TCAAP Energy Integration and Resiliency Framework
Process

Policy White Paper

• Energy vision statement
• Energy supply alternatives
• Demand-side management (energy efficiency)
• Policies & regulations
• Next steps
Process

Energy Integration and Resiliency Framework

• Build upon White Paper recommendations
  — Apply to the site
  — Environmental benefits
  — Cost-benefit analysis
  — Implementation planning

• Looking 50 years out
TCAAP’s Energy Vision

*TCAAP will be a vibrant development that leverages long-term energy conservation and resilience to attract investment and partnership, and achieves sustainable benefits for Arden Hills and the surrounding community.*
TCAAP’s Guiding Principles

• Establish TCAAP as a national model for development of integrated energy systems
• Develop a resilient community for energy and other utilities
• Implement infrastructure solutions that are flexible and scalable over the next 50 years
• Deliver a model of efficient energy and water usage that minimizes TCAAP’s impact on the environment
• Create an economically competitive and attractive environment for developers and businesses
Unique TCAAP Opportunities

Developing a greenfield site in the core of the metro area

• Infrastructure development
• Direct-fiber broadband
• Partnership
  — AHATS
  — Xcel Energy
  — Others
• Electric vehicle or smart grid demonstration platform
• Geothermal
• Snow and ice melt
### Total Projected Energy Consumption by Area

<table>
<thead>
<tr>
<th>Area</th>
<th>Load (Kbtu)</th>
<th>Square Feet</th>
<th>% of Load</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thumb</td>
<td>264,065,599</td>
<td>3,402,907</td>
<td>26%</td>
</tr>
<tr>
<td>Office</td>
<td>188,467,390</td>
<td>2,428,703</td>
<td>18%</td>
</tr>
<tr>
<td>Retail</td>
<td>63,852,464</td>
<td>682,184</td>
<td>6%</td>
</tr>
<tr>
<td>Mixed Use</td>
<td>32,790,602</td>
<td>350,327</td>
<td>3%</td>
</tr>
<tr>
<td>Multi-Family</td>
<td>34,990,409</td>
<td>1,599,240</td>
<td>3%</td>
</tr>
<tr>
<td>Town (low-density)</td>
<td>46,614,676</td>
<td>1,178,944</td>
<td>5%</td>
</tr>
<tr>
<td>Hill</td>
<td>13,775,509</td>
<td>348,400</td>
<td>1%</td>
</tr>
<tr>
<td>Creek</td>
<td>9,252,207</td>
<td>234,000</td>
<td>1%</td>
</tr>
<tr>
<td>Flex</td>
<td>366,704,807</td>
<td>3,917,786</td>
<td>36%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>1,020,513,663</strong></td>
<td><strong>14,142,492</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

### Percentage of Total Site Energy by Building Type

- **Office**, 44.3%
- **Flex**, 35.9%
- **Mixed-Use & Retail**, 9.5%
- **Single-Family**, 6.8%
- **Multi-Family**, 3.4%
Energy Supply Alternatives

- Solar PV
- Combined heat & power (CHP)
- Water/Ground-source heat pumps
- Microgrid development in collaboration with AHATS
- Storage
Demand-Side Management

Efficient Design

Advanced Infrastructure

Building Co-location

Occupant Behavior
Policy Recommendations

- Coordinate with existing state and utility programs
- Provide TCAAP Redevelopment Code flexibility
- Consider building orientation and shading in site plans
- High-efficiency lighting requirements
- Develop RFP specifications for low-energy use buildings
- Encourage citywide programs for ongoing efficiency
Next Steps

- Continuing ERAB collaboration
- Policy planning
- Spine Road utility coordination that includes thermal and communication infrastructure
- Partnership outreach and exploration
- Cost-benefit analysis of preferred supply and efficiency options
- Framework completion in March 2015