Resource Strategies

Advisory Board Presentation

August 12, 2003

Nancy Glaser, Director of Strategic Planning
Raquel Bennett, Strategic Advisor
Kevin Clark, Strategic Advisor

Contents

- **Concept of resource planning**
- **Tools**
- **Policies guiding current resource portfolio development**
- **Performance of current resource portfolio**
- **Issues/work items**
- **Possible roles of Advisory Board**

Resource Planning

- **Utility must meet customer load at all times**
- **Integrated approach: least cost, include social, environmental values, broad range of technologies, energy efficiency and other resources on the demand side**
- **Consider costs and risk**

Tools for Resource Planning at SCL

- **Excel-based model for long run**
- **Projections of loads, resource capabilities, prices, technologies, utility environment**
- **Hydro generation by water year**
- **Level of detail (annual, monthly)**

Guidelines for Resource Planning

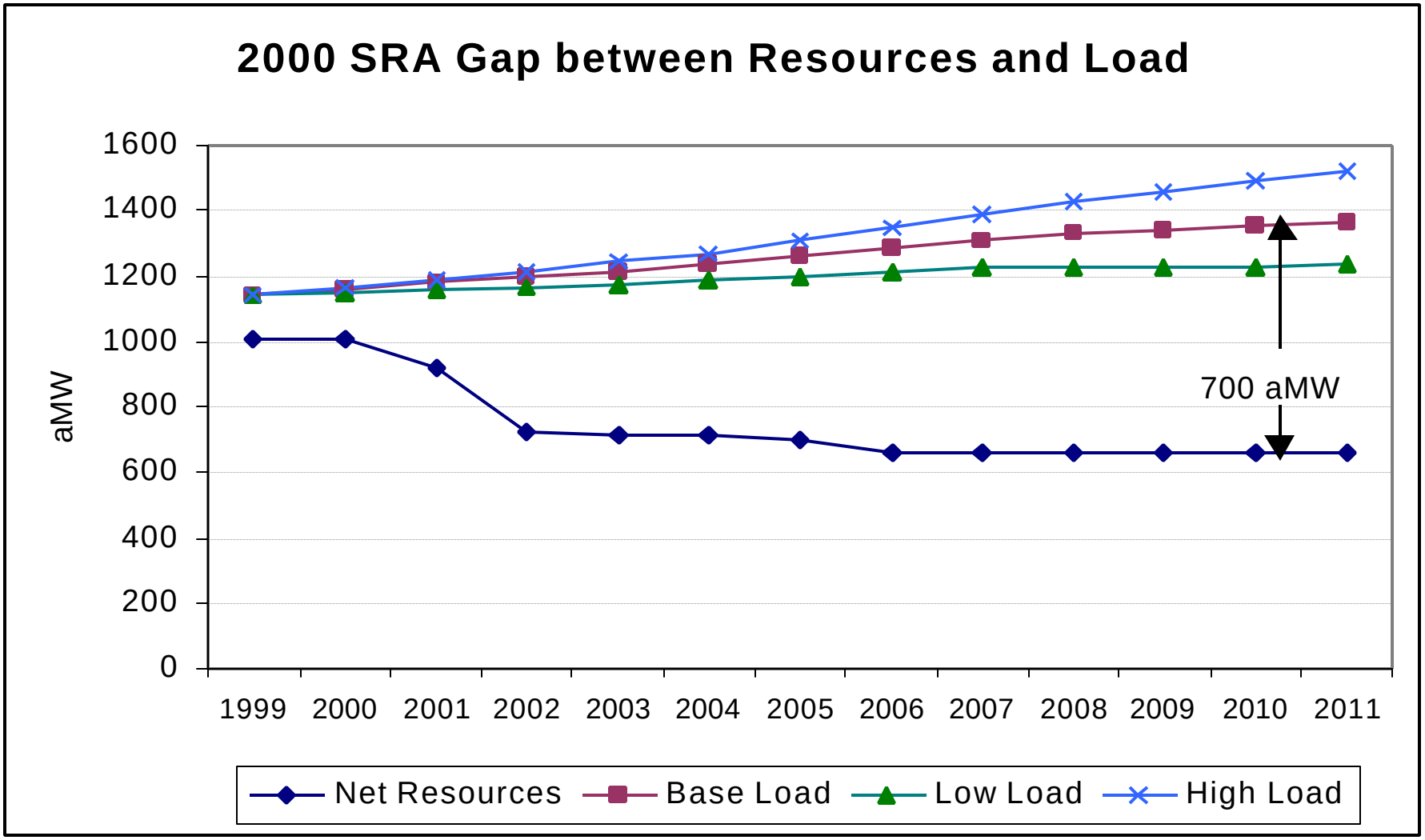
- **Influenced by utility goals and perception of industry environment**
- **Before 1996 BPA was marginal resource. BPA bore the risks associated with costs of new resources**
- **When City Light invested in new resources (conservation, South Fork Tolt) BPA helped with financing**

Guidelines for Resource Planning
Continued

- **Changes in 1996: deregulation, BPA no longer assisted with financing**
- **SCL estimated the risk of stranded cost to be high and increased reliance on market purchases**
- **Market events in 2000 led to new approach: minimize risk of not having sufficient resources and of having to pay high/volatile market prices**

Utility Environment before the 2000 Strategic Resource Assessment

- **Anticipated fast load growth**
- **Potential additions of very large customers (e.g., high tech)**
- **Resources declining over time**
- **Avoid resource shortages even in drought conditions**


2000 SRA Gap between Resources and Load
aMW
1600
1400
1200
1000
800
600
400
200
0
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
700 aMW
Net Resources
Base Load
Low Load
High Load

Policies that Emerged from 2000 SRA

- **April 2000 Earth Day Resolution**
  - **→Meet load growth with conservation and renewable resources**
  - **→Serve customers with no net greenhouse gas (GHG) emissions**
- **Acquire sufficient resources to meet customer load under drought conditions**

Implications of SRA Guidelines

- **Conservation and renewables: first priority to meet growth**
- **No type of resource specifically excluded**
- **Consider transmission to load**
- **Utility net seller 95% of the time**
- **Need for new financial policies**
- **Offset all GHG emissions from new resources: Klamath**
  - → **Est. cost for Klamath Falls: $0.60-1.25/MWh**
  - → **Est. cost of coal: $4/MWh**

2000 Specific Resource Decisions

- **Double conservation program: NWPPC/SCL Conservation Potential Assessment**
- **State Line: Earth Day Resolution, RFP for renewable resources**
- **Buy as much BPA as utility entitlement would allow: both “slice” and “block” competitive with market**
- **Klamath Falls contract: help in dry years, meet load growth, location benefits (transmission, marketing)**

State Line Wind

- **Energy and environmental attributes from 175 MW wind capacity**
- **Power at fixed price for 20 years**
- **Separate 10-year contract for wheeling and shaping energy**
- **Delivered flat HLH/LLH at Mid C**
- **Competitive over time with CT and market**

BPA Contract: Oct 2001-Sep 2011

- **Slice: 4.6676%of the system (330aMW dry); monthly shaped block originally 164 aMW**
- **Block increases by 115 aMW Oct 2006**
- **Block reduced by 19 aMW for $29 M in 2002-03 conservation funding and probably by 22 aMW more for $24 M in 2004-6**
- **2004 purchase amount preserved despite load loss by undeclaring resources to meet load**

Klamath Falls Contract

- **100 MW of capacity**
- **July 1, 2001-June 30, 2006, option to renew through 2011**
- **Gas: hedged June 2001-Dec 2002**
- **Capacity charge, O&M**
- **Limited flexibility, with 5 days notice:**
  - → **Take all or nothing each month (max of 9 months)**
  - → **Take all in HLH (max of 3 months)**

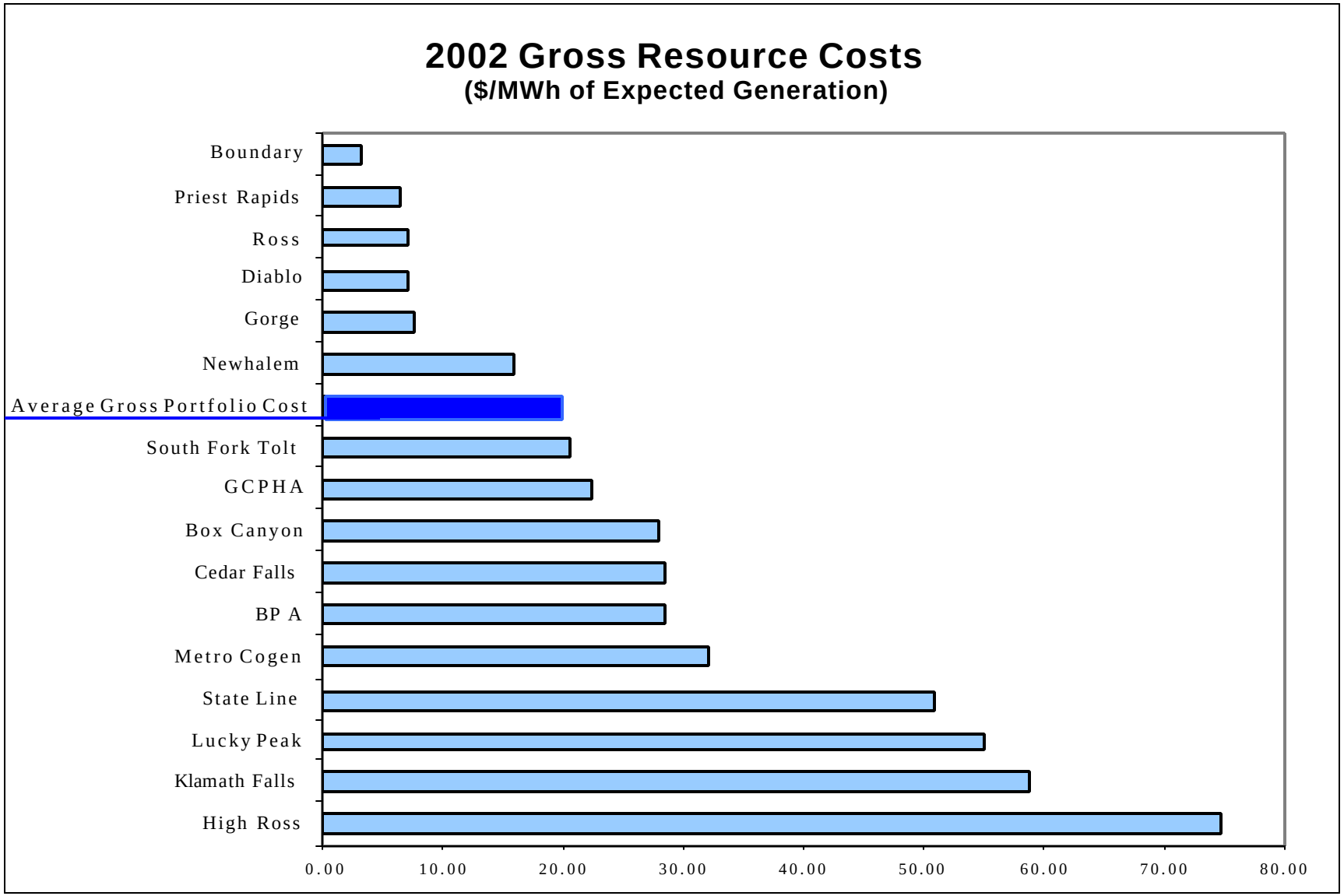
2002 SRA Update

- **Determine that the utility is on target to achieve policy goals**
- **Evaluate performance of portfolio under a variety of scenarios**
- **Review actual performance in 2002 compared with 2000 portfolio**

Actual 2000 and Estimated(*) 2002 Power Costs

	average MWh		Cost incl O&M and CIP		$/MWh	
Resources	2000	2002	2000	2002	2000	2002
Boundary	4,329,958	4,329,958	16,100,840	14,552,245	3.72	3.36
Diablo	844,880	844,880	5,845,764	5,920,288	6.92	7.01
Gorge	985,383	985,383	7,828,710	7,355,375	7.94	7.46
Ross	834,549	834,549	7,464,526	5,783,195	8.94	6.93
Newhalem	14,588	14,588	241,455	231,656	16.55	15.88
Cedar Falls	83,141	83,141	1,956,816	2,371,232	23.54	28.52
South Fork Tolt (net of billing credits	59,859	59,859	930,406	1,225,107	15.54	20.47
Centralia	278,444	0	5,752,653	0	20.66	
Priest Rapids	370,752	410,720	2,539,651	2,632,715	6.85	6.41
Irrigation Canals	237,822	233,408	9,032,480	5,212,001	37.98	22.33
Box Canyon	108,339	62,415	2,548,133	1,735,761	23.52	27.81
BPA	1,541,241	4,647,690	32,535,598	132,691,554	21.11	28.55
Metro Cogen	10,541	10,512	337,312	337,330	32.00	32.09
State Line	0	209,700	0	11,321,703		53.99
Lucky Peak	366,285	314,834	17,794,125	17,278,090	48.58	54.88
Klamath Falls	0	697,479	0	40,935,043		58.69
High Ross	310,246	317,523	22,449,401	23,766,597	72.36	74.85
Gross Portfolio Cost	10,376,028	14,056,639	133,357,871	273,349,892	12.85	19.45

(*) As of August 2002


2002 Gross Resource Costs
($/MWh of Expected Generation)
Boundary
Priest Rapids
Ross
Diablo
Gorge
Newhalem
Average Gross Portfolio Cost
South Fork Tolt
GCPHA
Box Canyon
Cedar Falls
BP A
Metro Cogen
State Line
Lucky Peak
Klamath Falls
High Ross
0.00
10.00
20.00
30.00
40.00
50.00
60.00
70.00
80.00

Portfolio Costs per MWh of Load
Actual 2000 and Estimated(*) 2002

Gross Portfolio	MWh		Total Costs in 000$		$/MWh generation	
	2000	2002	2000	2002	2000	2002
	10,376,028	14,056,639	133,358	273,350	12.85	19.45
percent of market purchases in load	28.20%	7.99%				
	MWh		Cost/Revenue in 000$		$/MWh of load	
	2000	2002	2000	2002	2000	2002
Market						
Purchases	2,883,460	795,339	212,279	12,935	73.62	16.26
Sales	2,333,672	4,867,731	103,301	113,323	44.27	23.28
Load	10,224,758	9,957,857				
Net Portfolio Cost ($/MWh of load)			242,336	172,961	23.70	17.37

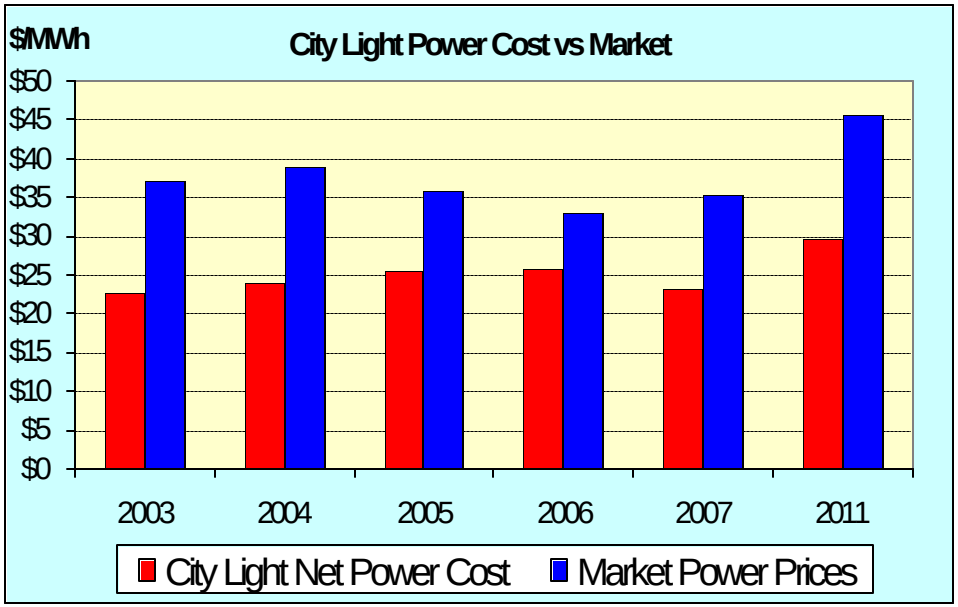
(*) As of August 2002

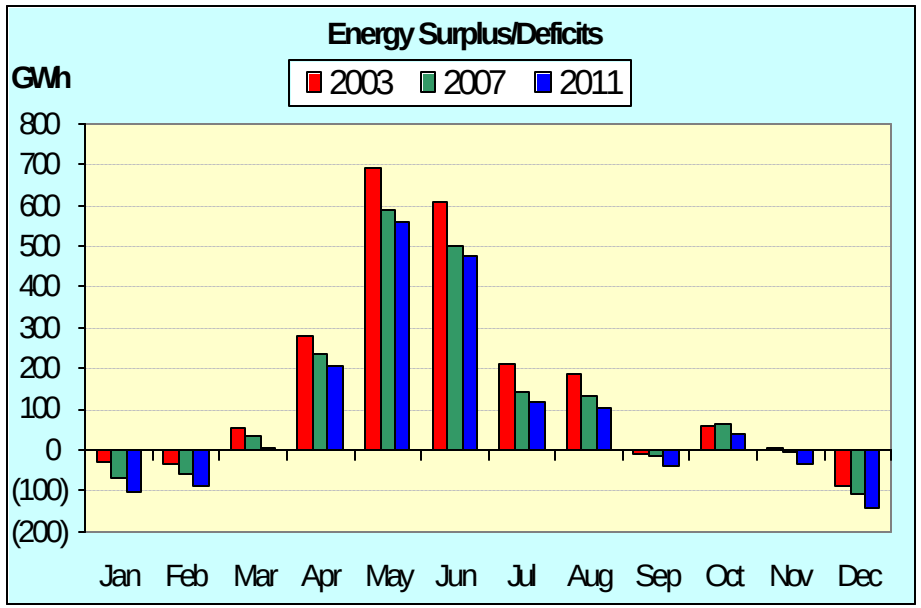
Tools for 2002 SRA

- **Expand model to:**
  - → **project monthly energy surpluses and deficits**
  - → **compute average annual portfolio costs compared with market prices**
- **Scenario analyses: change assumptions on electricity and gas prices, water conditions, load, future of Klamath Falls contract and future BPA costs**
- **Model sample sheet and main conclusions follow**

SCENARIO SELECTION PANEL

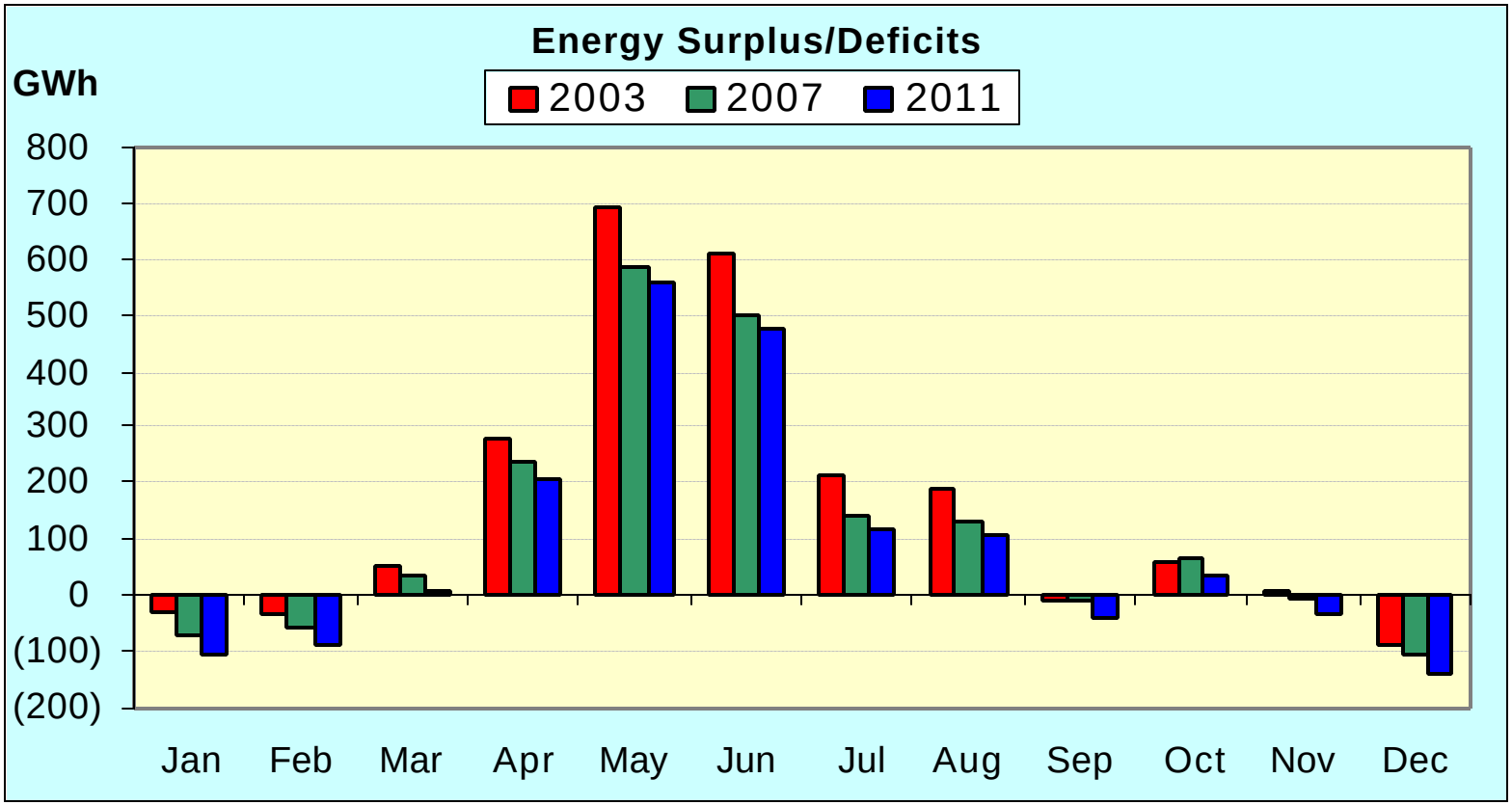
Retail demand	*Medium*	Klamath	*Contract Terminated 2006*
Wholesale Energy Price	*Medium*	Gas Price	*Medium*
Hydro Conditions	*Critical Shaped*	BPA Cost	*No Increase*





Resources Can Meet Load

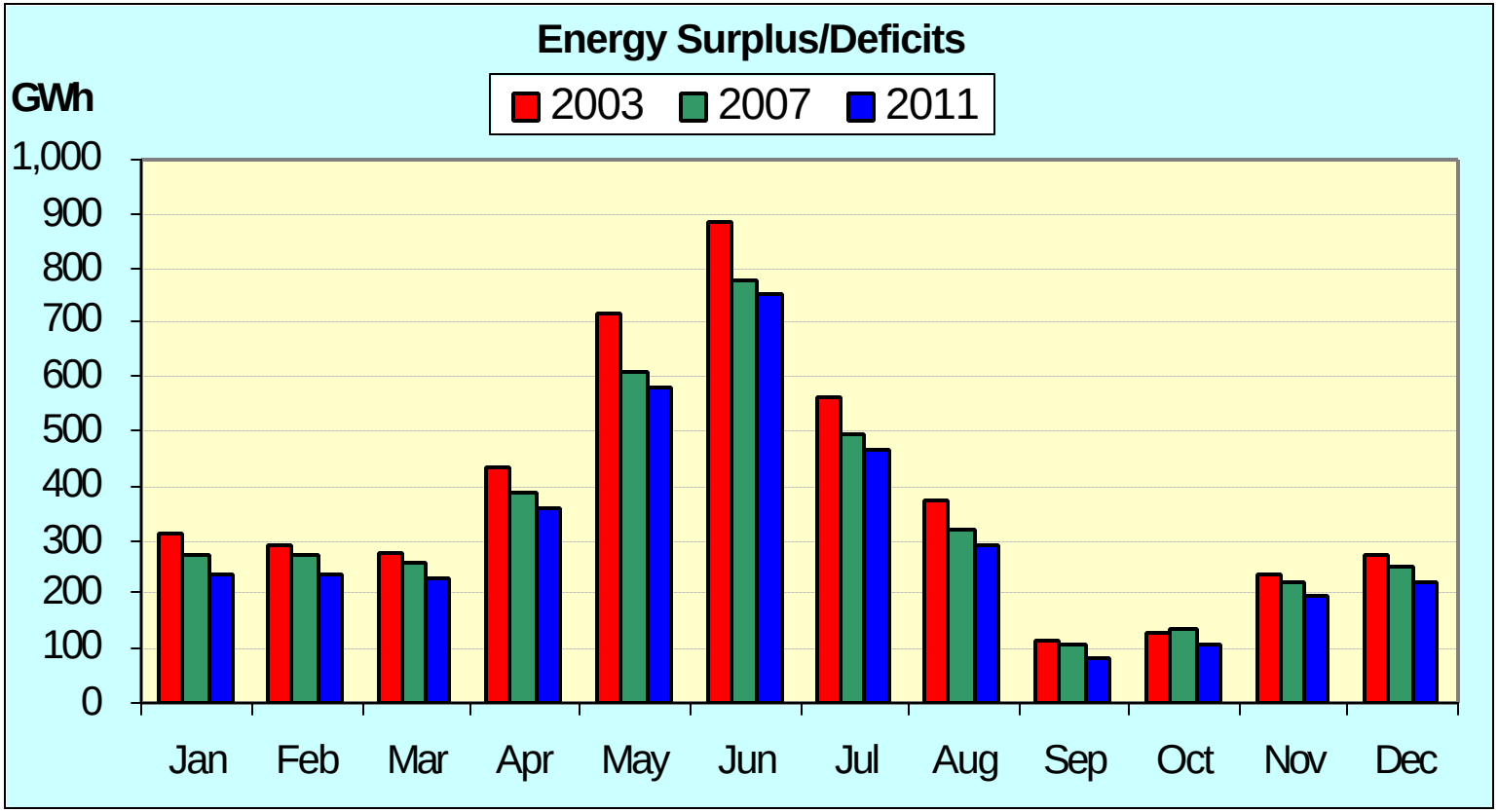
Drought Conditions (no Klamath after 2006)



Monthly Shape

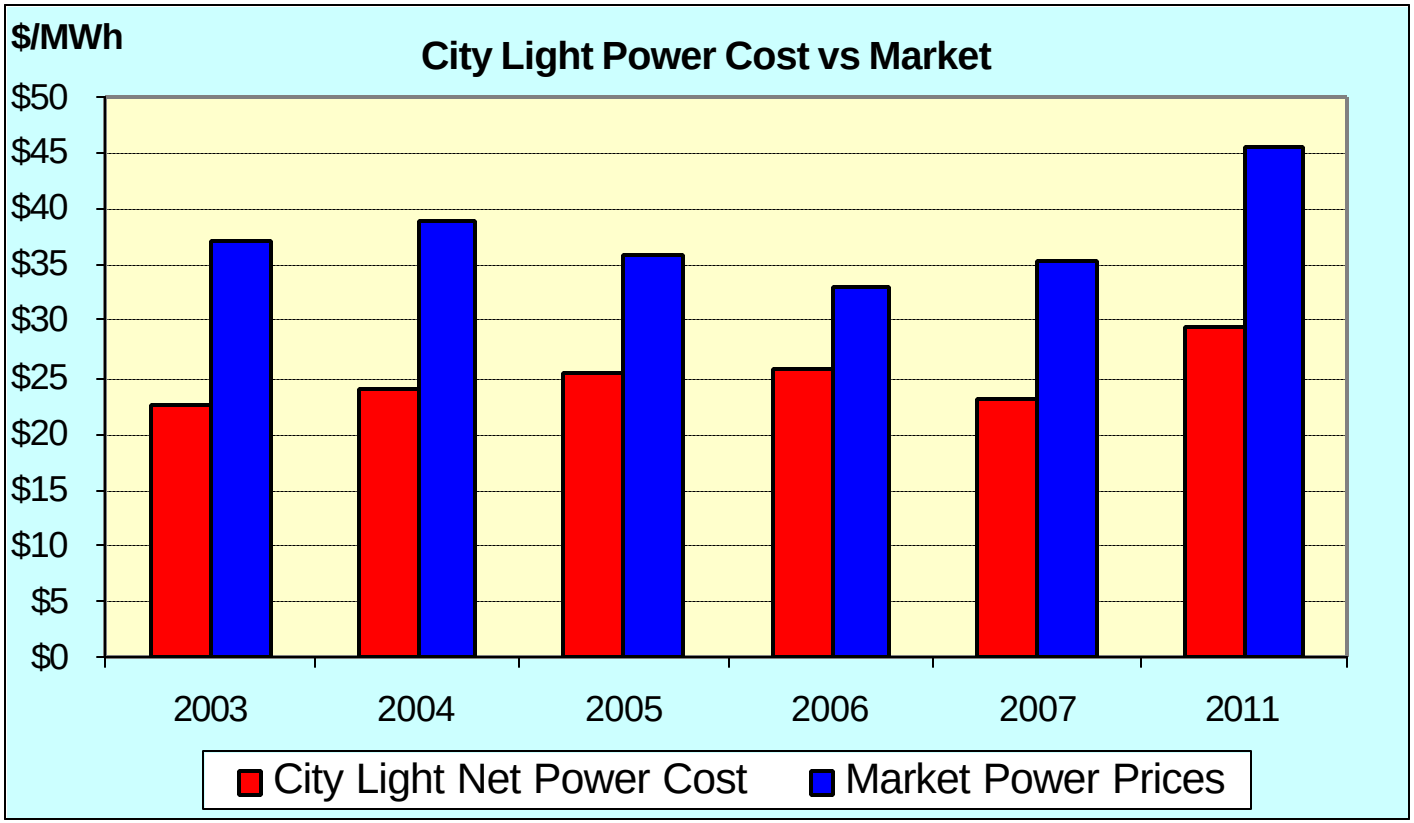
- **Average monthly deficits occur only in the winter months**
- **Monthly deficits begin to increase to about 100 to 180 aMW by 2006**
- **By 2011 in dry conditions, there might also be small deficits in the fall**
- **Surpluses in other months even in drought conditions through 2011**

Long All Months in Average Water



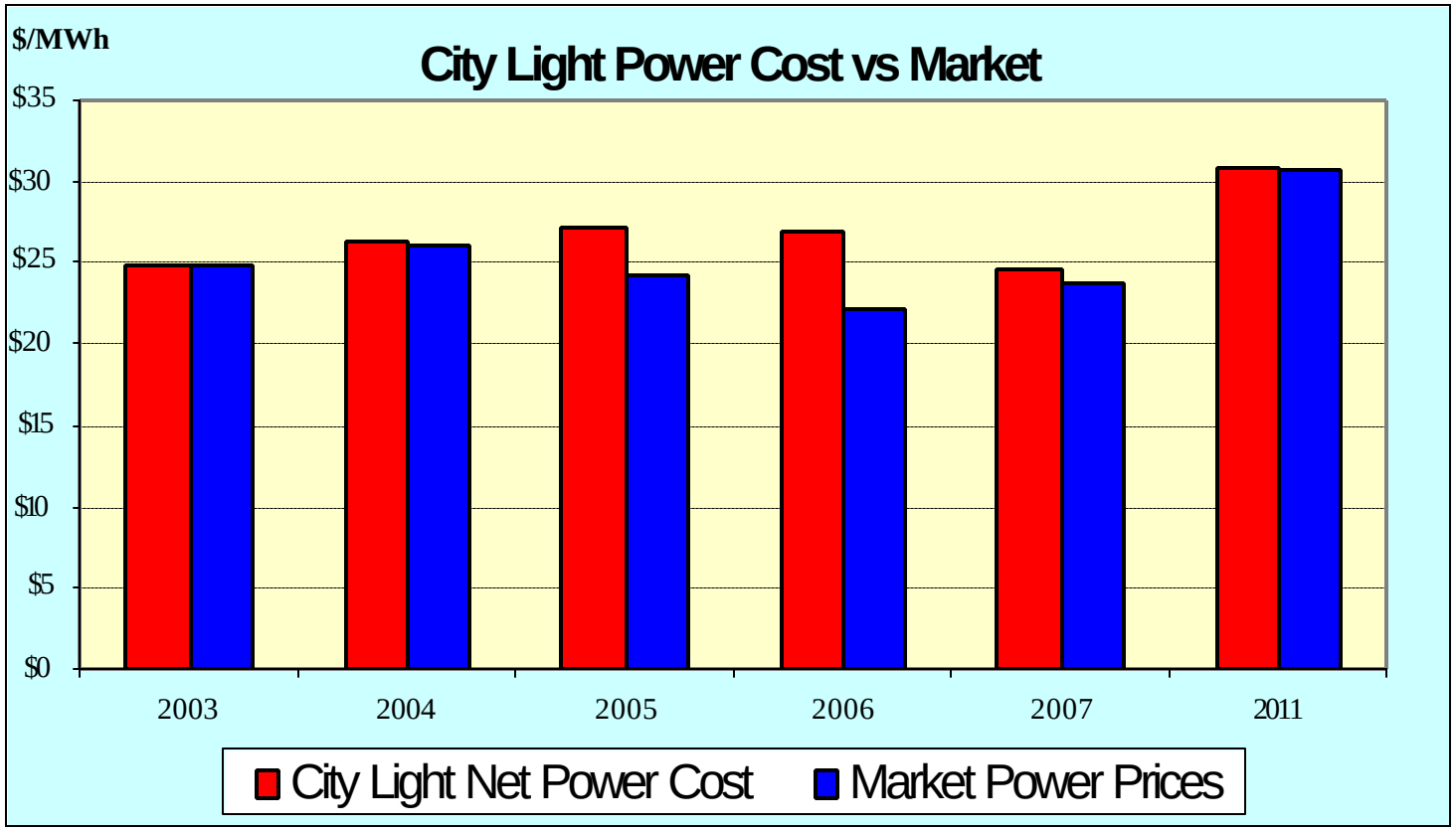
Costs: Portfolio Is Competitive

Dry Year, Average Price Forecast as of April 2003



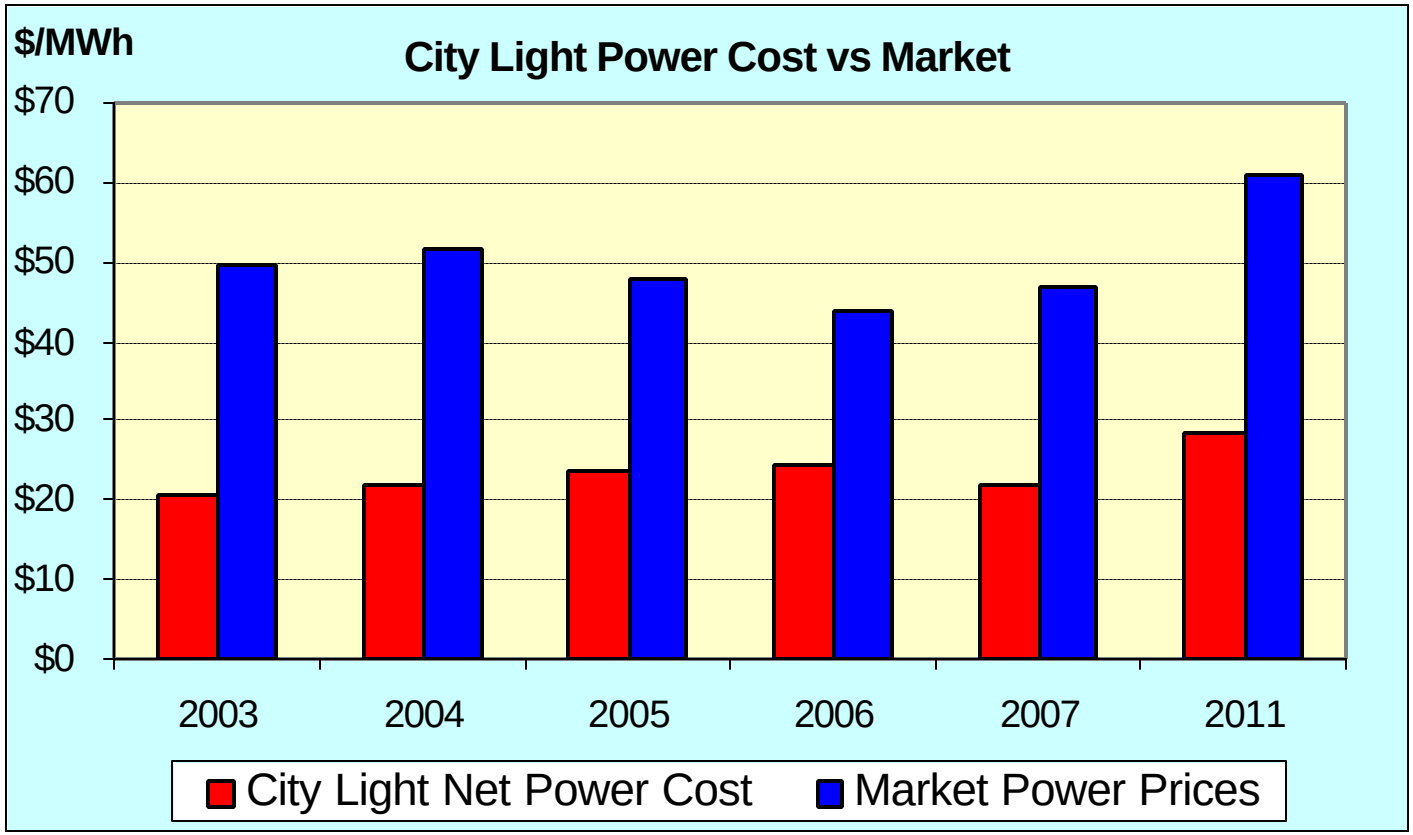
Portfolio Is Competitive

Dry Year, Prices 33% Lower than Base



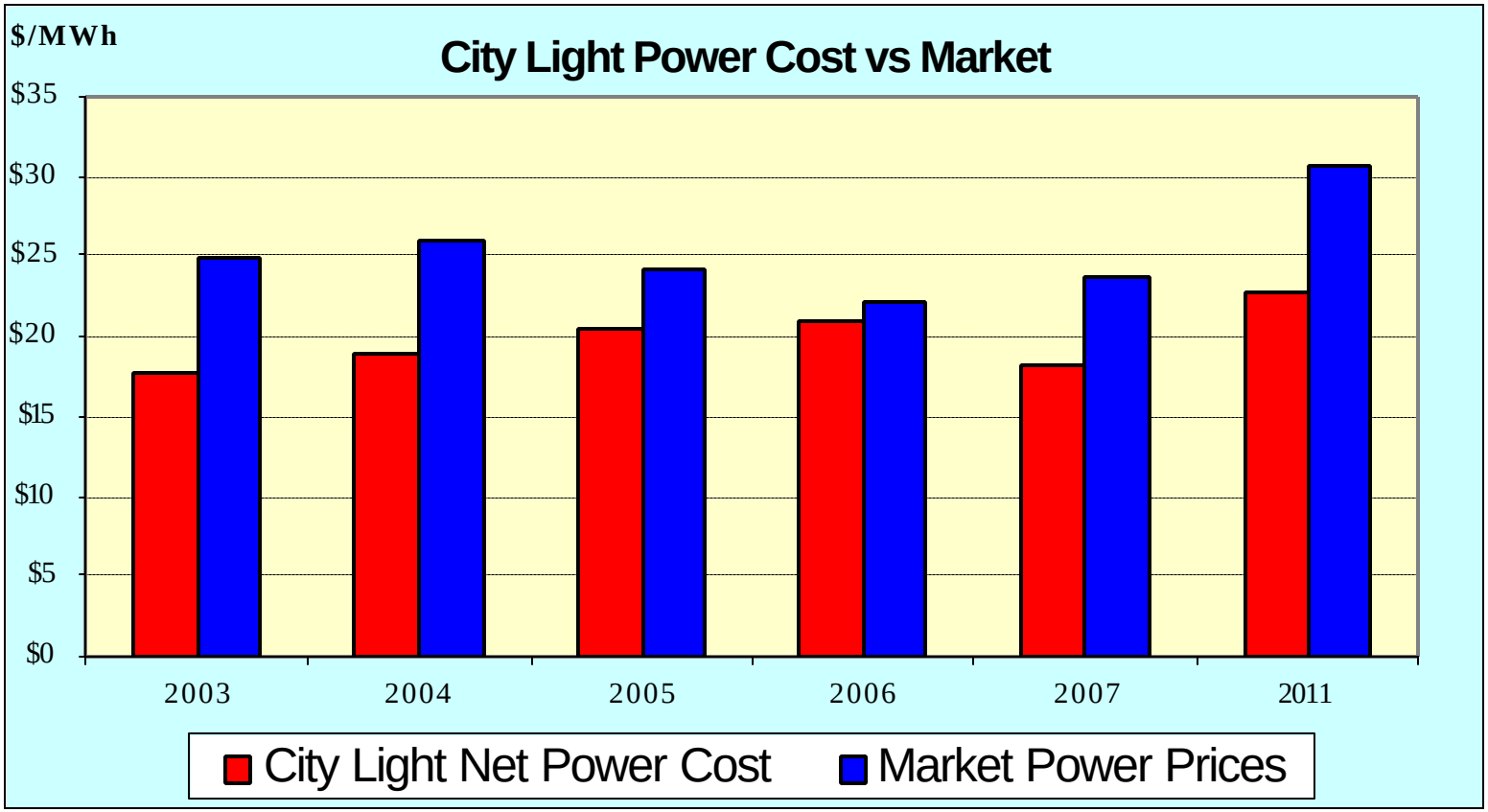
Portfolio Is Competitive

Dry Year, Prices 33% Higher than Base



Competitive Portfolio:

Average Year, Prices 33% Lower



Other Conclusions

- **Load changes have small impact on portfolio costs**
- **Water and price changes have more significant effect**
- **SCL is on target to meet load growth through 2011 with conservation and renewable resources. If load grows faster, new renewables may be needed**

Value of Green Tags from Portfolio

- **State Line Wind: currently surplus to load, sell green tags from 2002-3 at prices around $3 to $7 per MWh. If all sold, prices would be lower.**
- **Skagit: certified for five years by LIHI (fee $60,000)**
  - → **Not a new resource, low market value (25-75 cents/MWh)**
  - → **If all green tags were sold (not likely), less than $2 M annually of revenue from sale (less than one third of one percent of SCL's total revenues)**
  - → **If sold, customers who have paid the costs that made it certifiable, could not state that 25% of their consumption is served by low impact hydro**

Green Tag Markets

- **Most RPS and customers require new (after Jan 1999) and local green resources**
- **Green-e certification: resources built after January 1999**
- **Currently in NW supply>demand and prices are quite low**
- **New wind has largest share**

Specific Resource Decisions for SCL in Near Term

- **Cedar Hills: 6 - 9 months**
- **Klamath Falls contract extension: December 2004**
- **Possible adjustments to BPA contract**
- **2004 Strategy for Relicense of Boundary (2011)**
- **Voluntary Green Power Program**

Limitations of Current Tools

- **Include no transmission variables**
- **Monthly averages only**
- **No correlation among the assumptions**
- **Model does not provide a range of internally consistent potential outcomes, but “what if”scenarios**
- **Model does not optimize**

What Policies Should Guide Future Resource Decisions?

- **Should SCL continue to plan around serious drought conditions?**
- **If new resources are not needed to meet average monthly load, how might they help to increase the value of the portfolio to customers?**

→ **Increase flexibility**
→ **Add diversity**
→ **Environmental values**
→ **Reduce variability and risk**
→ **Develop in service territory/West of Cascades**

Issues/Work Areas

- **Output from portfolio still variable and value to customers still depends on market.**
- **How to meet temporary energy deficits without making the utility longer in runoff months: exchange contracts, options, etc.**

Issues/Work Areas
Continued

- **Impact of the proposed Regional Transmission Organization**
- **Standard Market Design impact**
- **City goals for Boundary relicensing**
- **Improve analysis, increase flexibility, deal with uncertainties**
- **Available tools have limitations**
- **Policy direction on risk management: maximize portfolio value vs. risk position**