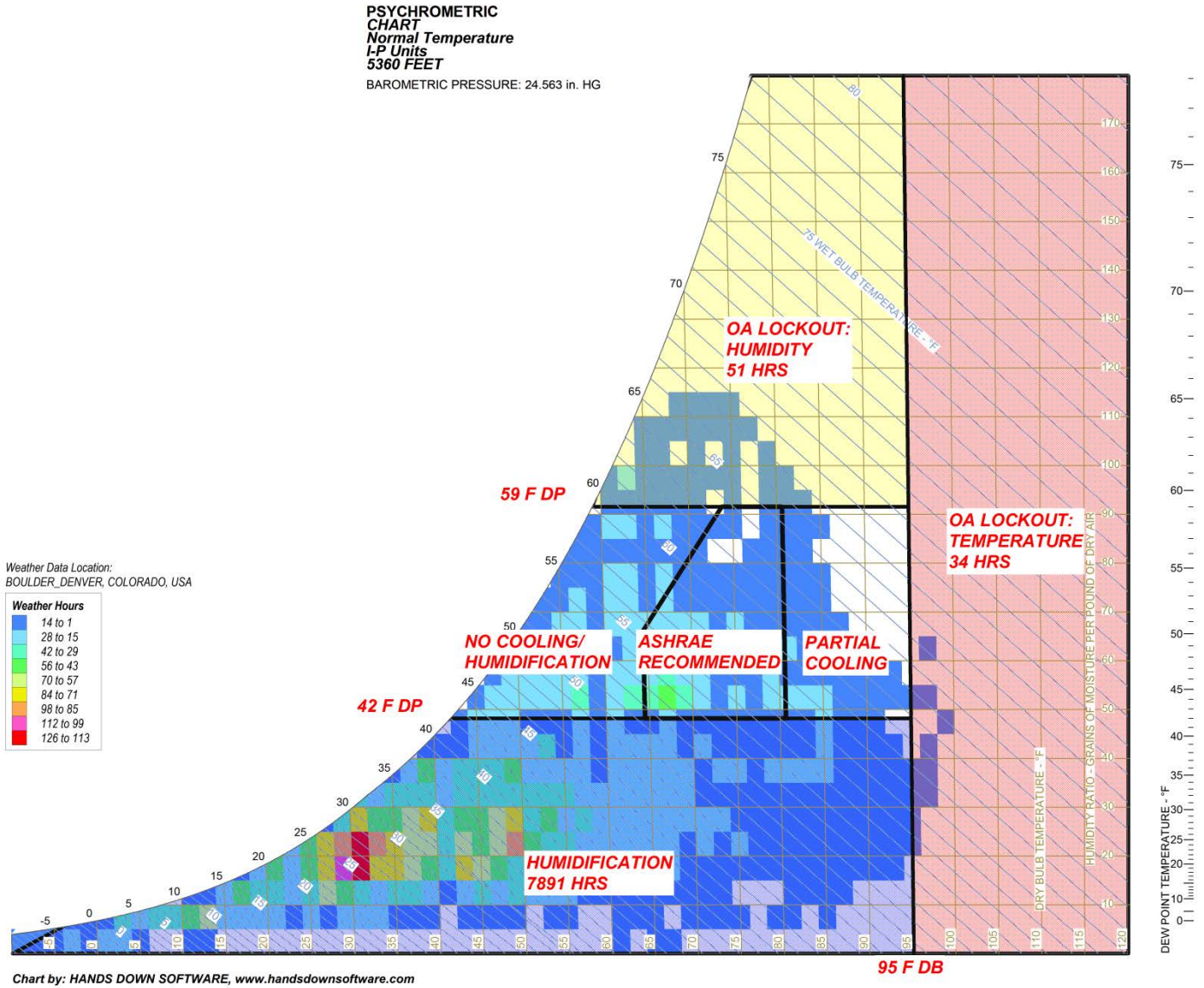
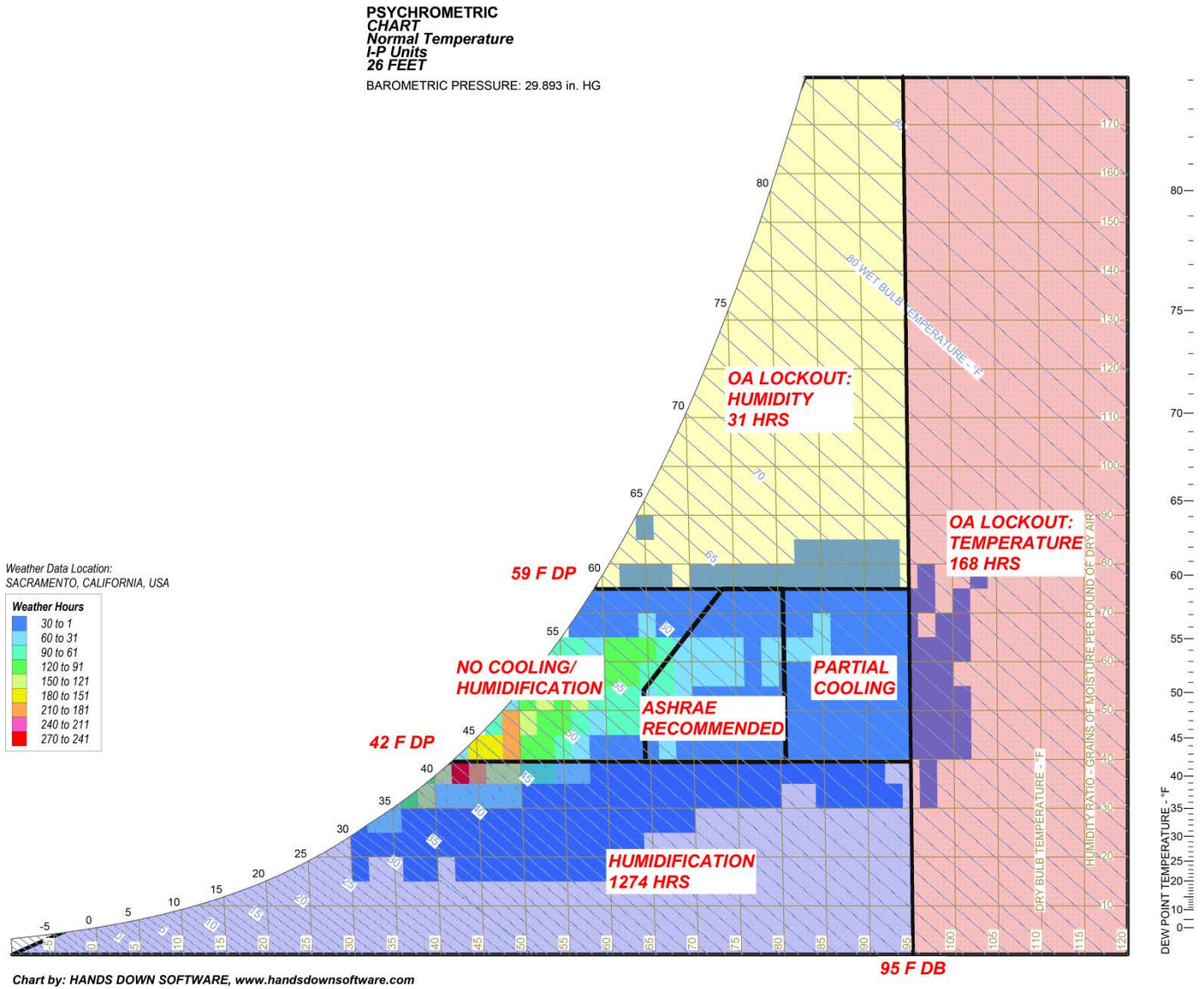
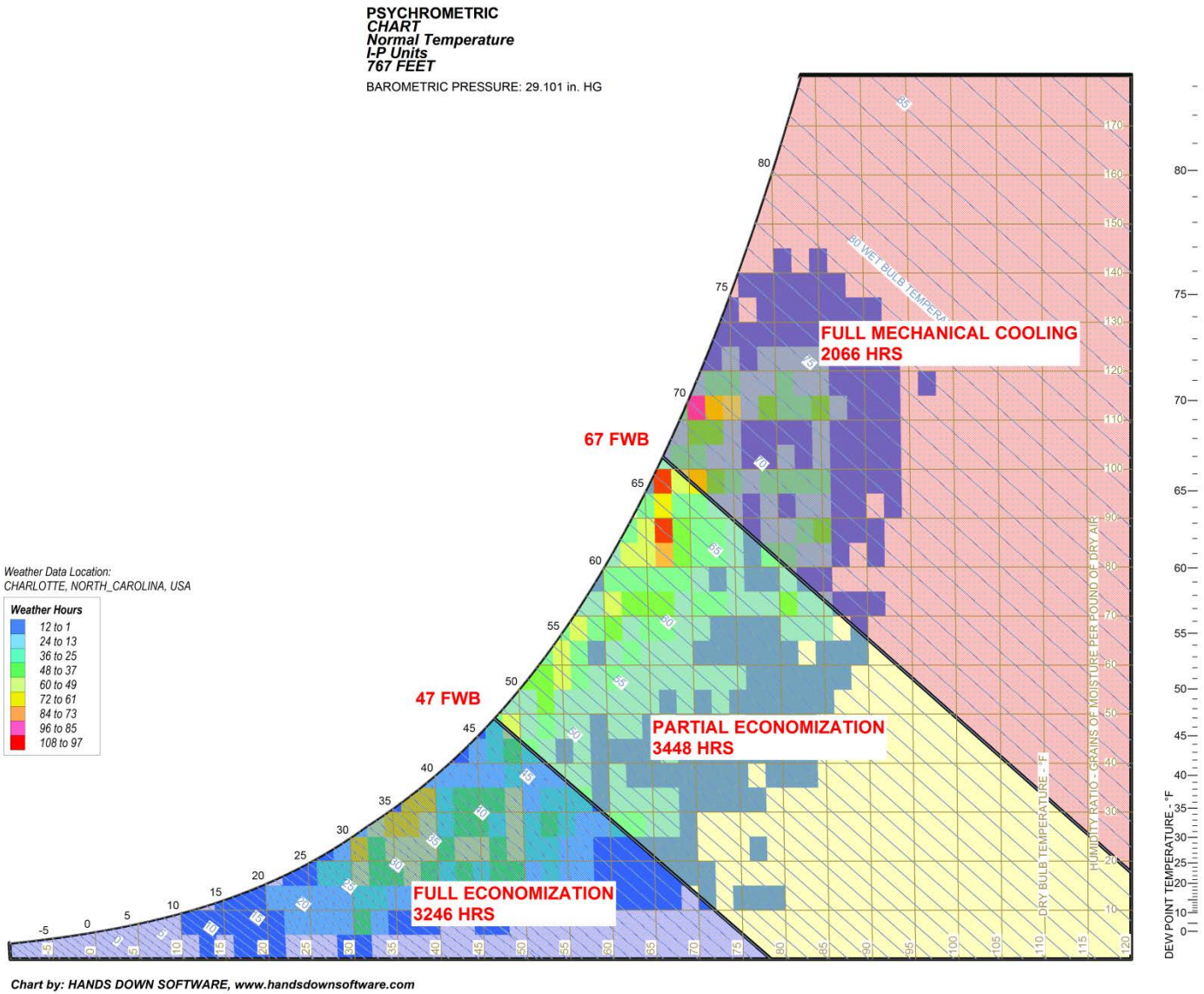
Air-side Economizer Free Cooling Zones – Denver, CO



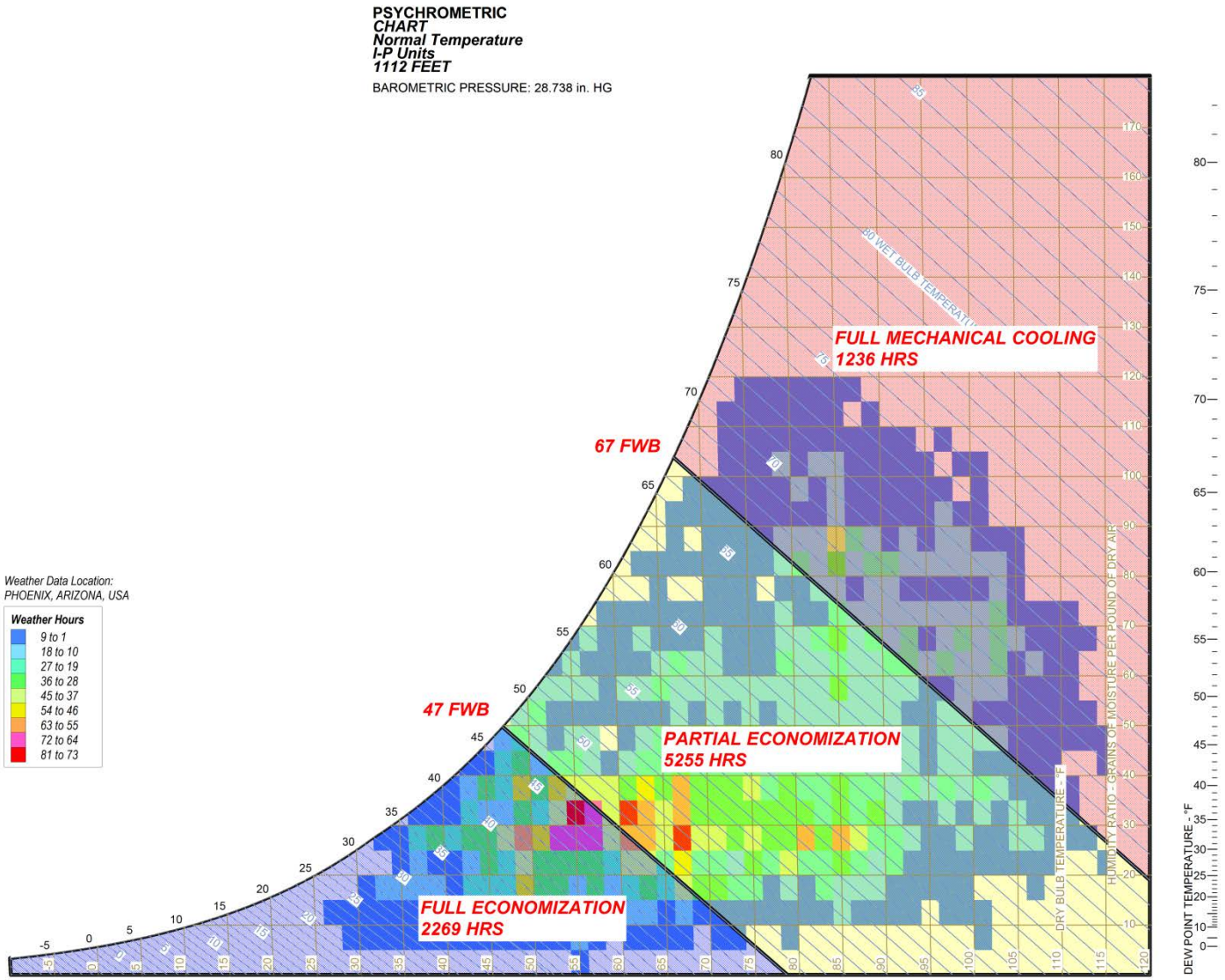
Air-side Economizer Free Cooling Zones – Sacramento



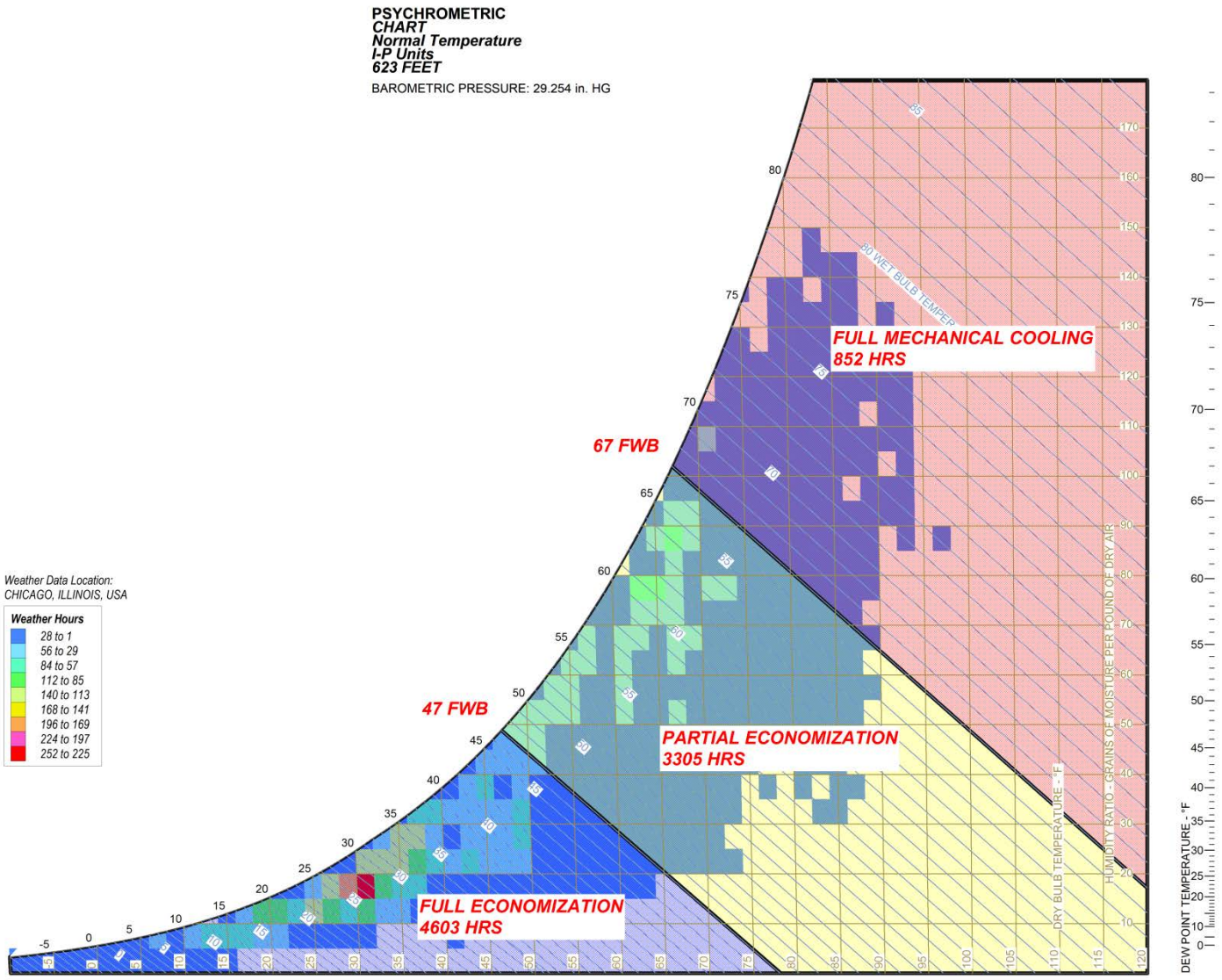
Water-side Economizer Free Cooling Zones – Charlotte



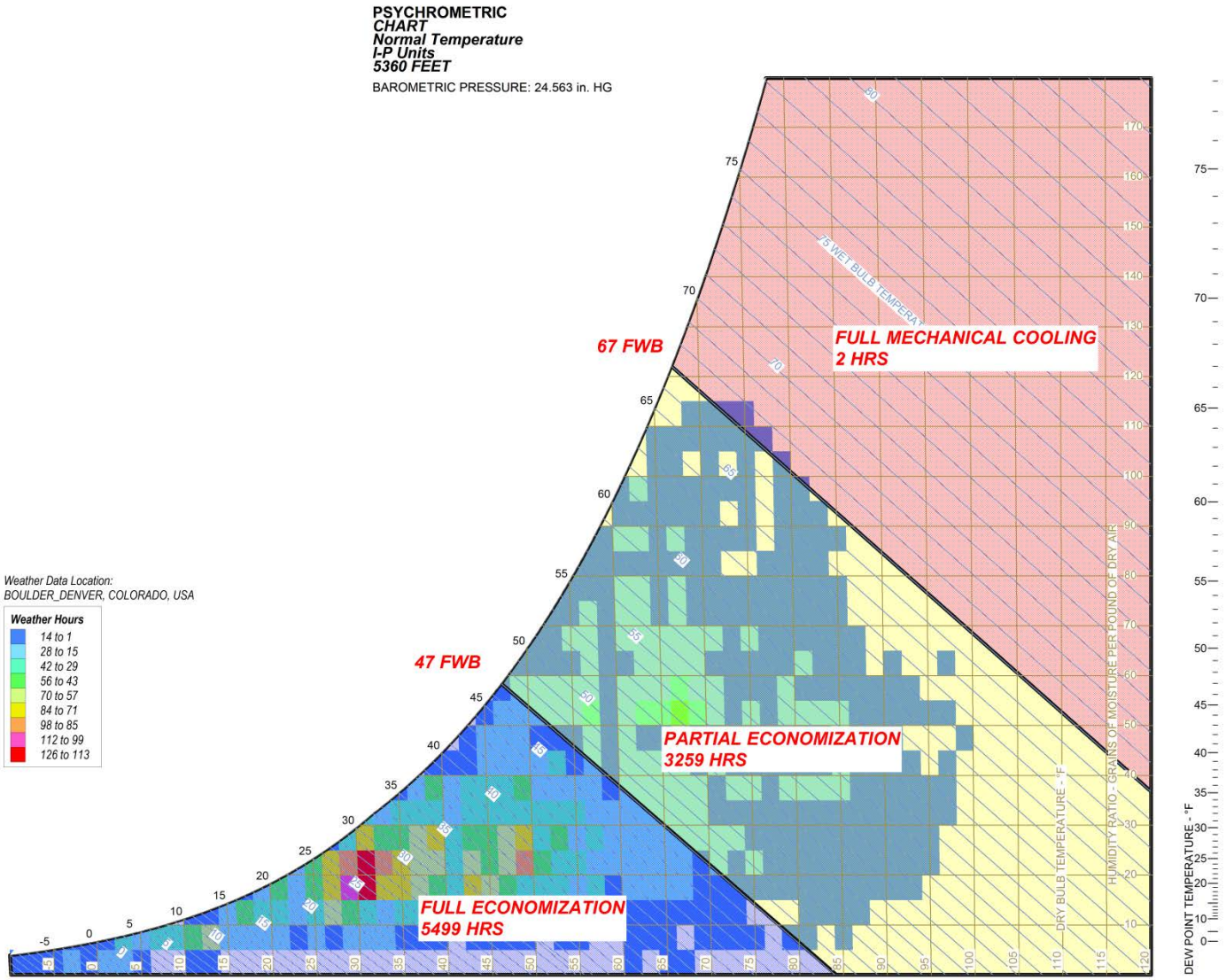
Water-side Economizer Free Cooling Zones – Phoenix



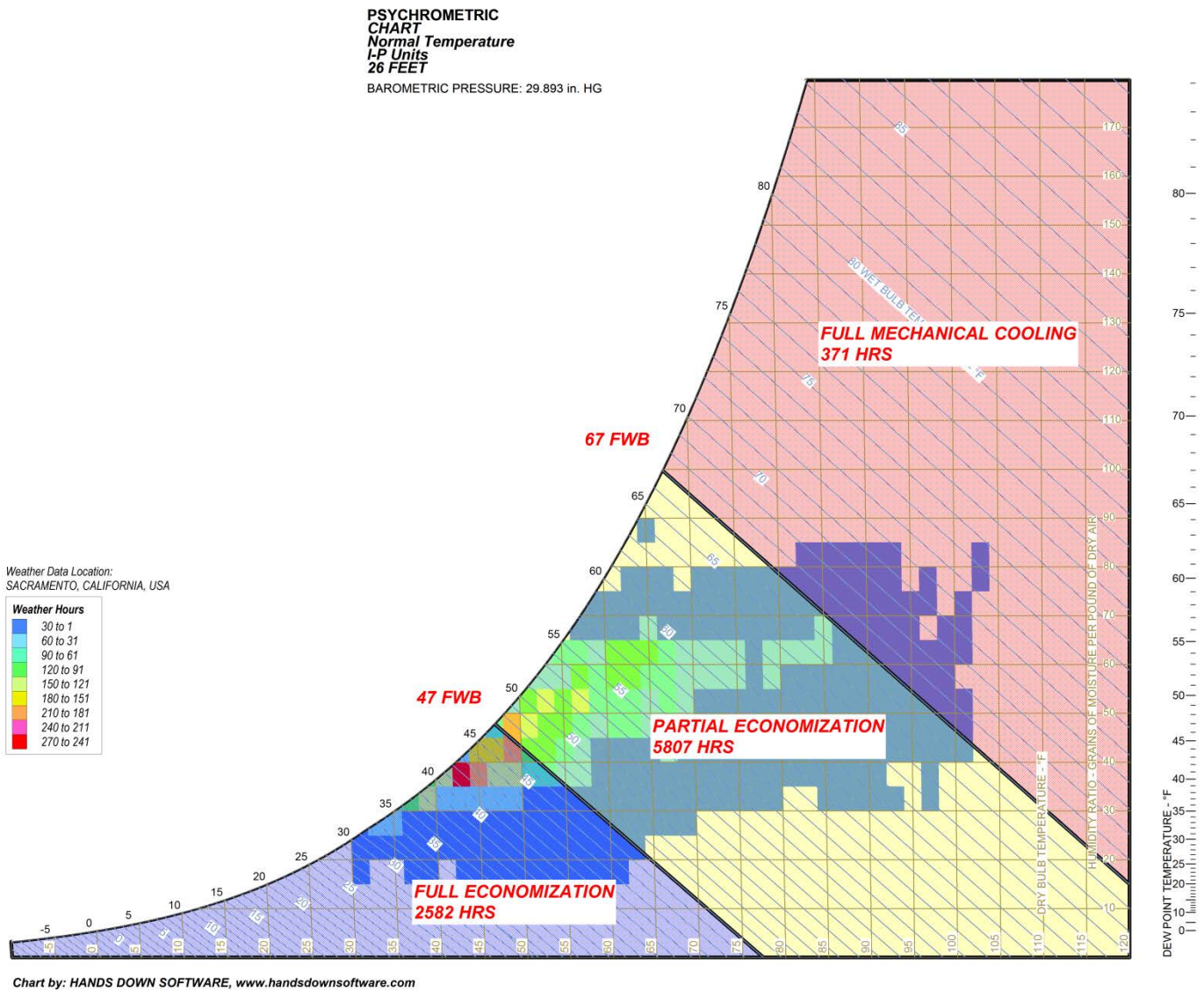
Water-side Economizer Free Cooling Zones – Chicago



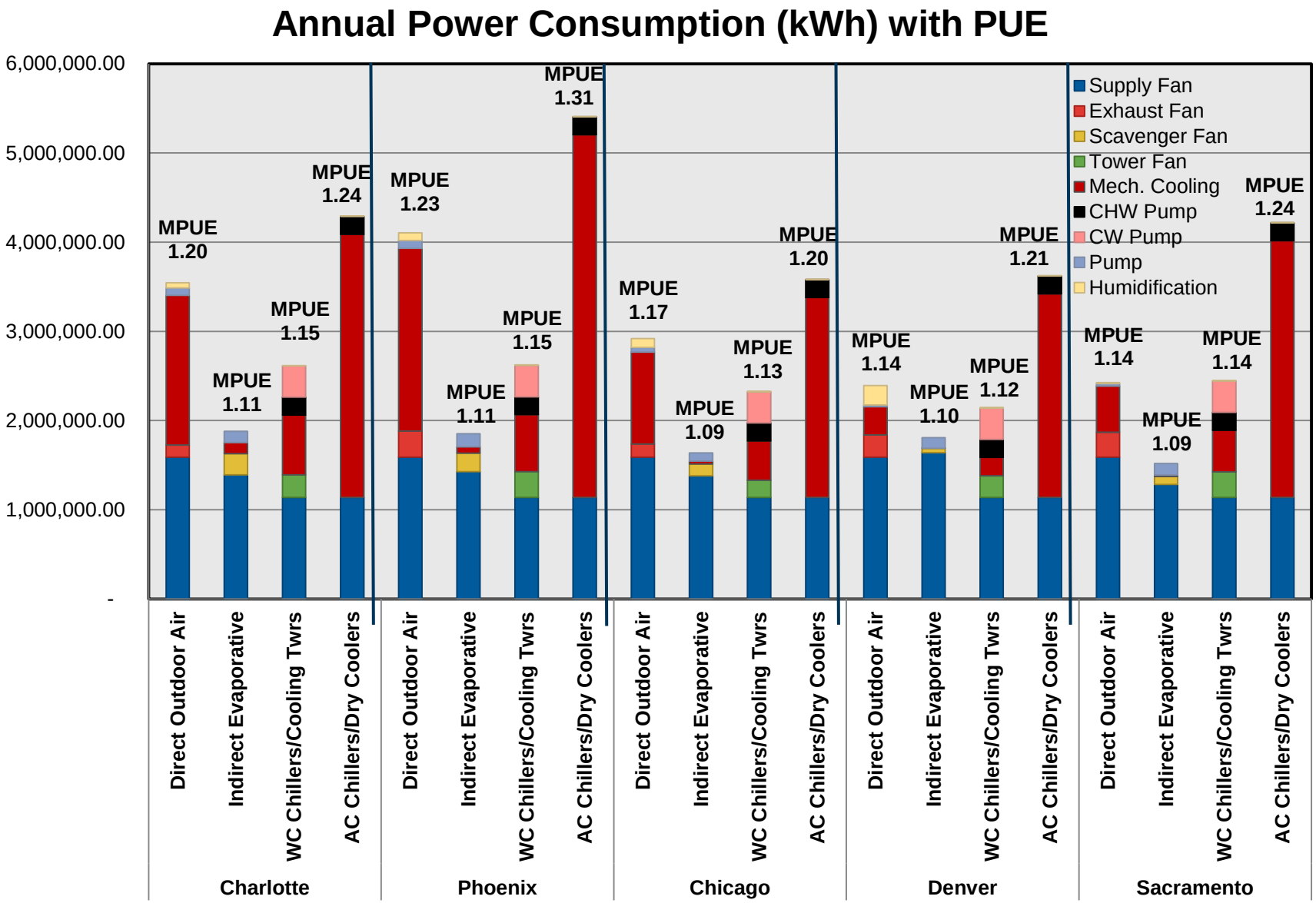
Water-side Economizer Free Cooling Zones – Denver



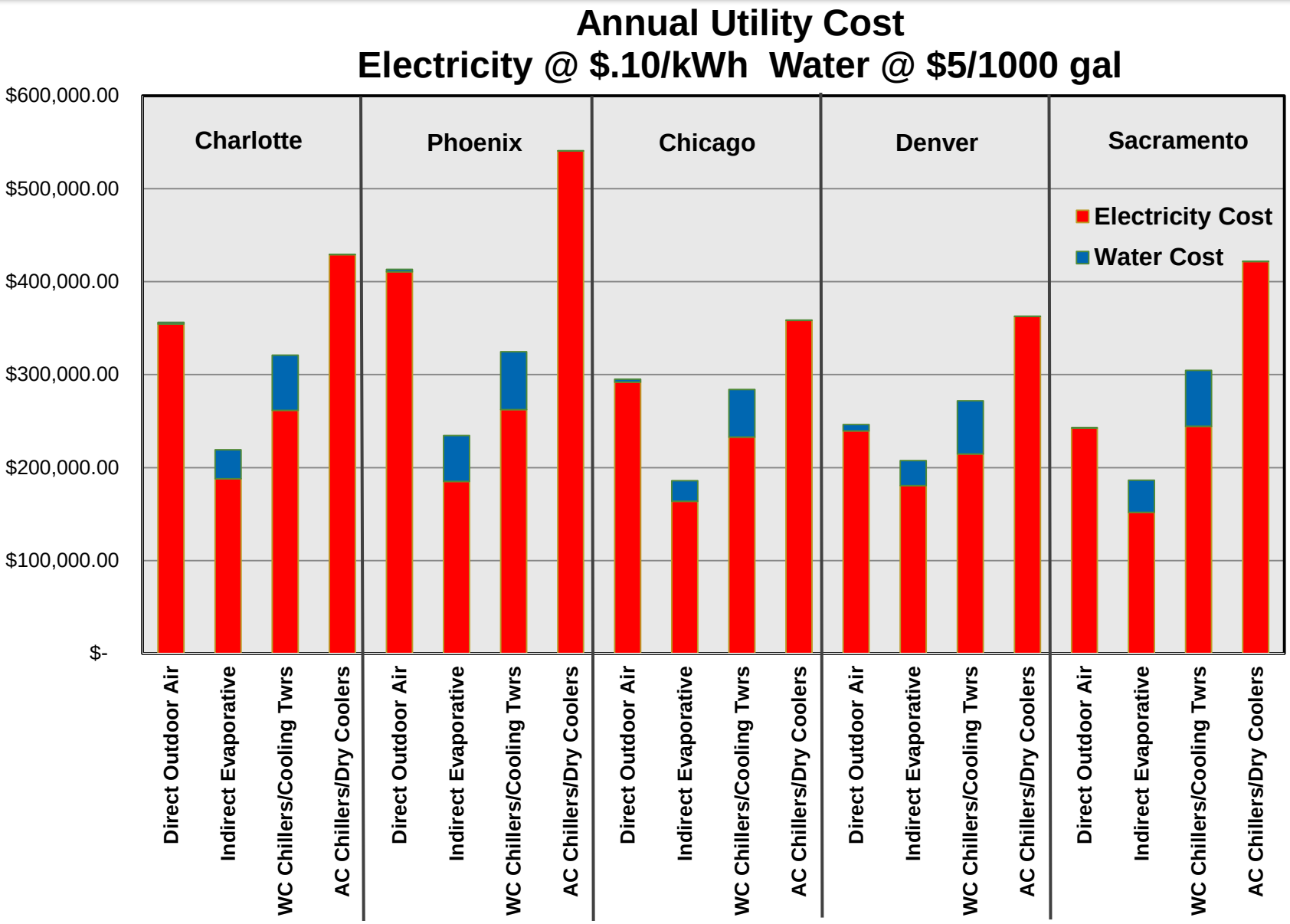
Water-side Economizer Free Cooling Zones – Sacramento



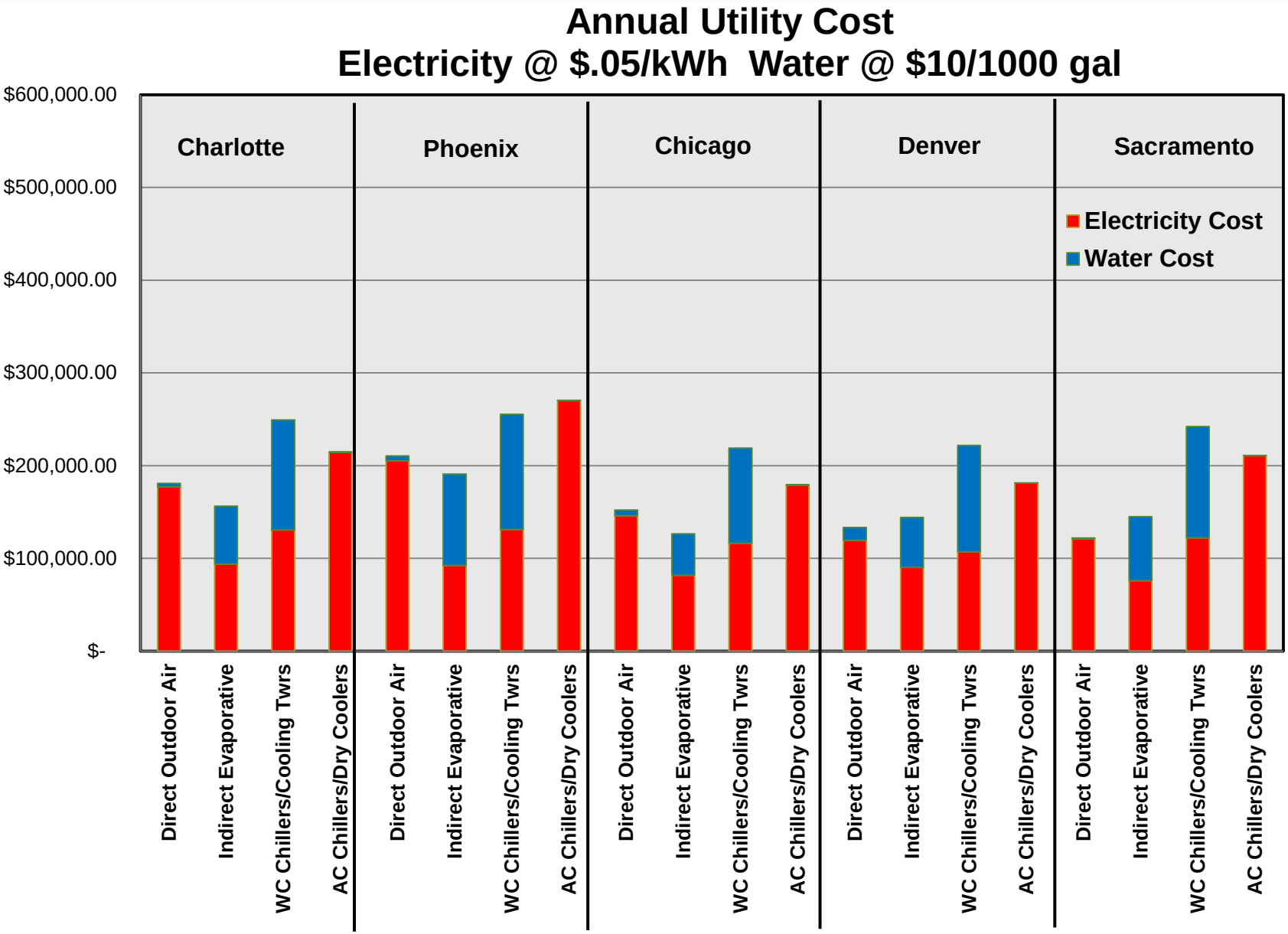
Annual Power Use Comparison



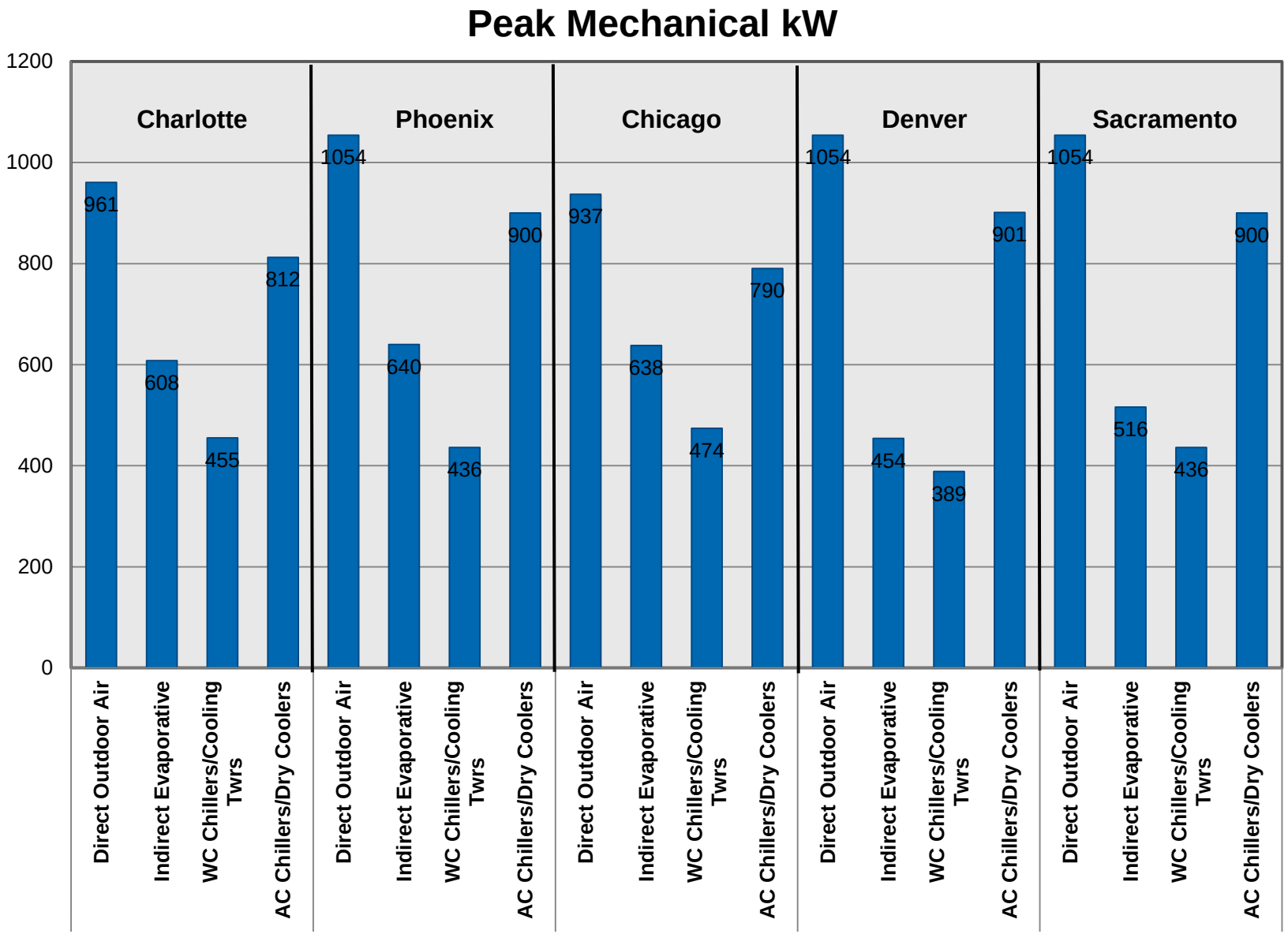
Annual Utility Cost Comparison - High Electricity Cost / Low Water Cost



Annual Utility Cost Comparison - Low Electricity Cost / High Water Cost



Peak Demand Comparison – Power for Mechanical



Conclusions

- Though direct outside air economizers are generally considered to be the most efficient way to provide free cooling, there are many factors that may limit their effectiveness, particularly for data centers.
- Indirect evaporative cooling may provide the most attractive solution if water quality, cost and availability is favorable.
- Water-side economizers with efficient chillers can be a very good choice if chillers are optimized for cooler condenser water and access to outside is limited.
- Look closely at the following:
  - Local climate
  - Power and water rates
  - Peak power requirements
  - Filter maintenance
  - Humidity issues