Draft 2008 Integrated Resource Plan: Overview and Preliminary Results

IRP Stakeholders
June 12, 2008

Seattle City Light

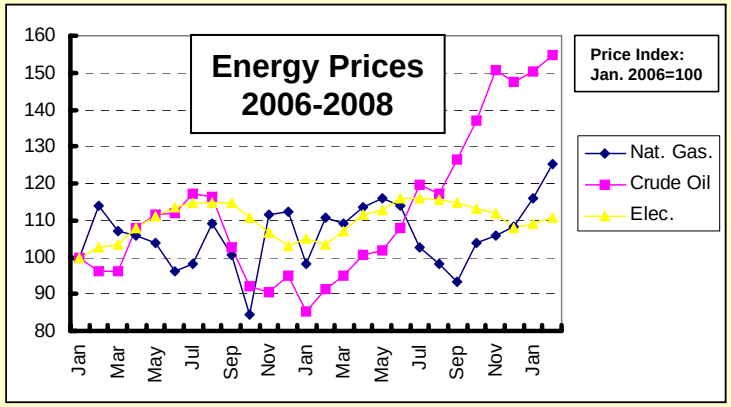
Agenda

• Introduction	4:00 PM – 4:15 PM
• Future Business Environment	4:15 PM – 4:45 PM
• Round 2 Preliminary Results	4:45 PM – 5:15 PM
• Summary of Findings	5:15 PM – 5:30 PM
• Wrap-up and Adjourn	5:30 PM – 6:00 PM

Why Update the IRP Every 2 Years?

…Because things can change a lot in 2 years!

Market Changes



Regulatory Changes

Initiative I-937
Washington state clean and renewable energy

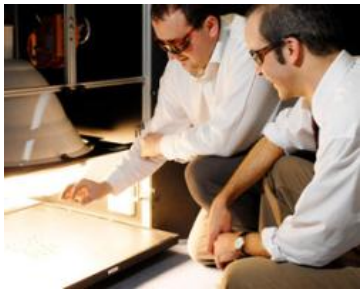
SENATE BILL REPORT
SB 6001

As Reported By Senate Committee On:
Water, Energy & Telecommunications, February 28, 2007

Title: An act relating to mitigating the impacts of climate change.

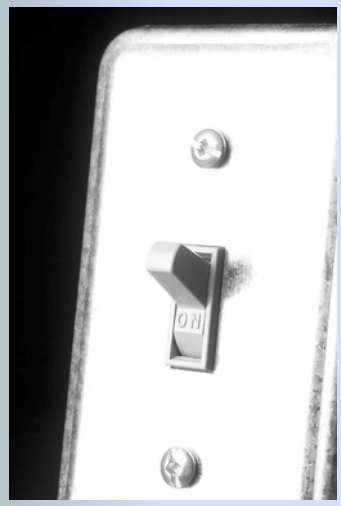
New Technologies

"Paint-on" Solar Cells



"Crude Oil" From Algae

How Can the IRP Affect Customers?

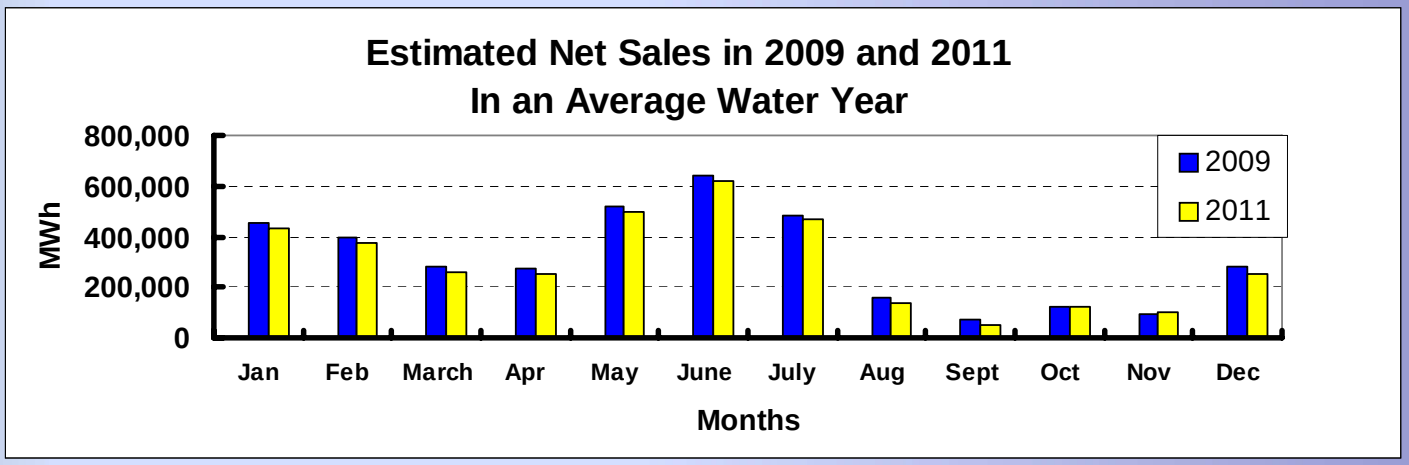


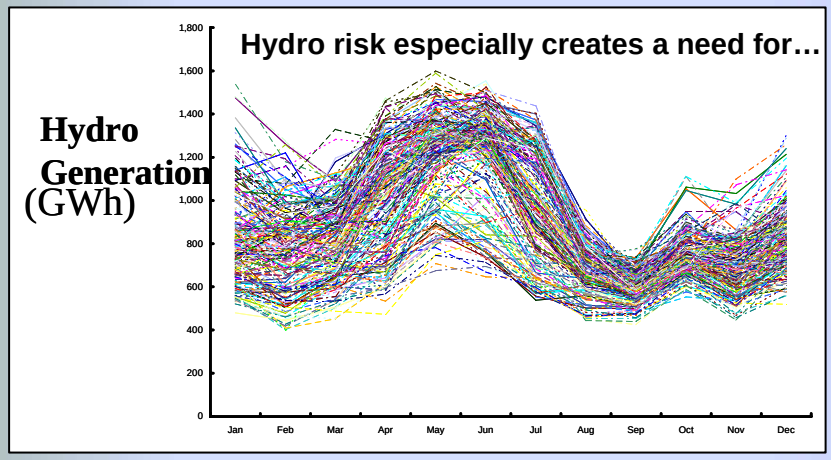
Reliability

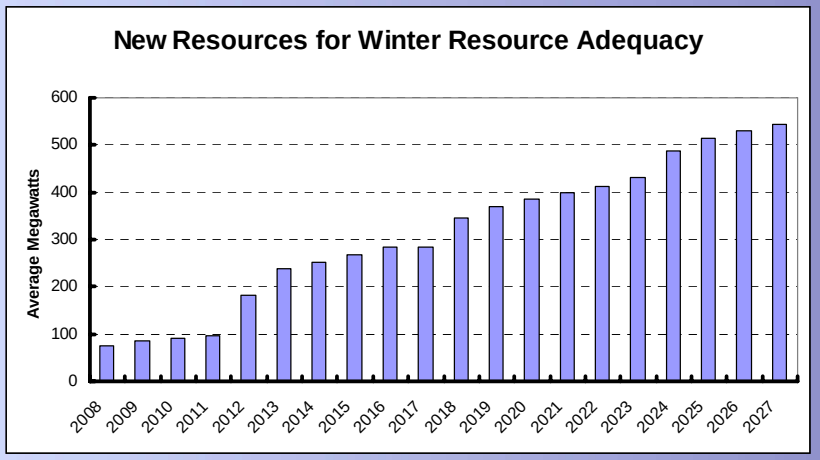
Electricity Bills

Environmental "Footprint"

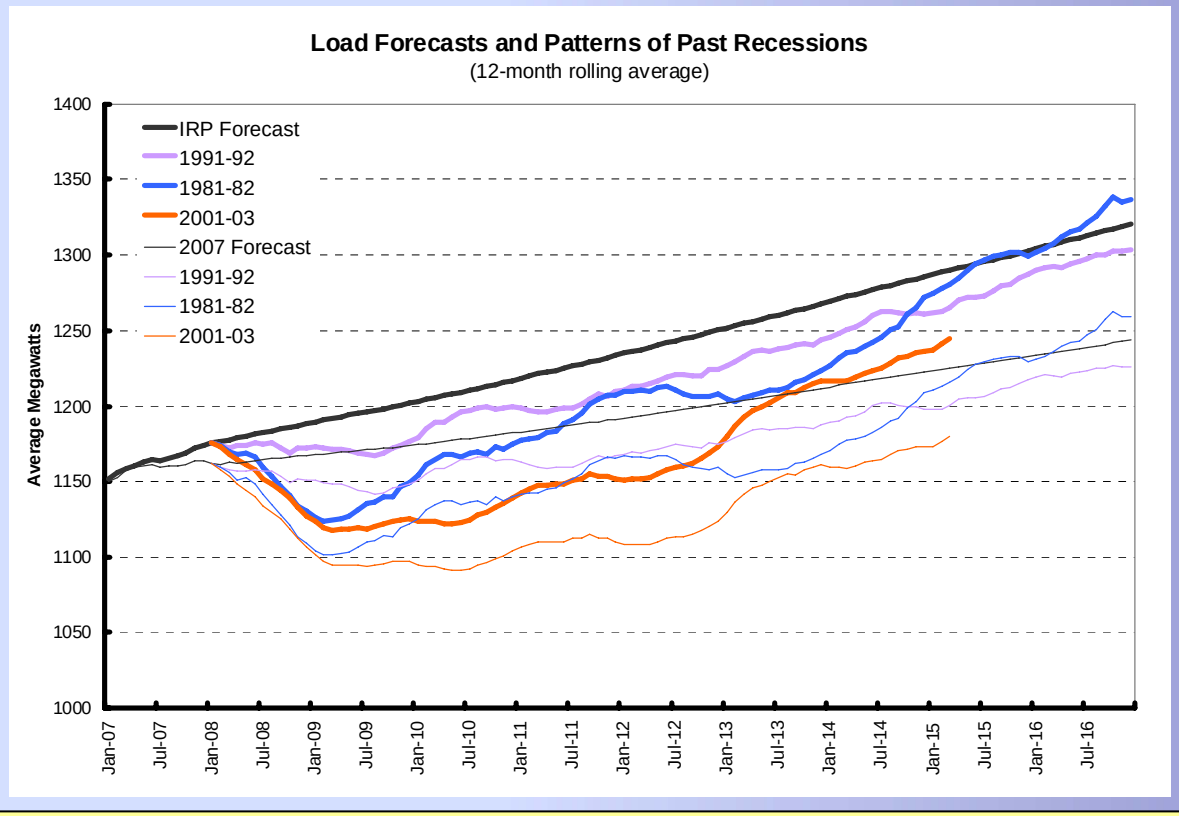
Sales on Average, But Volatility in Hydro and Temperature Still Create Risk





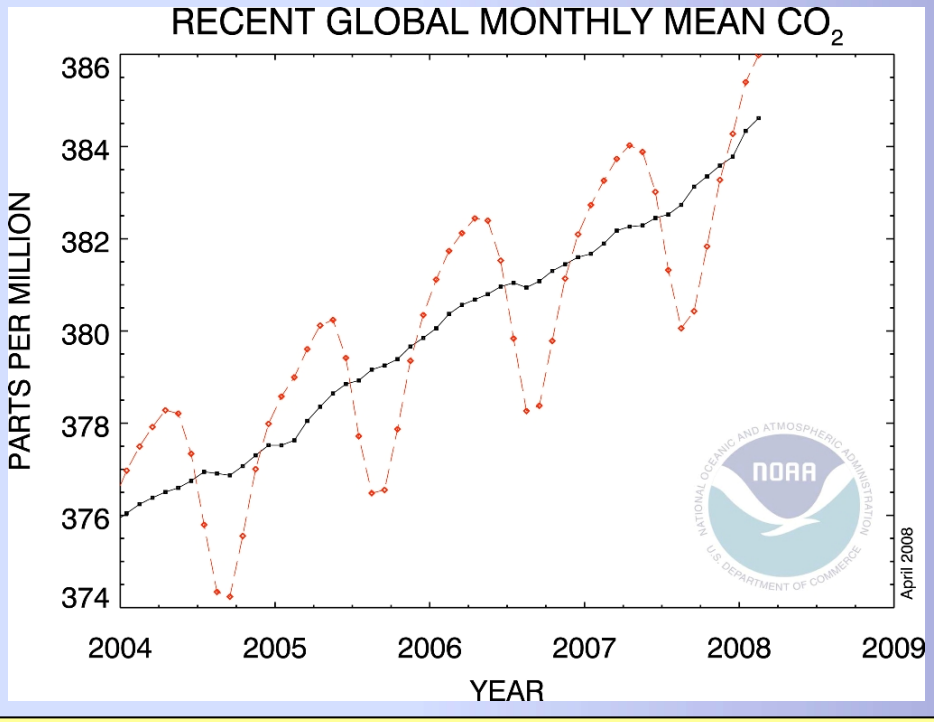


Uncertainty About the Economy Creates Uncertainty for Timing of Resource Needs



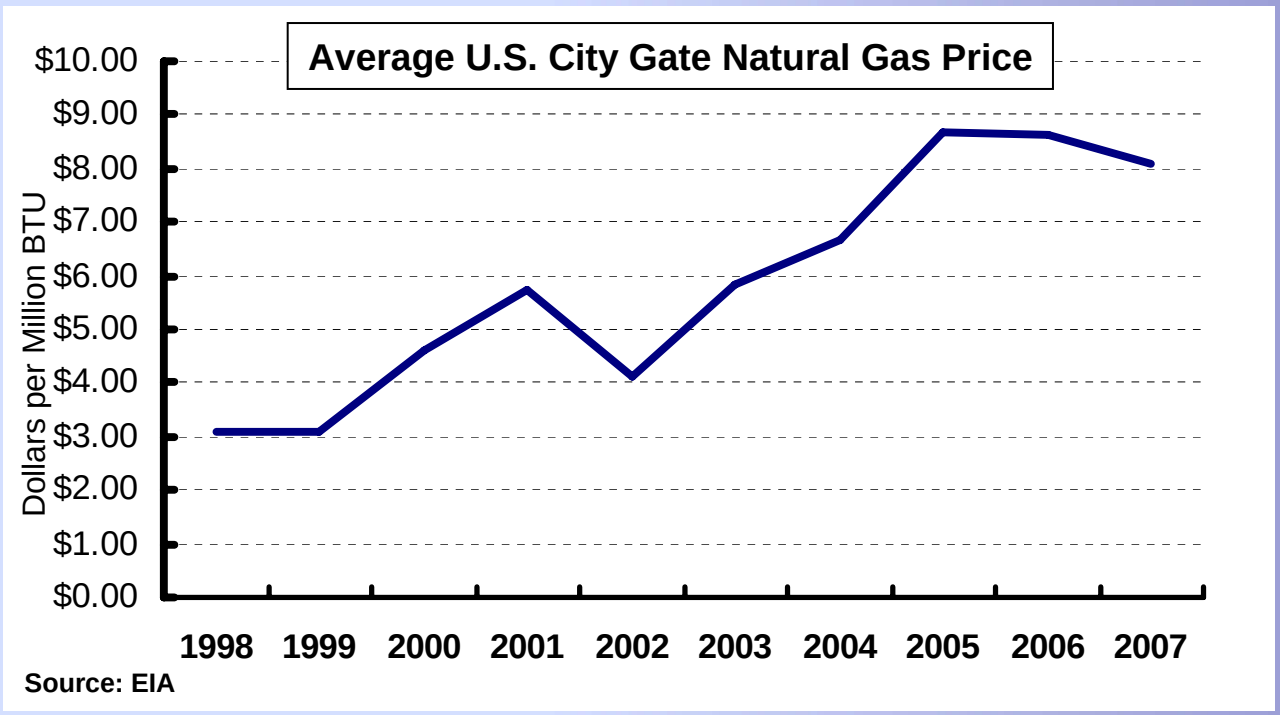
Recession could reduce resource needs, while rapid growth could increase them. SCL is preparing "Seattle Recession" and "Seattle High Growth" scenarios.

Federal Climate Change Legislation Likely as CO_2 Rises Even Faster



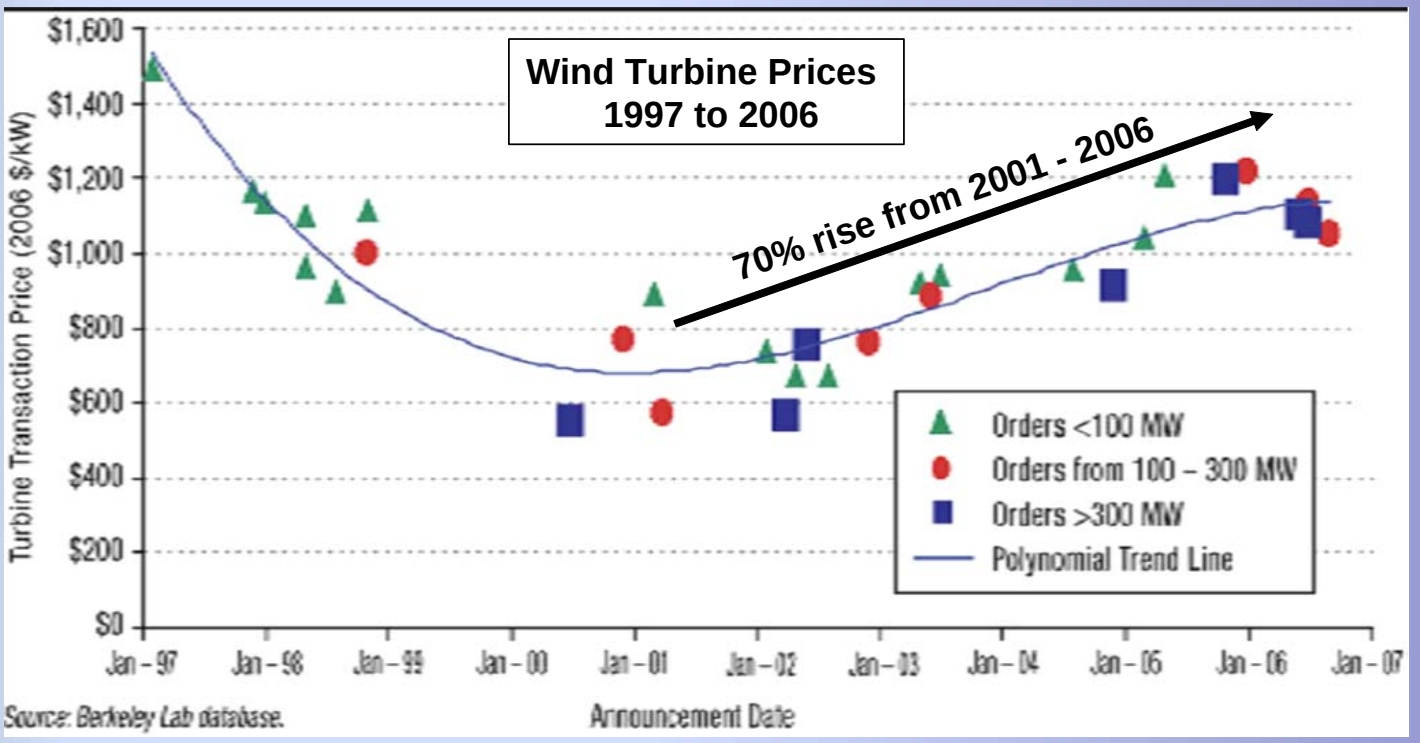
Generators are dispatched including an estimate of future costs for CO2 emission allowances in the Lieberman-Warner Bill.
A “Climate Change” scenario is also being prepared.

Natural Gas Prices and Power Prices Have Seen Significant Growth



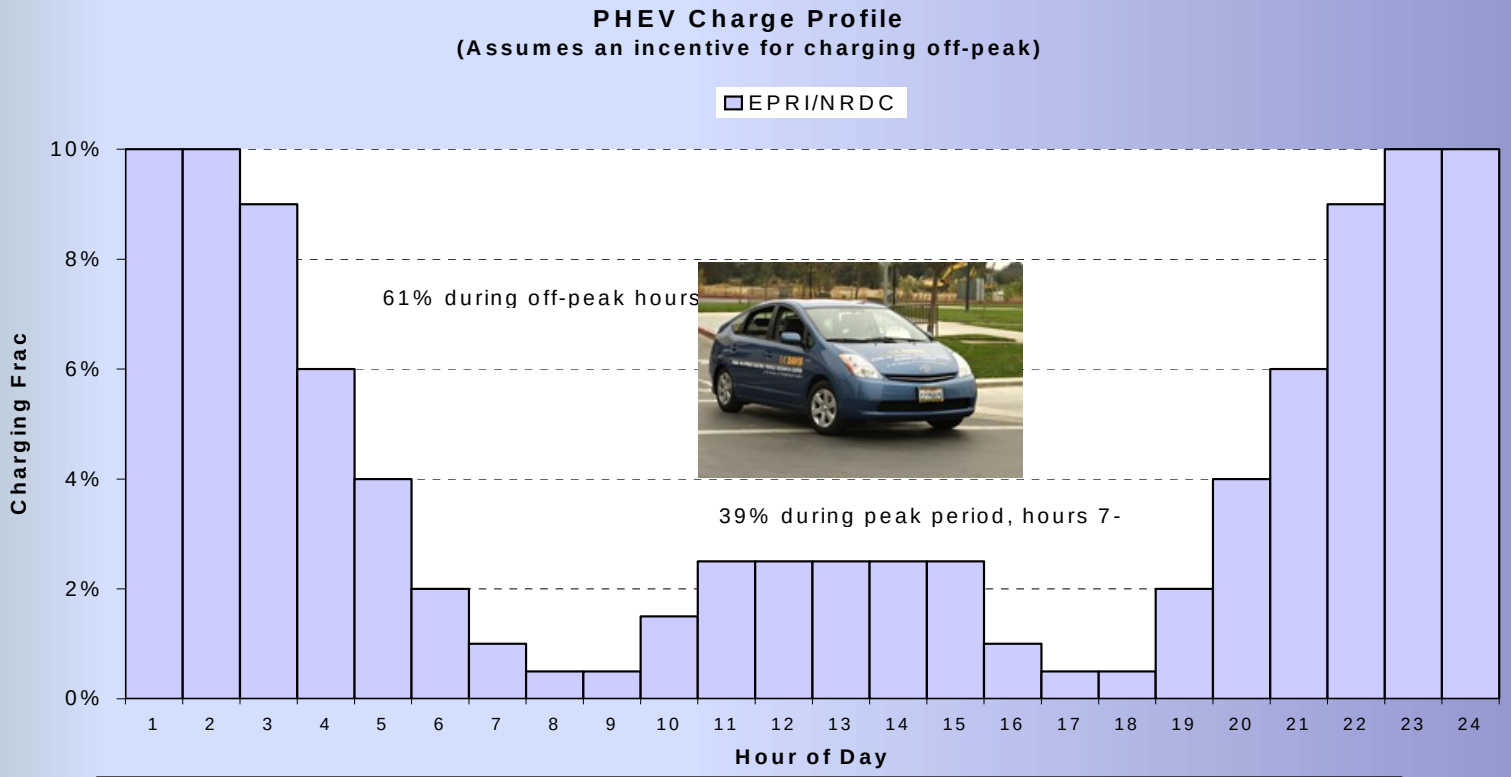
SCL is preparing a "High Natural Gas Price" scenario

Prices for Renewable Resources Seeing Rapid Growth



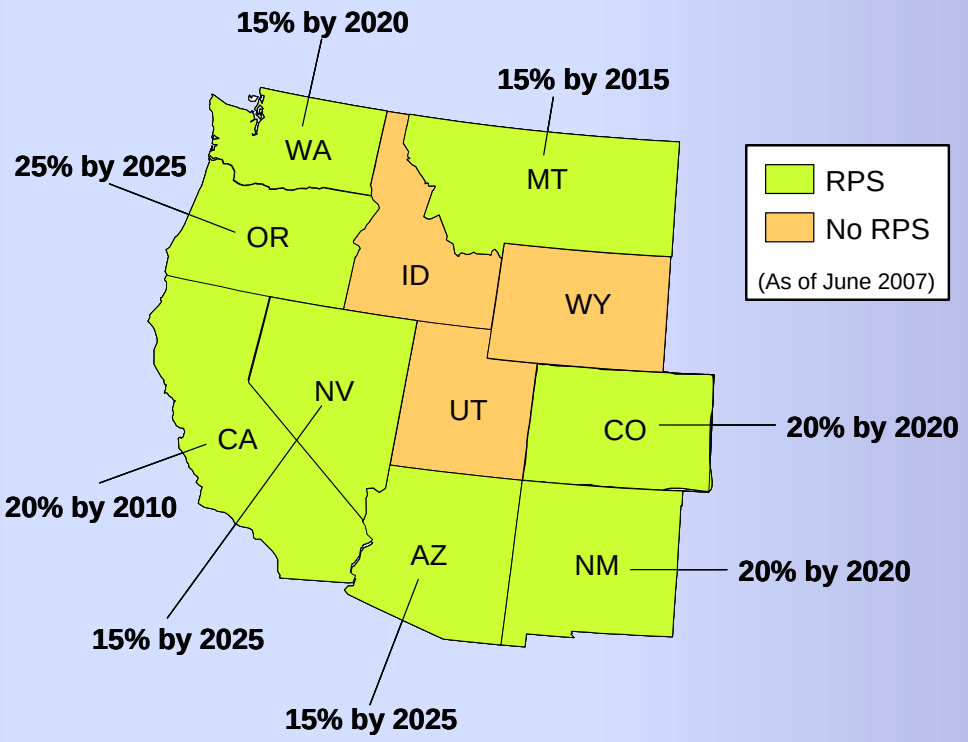
SCL is preparing a "High Renewables Cost" scenario

Electric Vehicles May Provide New Challenges for Utilities



SCL is preparing an analysis of the electricity demand implications for Plug-in Hybrid Electric Vehicles in Seattle

Renewable Portfolio Standards Driving Demand for Renewables



The PNW needs about 6,000 MW in 20 years

California needs almost 3,000 MW in 2 years (7,000 in 10 years)

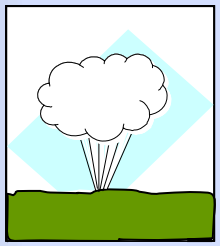
California is proposing 2 major transmission lines to the PNW

Strong competition for renewables is likely

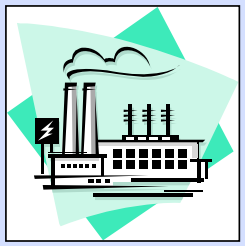
Round 2
Draft 2008 Integrated Resource Plan (IRP)

Resources in the 2008 IRP

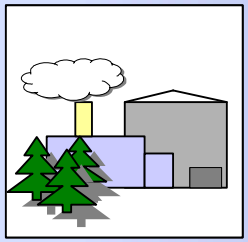
Conservation



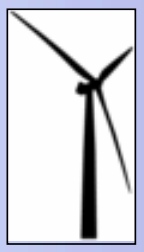
Geothermal (Binary)



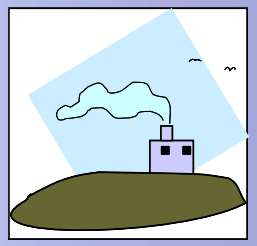
Natural Gas Turbines



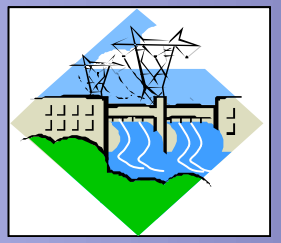
Large Biomass (Wood)



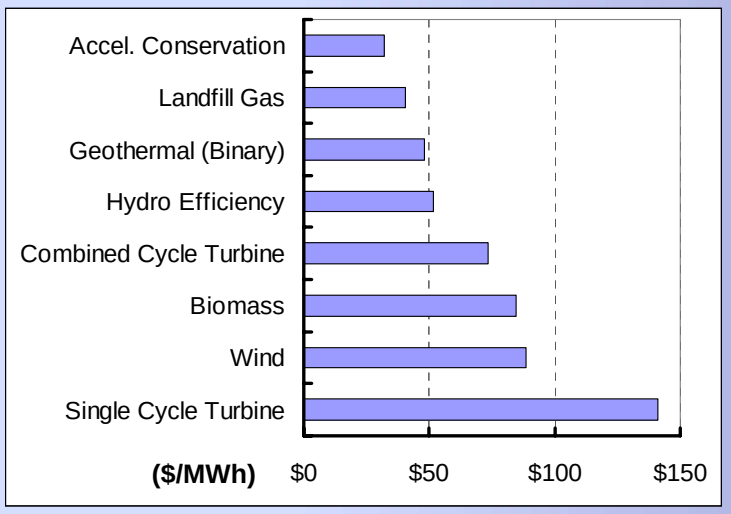
Wind



Landfill Gas



Efficiencies at Hydro Plants

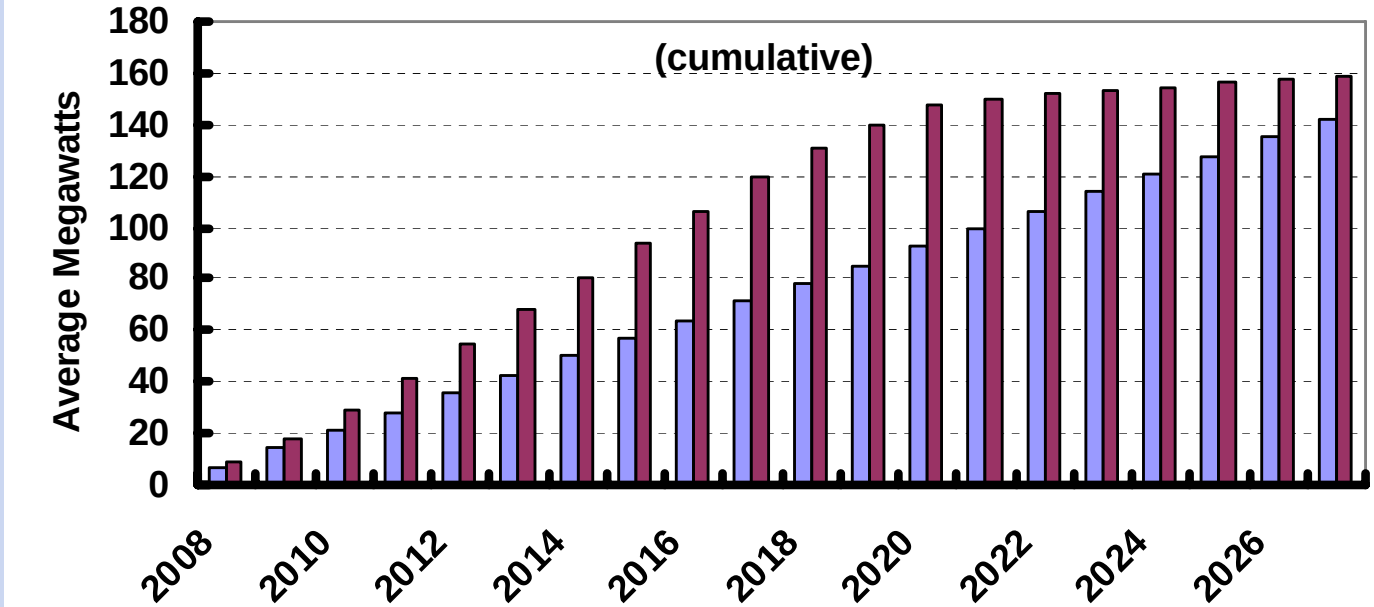


Coal and IGCC not considered because of I-937 and a carbon "tax" assumption

Distributed Generation: Reliability, Efficiency, Reduced Losses

- City Light Studying CHP and On-site Generation Potential
  - Independent evaluations by CHP consulting firm
  - In-depth look at 12 large customers
    - Voluntary for customers
  - Not complete, but early results indicate cost-effective potential does exist

Tested Accelerated Conservation in Round 1 Portfolios



Round 1 conservation would provide 36% of new resources by 2020

Round 1 Portfolios in Year 2027
Total Average Megawatts

Portfolios / Resources	Hi-LFG/ Biomass	Hi-Geo	Hi-Wind /SCCT	Hi-CCT	Hi-Exch.
*Accel. Conservation**	159	159	159	159	159
*Exchanges**	100	100	100	100	145
*Capacity Contracts**	20	5	10	5	20
Gorge Tunnel	13	13	13	13	13
Landfill Gas	32	22	22	22	22
Geothermal	100	125	0	45	125
Biomass	125	125	0	60	25
Wind	0	0	140	40	40
Comb. Cycle Turbine	0	0	0	100	0
Simple Cycle Turbine	0	0	100	0	0
Total aMW	**549**	**549**	**544**	**544**	**549**

**These resources do not add new generation capacity*

Steps for Round 2

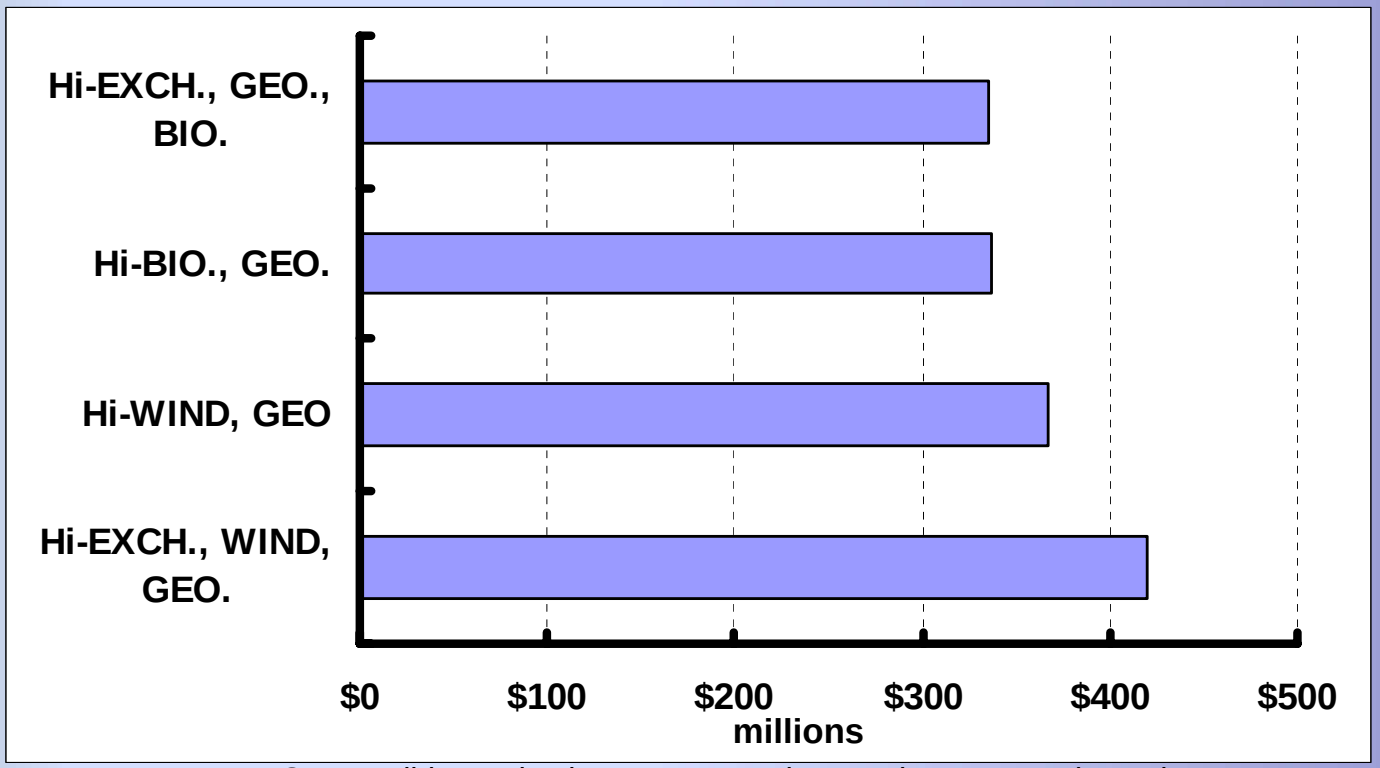
1. Update information and re-design portfolios for Round 2, aiming to improve performance from Round 1	**Complete**
2. Develop risk measures to better distinguish portfolios	**Complete**
3. Prepare scenarios and test portfolios	**In Progress**
4. Include cost of equity, debt, taxes, tax credits	**In Progress**
5. Identify a preferred portfolio based upon multiple performance measures and scenarios	**In Progress**
6. Prepare Action Plan, IRP documents, and EIS for the Mayor and City Council to review	**In Progress**
7. File with CTED by September 1	

Round 2 Portfolios in 2027
Total Average Megawatts in Winter

Portfolios / Resources	Hi-Bio/ Geo	Hi-Exch./ Geo., Bio.	Hi-Wind/ Geo	Hi-Wind/ Exch, Geo
*Accel. Conservation**	159	159	159	159
*Exchanges**	105	135	105	135
*Capacity Contracts**	5	15	5	0
Gorge Tunnel	5	5	5	5
Landfill Gas	21	21	21	21
Geothermal	125	125	125	125
Biomass	125	85	0	0
Wind	0	0	125	100
Total aMW	**545**	**545**	**545**	**545**

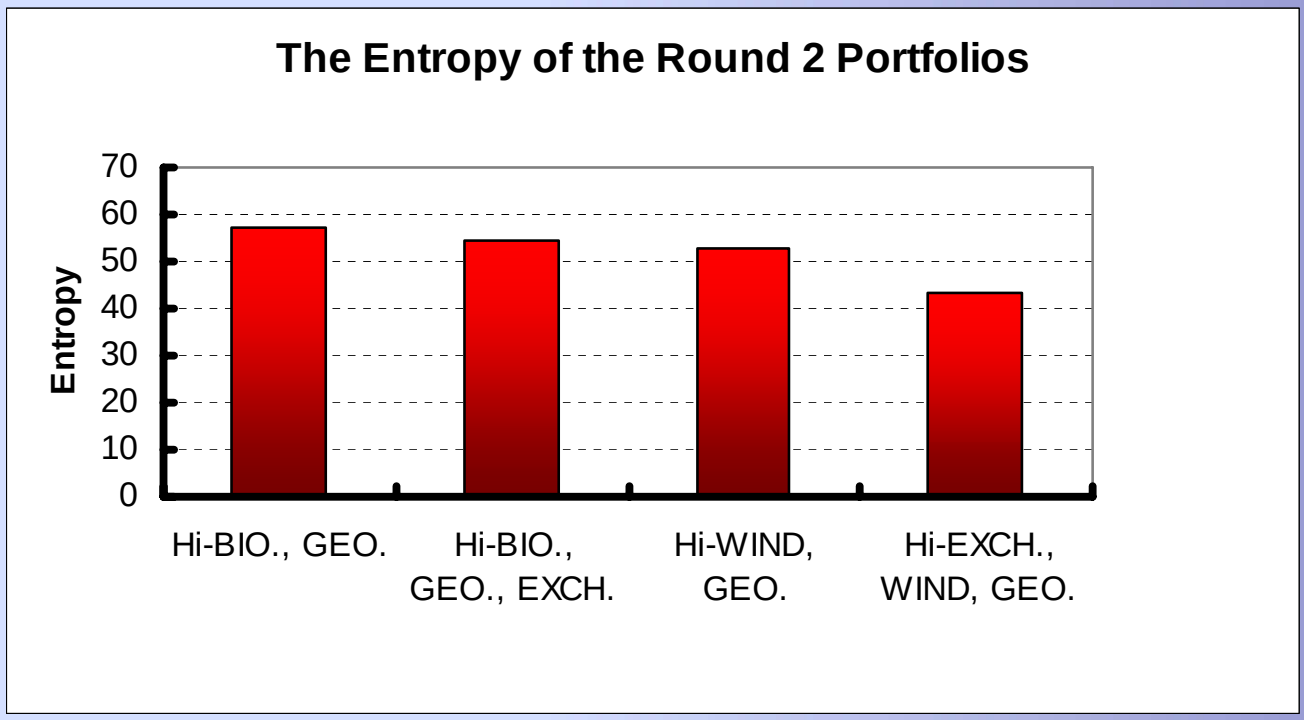
Round 2
Net Power Costs

All-in Production Costs, Net of Sales, Before Incentives and Tax Credits



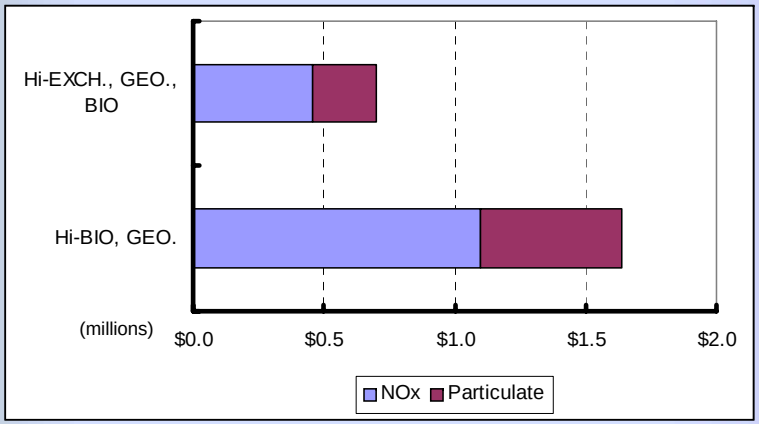
*Net Power Cost = All-in production costs + market purchases – market sales + contract purchases – contract sales (does not include emissions costs from purchases and sales)

Risk
Round 2 Portfolios

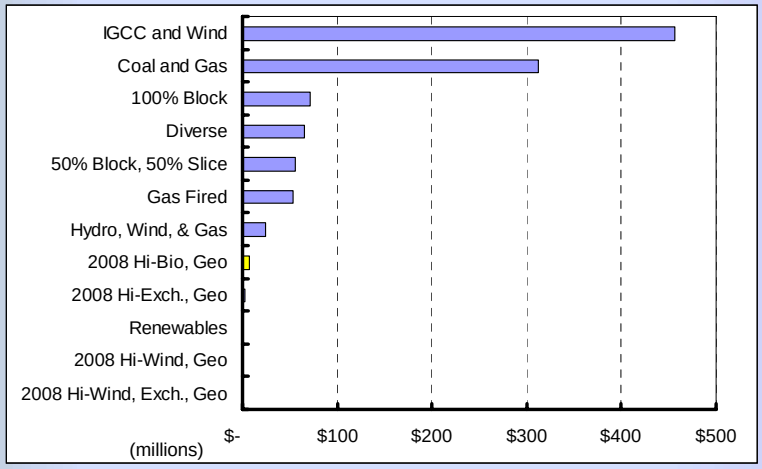


A measure of total portfolio variability from jointly varying demand, fuel costs, and hydropower production

Round 2 Portfolios
Emissions Mitigation Cost Estimates



Round 2 Emissions Mitigation Cost Estimates for the Only Two Portfolios With Emissions



Above Emissions Mitigation Cost Estimates for Round 2 Portfolios Compared With 2006 IRP Portfolios

(2006 in blue, 2008 in yellow)

Preliminary Results for Round 2 Summary

(NPV in Millions)

	Risk (Entropy)	Net Power Cost*	Emissions**	Total Cost
Hi-Biomass, Geothermal	57	$337	$2	$339
Hi-Exchange, Geothermal, Bio.	55	$335	$1	$336
Hi-Wind, Geothermal	53	$367	$0	$367
HI-Wind, Exch., Geothermal	43	$421	$0	$421

** Emissions costs are not actually incurred by City Light, but are estimates of the cost of mitigation of all emissions associated with a resource portfolio using control technologies. Does not include market purchases and sales.

Summary of Round 2 Findings

- Accelerated conservation is a clear winner as a portfolio strategy
- With all-renewable resource portfolios, the distribution of long-run portfolio costs is “bunched”
- The net effect of carbon cap & trade gives the portfolios higher revenues, since it drives up power prices
- The possible extension of the production tax credit can have a large impact on costs, although diluted to SCL
- Significant risk reduction comes with increased baseload resources
  - Risk for large biomass in part comes from economic dispatch

Draft 2008 IRP
2-Year Action Plan

- Pursue accelerated conservation aggressively
- Pursue full 2011 BPA contract rights
- Pursue summer for winter exchanges
- Contract for landfill gas resource by 2009
- Evaluate results of distributed generation study and pursue cost-effective opportunities with customers
- Continue to investigate geothermal resources, demand response, and new renewable technologies
- Investigate future capacity versus energy needs as the region grows shorter on capacity
- Participate in climate change research to allow more complete analysis of long-term impacts
- Work to ensure reliable transmission capacity