**Objective**

- **General need for product**
  - Electronics are a part of 21st century lifestyle
  - Electronics require sustainable power sources
  - Eco Power Tent provides clean power to electronics

- **Market Size**
  - 6,000,000+ tents are sold annually
  - 48% of people surveyed said ability to charge electronics in tent would be desired
  - 1,000,000 Eco Power Tent sales projected annually

- **Customer Requirements**
  - Low weight increase
  - Long battery life
  - Simple to use
  - Safety: Weather-proofing required

**Tradeoffs**

- Limited battery life
- Can only recharge during daytime

**Functionality Testing**

- With fully charged battery, tested how long power inverter worked with various electronic devices
- Timed how long to charge battery with solar panel
- The built in LED lights can run for 168 hours
- Prototype performs well under ideal circumstances; not for use in extreme weather

**Prototype and Testing**

- **Technology Testing**
  - Charged the battery using solar panel
- **Battery Run Time for Electronic Devices**

<table>
<thead>
<tr>
<th>Electronic Device</th>
<th>Battery Run Time (hrs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laptop</td>
<td>4.5</td>
</tr>
<tr>
<td>Camera Cell</td>
<td>5.2</td>
</tr>
<tr>
<td>Blanket</td>
<td>12.0</td>
</tr>
<tr>
<td>Electric Fan</td>
<td>24.0</td>
</tr>
<tr>
<td>GPS</td>
<td>48.0</td>
</tr>
<tr>
<td>iPod</td>
<td>96.0</td>
</tr>
</tbody>
</table>

**Battery Run Time for Electronic Devices**

**Future Improvements**

- Create plastic injection mold for electronics box
- Reduce wiring size/mass in connecting devices
- Better waterproof electronics
- Research other possible eco-friendly power generating alternatives

**Test Results and Future Work**

- **PDP Summary**
  - Collected customer responses from surveys to determine need for solar tent
  - Concept generation and selection using HOQ and AHP
  - Fabricated fully functional solar powered tent
  - Tested charging rate and efficiency of solar panel

- **Final Concept**
  - Utilizing only solar power generation

**Concept Generation**

- **Concept 1**
  - Utilizing solar and wind power generation

- **Concept 2**
  - Utilizing solar and hydro power generation

**Decision Characteristics and Weights**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Concept 1</th>
<th>Concept 2</th>
<th>Final Concept</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Required</td>
<td>19.42%</td>
<td>18.15%</td>
<td>19.42%</td>
</tr>
<tr>
<td>Battery Weight</td>
<td>16.50%</td>
<td>12.56%</td>
<td>18.15%</td>
</tr>
<tr>
<td>Product Cost</td>
<td>16.50%</td>
<td>12.56%</td>
<td>16.50%</td>
</tr>
<tr>
<td>Feature Weight</td>
<td>10.66%</td>
<td>10.66%</td>
<td>10.66%</td>
</tr>
</tbody>
</table>

**Decision Characteristics**

- Minimally intrusive redesign of tent structure and space
- Implementation of a reliable power generation source
- Satisfies the most highly weighted decision characteristics