Possible Approach to Evaluating Sustained Peaking Capacity

Based on 2005 Avista Integrated Resource Plan
PNW Resource Adequacy Technical Committee
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What Is Sustained Capacity

- A Tabulation of Loads and Resources Over a Period(s) Exceeding the Traditional 1-Hour Definition of Peak
- A Measure of Reliability
- An Essential Concept of Utility Planning
- A Recognition that Peak Loads Do Not Stress the System For Just One Hour
  - Especially important in energy-limited NW hydro system
- The “Grey Area” Between Energy and Capacity Planning
- An Event Which Occurs Infrequently
- A Concept Parallel to “Planning Margins”

Why Capacity Methods Matter

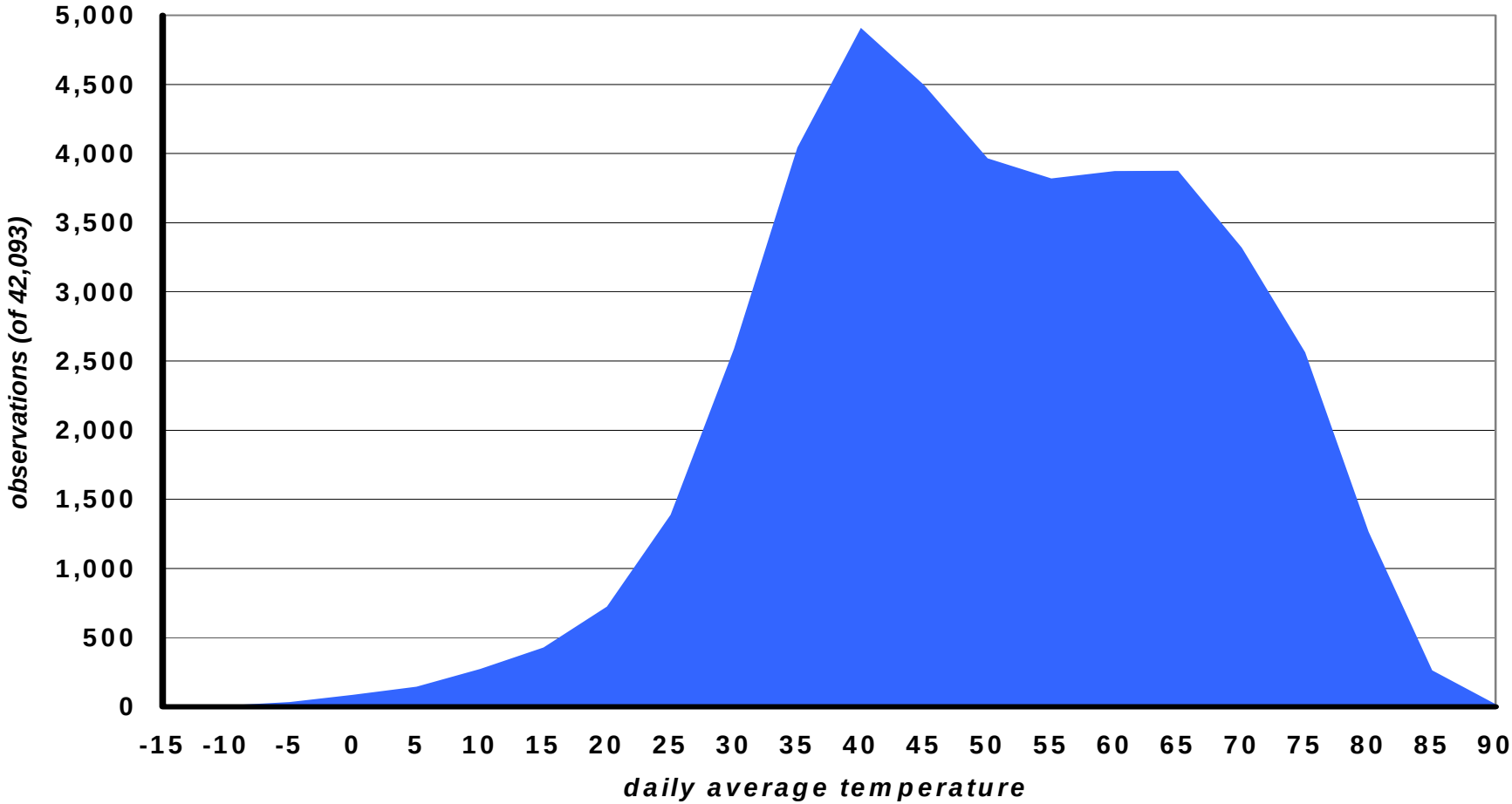
- Planning Method Defines Level of Capacity Required to Meet Load
- Larger Capacity Margins Cost Customers More
  - Capital and fixed costs are built into rates
    - 100 MW ~ $35-50MM, or ~$5-$8MM per year
  - Offsetting operating revenues are limited
    - capacity resources generally are inefficient relative to energy resources and therefore operate for very few hours

Comparison to Peak Forecasting

Item	Capacity L&R	Sustained Capacity
Period	One Hour	One Hour to Three Days, or More
Peak Load	Average Coldest Day Temp	Lowest Load on Record ~ 120-160 MW in 2005
Thermals	Average Temps	Lowest Temps & Colstrip Reduced for Freeze (~ 30 MW)
Hydro	Maximum Capability	Maximum Capability Reduced for Freeze (~ 60 MW)
Contracts	Actual Forecast	Actual Forecast

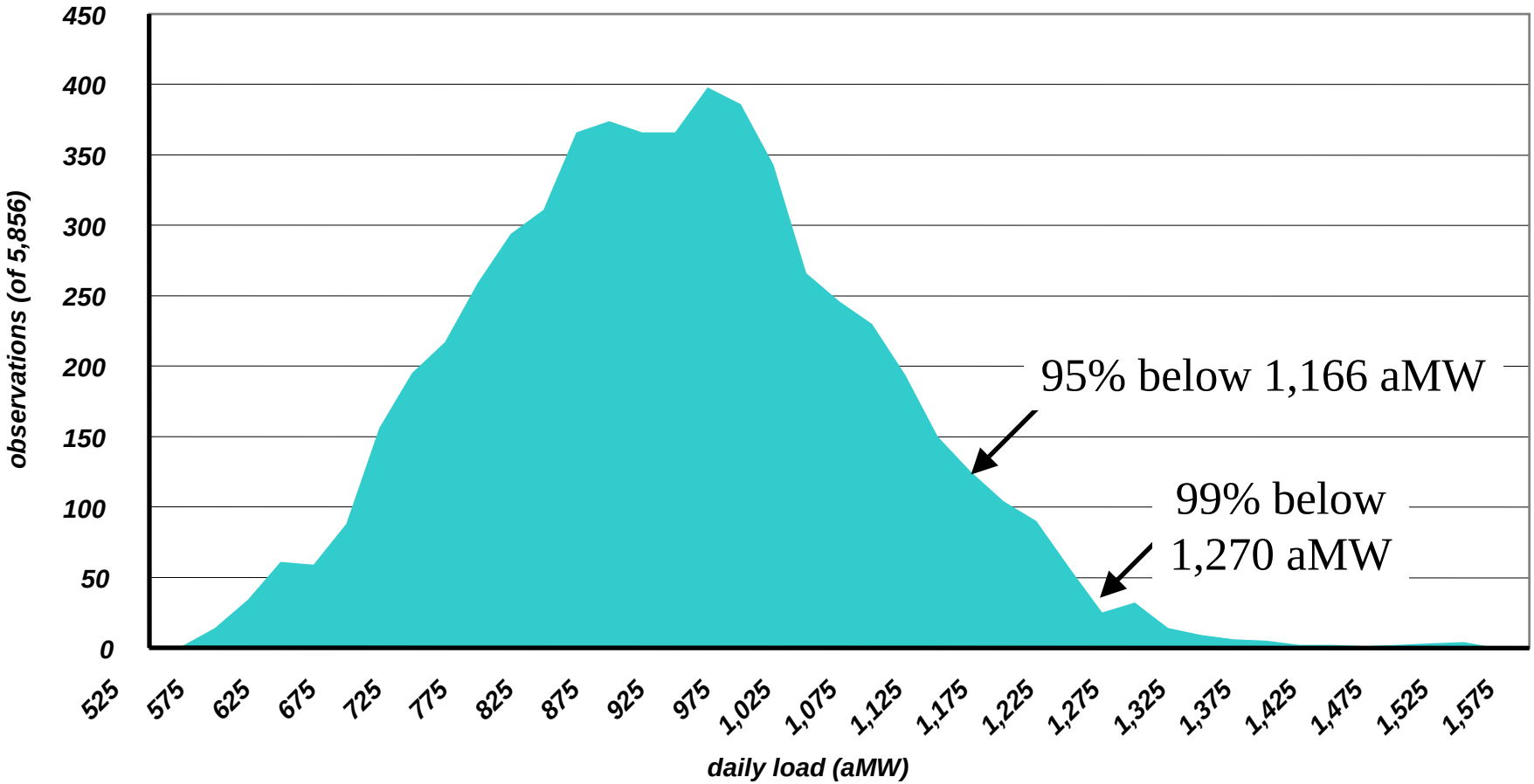
Temp. Distribution (1889-2004)

Spokane International Airport



Peak Load History (1989-04)

Avista Total



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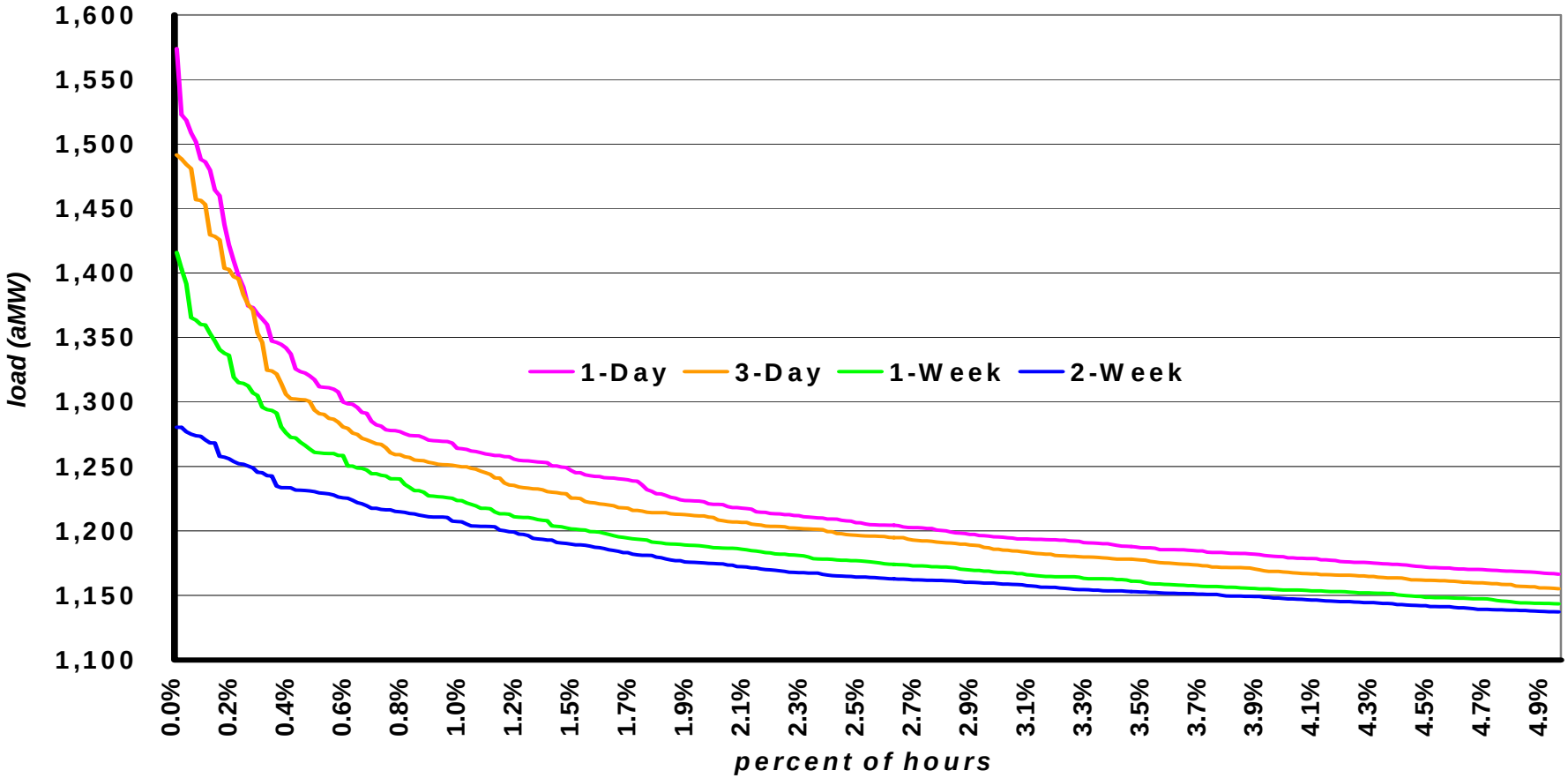
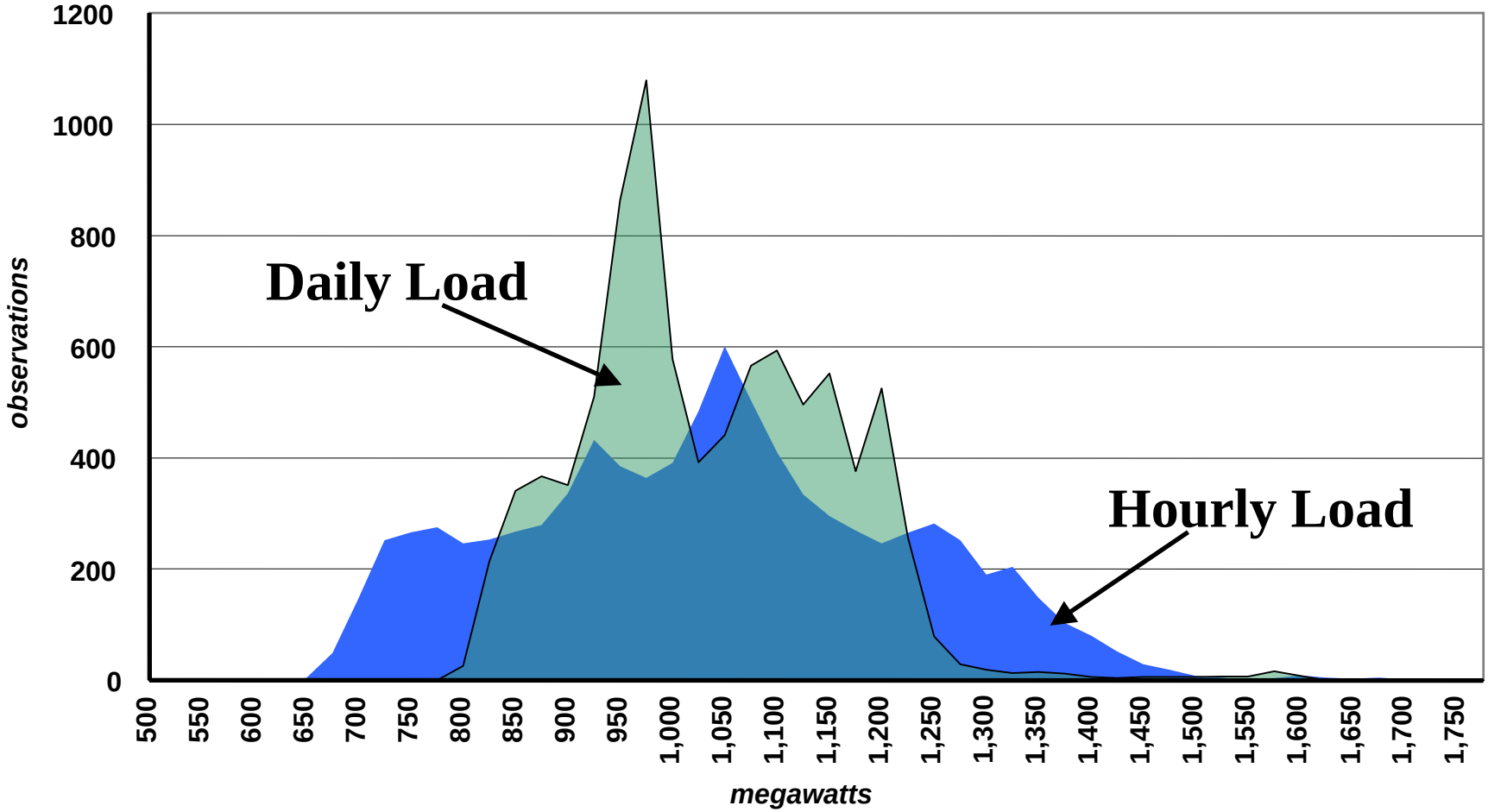


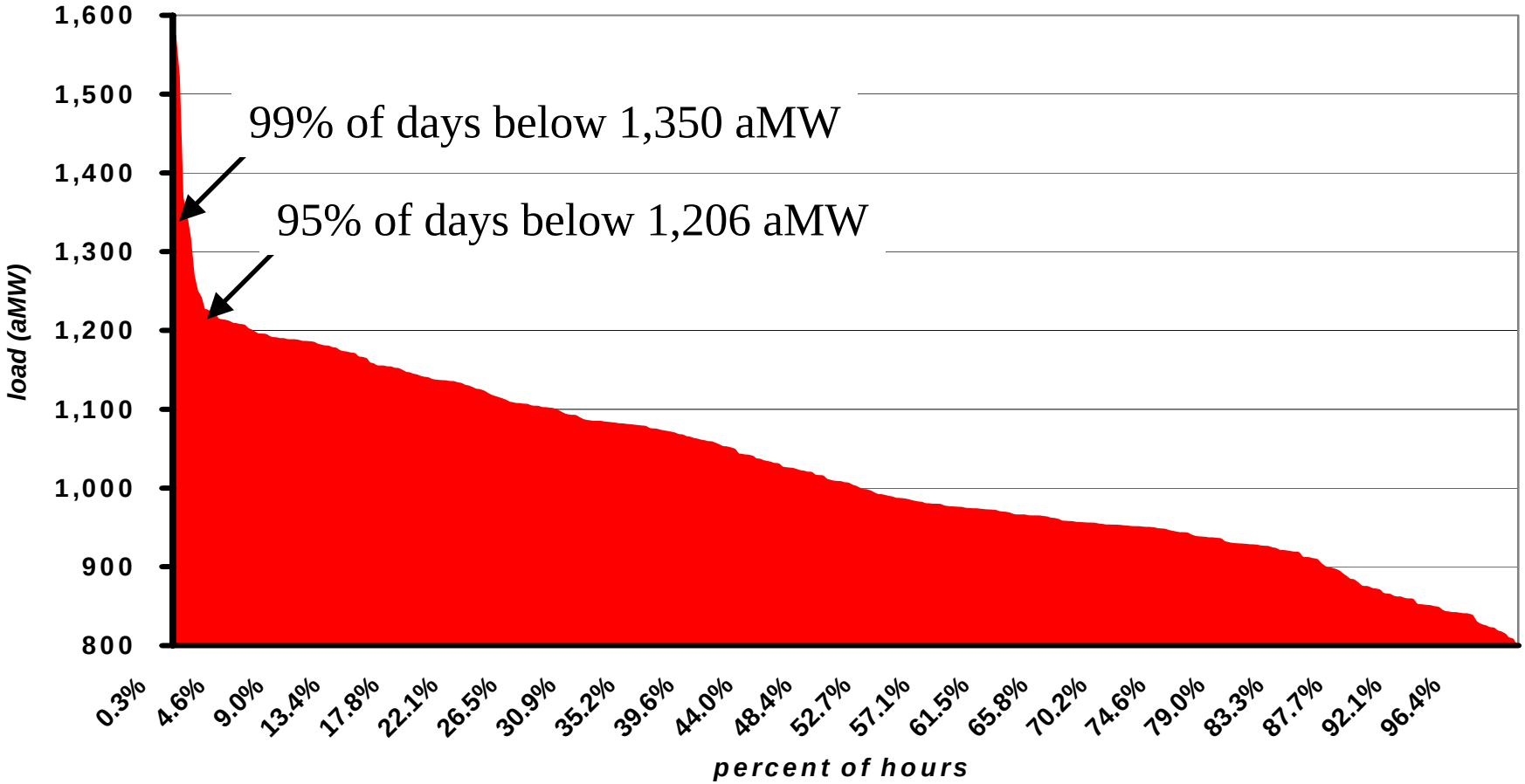
Daily Versus Hourly Peaks

2004 Load



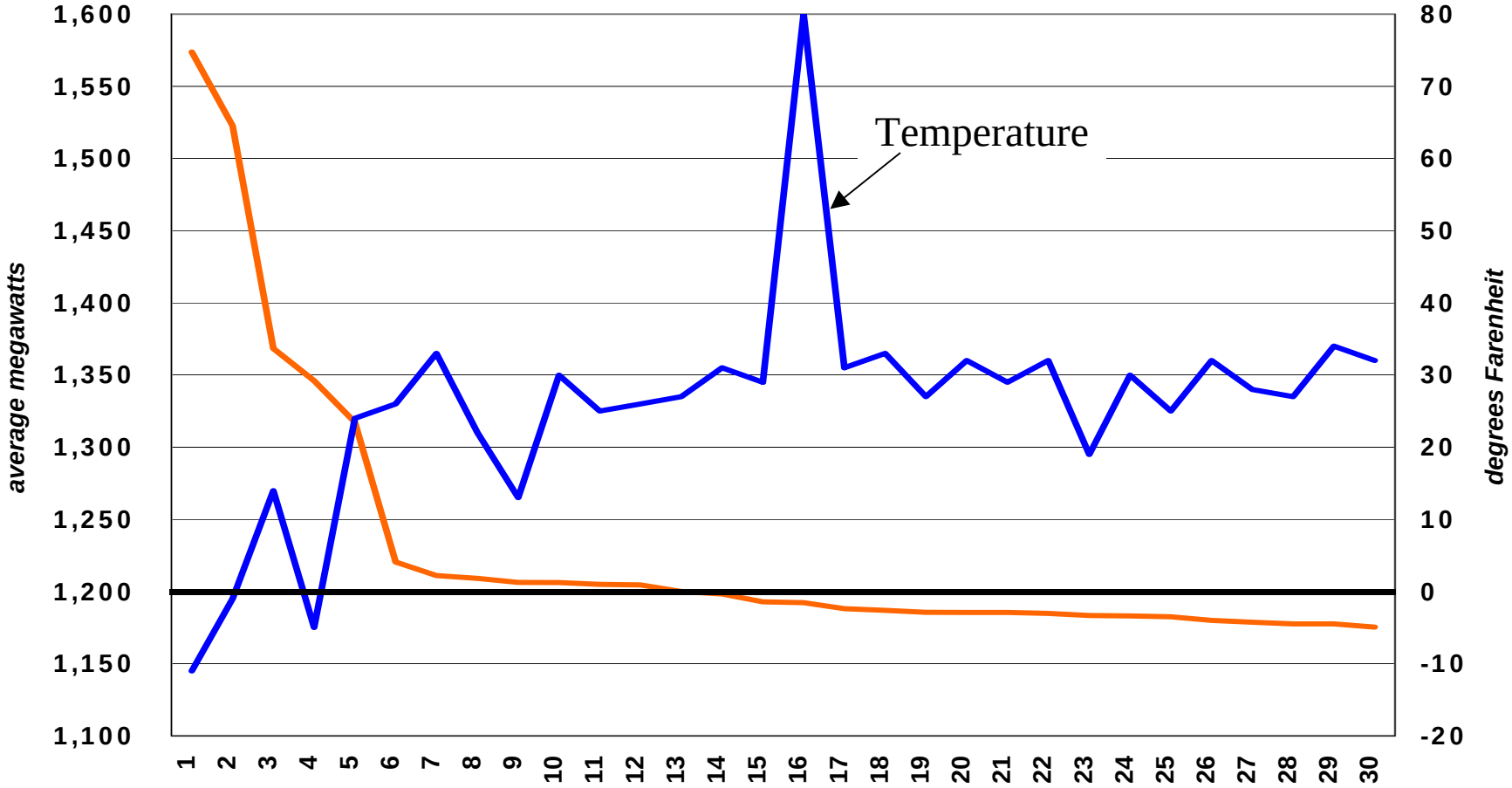
2004 Daily Load Duration

Peak Day = 1,574 aMW Peak Hour = 1,766 MW

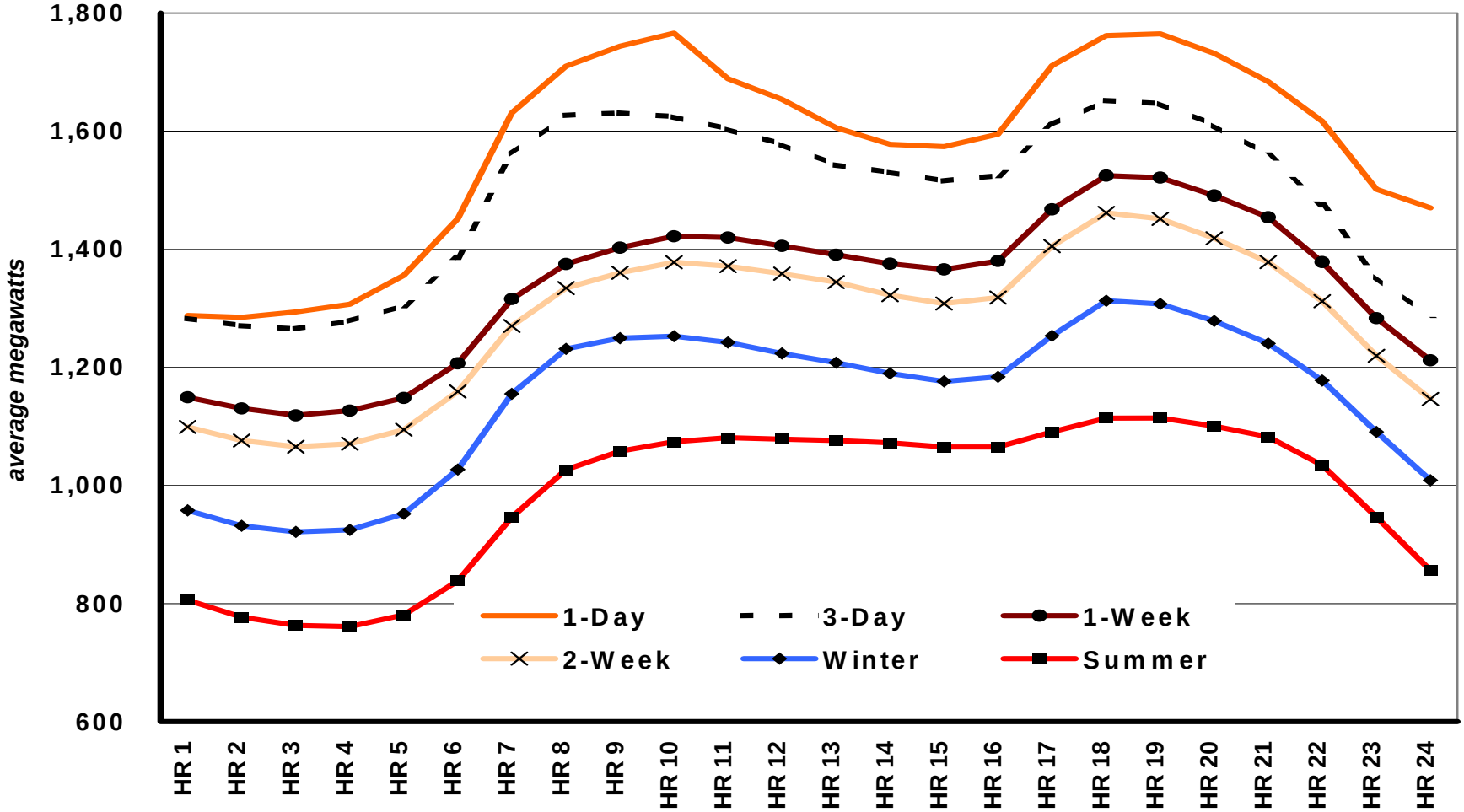


2004 Peak Load and Temps

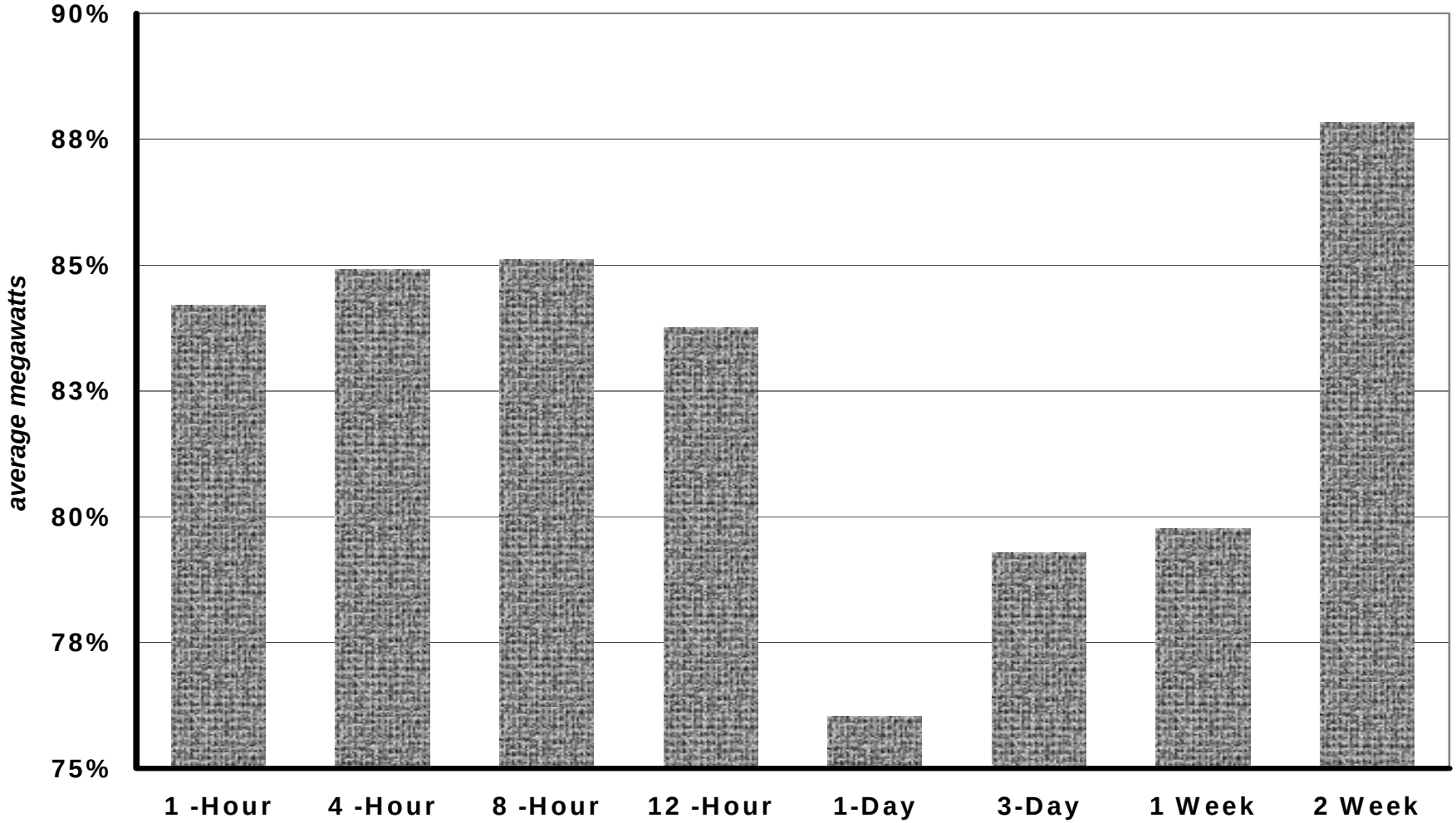
30 Highest Load Days



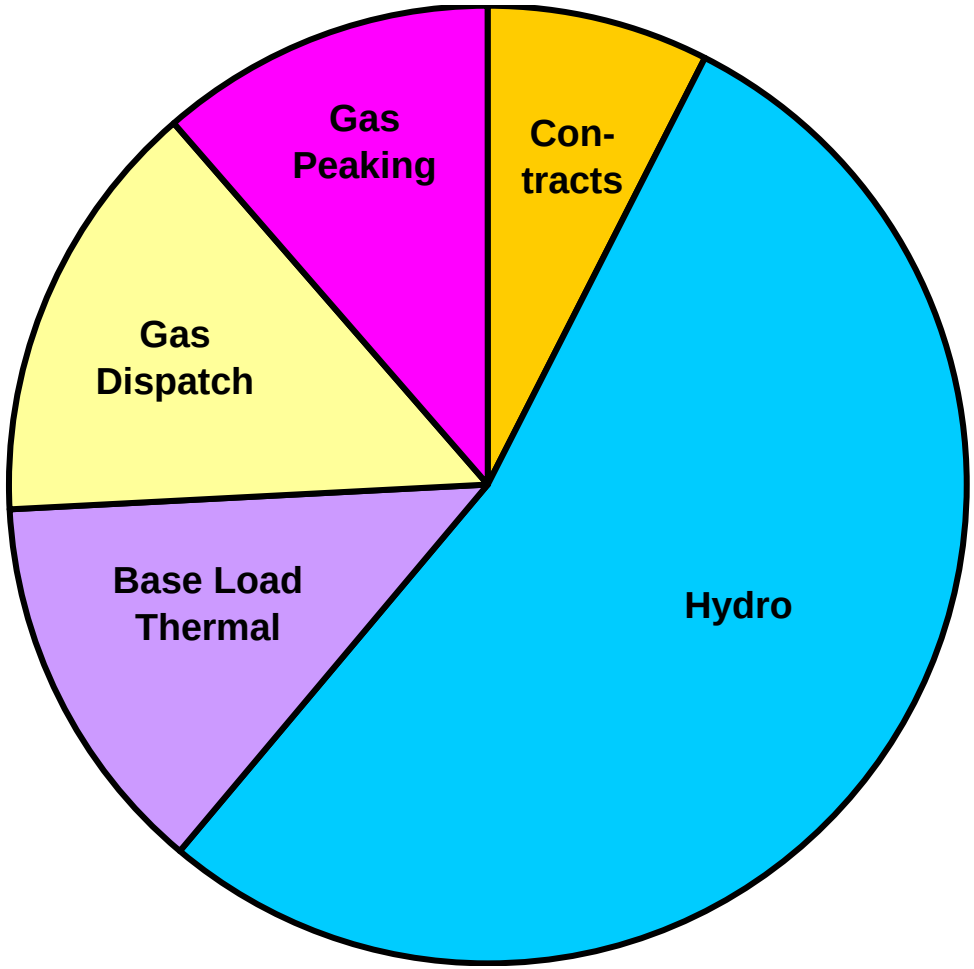
Peak Load Shape Comparison



Summer Vs. Winter Peaks

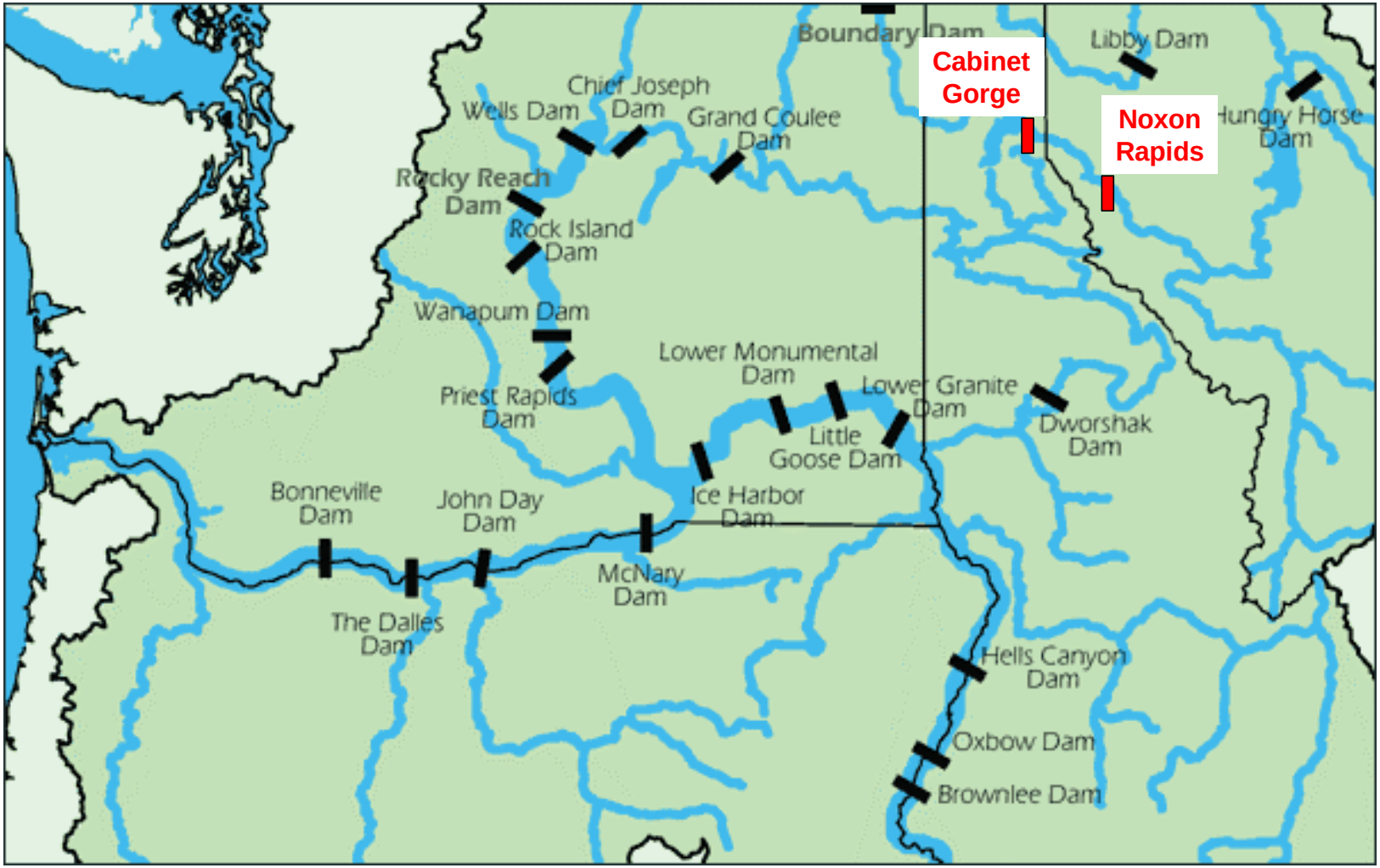


Avista's Resource Mix



Total = 2,122 MW

Avista's Hydro Facilities



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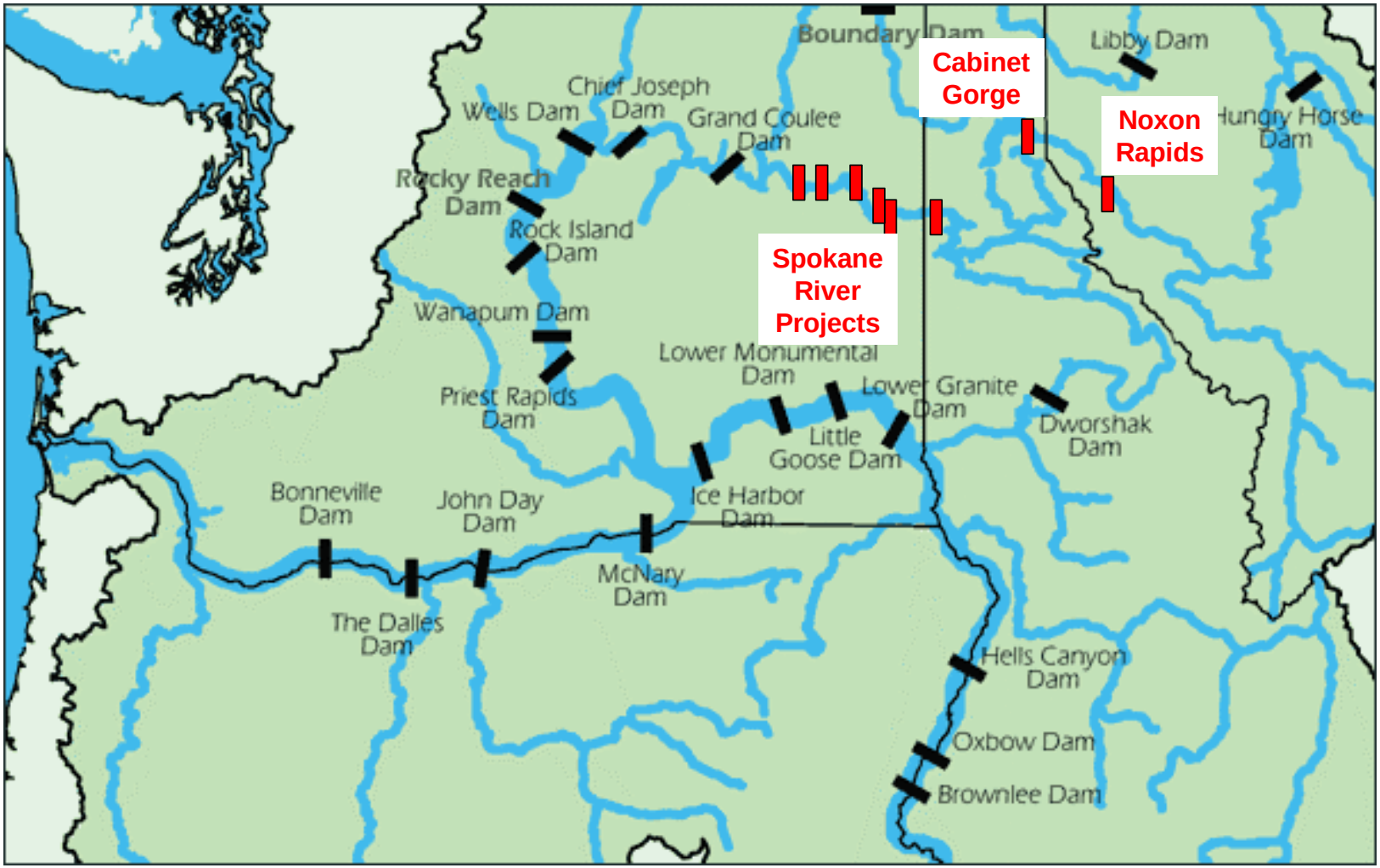

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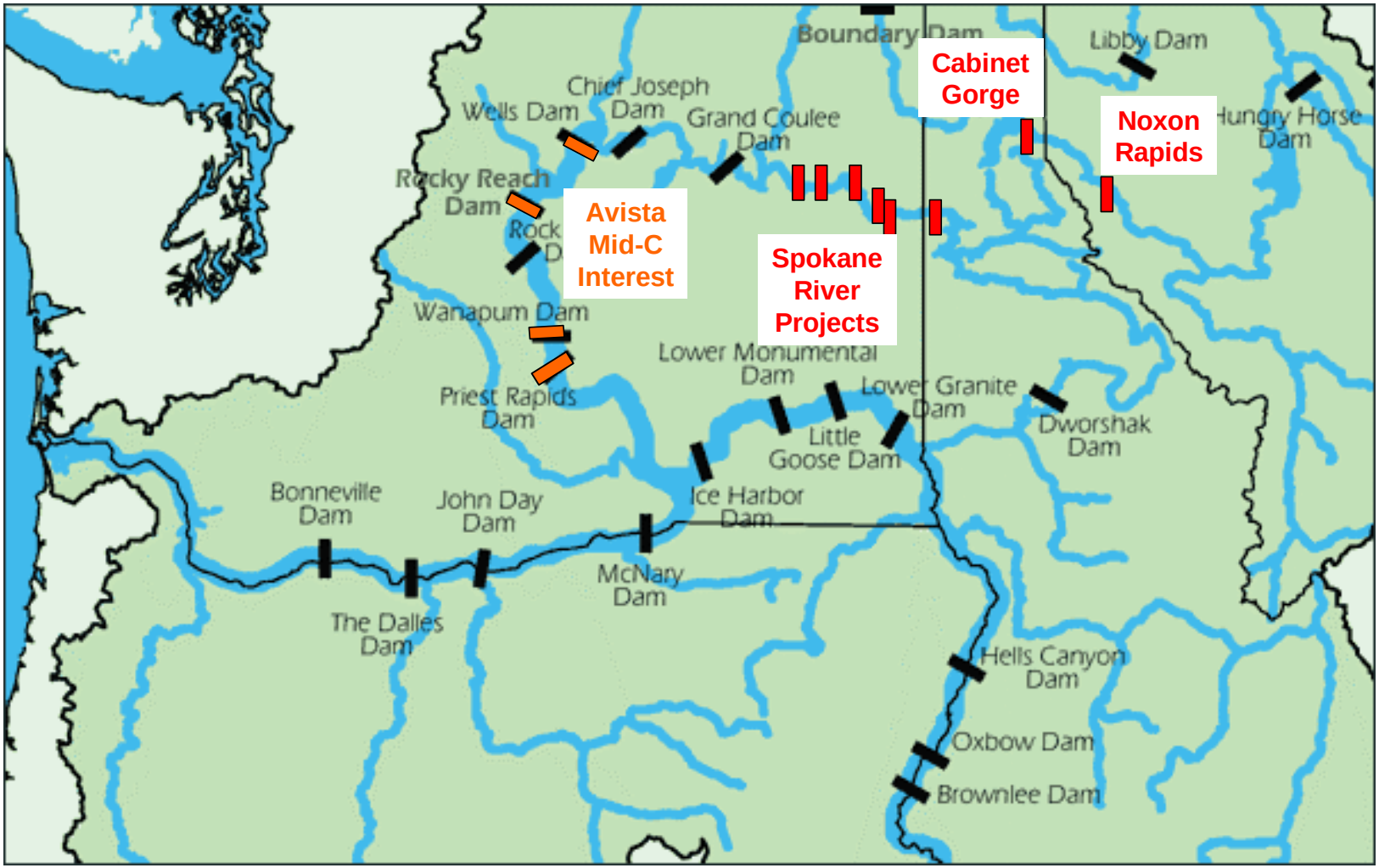

Sustained Peak Estimate—2005

Sustained Peak Period L&R Calculation Comparison
2005

Peak Period Considered	1 -Hour	4 -Hour	8 -Hour	12 -Hour	24 -Hour	72 -Hour	168 -Hour	336 -Hour
Load								
Peak Load	(1,619)	(1,598)	(1,579)	(1,542)	(1,450)	(1,377)	(1,369)	(1,175)
10% Contingency	(162)	(160)	(158)	(154)	(145)	(138)	(137)	(117)
Load Subtotal	(1,781)	(1,758)	(1,736)	(1,696)	(1,595)	(1,515)	(1,506)	(1,292)
Hydro Capability								
Hydro @ 90% CI	208	208	208	326	326	326	326	326
Hydro Storage	959	871	825	550	275	211	154	77
River Freeze Up	(60)	(60)	(60)	(60)	(60)	(60)	(60)	(60)
Hydro Subtotal	*1,107*	*1,019*	*973*	*816*	*541*	*477*	*419*	*342*
Thermal Capability								
Coyote Springs II	308	308	308	308	308	308	308	308
Colstrip	222	222	222	222	222	222	222	222
Rathdrum	184	184	184	184	184	184	184	184
Northeast	69	69	69	69	69	69	69	69
Kettle Falls	62	62	62	62	62	62	62	62
Boulder Park	25	25	25	25	25	25	25	25
Fuel Delivery System Freeze Up	(30)	(30)	(30)	(30)	(30)	(30)	(30)	(30)
Thermal Subtotal	*839*	*839*	*839*	*839*	*839*	*839*	*839*	*839*
Contracts								
Net Contracts	*139*	*139*	*139*	*139*	*139*	*139*	*139*	*139*
PGE Adjustment	0	0	0	25	38	46	105	105
PPM Wind @ 25% of Capacity	0	0	0	0	0	0	0	0
000 MW Spot Purchases	0	0	0	0	0	0	0	0
Contracts Subtotal	*139*	*139*	*139*	*164*	*177*	*185*	*245*	*245*
Net Position	304	240	215	123	(38)	(14)	(3)	134

Key Capacity Planning Questions

- Which Sustained Period is Adequate
- How Much Can/Should Avista Rely On The Market During Extreme Load Conditions
- What Capacity Should Be Given to Wind
- With Move To Gas-Fired Turbines, Will Gas Be Available To Meet Coincident Demands
- How Will Federal Projects Act During a Cold Snap
- What is the Significance of Transmission
- Is LOLP a Better Method & How Would We Do LOLP