Utilizing game theory and behavioral economics to catalyze Portland’s commercial real estate community.
About Northwest Energy Efficiency Alliance

- Formed in 1997 as non-profit organization with mission to mobilize the Northwest to become increasingly energy-efficient for a sustainable future

- Funded by utilities in Oregon, Washington, Montana and Idaho: Bonneville Power Administration on behalf 100+ utilities; Energy Trust of Oregon; and six public and five investor-owned utilities

- Delivers market initiatives across sectors: residential, commercial, industrial, emerging technology, codes & standards

- With diverse stakeholders, seeks long-term market transformation by removing barriers to the adoption of energy efficiency
Fills the energy efficiency pipeline, championing innovation, driving emerging technologies

Accelerates market adoption of energy-efficient products, services and practices

Leverages regional advantage through shared resources, economies of scale, reduced risk
Carbon Samurai
CO₂ has no place to hide.
What is Carbon4Square?

Model of stakeholder collaboration, funded by NEEA, supported and administered by

Comprehensive sustainability competition
- Engaging Portland area office buildings
- Framed around carbon emissions reduction
- Multi-year challenge
- Launched Fall of 2010
- Winners announced in 2012
How does Carbon4Square work?

Craft and execute simple sustainability and energy management plan:

- Supportive organizations provide:
  - Technical assistance
  - Energy audits (scoping studies)
  - Waste audits
  - Water audits
  - Tennant commuting survey tools
How does Carbon4Square work?

Competition organized around the four “W’s”

- **Watts**
  - Energy in building operations

- **Water**
  - Pumping, treating, moving, and disposing of water

- **Waste**
  - Consumption of products, removing and treating waste

- **Wheels**
  - Getting people, goods and services to and from buildings
How does Carbon4Square work?

Prizes and recognition for building accomplishments:

<table>
<thead>
<tr>
<th>Prize</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon Samurai Trophy</td>
<td>Grand prize – the “Stanley Cup” of carbon reduction</td>
</tr>
<tr>
<td>Carbon Leaders</td>
<td>Buildings having the most success across all categories</td>
</tr>
<tr>
<td>Most Improved Performance</td>
<td>Year over year change in energy consumption</td>
</tr>
<tr>
<td>Most Valuable Tenant</td>
<td>Recognize tenant contributions</td>
</tr>
</tbody>
</table>
Progress to date

Over 25% of the market participating
- 74 area office buildings
- 14 million square feet

Energy actions
- All are benchmarking - ENERGY STAR®
- 71 have conducted energy audits

Broader sustainability actions
- 52 are tackling all 4 “W’s”
- 34 have quantified water use for 2010
- 28 have quantified waste volumes for 2010
- 10 have surveyed tenant commuting patterns
Applying behavioral concepts
Applying behavioral concepts

Why a competition?

The real estate social network:
- Small, cohesive community
- Naturally competitive
- Self-referencing
- Relationship driven

Provides a “platform” for behavior change strategies:
- Game theory
- Social-norms
- Self-efficacy
- Loss-aversion
Applying behavioral concepts

Cognitive dissonance, feedback…

<table>
<thead>
<tr>
<th>12 Months Ending</th>
<th>Current Rating (1-100)</th>
<th>Current Site Energy Intensity (kBtu/Sq. Ft.)</th>
<th>Current Source Energy Intensity (kBtu/Sq. Ft.)</th>
<th>Change from Baseline: Energy Use Intensity (kBtu/Sq. Ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>December 2010</td>
<td>76</td>
<td>75.4</td>
<td>214.8</td>
<td>-4.7</td>
</tr>
<tr>
<td>December 2009</td>
<td>73</td>
<td>81.4</td>
<td>230.4</td>
<td>1.4</td>
</tr>
<tr>
<td>Change</td>
<td>-3</td>
<td>6.0</td>
<td>15.6</td>
<td>N/A</td>
</tr>
</tbody>
</table>
Applying behavioral concepts

- Prompts,
- decision paralysis,
- scripting,
- small-wins
Applying behavioral concepts

Modeling, social-norms, game-theory

Status Board
Applying behavioral concepts

Choice architecture...
Applying behavioral concepts

Goal-setting, priming, single-action bias

Carbon4Square Playbook

Market and Building Synopsis
The market and building synopsis is intended to be a short (1 to 2 sentence) description of your building's competitive position in the context of the local market. How do you want to position your building? What trends are affecting the market, and how will your building be impacted? How will your sustainability achievements fit into the larger marketing strategy? What sustainability issues most concern you about your building?

Examples might include:
- The building next door just received LEED certification; we’re concerned about our ability to compete
- Waste hauling costs have been skyrocketing, and we want to mitigate the impact of these on the overall CAM

Objective Statement
The objective statement should summarize your sustainability goals for the building. It may cover many of the four Carbon4Square categories, or it might focus on only one particular area such as energy. Regardless, the goal(s) for the building should address some of the concerns listed in the Market and Building Synopsis section and fit into the larger marketing strategy for the building.

- Achieve LEED-RB Gold Certification by 2013
- Reduce total energy consumption at the building by 22% by December 2012
- Focus on increasing the building’s marketability as a green building – earning the ENERGY STAR certification and calculating transportation statistics by summer 2012

Timeline
The timeline overview summarizes the key actions and tasks in chronological order and makes clear the next steps for staying on track. Action steps should derive from the building’s scoping study, waste stream tracking, and other analyses generated through Carbon4Square or other initiatives:

<table>
<thead>
<tr>
<th>Immediate Steps</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3 and Beyond</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Briefly list each project here</td>
<td>• Project 1</td>
<td>• Project 3</td>
<td>• Project 4</td>
</tr>
<tr>
<td>• Project 2</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Applying behavioral concepts

Self-efficacy, personal contact, reciprocity rule

Carbon4Square Coach
Applying behavioral concepts

Loss-aversion...
Applying behavioral concepts

Redefining the social (or market) norm...
(Thank you!)