Phoenix Water Services

We need more power!
RULE 1: NO WATTS NO WATER;
RULE 2: NO WATER NO WATTS

Stolen from Henry Day and Kevin Conway with permission.
Average Gal/MWhr for Arizona - Based Facilities

- Nuclear: 785
- Coal: 510
- Natural Gas: 415
- Landfill: 350
- Biofuel: 350
- Solar thermal: 311
- Natural CC: 195
- Geothermal: <5
- Solar pv: <1
Typical Energy Use in Surface Water Treatment

Surface Water Treatment Typical Energy Consumption

- Raw Water Pumping, Coagulation and Flocculation: 12%
- Filtration and Chlorination: 2%
- Sedimentation: 1%
- Finished Water Pumping: 85%

Source: Electric Power Research Institute (EPRI)
Drivers for More Treatment and Energy

- Quality
  - Micro Constituents
  - Regulations

- Quantity – New Supplies from Impaired Sources
  - Groundwater
  - Reclaimed Water
  - Sea Water
kWh per Acre Foot of Water

## Phoenix
### 2008 Power Requirement

<table>
<thead>
<tr>
<th>Water Treatment Plant</th>
<th>KWH</th>
<th>1000000 Gallons/year</th>
<th>KWH/1000 Gal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deer Valley</td>
<td>18,078,353</td>
<td>12,595</td>
<td>1.44</td>
</tr>
<tr>
<td>Union Hills</td>
<td>36,958,747</td>
<td>33,602</td>
<td>1.10</td>
</tr>
<tr>
<td>Verde</td>
<td>3,467,956</td>
<td>6,625</td>
<td>0.52</td>
</tr>
<tr>
<td>24th St</td>
<td>14,280,915</td>
<td>19,522</td>
<td>0.73</td>
</tr>
<tr>
<td>Val Vista</td>
<td>10,440,961</td>
<td>17,383</td>
<td>0.60</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>83,226,932</strong></td>
<td><strong>89,727</strong></td>
<td><strong>0.93</strong></td>
</tr>
</tbody>
</table>
## Phoenix New Water Plant

### Power Requirement

<table>
<thead>
<tr>
<th>Western Canal</th>
<th>KWH</th>
<th>1000000 GAL/Year</th>
<th>KWH/1000 Gal</th>
</tr>
</thead>
<tbody>
<tr>
<td>MF/UF</td>
<td>25734000</td>
<td>14600</td>
<td>1.8</td>
</tr>
<tr>
<td>RO</td>
<td>23438000</td>
<td>7300</td>
<td>3.2</td>
</tr>
</tbody>
</table>

Note: 50 of flow will be processed through RO Unit