2012 IRP
Process & Assumptions

Seattle City Light

IRP Stakeholders

June 9, 2011

Agenda

- Introductions
- Stakeholder's Role in 2012 IRP
- Assumptions
  - Demand Outlook
  - Conservation
  - New Resources
  - Environmental Impacts

2012 IRP Stakeholders (to-date)

John Chapman	University of Washington
Calvin Chow	Mayors Staff
Stuart Clarke	Bonneville Power Administration
Cameron Cossette	Nucor Steel Seattle
Danielle Dixon	Northwest Energy Coalition
Tom Eckman	Northwest Power & Conservation Council
Dan Eder	City Council Staff
Pam Jorgenson	Harborview Medical Center
Tony Kilduff	City Council Staff
Steve LaFond	The Boeing Company
Mike Locke	McKinstry
Henry Louie	Seattle University
Christy Nordstrom	Residential Customer
Mike Ruby	Envirometrics, Inc.
Jennifer Sorensen	Seattle University
Paul Zemtzov	Sierra Club

2012 IRP Team

Sarang Amirtabar, IRP & Forecasting
David Clement, IRP & Forecasting
Carsten Croff, Financial Planning
Steven Dadashi, Resource Acquisition & Contracts
Eric Espenhorst, Resource Acquisition & Contracts
Corinne Grande, Environmental Affairs
Mike Little, Conservation Resources
Marilynn Semro, Resource Acquisition & Contracts
Ron Tressler, Environmental Affairs
Gary Voerman, Environmental Affairs
Mary Winslow, IRP & Forecasting

IRP Process and Stakeholder Roles

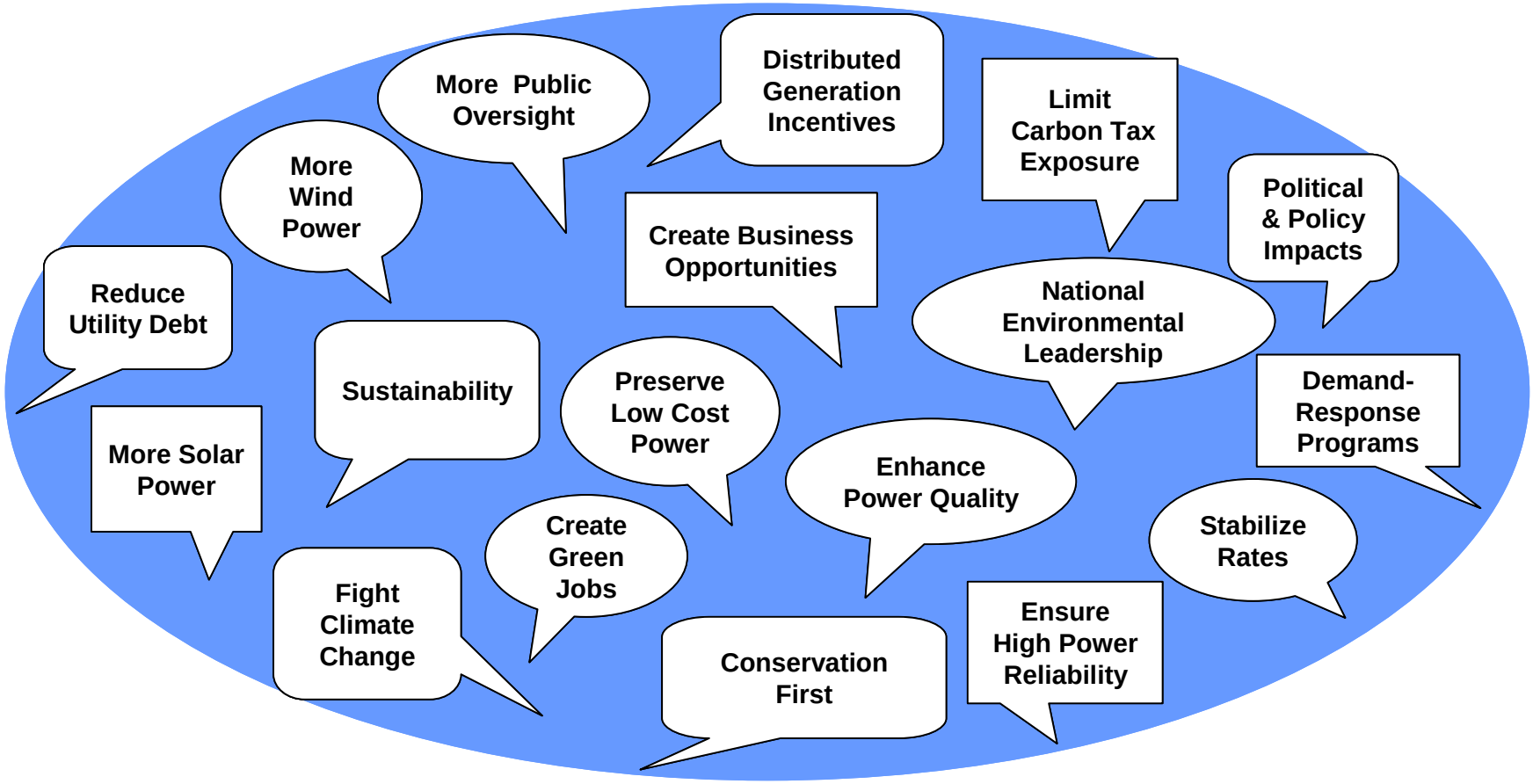
Integrated Resource Plan (IRP)

- An Integrated Resource Plan:
  - Identifies <u>how much</u>, <u>when</u>, and <u>what kind</u> of energy resources are needed
  - Treats conservation as equal to power generation
  - Includes public involvement
  - Is updated often (every 2 years)
  - Is required by state law
- City Light Evaluates Resource Plans By:
  - Cost, Risk, Reliability, and Environmental Performance

The IRP and SCL Resource Choices

- The IRP Recommended:
  - Increasing and accelerating conservation targets
    - Nearly doubled in 2008
  - Biomass
    - SPI wood waste biomass contract signed
  - Exchanges for seasonal shaping
    - Seasonal exchanges annually with Idaho Power and others
  - Landfill gas
    - Columbia Ridge landfill gas contract
  - **Distributed energy/cogeneration**
    - West Point wastewater treatment cogeneration contract
  - Hydro Efficiency
    - Pursuit of the Gorge Tunnel 2 project and turbine replacements
  - RECs to partially cover I-937 requirements
    - Multiple REC purchases covering City Light past 2016

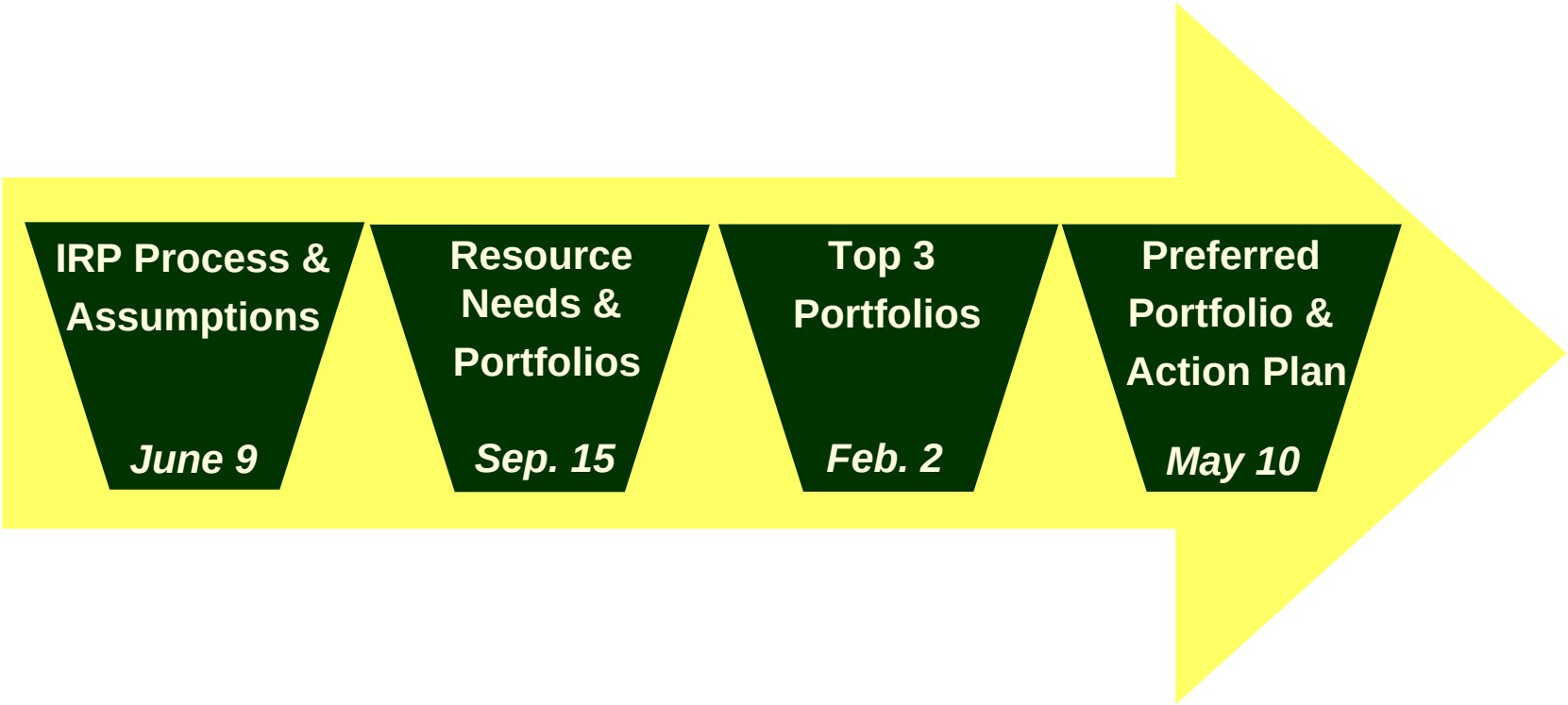
Many Public Objectives for SCL's Resource Planning



Seattle City Light's 2012 IRP Public Input Process

1	2	3	4
Process, Assumptions	Resource Needs, Rd. 1 Portfolios	Top 3 Portfolios	Preferred Portfolio, Action Plan
IRP Policy Group	IRP Policy Group	IRP Policy Group	IRP Policy Group
IRP Stakeholders	IRP Stakeholders	IRP Stakeholders	IRP Stakeholders
	Public Meetings	Public Meetings	
City Council ETCR	City Council ETCR	City Council ETCR	City Council ETCR

2011-2012 Stakeholder Meetings



Poll on Issues and IRP Improvements

<u>Ranking of Issues for 2012 IRP</u>

1. Reliability: How much do we really want?
   - Six voted #1
2. Biomass
   - Two voted #1
3. Impacts of another 3,000 MW of wind
   - Zero voted #1
4. “Game changing” technologies (solar, fuel cells)?
   - Zero voted #1

Other Stakeholder Comments

Improvements to IRP Process

- Respondents generally satisfied with process

Improvements to Engagement of Stakeholders

- Facilitate the group more to get quiet people to speak
- Offer webex for at least some meetings

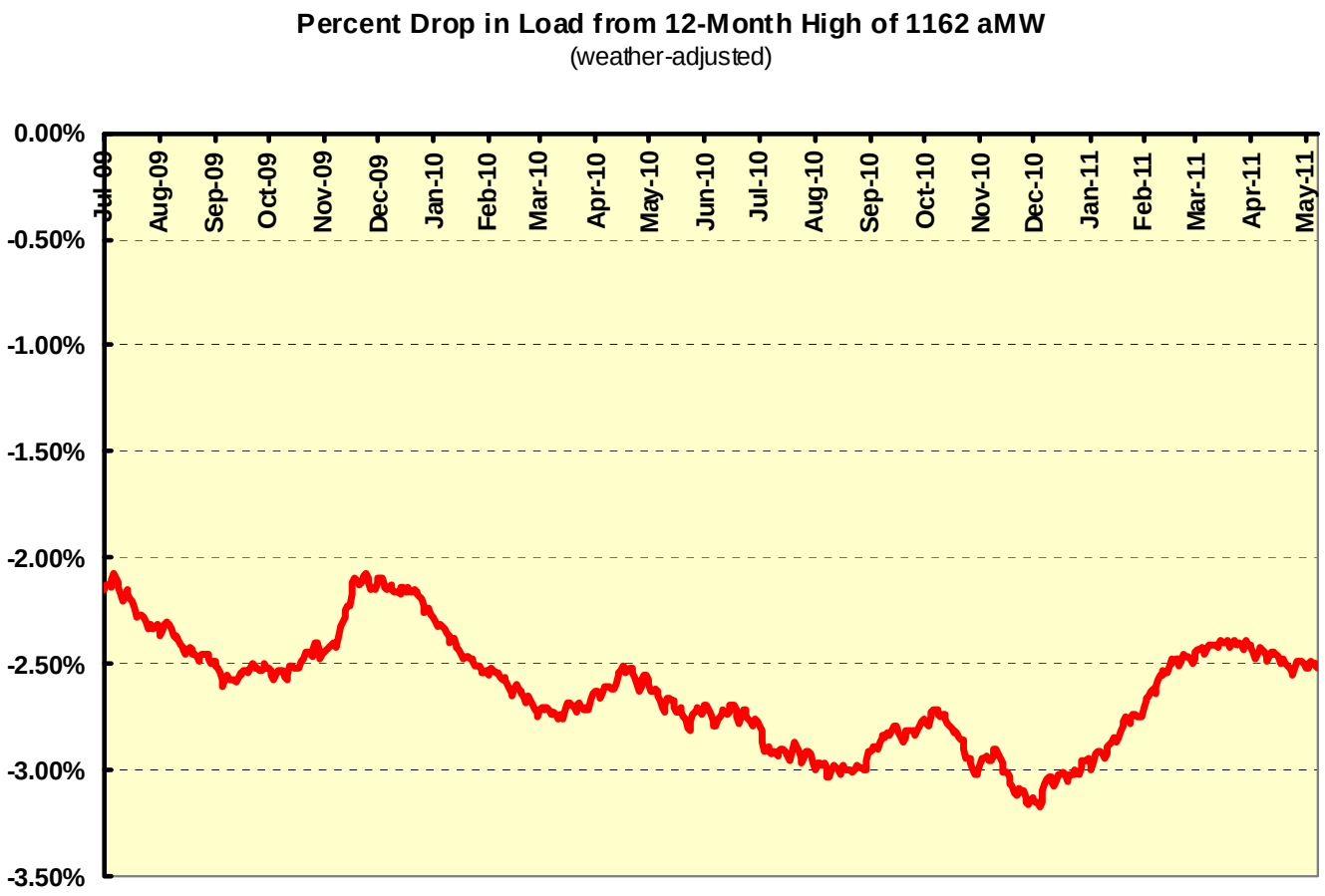
General Comments

- Like to learn more about conservation and the programs
- Choose 1 topic for in-depth study each IRP (e.g. geothermal)
- What could change demand significantly from outlook?
- What happened to the conservation 5-year plan?
- Try setting up focus groups to assess public opinion
- Would like to know more about the Aurora model

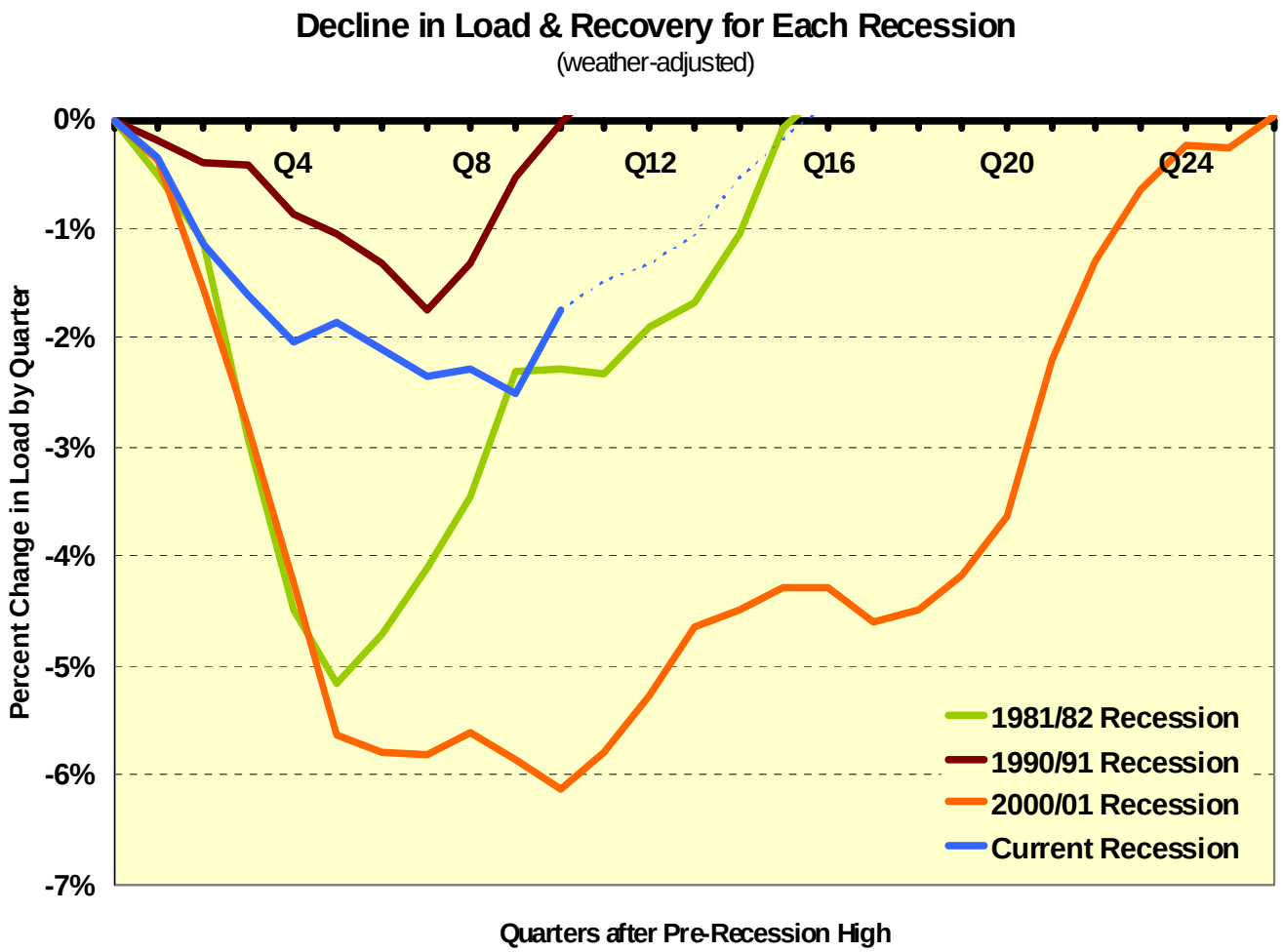
2012 IRP Assumptions

2011 Load Forecast

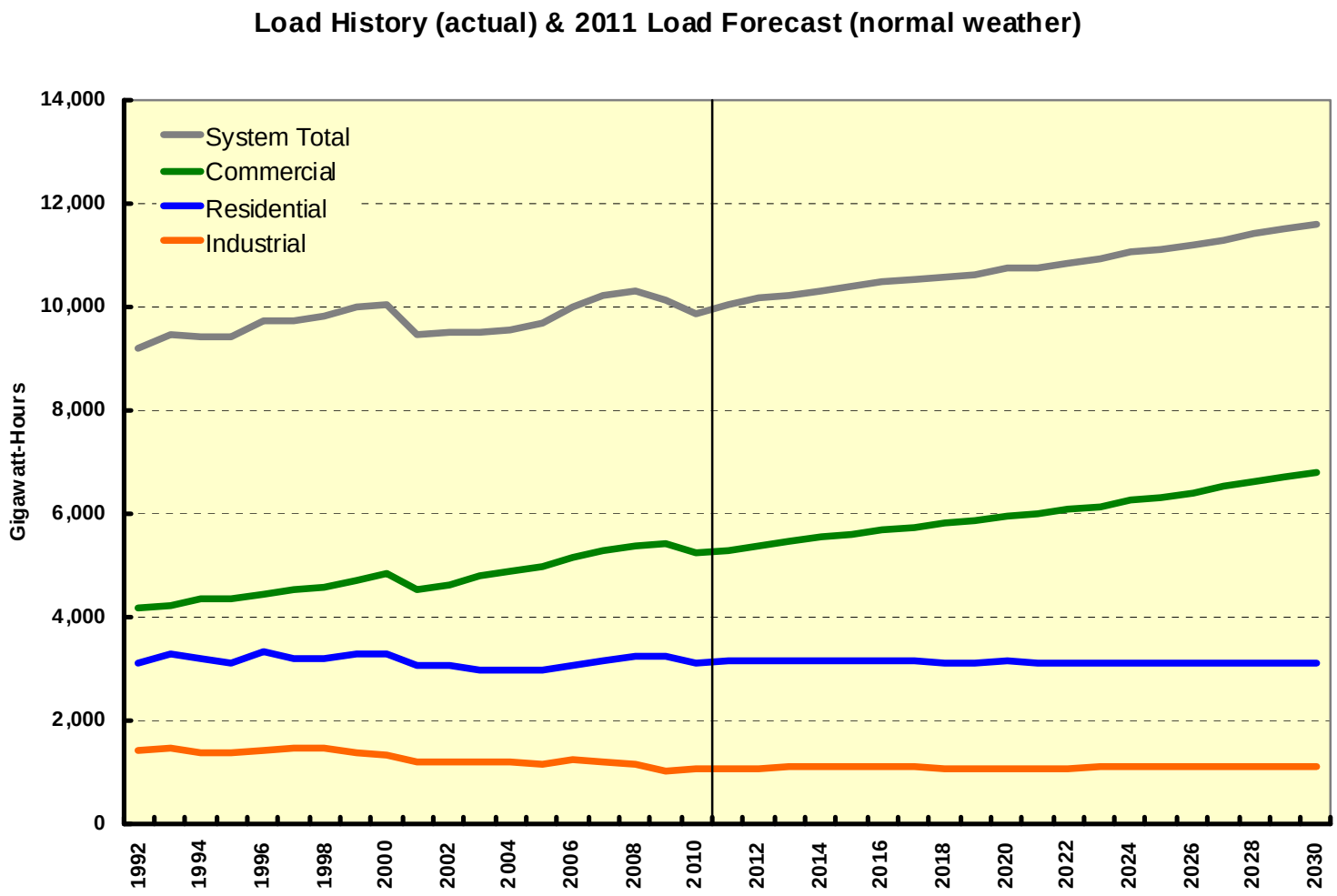
Load Recovery Slowing



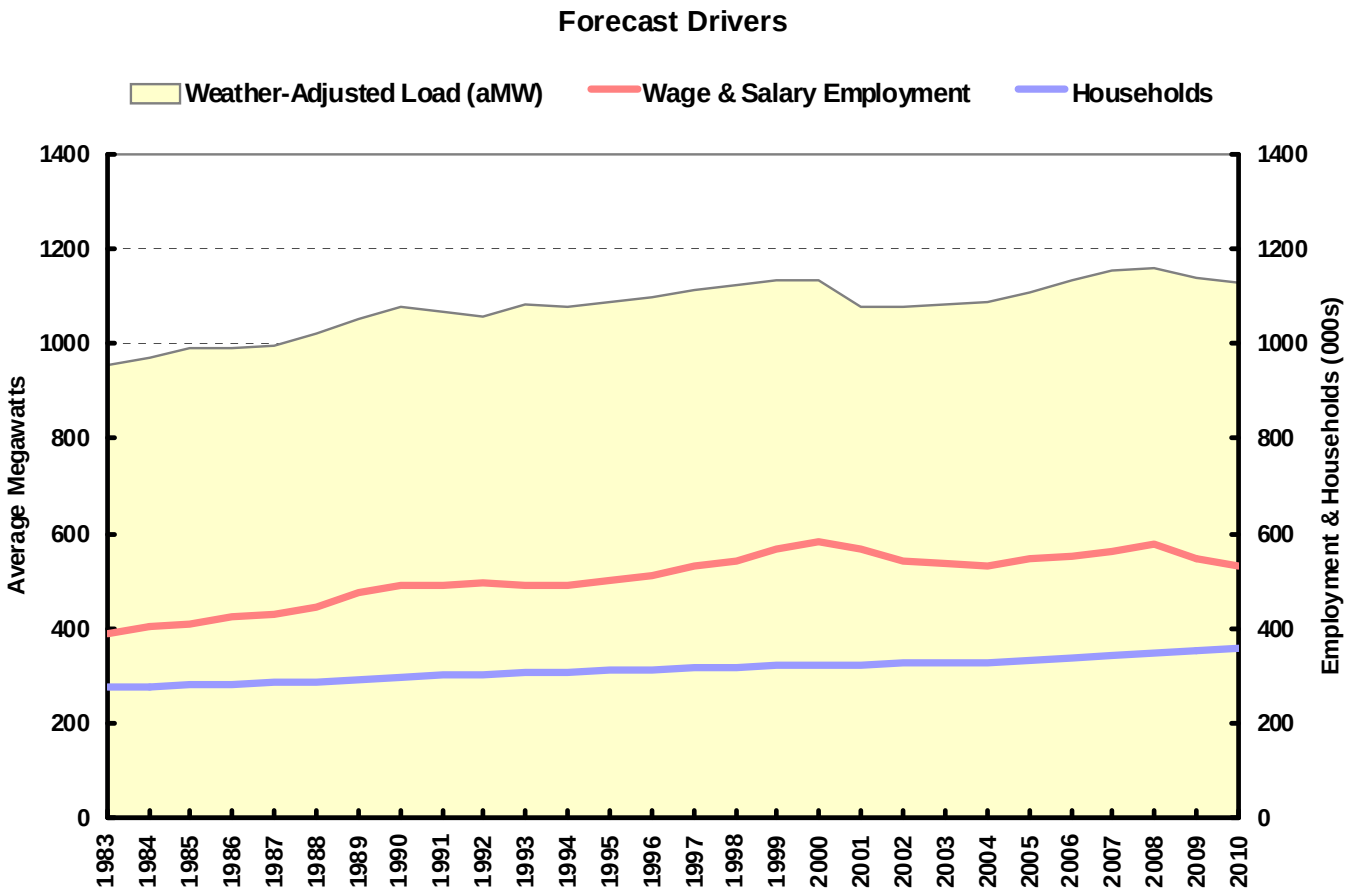
Load during Past Recessions



Forecast by Customer Class



Employment & Households



Energy Conservation

Overview

- Background
- IRP approach
- Conservation Potential Assessment
- I-937 & 6th Power Plan

Background

- Energy conservation is SCL's first priority resource, and has been since 1976
  - Least cost
  - Least environmental Impact
  - Least risk
- Implementing programs since 1977
- Significant resource – energy savings in place through 2010 = 126 aMW ~ 10% of retail load
- Completions 2007 – 2009 = ~10 aMW/year
  2010 = 12.8 aMW
- Anticipate meeting the 2010/2011 I-937 calculator biannual target of 19.68 aMW (at 80% through March 2011)

Conservation: IRP Portfolio Approach

- Current near-term approach:
  - Single conservation portfolio used for resource adequacy analysis
  - Based on assumptions in SCL's Strategic Plan Baseline and averages ~14 aMW/year over the next 7 years
  - Average cost of energy savings: $47/MWh total resource cost (levelized)
- Moving forward:
  - Complete a Conservation Potential Assessment (CPA) by September 1 to provide supply curve for the IRP
  - Establish an avoided cost threshold
  - CPA will create a base portfolio of cost-effective conservation to establish I-937 ten-year potential and savings acquisition targets for 2012-2013
  - Consider alternative portfolios by accelerating retrofit activity

Conservation Potential Assessment

- RFP released in late-March 2011
- Four firms responded
- Negotiations have started with one firm
- Anticipate supply curves available for the IRP by September 1

Conservation Potential Assessment

September 2011

Market Inputs:

- Customer Forecast
- End Use Saturation
- Fuel Shares
- Baseline Consumption

Measure Inputs:

- Savings
- Costs
- Lifetimes

Characterize Market and Energy Efficiency Measures

Potential of energy efficiency measures in all technically feasible applications

Estimate Technical Potential

Potential of energy efficiency measures with market constraints applied

Estimate Achievable Potential

Resource bundles by customer group, end use, and price point

Integrated Resource Portfolio Analysis

I-937 & NWPCC 6th Power Plan

- I-937
  - Requires City Light to submit and meet biennial conservation target starting in 2010
  - 2010-2011 targets based on NWPCC 5th Plan Calculator: 19.68 aMW
  - Utility to conduct CPA to establish targets
  - Anticipate a lower target for 2012-2013 than 6th Plan calculator of 28.9 aMW
    - Due to past program participation, load growth assumptions and lower electric saturations than region
- NWPCC 6th Power Plan
  - Higher regional conservation targets for 2012 and beyond
  - Higher avoided costs
  - Emerging technologies with significant energy savings included
  - Calculator estimates 23.5 aMW for 2010-2011 and 28.9 for 2012-2013

Summary

- Initiate inputs to IRP resource adequacy with a single portfolio
- Update the CPA to establish new supply curves for IRP
- Establish I-937 targets for 2012-2013 by October 2011

New Supply Resources

Generic Supply Options

- Geothermal – engineered or conventional
- Wind
- Biomass (I-937 has some restrictions)
- Landfill gas
- Wastewater treatment plant gas
- Hydroelectric (I-937 allows efficiency upgrades, which excludes most of SCL's hydroelectric resources)
- Solar photo-voltaic
- Solar thermal
- Wave, ocean, or tidal
- Fuel cells
- Natural gas

Supply Considerations in the IRP

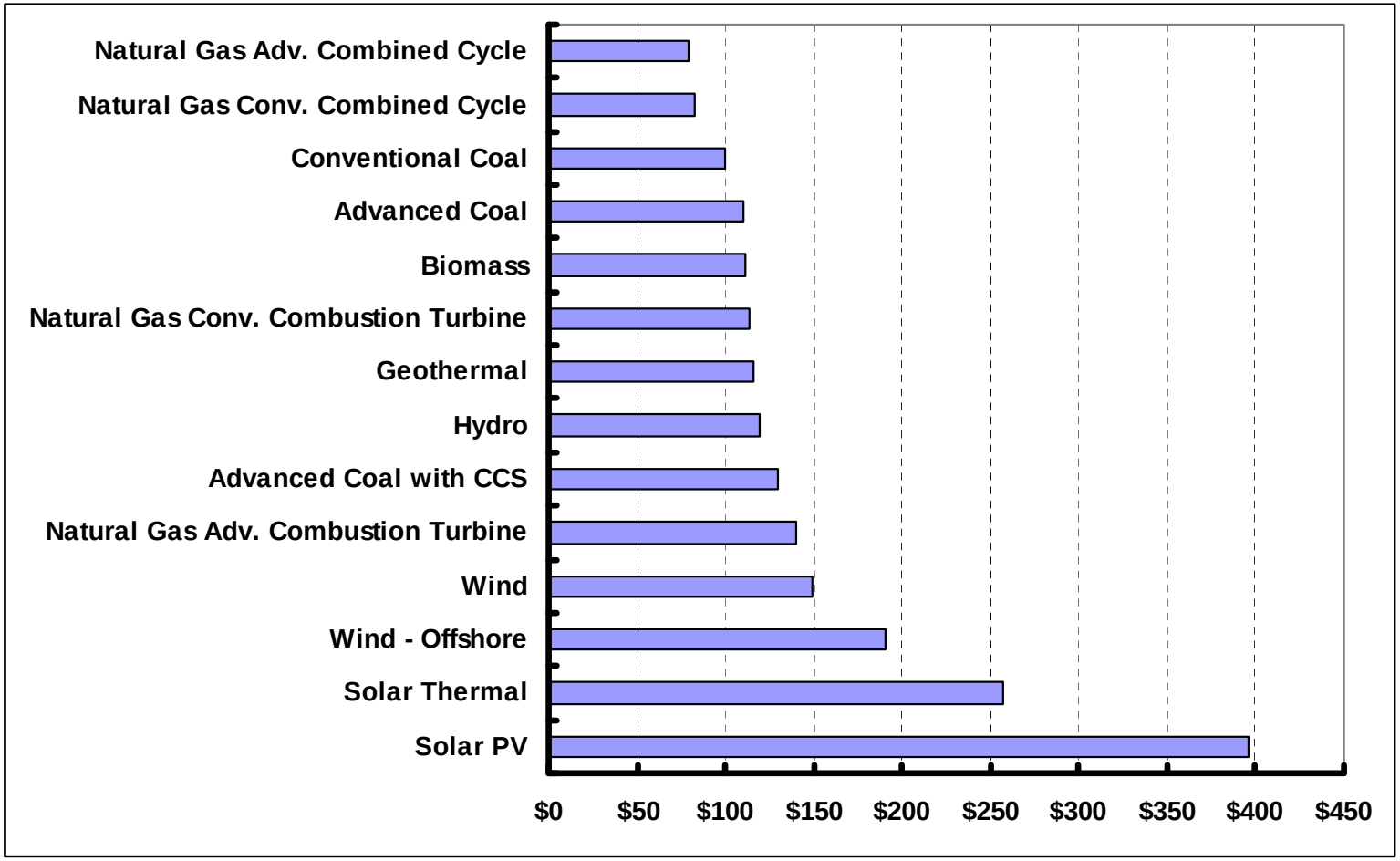
- Time horizon: 2012-2031
- Regulatory and policy compliance
- New resources should complement existing resources
- Evaluation criteria include:
  - Reliability,
  - Cost,
  - Environmental impact,
  - Availability,
  - Deliverability, and
  - Risk

Relative Cost Example

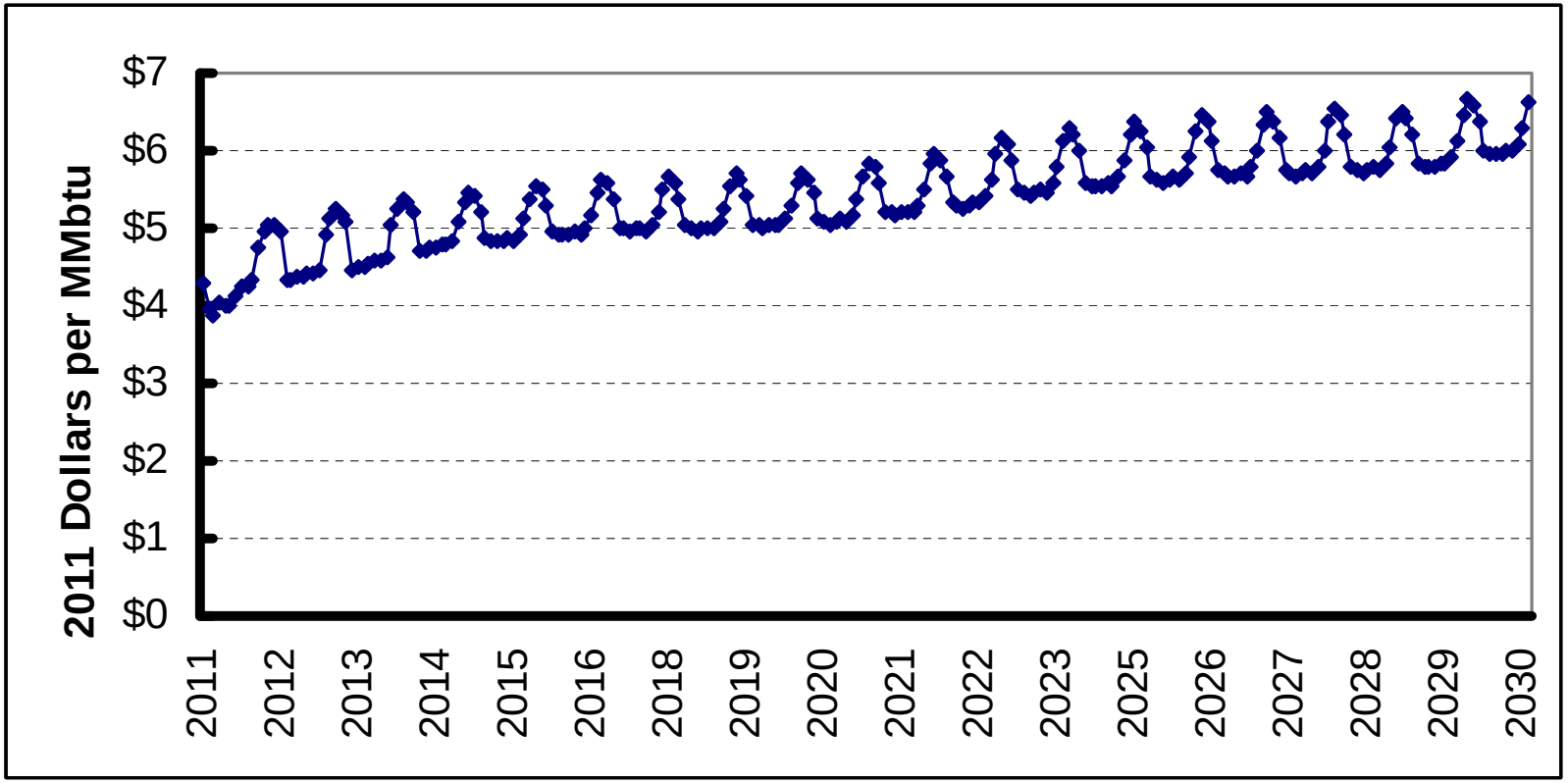
(2014 Delivery, Before Incentives, Transmission, and CO_2 Costs)

	Delivered Cost ($/MWh)
Wind	$75-120
Biomass	$100-150
Landfill gas	$60-100
Solar	$150-300
Natural gas	$40-100

Levelized Cost ($2008/MWh) in 2016



Ventyx Natural Gas Price Outlook: Monthly Sumas Price



Market and Policy Uncertainties

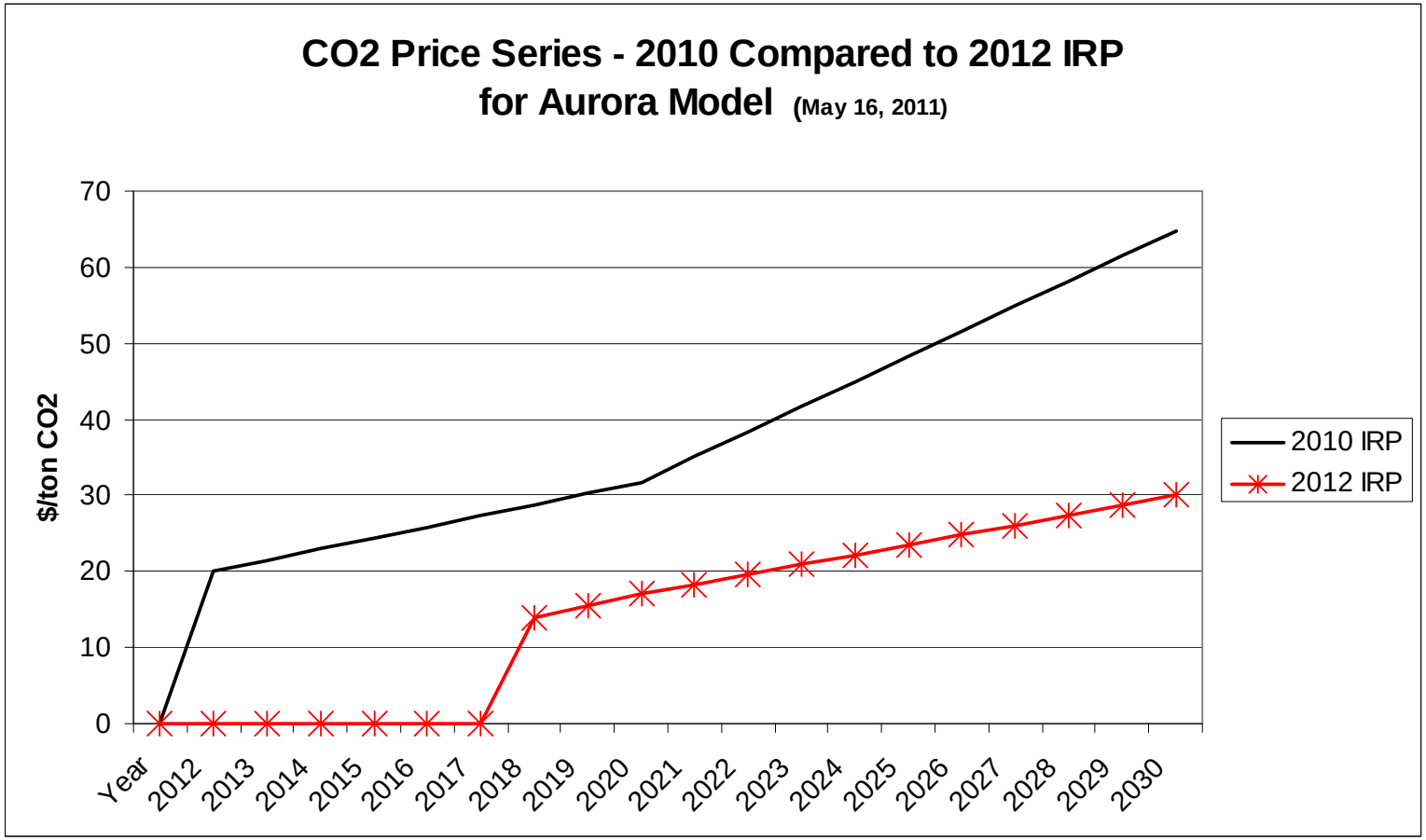
- Price of natural gas
  - Varied from $12/MMBTU in 2008 to $3.50/MMBTU in 2010
  - Affects short term and long term market price for electricity
- Reasons why actual power plants may cost more or less than generic examples
  - Economic conditions
  - Developer experience and requirements
  - Site quality
  - Transmission availability
- Federal or state greenhouse gas emission limits
- Taxes and incentives
  - Production tax credits, investment tax credits, and other federal programs may lower prices
  - These programs have conditions and are time-limited

More Uncertainties

- SCL is a buyer
  - SCL is competing with all other utilities
  - Expect to pay comparable prices, 7-15 cents/kWh
- Reduce risk to ratepayers
  - Bring public power benefits to SCL's ratepayers
  - SCL has transmission to bring power to customers
- Find and take opportunities to provide long term value to SCL customers

Environmental Impacts

CO2 Prices


CO2 Price Series - 2010 Compared to 2012 IRP
for Aurora Model (May 16, 2011)
$/ton CO2
70
60
50
40
30
20
10
0
Year
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
2010 IRP
2012 IRP

Impact of EPA Proposed Utility MACT

- Applies to coal and oil only, not natural gas plants
- Mercury (HG), fine particles (PM2.5), acid gases (HCl)
- Plants with controls can probably meet limits with few modifications, those w/o controls will face high expense
- Result will be coal plant retirements
- Aurora will ‘close’ coal plants based on EIA and SNL data (April 2011) on WECC announced coal plant retirements
- Almost 4,500 MW coal retirement between 2012 and 2025, of approximately 33,000 MW coal capacity

NOx and SO2 Prices

- 2010 IRP:
  - SO2: $1,302 (2009$/ton) years 2012-2014
    $2,063 (2009$/ton) years 2015-2030
  - NOx: $1,490 (2009$/ton) years 2012-2014
    $2,328 (2009$/ton) years 2015-2030

Climate Change

- 2008 IRP
  - Implications of UW work for NPCC 5th Plan
- 2010 IRP
  - SCL work with UW: Downscaling models to watershed level; glacier melt and snowpack patterns; and impacts at Skagit
- 2012 IRP
  - Continued work on glaciers
  - Assess the implications of other new research

Questions or Comments?

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E-Mail: SCL.IRP@Seattle.gov

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