Retail Clothing Chain	Don't know yet - new at the job
	Sr. Director Resource Services	RESTAURANT CHAIN HOLDING COMPANY	Don't look at from sq. footage point of view, \$4-8000 per restaurant, \$3,000/rest/yr for lighting
	Manager Utility & Energy Management	Electronics Big Box Retail Chain	Don't know
	VP of Construction & Property Mgt	Sporting Goods Chain	\$400 per location for program maintenance, don't know on lighting, don't keep track per square foot basis
	Dir of Store Planning & Construction	Game Store Chain	Don't know
	Facilities Manager	Retail Shoe Store Chain	HVAC - 12000 sq foot \$1700, don't know on lighting
	VP Facilities Management	Restaurant Chain HQ	Restaurants are 4700-9000 sq feet HVAC PREVENTIVE MAINTENANCE runs \$275/month - \$425/month; \$140 - 160 month including all signage outside for lighting, no info on interior lighting
	Manager of Building Services Operations	Major Big Box Retail Chain	na
	HVAC Specialist	Quick Service Restaurant Chain	\$4000 per year for pm/5000 square, interior lighting ?
	Dir of Facility Maintenance	Cafeteria Restaurant Chain	Don't know
	Director of Store Design and Construction	Major Department Store Chain	don't know
	HVAC Store Facilities Coordinator	Specialty Clothing Retail Chain	Avg store is 2600 sq ft about \$3000 per store/year. Someone else handles interior lighting.

## What is your approximate annual budget for HVAC repairs, emergency service and equipment replacement? [q3]

Name	Title	Organization	Q3 Annual Budget
	Construction/Maintenance Dept	Quick Service Restaurant	In total budget, don't break out HVAC particularly, don't track
	Maintenance Manager	Specialty Retail	Don't know as she doesn't see breakout - only whole maintenance budget
	National Director of Energy	Fitness Chain	Don't know
	Energy Director	Auto Parts Retail Chain	\$3,800,000 - 900,000 program maintenance, service 2,400,000 replacement 430,000
	Facilities Management	Quick Service Chain	\$5 million - replacement 60%, split evenly among others
	Facilities Manager	Import Specialty Retail Chain	Don't break out - just a maintenance budget
	Energy Analyst	Office Supply Chain	Don't Know
	Facilities Manager	Auto Parts Retail Chain	HVAC capital 3.2 million, maintenance & repair 600,000
	Facilities Manager	Retail Clothing Chain	program maintenance - \$6000/mo/unit at 35 units includes emergency units
	Sr. Director Resource Services	RESTAURANT CHAIN HOLDING COMPANY	Under maintenance group
	Manager Utility & Energy Management	Electronics Big Box Retail Chain	Don't know
	VP of Construction & Property Mgt	Sporting Goods Chain	\$200,000 to replace ac and \$40,000 for compressors
	Dir of Store Planning & Construction	Game Store Chain	\$5 million
	Facilities Manager	Retail Shoe Store Chain	\$90 - 100 per month, \$110,000 - 251 stores
	VP Facilities Management	Restaurant Chain HQ	170 restaurants \$400,000-\$500,000
	Manager of Building Services Operations	Major Big Box Retail Chain	\$10 million - 60% repairs, 40 replacement
	HVAC Specialist	Quick Service Restaurant Chain	\$160,000 for 90 stores
	Dir of Facility Maintenance	Cafeteria Restaurant Chain	Don't break in down - \$14,000,000 - 33% is HVAC maintenance
	Director of Store Design and Construction	Major Department Store Chain	don't know
	HVAC Store Facilities Coordinator	Specialty Clothing Retail Chain	\$1.5 million - service, replacement and maint.

**How are HVAC equipment and control system investment decisions made? Decisions like lighting or controls system upgrades or upgrades to higher efficient Roof Top Units (RTUs)? Is the decision centralized or regional/local decision? Who is involved? [q4]**

Name	Title	Organization	Q4 Decisions
	Construction/Maintenance Dept	Quick Service Restaurant	Primarily - new buildings will spec out a system with an energy system, replacement, OEM equipment, centralized decision among designers and engineers, use external sources - third party, manager of design and engineering
	Maintenance Manager	Specialty Retail	Proposed to Cap Expenditure board and they decide. She is not involved but John - her boss is along with some other people. Decision is centralized
	National Director of Energy	Fitness Chain	Made in two ways - new facilities - standard. Whole network of people, large staff across the country, maintenance supervisor per territory, how much it will cost, combination of both, centralized but some regionally based on contractors. Process is on a Case by case
	Energy Director	Auto Parts Retail Chain	Look at payback, comfort to customers, user friendly. Team within facility, decision is centralized. People involved are energy, facility management, director of facility and director of construction
	Facilities Management	Quick Service Chain	Construction/Development take recommendations from field for new construction. Replacement in old buildings comes up to new building specs. Decision is centralized and made by VP development, VP purchasing, VP operations
	Facilities Manager	Import Specialty Retail Chain	Engineers look at blueprints and tell how much tonnage they need, sometimes landlord has already put the equipment, don't do too many upgrades - try to get it right on the front side, don't necessarily do a lot retrofitting because they will be out of space as leases come up in two or three years. May be moving anyway, try to get it right the first time, centralized decisions, try to use Trane.
	Energy Analyst	Office Supply Chain	Made through store planning, recommended from store level to facility management, decisions are centralized, facility coordinators, Dir of facility and VP of store planning
	Facilities Manager	Auto Parts Retail Chain	Proposal at his level, based on ROI, to Sr VP. They will test it in a number of stores before going chain wide. For example they are working with energy management systems in 20 stores, after prove that they are worthwhile, then go chain wide. Go from real estate to the executive committee for sign off.

Name	Title	Organization	Q4 Decisions
	Facilities Manager	Retail Clothing Chain	Through real estate department, Sr VP of Real Estate and Director of New Construction & Facilities
	Sr. Director Resource Services	RESTAURANT CHAIN HOLDING COMPANY	Arch & engineering building new stores, facilities for current stores, VP A&E, Sr. Director of Facilities, Plan Owners
	Manager Utility & Energy Management	Electronics Big Box Retail Chain	Prototype docs for facility, put in HVAC specs. Store GM, Regional Facilities Manager for corporate, centralized decision
	VP of Construction & Property Mgt	Sporting Goods Chain	Do not upgrade unless it breaks and then buy inefficient, light stat thermostat so air is preset and store can't change, property manager then approved by him, then president signs off (formality).
	Dir of Store Planning & Construction	Game Store Chain	Store specific. Based on location, profitability of store. Sr management as a group makes a decision. Centralized.
	Facilities Manager	Retail Shoe Store Chain	As needed basis, look at stores, utility consumption, then look at the equipment, get quotes, VP of store planning then approves
	VP Facilities Management	Restaurant Chain HQ	Get estimates for repair or replacement - decide whether worth to replace, then talk to regional Vp of operation and he approves based on recommendations - as it is under his budget.
	Manager of Building Services Operations	Major Big Box Retail Chain	Aging condition, using by brand, HVAC aging and historical decision, Building Services
	HVAC Specialist	Quick Service Restaurant Chain	He would do the research, Executive, President
	Dir of Facility Maintenance	Cafeteria Restaurant Chain	Through feedback from facility management, construction, accounting department and operators, cost - low initial investment, facility have technical - Director, Director of Construction, go to SR VP of development, CFO
	Director of Store Design and Construction	Major Department Store Chain	Relocating to standard, his main, best cost per ton that fits into the same hole in the roof, so don't have to create a new one. His group and Joe's Group, Maintenance - look at beginning of life or end of life and lease life - depts involved are Design & Construction and Procurement & Facility Maintenance
	HVAC Store Facilities Coordinator	Specialty Clothing Retail Chain	He makes all HVAC decisions. No one else is involved.

## Does your company have short or long-range energy conservation goals? If so, what are they? [q5]

Name	Title	Organization	Q5 Conservation Goals
	Construction/Maintenance Dept	Quick Service Restaurant	No, not specific
	Maintenance Manager	Specialty Retail	Long range - she is not involved in this area and doesn't know what type of measurement they use
	National Director of Energy	Fitness Chain	Short - least amount of capital, look for large rebates from utility company like for lighting upgrades. Difficult to calculate ROI on facilities controls. It's a slow process, testing energy management. Cogeneration - much more capital needed in this era. They have energy contracts with the utilities for their conservation efforts
	Energy Director	Auto Parts Retail Chain	Yes, reduce energy use by \$4,000,000 in next two years - use sub metering and utilities to measure their progress
	Facilities Management	Quick Service Chain	Both, alternative lighting for exterior, more energy efficient for interior lighting - in process of developing specific goals for cost reduction so don't know right now what they are or how they will measure
	Facilities Manager	Import Specialty Retail Chain	No - just getting her hands around that, will look at in the future
	Energy Analyst	Office Supply Chain	Short range, reduce cost by 5% and consumption by 7% per year, use bills and comparison consumption to measure
	Facilities Manager	Auto Parts Retail Chain	Yes, Matt McCabe has them (see interview with Matt above), for HVAC try to get most efficient for least amount of money
	Facilities Manager	Retail Clothing Chain	Just developing short range
	Sr. Director Resource Services	RESTAURANT CHAIN HOLDING COMPANY	Short Term have projects, but no long term
	Manager Utility & Energy Management	Electronics Big Box Retail Chain	Long term - keep costs down, no more specific information than that
	VP of Construction & Property Mgt	Sporting Goods Chain	No
	Dir of Store Planning & Construction	Game Store Chain	Yes, can't define them right now as they are working on developing
	Facilities Manager	Retail Shoe Store Chain	No - working with nat'l utility right now but in the early stages
	VP Facilities Management	Restaurant Chain HQ	Yes - they do the best they can to manage energy usage - no specific numbers to hit as they don't have much capital available for these kind of upgrades
	Manager of Building Services Operations	Major Big Box Retail Chain	both - reduce annual energy budget by 10%, by tracking projects and comparing to utility bills
	HVAC Specialist	Quick Service Restaurant Chain	Every year they have committees to conserve energy - lighting, insulation, higher efficiency equipment, turn on and off,

Name	Title	Organization	Q5 Conservation Goals
			controlling equipment. Not sure, he gets involved on technical aspects keep costs the same.
	Dir of Facility Maintenance	Cafeteria Restaurant Chain	Now just looking at that. Added a utility manager to look at that. Automation control system in restaurants going forward, monitor and limit. Don't know of specific goals. Utility manager, he is just implementing.
	Director of Store Design and Construction	Major Department Store Chain	No, don't do national rollouts, depends how it effects the day to day or monthly costs, trying to standardize as they have acquired a lot of independents. So should they get acquired by someone who has more resources they can monitor better.
	HVAC Store Facilities Coordinator	Specialty Clothing Retail Chain	Starting to work on them right now especially since states are starting to dictate what they can use - maximum size of unit.

## What are the most serious issues you currently face related to facility operations? [q6]

Name	Title	Organization	Q6 Serious Issues
	Construction/Maintenance Dept	Quick Service Restaurant	Equipment performance/failure
	Maintenance Manager	Specialty Retail	Customers space comfort is very important
	National Director of Energy	Fitness Chain	Aging plant equipment, poor efficiency - they are capital intensive to replace
	Energy Director	Auto Parts Retail Chain	Fuel charges, facility maintenance, weather
	Facilities Management	Quick Service Chain	manpower - self-maintained, hard to find
	Facilities Manager	Import Specialty Retail Chain	AC down loses them business, if one is down - customer complaints go up
	Energy Analyst	Office Supply Chain	Justifying actual costs, life cycle costs, available funding to make repairs, payback for investments, getting a short enough payback - under two years on investments.
	Facilities Manager	Auto Parts Retail Chain	Faced with physical security issues, better job of energy management, peak shaving function where can throttle it back with oil prices rising this will be important over next few years
	Facilities Manager	Retail Clothing Chain	Refrigeration, Rooftop Units
	Sr. Director Resource Services	RESTAURANT CHAIN HOLDING COMPANY	Overall maintenance and continued operations, re-imaging - remodeling and updating facilities
	Manager Utility & Energy Management	Electronics Big Box Retail Chain	Aging equipment, tight budgets
	VP of Construction & Property Mgt	Sporting Goods Chain	Getting people they can trust in the AC world. Honesty is a big issue have switched 3 - 4 times and found out that maintenance had not been done as they said it would be.
	Dir of Store Planning & Construction	Game Store Chain	HVAC - efficiency and maintaining equipment
	Facilities Manager	Retail Shoe Store Chain	Exp. Ballast replace, HVAC repair
	VP Facilities Management	Restaurant Chain HQ	Age of the building - going through re-image program right now, repositioning the restaurant, energy at the bottom of the list. Mostly they look for fresh new ideas to increase sales and keep things interesting for the customer
	Manager of Building Services Operations	Major Big Box Retail Chain	Completing replacement projects in reasonable time frame - Between Feb 1 and April 30 <sup>th</sup> .
	HVAC Specialist	Quick Service Restaurant Chain	Control and budget maintenance and repair costs. Don't know whether they are going to be able to repair

Name	Title	Organization	Q6 Serious Issues
	Dir of Facility Maintenance	Cafeteria Restaurant Chain	Asset management maintenance Software, good communication between operators and service side of facilities.
	Director of Store Design and Construction	Major Department Store Chain	Space comfort for customers (glasses in front, lab in back, examinations in patient areas).
	HVAC Store Facilities Coordinator	Specialty Clothing Retail Chain	Sense of urgency - only have one ac must have it fixed.

**Please rate the following topics related to your heating and cooling system operations as to how important they are to you? (1= low concern; to 10 = high concern)? [q7]**

	<b>Means (n = 20)</b>
<b>Performance of your maintenance staff or out sourced service provider?</b>	9.4
<b>Response time for required equipment repairs?</b>	9.3
<b>Provide comfortable customer space conditions?</b>	9.3
<b>Availability of reliable HVAC maintenance staff or out-sourced service providers?</b>	9.0
<b>Extending the useful life of RTU equipment?</b>	8.7
<b>Unplanned HVAC equipment failures?</b>	8.6
<b>Cost of unanticipated equipment failure and repair/replacement?</b>	8.2
<b>Availability of HVAC system for critical areas?</b>	8.3
<b>Total cost for HVAC system maintenance?</b>	7.9
<b>Energy costs for rooftop equipment?</b>	7.5

n = number of respondents

**Of the following heating and cooling system operations topics, which of these are the top 3 most important? [q7]**

	n	%
<b>Provide comfortable customer space conditions?</b>	15	75
<b>Cost of unanticipated equipment failure and repair/replacement?</b>	9	45
<b>Response time for required equipment repairs?</b>	7	35
<b>Total cost for HVAC system maintenance?</b>	7	35
<b>Unplanned HVAC equipment failures?</b>	6	30
<b>Availability of reliable HVAC maintenance staff or out-sourced service providers?</b>	6	30
<b>Performance of your maintenance staff or out sourced service provider?</b>	5	25
<b>Energy costs for rooftop equipment?</b>	4	20
<b>Extending the useful life of RTU equipment?</b>	1	5
<b>Availability of HVAC system for critical areas?</b>	0	0
<b>Total Respondents*</b>	20	—

n = number of responses

- Multiple responses were accepted, total will not equal 100%.

**Of the following heating and cooling system operations topics, which of these is most important to you? [q7]**

	n	%
<b>Provide comfortable customer space conditions?</b>	13	68
<b>Total cost for HVAC system maintenance?</b>	2	11
<b>Cost of unanticipated equipment failure and repair/replacement?</b>	1	5
<b>Energy costs for rooftop equipment?</b>	1	5
<b>Availability of reliable HVAC maintenance staff or out-sourced service providers?</b>	1	5
<b>Response time for required equipment repairs?</b>	1	5
<b>Unplanned HVAC equipment failures?</b>	0	0
<b>Performance of your maintenance staff or out sourced service provider?</b>	0	0
<b>Extending the useful life of RTU equipment?</b>	0	0
<b>Availability of HVAC system for critical areas?</b>	0	0
<b>Total</b>	19	100

n = number of respondents

One respondent could not choose a most important topic, instead said that *providing comfortable customer space, unplanned HVAC equipment failure* and *cost of unanticipated equipment failure were the most important*. This respondent's answers are not included in the table above.

**To deliver your HVAC system’s maintenance, do you use...? [q8]**

Name	Title	Organization	Company Maintenance Staff	Outsourced to Independent Contractors	Broker
	Construction/Maintenance Dept	Quick Service Restaurant	Yes - 20 facilities by each staff	Yes - use about 75 outside contractors	No
	Maintenance Manager	Specialty Retail	No	Yes - 2 national companies that outsource	No
	National Director of Energy	Fitness Chain	No	Yes	Yes
	Energy Director	Auto Parts Retail Chain	No	No	Yes
	Facilities Management	Quick Service Chain	Yes - 10 per staff	Yes - 12 outside contractors as fill in	No
	Facilities Manager	Import Specialty Retail Chain	No	Yes - 1 company uses own technicians in two states	Yes - rest is brokered out
	Energy Analyst	Office Supply Chain	No	No	Yes
	Facilities Manager	Auto Parts Retail Chain	No	Yes - 6	No
	Facilities Manager	Retail Clothing Chain	No	Yes - 1	No
	Sr. Director Resource Services	RESTAURANT CHAIN HOLDING COMPANY	No	Yes - on corporate side have 40 facility leaders that handle about 75-100 companies for corporate side, probably 1000 for all franchises. Try to regionalize where possible but for the most part franchise take care of their own.	No
	Manager Utility & Energy Management	Electronics Big Box Retail Chain	No	Yes - 50 companies	No
	VP of Construction & Property Mgt	Sporting Goods Chain	No	Yes - (30% of stores) 100 companies used.	Yes - (70% - convenient - they have the resources within the town, but don't provide anything really.
	Dir of Store Planning & Construction	Game Store Chain	No	Yes - 6	No
	Facilities Manager	Retail Shoe Store Chain	No	No	Yes
	VP Facilities Management	Restaurant Chain HQ	No	Yes - 80	No
	Manager of Building Services Operations	Major Big Box Retail Chain	Yes - 10 to 15	Yes - 250	No
	HVAC Specialist	Quick Service Restaurant	No	Yes - 11	No

Name	Title	Organization	Company Maintenance Staff	Outsourced to Independent Contractors	Broker
		Chain			
	Dir of Facility Maintenance	Cafeteria Restaurant Chain	Yes – 8	No	Yes – (20% - They support stores that are isolated and it's not cost effective for him to staff.)
	Director of Store Design and Construction	Major Department Store Chain	No	No	Yes - less people in house to monitor, saves headcount, time -
	HVAC Store Facilities Coordinator	Specialty Clothing Retail Chain	No	Yes - 1 outside company handles 50 stores	Yes - 1 broker handles 400 stores

**What is your organization's approach to HVAC system maintenance? [q9]**

Name	Title	Organization	Mostly Ignore Maintenance	Seasonal Inspection and Cost	Scheduled Maintenance Procedures and Cost	Full Service Maintenance Agreement and Cost
	Construction/Maintenance Dept	Quick Service Restaurant	No	Yes - \$500/year with minor repairs	No	No
	Maintenance Manager	Specialty Retail	No	No	Yes - first 90 days its building owner, after that they are, cost per unit, \$1500	No
	National Director of Energy	Fitness Chain	No	No	Yes - every region has a budget, varies with the lease agreement	Yes - Don't know, some have contracts which are different region to region.
	Energy Director	Auto Parts Retail Chain	No	Yes - 4, \$800/year	No	No
	Facilities Management	Quick Service Chain	No	No	Yes - they own their buildings	No
	Facilities Manager	Import Specialty Retail Chain	No	Yes - quarterly, some places six times per year, don't know cost	No	No
	Energy Analyst	Office Supply Chain	No	Yes - 4 don't know	No	No
	Facilities Manager	Auto Parts Retail Chain	No	No	Yes - every quarter, 2 lighter, 2 full blown look at everything (spring, fall), depends on lease, mostly they are	No
	Facilities Manager	Retail Clothing Chain	No	No	Yes - varies	No
	Sr. Director Resource Services	RESTAURANT CHAIN HOLDING COMPANY	No	Yes - preventative maintenance, 2 annual basis, don't know	No	No
	Manager Utility & Energy Management	Electronics Big Box Retail Chain	No	No	Yes - mostly lease, Electronics Big Box Retail Chain, don't know	No

Name	Title	Organization	Mostly Ignore Maintenance	Seasonal Inspection and Cost	Scheduled Maintenance Procedures and Cost	Full Service Maintenance Agreement and Cost
					cost per RTU/year	
	VP of Construction & Property Mgt	Sporting Goods Chain	No	Yes - 4 times a year - \$400	No	No
	Dir of Store Planning & Construction	Game Store Chain	No	Yes - 4	No	No
	Facilities Manager	Retail Shoe Store Chain	No	No	No	Yes - quarterly with large in spring and fall, they are responsible for the cost, about \$500,000. Coil cleaning, full heat check, change belts, pretty comprehensive, repairs
	VP Facilities Management	Restaurant Chain HQ	No	No	Yes - Preventative maintenance they provide a recommended scope of work for their seasonal inspections (4 x per year) which varies by site. The operations are responsible for getting it done. They do not monitor. Cost varies per RTU because the work required varies based on site (mall or free standing store).	No
	Manager of Building Services Operations	Major Big Box Retail Chain	No	No	Yes - Own	No
	HVAC Specialist	Quick Service Restaurant Chain	No	No	Yes - time and material rather than contract, then, \$4000/per year - no breakdown by RTU -	No

Name	Title	Organization	Mostly Ignore Maintenance	Seasonal Inspection and Cost	Scheduled Maintenance Procedures and Cost	Full Service Maintenance Agreement and Cost
					everything	
	Dir of Facility Maintenance	Cafeteria Restaurant Chain	No	No	Yes	No
	Director of Store Design and Construction	Major Department Store Chain	No	Yes – 3	No	Yes - outside contractor, except those stores that are in a mall
	HVAC Store Facilities Coordinator	Specialty Clothing Retail Chain	No	No	Yes -company is responsible - \$180 x 6 (every other month inspection) - 1080 per unit per year	No

**Do you carry major equipment failure "insurance" with one of the above options? [q10]**

	<b>n</b>	<b>%</b>
<b>Yes</b>	0	0
<b>No</b>	18	90
<b>Don't Know</b>	2	10
<b>Total</b>	20	100

n = number of respondents

## How do you evaluate your current service approach or service provider? [q11]

Name	Title	Organization	Q11 Evaluate Service
	Construction/Maintenance Dept	Quick Service Restaurant	Service, Quality, cost – immed, within 2 hours, Quality is measure by call backs, re-do's, they do keep track of that.
	Maintenance Manager	Specialty Retail	Response time, service - one day
	National Director of Energy	Fitness Chain	Reliability - know that the person in going to respond, downtimes are critical, honesty - replace compressor and charges \$2000 you want to make sure they are honest. Poor response is within days. Good response within hours. Cooling is very critical to them. Technical knowledge - knows the latest technology, well trained and right equipment.
	Energy Director	Auto Parts Retail Chain	Evaluate based on complaints, expense analysis on service, compared to a budget
	Facilities Management	Quick Service Chain	By cost per unit, personal evaluations, quarterly survey with stores - how efficient they answer calls. They are a staff group that supports the stores
	Facilities Manager	Import Specialty Retail Chain	No computerized time keeper, repetitive service calls, how many times they go back to the same thing, check with the stores, complaints, let broker know of complaints
	Energy Analyst	Office Supply Chain	Don't know
	Facilities Manager	Auto Parts Retail Chain	Quarterly review process where look at calls, cost vs. industry, four or five, maintenance date vs. actual, feedback from store mgrs, on time,
	Facilities Manager	Retail Clothing Chain	Quality of the work, call backs, get done what they said they would
	Sr. Director Resource Services	RESTAURANT CHAIN HOLDING COMPANY	Looking at RTU replacement levels and looking at places where have had program maintenance that was sufficient vs. areas that have been insufficient. Just working on this process now. Shortened RTU life, higher incidence of frozen compressors.
	Manager Utility & Energy Management	Electronics Big Box Retail Chain	Look at dispatch rate, failures of the unit and where they should have caught the problem
	VP of Construction & Property Mgt	Sporting Goods Chain	Based on store managers feedback and property managers treated, failure rates
	Dir of Store Planning & Construction	Game Store Chain	Response time, failure rate of the equipment
	Facilities Manager	Retail Shoe Store Chain	Response time, price, compatibility - do they balk at things or just take care of them, do they offer suggestions
	VP Facilities Management	Restaurant Chain HQ	Based on performance reported from the manager of the store and response time

Name	Title	Organization	Q11 Evaluate Service
	Manager of Building Services Operations	Major Big Box Retail Chain	Expectation matrix that they are responsible to adhering, response time, cost control
	HVAC Specialist	Quick Service Restaurant Chain	Close eye on the bills, # of calls, callbacks, etc. know whether they know what they are doing.
	Dir of Facility Maintenance	Cafeteria Restaurant Chain	Based on previous costs - year to year comparison and then basic goal per restaurant based on guest count
	Director of Store Design and Construction	Major Department Store Chain	don't know
	HVAC Store Facilities Coordinator	Specialty Clothing Retail Chain	Callback, response time, how thorough they are, he gives them the latitude to do what they need to do, minimize the down time of the unit, he specifically records what is done on a report.

Please rate how satisfied you are with your current approach for evaluating your current service approach or service provider (1=low; 10=high)? [q12]

	<b>Mean n = 20</b>
<b>Satisfaction</b>	6.3

n = number of respondents

## If you could, what would you change in your current approach to maintenance and service? [q13]

	<b>Title</b>	<b>Organization</b>	<b>Q13 What you would change</b>
	Construction/Maintenance Dept	Quick Service Restaurant	Take a more proactive approach to service
	Maintenance Manager	Specialty Retail	One company that does filter changes other does program maintenance - would like all to be in one company
	National Director of Energy	Fitness Chain	Better Knowledge of Service, Rooftop Packages, Better understanding of Performance, Record Keeping, logs, more data on what spending and what has been done, better monitoring of performance of units and costs
	Energy Director	Auto Parts Retail Chain	Detailed inspection - more steps in the inspections, preventative - efficiency of units
	Facilities Management	Quick Service Chain	Have a plan, upgrading quality of personnel is biggest issue
	Facilities Manager	Import Specialty Retail Chain	Store visits and looking at the unit at problem stores, follow-up on what service people do
	Energy Analyst	Office Supply Chain	Don't know
	Facilities Manager	Auto Parts Retail Chain	Looking at doing it themselves in larger markets would cost approx 2/3 of what currently pay for outside services
	Facilities Manager	Retail Clothing Chain	Get hourly rate down, critical areas taking too much time
	Sr. Director Resource Services	RESTAURANT CHAIN HOLDING COMPANY	More control of the outcome or know that the program maintenance were done. Check on the quality, quantitative control what was going. Trying to figure out how things are running. Right now, just replace units when they fail. More data on the units.
	Manager Utility & Energy Management	Electronics Big Box Retail Chain	Do better program maintenance - critical to operations - catching more stuff, don't spend enough time or have proper diagnostic tools
	VP of Construction & Property Mgt	Sporting Goods Chain	Would like to get rid of brokers, but don't have the staff to manage that
	Dir of Store Planning & Construction	Game Store Chain	Nothing, just developing system - it's only 2 years old
	Facilities Manager	Retail Shoe Store Chain	Get a company that is self performing - doesn't use independent contractors, uniform rates, more bang for the buck, don't subcontract
	VP Facilities Management	Restaurant Chain HQ	Sales come in on Major Big Box Retail Chain so they have the budget to do what they need to do - for example, adding more energy efficient units.
	Manager of Building Services Operations	Major Big Box Retail Chain	Increase staff to manage external
	HVAC Specialist	Quick Service Restaurant Chain	Hire in-house guys would be doing nothing but 99, benefits working for the company. Would save a lot of money.

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	<b>Title</b>	<b>Organization</b>	<b>Q13 What you would change</b>
	Dir of Facility Maintenance	Cafeteria Restaurant Chain	Maintenance software – analyze.
	Director of Store Design and Construction	Major Department Store Chain	Reaction time of the vendor - replacement could take 10 days would like to reduce to 24 to 36 hours - units dedicated to them so can react quickly. They do now but it is not fast enough.
	HVAC Store Facilities Coordinator	Specialty Clothing Retail Chain	Implement Quality Control program - make sure that service companies are doing what they say they did.

## What major benefits does a broker provider? [q14]

Name	Title	Organization	Q14 Outside Contractors
	Construction/Maintenance Dept	Quick Service Restaurant	Na
	Maintenance Manager	Specialty Retail	Na
	National Director of Energy	Fitness Chain	Don't know
	Energy Director	Auto Parts Retail Chain	Able to service stores in rural areas
	Facilities Management	Quick Service Chain	Na
	Facilities Manager	Import Specialty Retail Chain	Broker should be treating outsourced technicians like their own, not put all eggs in one basket, keep them competitive, don't get complacent of business
	Energy Analyst	Office Supply Chain	They provide cost control, have two national contractors that have local contractors under contract
	Facilities Manager	Auto Parts Retail Chain	Na
	Facilities Manager	Retail Clothing Chain	Na
	Sr. Director Resource Services	RESTAURANT CHAIN HOLDING COMPANY	Na
	Manager Utility & Energy Management	Electronics Big Box Retail Chain	Na
	VP of Construction & Property Mgt	Sporting Goods Chain	Convenience, but hasn't found them that useful. Don't have internal staff to find people on their own.
	Dir of Store Planning & Construction	Game Store Chain	Na
	Facilities Manager	Retail Shoe Store Chain	Hard to say, looking to go away from that, been using for awhile, more and more self performing companies, cut out middle man, too many lines of communications, try to streamline communication, she inherited this system
	VP Facilities Management	Restaurant Chain HQ	Na
	Manager of Building Services Operations	Major Big Box Retail Chain	Na
	HVAC Specialist	Quick Service Restaurant Chain	References, prices, charge per hour, markup on parts.
	Dir of Facility Maintenance	Cafeteria Restaurant Chain	Na
	Director of Store Design and Construction	Major Department Store Chain	Less people in house to monitor, saves headcount, time.
	HVAC Store Facilities Coordinator	Specialty Clothing Retail Chain	They manage the process and pre-qualify service contractors.

## What are the primary criteria that you use in selecting service contractors? [q15]

Name	Title	Organization	Q15 Selection Criteria
	Construction/Maintenance Dept	Quick Service Restaurant	Service, Quality, cost – immed. within 2 hours, Quality is measure by call backs, re-do's, keep track of that.
	Maintenance Manager	Specialty Retail	Prices, area of availability (geographic) a lot of stores in small town, quality - response time
	National Director of Energy	Fitness Chain	Same as use to evaluate - reliability
	Energy Director	Auto Parts Retail Chain	Reputation, cost, references
	Facilities Management	Quick Service Chain	By reference, locality, price
	Facilities Manager	Import Specialty Retail Chain	Go to industry conference and get to know people in the industry, personal referrals, what they stand for, respect in the industry
	Energy Analyst	Office Supply Chain	National reach, network of contractors, cost, reliability - ability to perform as expected.
	Facilities Manager	Auto Parts Retail Chain	Pricing, territory, experience, current customers
	Facilities Manager	Retail Clothing Chain	ability to handle national account, references, reputation, price
	Sr. Director Resource Services	RESTAURANT CHAIN HOLDING COMPANY	Service value - cost and capability. References in business, experience, response time, ability to do repairs
	Manager Utility & Energy Management	Electronics Big Box Retail Chain	Dealer affiliations - have mostly Trane equipment dealers, have stock parts, size of service entity - too small an operation will not be able to meet their needs when it's hot or cold, enough staff when need to service
	VP of Construction & Property Mgt	Sporting Goods Chain	Own technicians, or just sit in an office that dispatch local contractors, talk to other retailers at conferences
	Dir of Store Planning & Construction	Game Store Chain	Reputation - handful that cater to retailers, specific references
	Facilities Manager	Retail Shoe Store Chain	Price, coverage across the country, how they handle technicians do they have field follow-up, make sure their people have done what they say they have
	VP Facilities Management	Restaurant Chain HQ	Manufacturer's (I.e. Carrier or Lenox) recommendations
	Manager of Building Services Operations	Major Big Box Retail Chain	Already have history, familiarity with them, proven performance.
	HVAC Specialist	Quick Service Restaurant Chain	Specific reports, some informal. Notation section nothing fancy- what they did to the unit. Verbal.
	Dir of Facility Maintenance	Cafeteria Restaurant Chain	Certified contractors, equipment companies

Name	Title	Organization	Q15 Selection Criteria
	Director of Store Design and Construction	Major Department Store Chain	Price, national presence, single source so that have facilities around the country and one person contact, so don't have to go through voicemails - real person to answer phone.
	HVAC Store Facilities Coordinator	Specialty Clothing Retail Chain	Persistence on contacting him about the business, then on-going performance.

**Does your current service provider provide any measure of your HVAC equipment performance? If so, how do they report status and results of their service to you? [q16]**

Name	Title	Organization	Q16 Performance Measurement
	Construction/Maintenance Dept	Quick Service Restaurant	Yes, report on outliers
	Maintenance Manager	Specialty Retail	No
	National Director of Energy	Fitness Chain	Don't know,
	Energy Director	Auto Parts Retail Chain	Yes, keep histories of replacements, potential problems, difference, can't measure efficiencies
	Facilities Management	Quick Service Chain	Energy use, maintenance cost
	Facilities Manager	Import Specialty Retail Chain	No
	Energy Analyst	Office Supply Chain	Not to his knowledge
	Facilities Manager	Auto Parts Retail Chain	Not really, condition reports that's about it
	Facilities Manager	Retail Clothing Chain	Dyes, standard report on projects.
	Sr. Director Resource Services	RESTAURANT CHAIN HOLDING COMPANY	Required to provide reports. Did filter change, amt of freon, refill, service reports - information that is provided on the invoices
	Manager Utility & Energy Management	Electronics Big Box Retail Chain	Yes, form - includes drawing, pressures, can calculate efficiency but not specifically how efficient unit is
	VP of Construction & Property Mgt	Sporting Goods Chain	No
	Dir of Store Planning & Construction	Game Store Chain	No
	Facilities Manager	Retail Shoe Store Chain	No
	VP Facilities Management	Restaurant Chain HQ	Yes, manager is given amp test, identifies units that are about ready to go out then Facilities dept is contacted
	Manager of Building Services Operations	Major Big Box Retail Chain	Some do and some don't, every pm on unit per, disch, air flow, temp/pressure readings, amp reading on motors, compressors, some provide digital over 1/2.
	HVAC Specialist	Quick Service Restaurant Chain	Na
	Dir of Facility Maintenance	Cafeteria Restaurant Chain	Efficiency - provide maintenance report on web for unit.
	Director of Store Design and Construction	Major Department Store Chain	Not unless ask, then survey the stores.
	HVAC Store Facilities Coordinator	Specialty Clothing Retail Chain	Whether units are running or not-nothing on efficiency. Everyone is on the same contract, same schedule, preventative maintenance.

**On a scale of 1 to 10, how would you rate your level of interest in an HVAC equipment maintenance program that would reduce your overall cost of operation? [q17]**

<b>Reduced by:</b>	<b>Means (n = 19)</b>
<b>2.5%</b>	6.1
<b>5%</b>	7.6
<b>10%</b>	8.5
<b>15%</b>	9.5
<b>20%</b>	9.9
<b>25% or more</b>	9.9

n = number of respondents

Respondents were asked to rate on a scale of 1 to 10 where 1 represents “No Interest” and 10 represents “High Interest”.

**On a scale of 1 to 10, how would you rate your level of interest in an HVAC equipment maintenance program that would reduce your HVAC related energy expenses? [q18]**

<b>Reduced by:</b>	<b>Means (n = 19)</b>
<b>2.5%</b>	5.9
<b>5%</b>	7.4
<b>10%</b>	8.5
<b>15%</b>	9.4
<b>20%</b>	9.8
<b>25% or more</b>	9.9

n = number of respondents

Respondents were asked to rate on a scale of 1 to 10 where 1 represents “No Interest” and 10 represents “High Interest”.

**Does your organization currently analyze the building performance and efficiency of each individual building, region, or entire enterprise? [q19]**

	Number of Responses
<b>Yes – Building</b>	3
<b>Yes – Region</b>	7
<b>Yes – Entire Enterprise</b>	7
<b>No</b>	10
<b>Don't know/ Not sure</b>	2

Name	Title	Organization	Q19 Building Analyze
	Construction/Maintenance Dept	Quick Service Restaurant	Do have a service that monitors energy that will identify outliers on individual building and look at it enterprise wide as well.
	Maintenance Manager	Specialty Retail	She does not know, someone else handles that
	National Director of Energy	Fitness Chain	Operating costs, but not by efficiency
	Energy Director	Auto Parts Retail Chain	Yes by region, by entire enterprise
	Facilities Management	Quick Service Chain	Yes by entire enterprise
	Facilities Manager	Import Specialty Retail Chain	No
	Energy Analyst	Office Supply Chain	Yes, enterprise
	Facilities Manager	Auto Parts Retail Chain	Yes
	Facilities Manager	Retail Clothing Chain	Not sure
	Sr. Director Resource Services	RESTAURANT CHAIN HOLDING COMPANY	No - look at utility bills but no actual metering basis, looking at outlier stores.
	Manager Utility & Energy Management	Electronics Big Box Retail Chain	Region and by enterprise
	VP of Construction & Property Mgt	Sporting Goods Chain	No
	Dir of Store Planning & Construction	Game Store Chain	No
	Facilities Manager	Retail Shoe Store Chain	No
	VP Facilities Management	Restaurant Chain HQ	No
	Manager of Building Services Operations	Major Big Box Retail Chain	Yes - by region and entire
	HVAC Specialist	Quick Service Restaurant Chain	Yes, store to store sales
	Dir of Facility Maintenance	Cafeteria Restaurant Chain	No, no
	Director of Store Design and Construction	Major Department Store Chain	No
	HVAC Store Facilities Coordinator	Specialty Clothing Retail Chain	No - no

**When your organization makes decisions about investments in it HVAC system, what type of payback analysis do you use, in years or ROI percent? What would be the criteria you'd use for investments that would reduce your cost of operation or your HVAC-related energy expenses? [q21]**

	Number of Responses
Years	8
ROI Percent	1
Both	4
Don't do payback analysis	2
Don't know/ Not sure	2

Name	Title	Organization	Q21 Payback Analysis – Years/ROI Percent
	Construction/Maintenance Dept	Quick Service Restaurant	Both but primarily years, 18 months.
	Maintenance Manager	Specialty Retail	Don't know
	National Director of Energy	Fitness Chain	[could not reach respondent for this question]
	Energy Director	Auto Parts Retail Chain	3 years
	Facilities Management	Quick Service Chain	Years - doesn't know the exact amount
	Facilities Manager	Import Specialty Retail Chain	Doesn't know, spec'd by engineers, she doesn't look at it
	Energy Analyst	Office Supply Chain	Years - 12 - 18 months
	Facilities Manager	Auto Parts Retail Chain	ROI and years, higher efficiency, acquired fairly, establishing model if more than x years old replace it, depends on tonnage, under 3 years
	Facilities Manager	Retail Clothing Chain	[could not reach respondent for this question]
	Sr. Director Resource Services	RESTAURANT CHAIN HOLDING COMPANY	payback would be 2 years or better
	Manager Utility & Energy Management	Electronics Big Box Retail Chain	ROI - # of years payback - Fred Heron 612-291-3792 - short not sure how many
	VP of Construction & Property Mgt	Sporting Goods Chain	Don't know that they look at that, replace when they feel it's gotten its useful life
	Dir of Store Planning & Construction	Game Store Chain	ROI in years - 2 1/2 for 10 year lease, 1 1/2 for 5 year lease

Name	Title	Organization	Q21 Payback Analysis – Years/ROI Percent
	Facilities Manager	Retail Shoe Store Chain	[could not reach respondent for this question]
	VP Facilities Management	Restaurant Chain HQ	Sales vs cost of construction 30% cash on cash return, ease of serviceability, cost, don't have the money to invest
	Manager of Building Services Operations	Major Big Box Retail Chain	Simple payback in years, then send to finance for tax implications, ROI and net present value. Net present value must be positive in 5 years. ROI based on current interest rates. Right now its about 13% ROI.
	HVAC Specialist	Quick Service Restaurant Chain	1 year or 1 1/2 years
	Dir of Facility Maintenance	Cafeteria Restaurant Chain	ROI - varies 1 year
	Director of Store Design and Construction	Major Department Store Chain	ROI - with 5 year average payback on the RTU -
	HVAC Store Facilities Coordinator	Specialty Clothing Retail Chain	Don't do payback analysis - have national account with Lennox

**Would you be interested in more in-depth analysis of units that directly relate to the cost of operation and energy expenses? [q22]**

	Number of Responses
Yes	17
Maybe	1
No	2
Don't know	1

Name	Title	Organization	Q22 More Indepth analysis
	Construction/Maintenance Dept	Quick Service Restaurant	Yes
	Maintenance Manager	Specialty Retail	Yes
	National Director of Energy	Fitness Chain	Yes
	Energy Director	Auto Parts Retail Chain	Yes
	Facilities Management	Quick Service Chain	Yes
	Facilities Manager	Import Specialty Retail Chain	Don't see that as being any one focal point
	Energy Analyst	Office Supply Chain	Yes
	Facilities Manager	Auto Parts Retail Chain	Yes
	Facilities Manager	Retail Clothing Chain	Too new
	Sr. Director Resource Services	RESTAURANT CHAIN HOLDING COMPANY	Yes, problem is that they can't justify the expense if can't use to reduce their expenses
	Manager Utility & Energy Management	Electronics Big Box Retail Chain	Depends on what the gal – overall savings, balancing act between costs and capital outlay, would have to recapture costs in less than 4 years
	VP of Construction & Property Mgt	Sporting Goods Chain	Yes
	Dir of Store Planning & Construction	Game Store Chain	Yes
	Facilities Manager	Retail Shoe Store Chain	Yes
	VP Facilities Management	Restaurant Chain HQ	Yes
	Manager of Building Services Operations	Major Big Box Retail Chain	Yes

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Name	Title	Organization	Q22 More Indepth analysis
	HVAC Specialist	Quick Service Restaurant Chain	Yes
	Dir of Facility Maintenance	Cafeteria Restaurant Chain	Yes
	Director of Store Design and Construction	Major Department Store Chain	Yes
	HVAC Store Facilities Coordinator	Specialty Clothing Retail Chain	Yes

## Are you interested enough in the concept to be open to future discussions with Honeywell as the product is further refined? [q23]

	Overall	
	n	%
<b>Yes</b>	18	87
<b>No</b>	0	0
<b>Don't Know</b>	2	13
<b>Total</b>	20	100

n = number of respondents

Name	Title	Organization	Q23 Future Discussion
	Construction/Maintenance Dept	Quick Service Restaurant	Yes
	Maintenance Manager	Specialty Retail	Yes
	National Director of Energy	Fitness Chain	Yes
	Energy Director	Auto Parts Retail Chain	Yes
	Facilities Manager	Import Specialty Retail Chain	Don't Know
	Facilities Management	Quick Service Chain	Probably, but would defer to development department
	Energy Analyst	Office Supply Chain	Yes
	Facilities Manager	Auto Parts Retail Chain	Yes
	Facilities Manager	Dave and Buster's	Don't Know
	Sr. Director Resource Services	RESTAURANT CHAIN HOLDING COMPANY	Yes, HVAC diagnostics
	Manager Utility & Energy Management	Electronics Big Box Retail Chain	We'll always look at it
	VP of Construction & Property Mgt	Sporting Goods Chain	Yes, but can't have thermostat that can be changed - explained that it wasn't a thermostat that they were working on
	Dir of Store Planning & Construction	Game Store Chain	Yes
	Facilities Manager	Retail Shoe Store Chain	Yes
	VP Facilities Management	Restaurant Chain HQ	Yes
	Manager of Building Services Operations	Major Big Box Retail Chain	Yes
	HVAC Specialist	Quick Service Restaurant Chain	Yes
	Dir of Facility Maintenance	Cafeteria Restaurant Chain	Yes
	Director of Store Design and Construction	Major Department Store Chain	Yes

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	HVAC Store Facilities Coordinator	Specialty Clothing Retail Chain	Yes
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# *Appendix A Final Questionnaire*

## *Advanced A/C Portable and Embedded Diagnostics Qualitative Interview Survey*

### ***Objectives:***

20. Identify critical business issues that embedded advanced HVAC diagnostics can detect and solve.
21. Identify how these organizations make purchase decisions for HVAC system maintenance and control systems.
22. Assess readiness to purchase.
23. Identify specific highly sought benefits and measure degree of demand that will compel Honeywell to commit resources to design and develop winning products and services.

### ***Major Big Box Retail Chain Audience:***

Restaurant and retail National Accounts: Leisure and quick service restaurants, drug store chains, apparel and non-apparel retail and medium to large big-box retail organizations with 50 or more facilities of at least 2,500 square feet.

### ***Valid Respondents***

1. Typically, at least 2 individuals will need to be interviewed at each firm:
  - Financial decision-maker
  - Operations lead/Purchasing services
  - Energy lead and new construction/expansion leads as available
2. Respondent titles sought are:
  - CFO, VP for Finance, Controller
  - Facilities/Operations VP, Manager, Director
  - Director of Corporate Energy Department
3. Qualifying questions:
  - Decider or strong influencer regarding decisions to upgrade their facility HVAC system's reliability and performance
  - Have budget and authority for maintenance/operations decisions
  - Have budget and authority for implementing energy cost-reduction programs

***Database***

1. Names of qualifying individuals are in the database.
2. Only call those individuals that have been identified as “OK to Call” by Honeywell.
3. Other individuals in one of the Major Big Box Retail Chain companies can be identified through internal referrals.

***Survey Length***

About 25 minutes. May need to schedule survey.

***Completed Interviews***

30 to 50

***Data Collection Overview:***

- Honeywell IS named as study sponsor
- A valid completed interview contains responses to all relevant questions
- Field dates: March 3 - 27.

**SURVEY**

***RESPONDENT CONTACT INFORMATION***

Name \_\_\_\_\_

Title \_\_\_\_\_

Company \_\_\_\_\_

Address 1 \_\_\_\_\_

Address 2 \_\_\_\_\_

Phone Number (with a/c) \_\_\_\_\_

Email \_\_\_\_\_

Date and Time of Interview \_\_\_\_\_

Length of Interview \_\_\_\_\_