<table>
<thead>
<tr>
<th>Disaggregation: One VC’s View</th>
</tr>
</thead>
<tbody>
<tr>
<td>Matthew M. Nordan</td>
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<tr>
<td>Matthew Trevithick</td>
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<tr>
<td>May 28, 2010</td>
</tr>
</tbody>
</table>
Think back…
### Feedback decreases home electricity use

<table>
<thead>
<tr>
<th>Feedback type</th>
<th>Number of studies</th>
<th>Sample size range</th>
<th>Average conservation %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enhanced billing</td>
<td>7</td>
<td>79-2,000</td>
<td>9%</td>
</tr>
<tr>
<td>Estimated feedback</td>
<td>2</td>
<td>137-152</td>
<td>4%</td>
</tr>
<tr>
<td>Daily/weekly</td>
<td>5</td>
<td>15-267</td>
<td>8%</td>
</tr>
<tr>
<td>Real-time</td>
<td>12</td>
<td>10-422</td>
<td>7%</td>
</tr>
<tr>
<td>Real-time, plus HAN/appliance level</td>
<td>5</td>
<td>4-25</td>
<td>12%</td>
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*Of the 31 studies above, 12 measured persistence over time, up to 36 months. In 7 cases, savings effect remained unchanged and in 3, it even increased.*

Why is there no business here?

Good for consumers

1) Urgency
2) Cost

Good for PUCs

Good for providers
Utilities look unenthusiastic...

- Average monthly elec. bill: $150
- Utility profit: $15
- Average customer service call: $10
...and so do consumers

- Few consumers can save much
- Few of those will swallow $200+ CPE for unproven gadget

**Segment 1: The rich**
- 13.3M homes in U.S. > 4,000 sq. feet
- Avg. elec bill = $220/mo. (versus $151 across all households)
- Of those 13.3M, 3.5M have > 4,000 cooled square feet
- Assume they have ~2x bill = $440/mo.

= 3.5M U.S. homes

**Segment 2: The green**
- Use residential solar as proxy
- ~ 250K U.S. homes have installed solar since 2000
- 44% report household incomes > $100K
- Presume 60% do not overlap with “rich” segment

= ~150K U.S. homes

3.65M homes x $200/unit = $750M one-time unit purchase
x $5/mo. subscription = ~$220M/year annual subscriptions

Assume 20% penetration (1/4 home security) = $190M one-time, $50M sub

Sources: 1) DOE, 2) Lux Research, 3) Solar Electric Power Association
What’s the breakout opportunity?

Unattractive market → Forcing function → Hot market

- Small online ad market
- 200 MW solar market (’00)
- No DR biz model
- Moribund EV interest

Eyeballs + search targeting
- European subsidies
- Forward capacity market reg.
- Prius + green sentiment

Huge online ad market
- 1,200 MW solar market (’05)
- DR “cash register” enabled
- Re-ignited EV demand

= Google, SunPower, EnerNOC, Tesla…
### Two forcing functions for home energy monitoring: Both circa 2012-2013

- Limiting factors are 1) **urgency** and 2) **cost**
- **Time-of-use electricity pricing boosts urgency**
  - Mandatory in Ontario today
  - Rollout process begun in CA and TX in next 2 years
  - Mandates on regulatory docket in 7 other states
  - = more people care about measuring/changing elec. consumption
- **Unlocked smart meters + disaggregation slashes cost**
  - 80M smart meters slated for installation in U.S. (< 10M in today)
  - Regulators forcing utilities to open meter data to home users
  - CA passed ruling last month, TX under consideration now
  - = $200+ data collection device → $30 USB dongle
  - = professional electrician install → consumer self-install
- **Secondary:** PACE; PUCs seeking smart meter payoff
Home energy monitoring’s breakout

Unattractive market
- < 4M homes addressable
- $100s upfront price
- Professional installation
- $750M one-time equipment
- $220M annual subscription

Forcing function

Hot market
- 50M+ homes addressable
- $10s upfront price
- Consumer self-install
- $1.5B one-time equipment*
- $3.0B annual subscription*

Time-of-use pricing
Unlocked smart meters

* Assumes 50M addressable households (there are 111M total), $30 equipment price, $5/mo. subscription fee
<table>
<thead>
<tr>
<th>Thank you</th>
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</table>
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