What about Everyone Else?
Thinking Beyond the Customer: Market Barriers to Adoption of Efficient HVAC Technologies

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Study overview

- **Problem:** Chicken and egg of stakeholder adoption
- **Objectives** - To identify:
  1. Market barriers to adoption
  2. Opportunities to increase adoption
- **Sponsor:** Southern California Edison
- **Technology:** retrofits (2) for commercial HVAC units
- **Geographic scope:** SMEs in SCE territory
- **Timeline:** November 2013 – February 2015
Research approach

- Exploratory research:
- Mixed methods for collecting data
  - Semi-structured interviews
  - Group discussions
  - Online surveys
- 76+ respondents representing key stakeholder groups:
  - Utilities
  - Design engineers
  - Manufacturers
  - Contractors
  - Distributors
  - Customers
- Analyzed content of transcriptions using successive pile sorting according to emergent themes
Who does what...

Utility
Offers rebate for...
Decides to

Manufacturer
sells to
Decides to

Distributors
sell to
Decides to

Contractors
sell to
Decides to

Consumers
(Building owners)
purchase
Decides to

Each action is preceded by the decision to take such action
Why do stakeholders decide to buy/sell/adopt/promote?

Source: http://www.behaviormodel.org/
8 key factors affecting motivation to adopt/promote ET

1. **Technical requirements and performance**, including the human, material, and logistical resources
2. **Technology costs**, initial and ongoing, uncertainty, and diffused responsibility
3. **Additional benefits** beyond energy savings
4. **Access to information**
5. **Endorsements**: stakeholder recommendations and social norms
6. **Status quo bias**
7. **Stakeholder coordination**
8. **Accountability and support**, especially if problems arise
6 key factors affecting ability to adopt/promote ET

1. **Technical feasibility**, given the climate, human resources required, building and HVAC characteristics
2. **Cost** (and uncertainty) of retrofits and utility incentives
3. **Effort**: selling, installing and maintaining, obtaining rebates
4. **Awareness, knowledge and communication**
5. **Access**: logistics of supply chain acquisition
6. **Empowerment**: can stakeholders adopt and/or promote retrofits

- Are you pitching to the guy that can buy it?
- Will he be the one that sells it?
## 5 cross-cutting themes

<table>
<thead>
<tr>
<th>Motivation</th>
<th>Ability</th>
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<tbody>
<tr>
<td>Technical requirements &amp; performance</td>
<td>Technology costs</td>
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<td>Technology costs</td>
<td>Additional benefits</td>
</tr>
<tr>
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<tr>
<td>Accountability &amp; support</td>
<td>Technical feasibility</td>
</tr>
</tbody>
</table>

### Dependency
- Risk
- Opaqueness
- Accountability
- Trust
Three Conclusions - #1

1. Information is vital in ET adoption and promotion.

Trusted source?

Correct target?
Three Conclusions - #2

2. A behavioral analysis of the costs and benefits reveals an imbalance.

(Perceived) Costs

<table>
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<tr>
<th>Immediate Known Certain</th>
<th>Immediate Known Certain</th>
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(Perceived) Benefits

<table>
<thead>
<tr>
<th>Delayed Opaque Uncertain</th>
<th>Delayed Opaque Uncertain</th>
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Immediate Known Certain
3. Stakeholders differ in the specific impediments to adoption they face.
Thank you.


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Triggers to adopt/promote ET

- ET doesn’t have the benefit of existing equipment failure as a trigger for *replacement*, but…you can leverage
  - HVAC failure or degradation
  - Adoption by another stakeholder group
  - Awareness, training, outreach
  - Rising energy prices, low interest rates
  - Changes in customer needs with occupant turnover