Small Commercial HVAC O&M Pilot Project

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Project Goals

- Develop and test an enhanced O&M service for RTU aimed at small commercial customers
- Determine if an enhanced service will be valued by **customers**
- Determine if service **providers** are willing and able to incorporate a new service offering
- Evaluate marketing strategies and tools

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Phased Approach

Phase I – 2002

- Technical development
- Market research

Phase II – 2003

- Test the business proposition for service contractors
- Identify the best value proposition for owners
- Test several program delivery scenarios
- Gather experience and market intelligence

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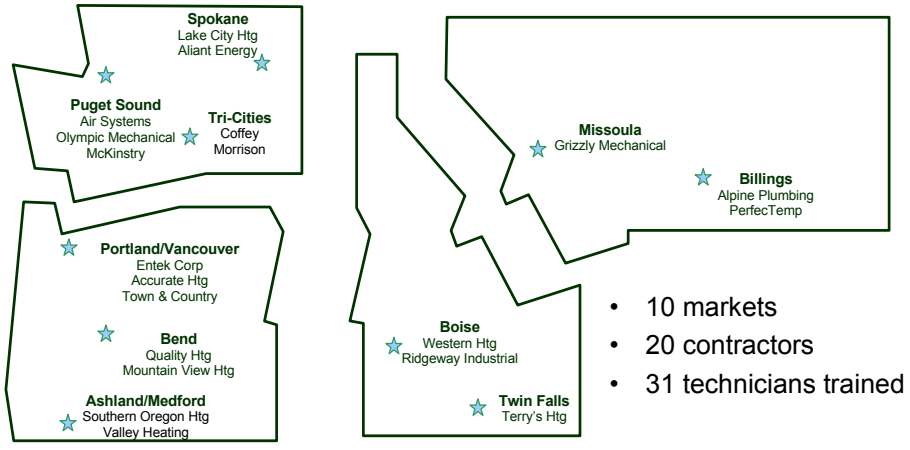
Phase II Markets & Contractors



- 10 markets
- 20 contractors
- 31 technicians trained

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Service Protocol

- Refrigerant charge
  - Honeywell Service Assistant
- Airflow
  - Flow plates
- Economizer functionality & optimization
  - Test procedures customized for equipment
- Thermostat settings
  - Occupant interviews

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Program Features

- Tools provided if agreement fulfilled
- Technical training – classroom & field
- On-call technical support
- Sales training
- Marketing materials

- Monitoring & verification of savings methodology
- Real-time evaluation

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Sales

- 10 Contractors sold the service (50%)
  - 5 sold 80% of the jobs
- 125 units services and 58 buildings sold

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Sales and Service Summary

	WITH Rebates	WITHOUT rebates	Totals
Utilities	7*	7	14
Contractors	13**	7	20
Buildings/Sales	50	8	58
Units sold	114	11	125
Units serviced	73	7	80
Units monitored	35	2	37

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Components Serviced

AirCare Plus Service Summary			
Service	**% of all units with Recommended Adjustment**	**% of Recommended Units Adjusted**	**% Adjusted of all units**
Economizer	74%	78%	58%
Thermostat	68%	46%	32%
Airflow	48%	70%	33%
Refrigerant	43%	17%	7%
* Data for first 69 units			

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Phase II Average Savings Actual Service & (Potential)

N= 80 units	Economizer	Airflow & Charge	Controls	TOTALS
kWh/ unit	**404** (823)	**58** (387)	**436** (607)	**825** **(1742)**
therms/unit	53 (41)	0 (0)	35 (119)	**84** **(168)**
kWh/ ton	73 (132)	9 (44)	88 (143)	**166** **(331)**
therms/ton	8 (0)	0 (0)	7 (20)	**13** **(27)**

*PECI modeled results, Actual based on work performed.

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M&V Methodology

- Measure thermal output, electrical input energy
- Quantified in short-term monitoring
- Use engineering model to estimate annual impact
- Energy audit to develop load profile. Extrapolate over all seasons
- 37 units monitored

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Quantitative Results

Overall Savings are in Agreement

Initial Estimate (PECI) Average per AHU	Interim Estimate (Stellar) Average per AHU
998 kWh	**1096 kWh**
181 therm	**204 therm**

* Does not include extreme outliers

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Looking Ahead

- What would be required in order to establish ACP?
  - Compelling energy savings
  - Streamlined protocol
  - Strong utility support
  - Sustained, evangelical efforts by Service Providers throughout the region

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Conclusions

- Improving HVAC operation appears to be worthwhile, but the service needs streamlined (screening protocol).
- Unlikely to be a market transformation effort in the short run w/out utility support; but strong candidate for a utility-based program.

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