

# Resource Adequacy Economic Target

**Resource Adequacy Forum**  
**Technical Committee**  
**July 5, 2006**  
**Portland, Oregon**



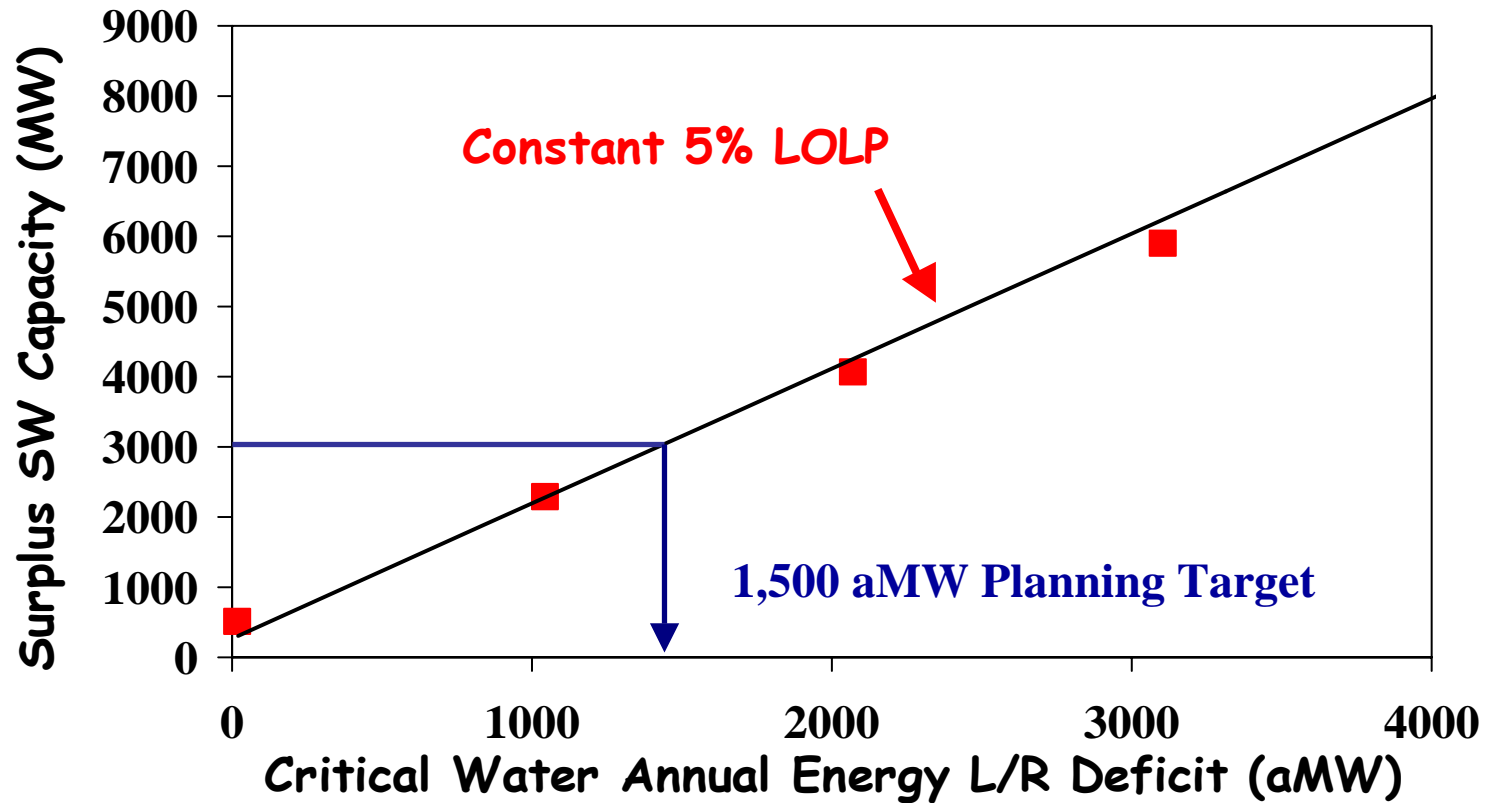
# Objectives

- What do we mean by “physical” adequacy?
- Review of the current energy standard.
- What is “economic” adequacy?
- Defining an economic target.

# Defining Physical Adequacy

- **Significant problem** = Lose 1,200 MW for one day
- **Goal** = No more than 5% likelihood of significant problems for future winters (5% LOLP)
- **Assessment** = Simulate many future winters and count how many have significant problems.
- **Solution** = Plan sufficient resources to attain a 5% LOLP.

# Linking LOLP and L/R Balance



# Pacific NW Energy Standard

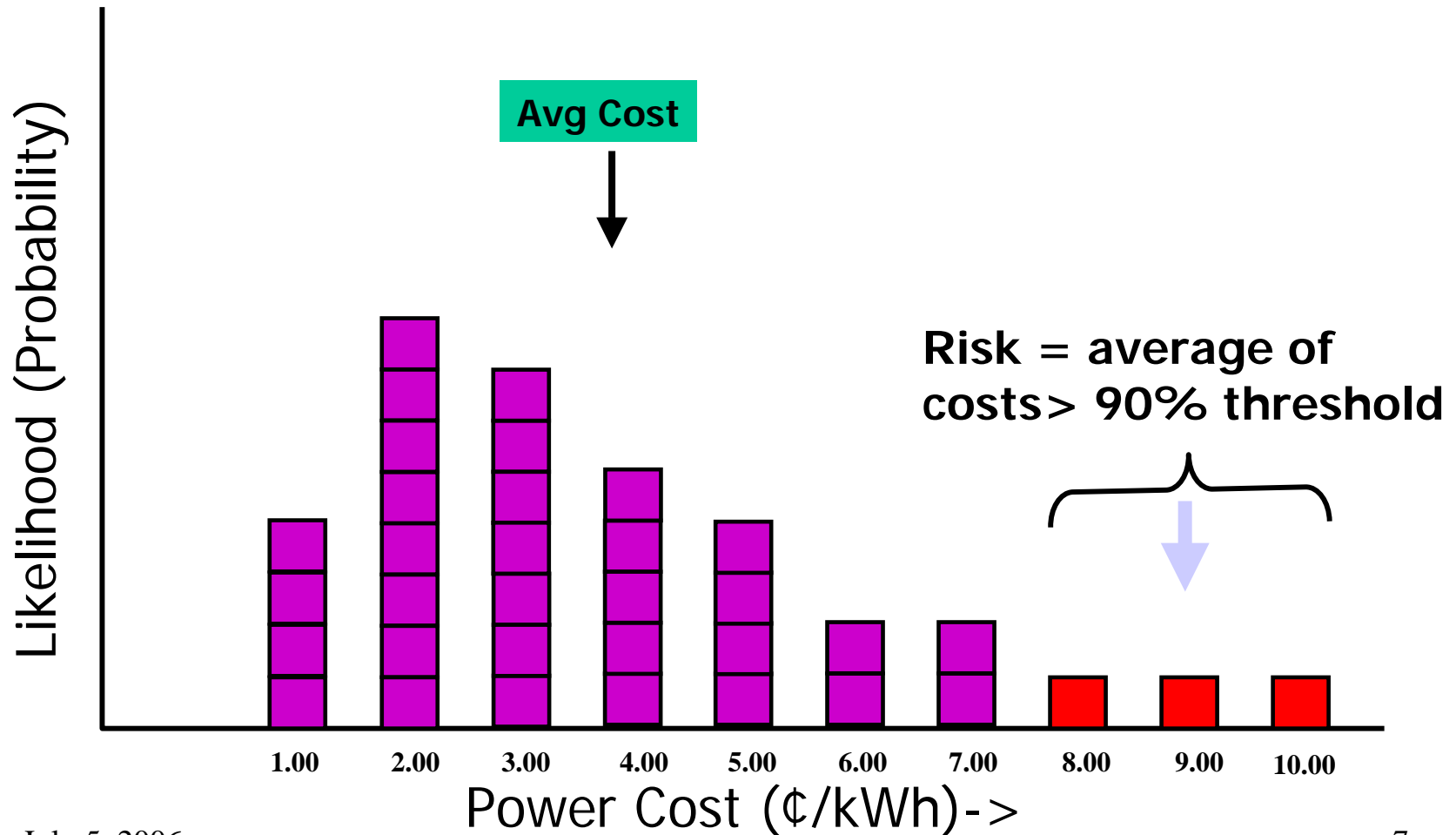
- **Metric** – Annual average Load/Resource balance
  - Load = annual average load
  - Resource = thermal resources + firm hydro  
+ 1,500 aMW planning adjustment
- **Target** – Zero
- Meeting this standard yields a 5% LOLP

# Assessing Economic Risk

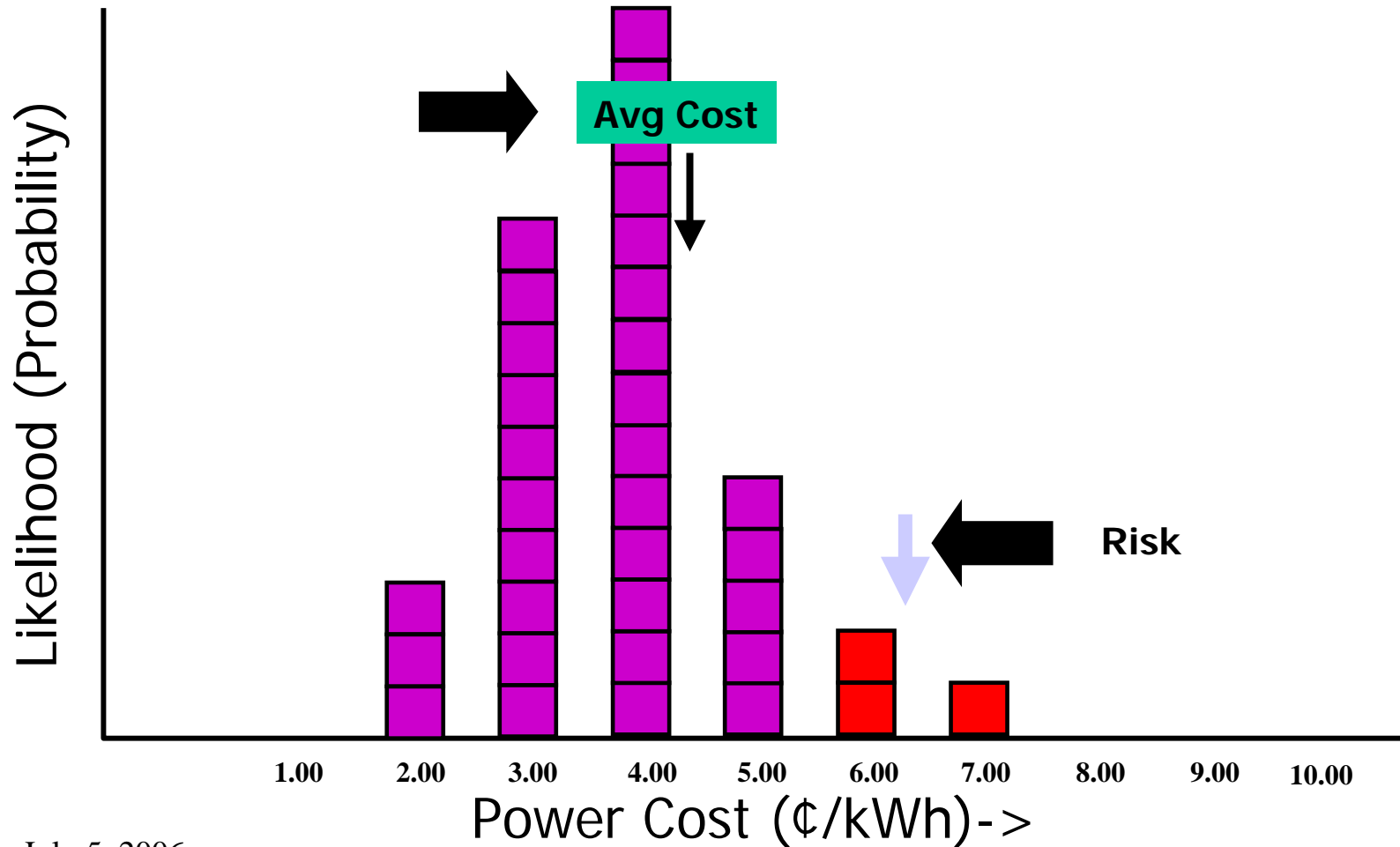
- Select a resource “plan”
  - A plan consists of a number of new resources
  - Over a 20 year period
- Simulate that plan over 700 or more futures
  - Random water, load, fuel price, carbon tax, etc.
  - Compute the cost for each future
  - Compute the average cost over all futures
- Do the same for 1,000 or more different plans and graph the results.

# Balancing Cost and Risk

Average Cost and Economic Risk for **One** Resource Plan



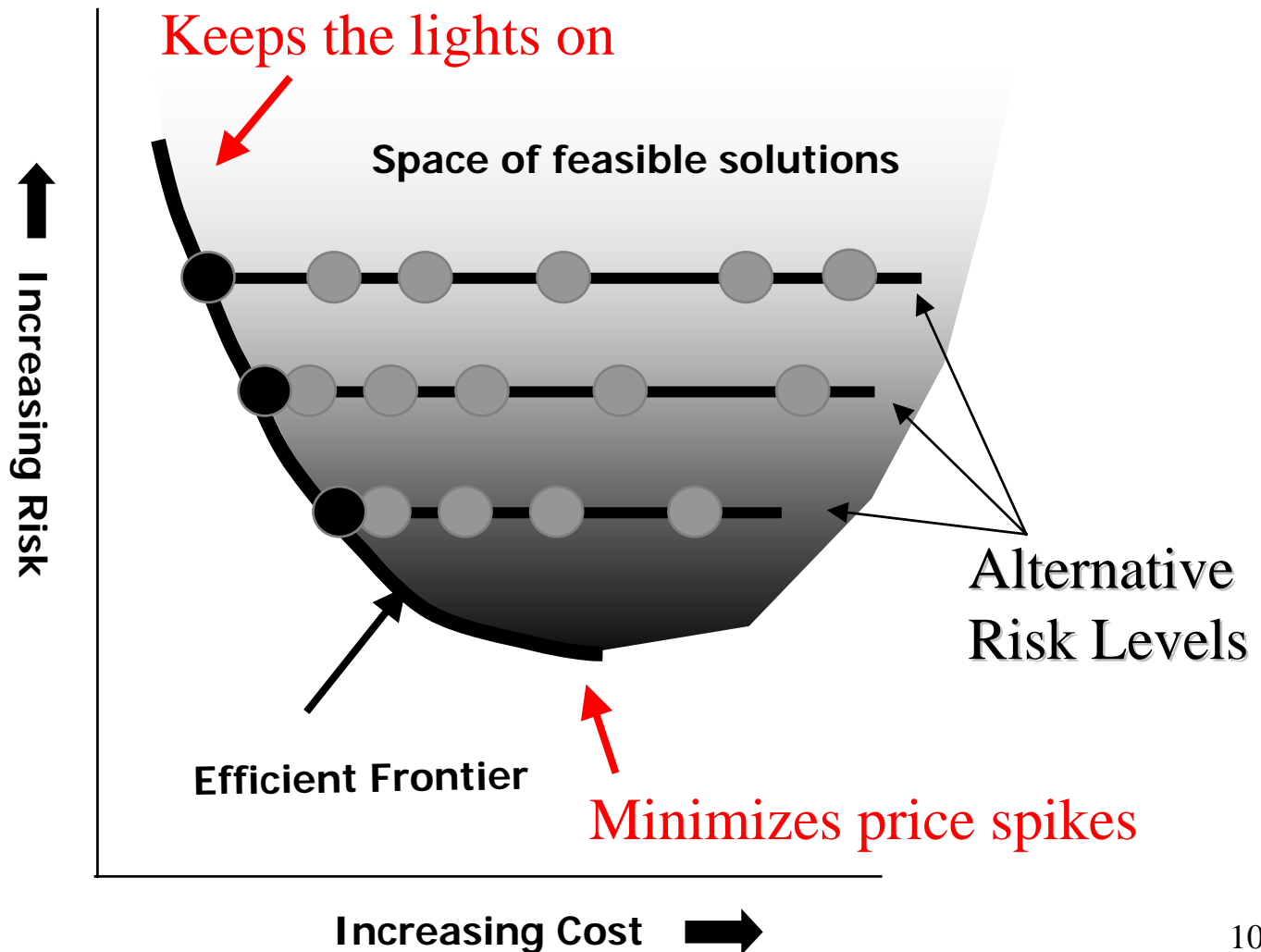
# A Different Plan: The Trade-off Higher Avg Cost but Lower Risk



# Relationship between Cost and Risk

- Fewer resources = higher dependence on the spot market (higher risk)
- More resources = higher average cost but not necessarily lower risk
- Wrong resources can increase cost but not improve risk (i.e. too much dependence on a single fuel type)

# All Plans: The Efficient Frontier



# Deviating from the Economic Target

There are many resource plans that provide a physically adequate supply but do not minimize the risk of high-cost futures, i.e. plans with:

- Too few resources
- Too many resources
- Wrong kind of resources

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Risk

