



 **Your Seattle City Light**

Contribution to Climate Action

Seattle City Council Energy and Environment Committee
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www.seattle.gov/light

Seattle City Light's Contribution to Climate Action

Outline

- Greenhouse Gas Neutrality
- Energy Supply
- Green Ribbon Commission (GRC) Sectors
 - Building Energy: Energy Conservation
 - Transportation (and Non-Road Electrification)
 - Climate Impact Research and Adaptation

Seattle City Light's Legacy of Environmental Leadership

Greenhouse Gas Neutrality

- City Light was the first utility to be GHG neutral (2005)
- 2012 was our 8th year in a row of being GHG neutral
- How we did it
 - Eliminate and Reduce Emissions
 - Inventory Remaining Emissions
 - Purchase Offsets
- Reducing emissions
 - Divested fossil fuel resources
 - Met all load growth since 2000 with conservation and renewables

Seattle City Light's Legacy of Environmental Leadership

Greenhouse Gas Emissions Inventory

- Primarily from purchased power
- Small amount from operations
 - Vehicles
 - Airline travel
 - Natural Gas
 - SF6 (electrical insulation)
- Reported to The Climate Registry
- Independently verified

Seattle City Light's Legacy of Environmental Leadership

2011 Greenhouse Gas Inventory

Remaining Emissions – Metric Tons CO2 per year

High Ross	5,222
BPA Block	76,853
BPA Slice	12,373
Distribution Losses	3,597
Non-Generation Sources	
Airline travel	127
Vehicle Fleet	4,193
Natural Gas (heat)	373
SF6/Refrigerant	1,535
TOTAL	104,273

Seattle City Light's Legacy of Environmental Leadership

City Light GHG Emission Offset Projects

Offset projects include:

- Cedar Grove organic waste composting
- Dairy methane capture/electricity generation
- Improved manure management
- Landfill gas capture and destruction
- Shore power – Princess and Holland Lines cruise ships



Seattle City Light's Legacy of Environmental Leadership

Net-Zero Emissions Energy Supply

- Clean hydro legacy – 90% of current power supply
- Greenhouse Gas Emissions accounted for in resource planning starting in 1991
- Divested fossil fuel resources – sold Centralia coal plant share in 2000
- Policy since 2000: meet all load growth with conservation and renewables
- Energy conservation – first priority resource since 1970's
- Added new renewables including wind, biomass and landfill gas
 - Stateline Wind: 3% to 4% of load
 - Burlington Biomass
 - Columbia Ridge Landfill
- 2012 IRP: Preferred Portfolio = Conservation & Renewables

GRC: Building Energy

GRC Building Energy Recommendations

- Maintain Seattle City Light commitment to **meet load growth** with conservation and renewables, as well as to providing zero net emission electricity.
- Outcome-Based Incentives: Seattle City Light should coordinate with other utilities to pilot a **performance-based** utility incentive program.
- If pilot results are positive, identify resources to scale up and expand Seattle City Light's **retro-commissioning** pilot program.
- Support the rapid deployment of **advanced metering** infrastructure.

Building Energy

Energy Conservation

- Conservation meeting > 10% of load
- Current targets under Strategic Plan and 2012 IRP = 14 aMW, 1.3% of load per year
- Doubled targets and budgets since 2007
- Energy Independence Act (I-937) includes conservation requirement
- Range of conservation programs: retail CFL markdowns to complex industrial projects
- 2012 Activity: 13.0 aMW, 93% of target
 - Retail: >1.25 million CFLs, 3800 clothes washers
 - Multifamily: projects for 55 existing buildings
 - Small business: 288 projects funded
 - Commercial & industrial: contracted for 408 new projects

GRC: Building Energy

New or Expanded Efforts

- Residential Weatherization
 - Scaling up residential weatherization program across service territory by 4th Qtr
 - Comprehensive set of rebates
 - Insulation, windows, heating systems, air sealing
 - Encourage full package of measures but flexible
 - Loan offering with on-bill repayment
 - Cooperating with OSE on transition of CPW for Home
 - Collaborate closely with PSE, other funding sources
- Pay for Performance Pilot

GRC: Transportation

City Light Support for EVs & Non-Road Electrification

- Public outreach: events & civic engagement
- EV Inter-departmental task force (sponsored by OSE)
- Internal/Industry efforts
 - EPRI, WA State, North Cascades
 - On-going distribution system impact evaluation
 - City Light Nissan Leaf acquisition
 - Eight all-electric Leafs currently in fleet (16% of sedan fleet)
 - Expand to 32 by 2016 (65% of sedan fleet)
- Work with Port of Seattle: shore power/EPRI

GRC: Climate Change Adaptation

GRC Recommendation

Research the impacts of climate change on hydroelectric projects

Impacts of Climate on City Light System

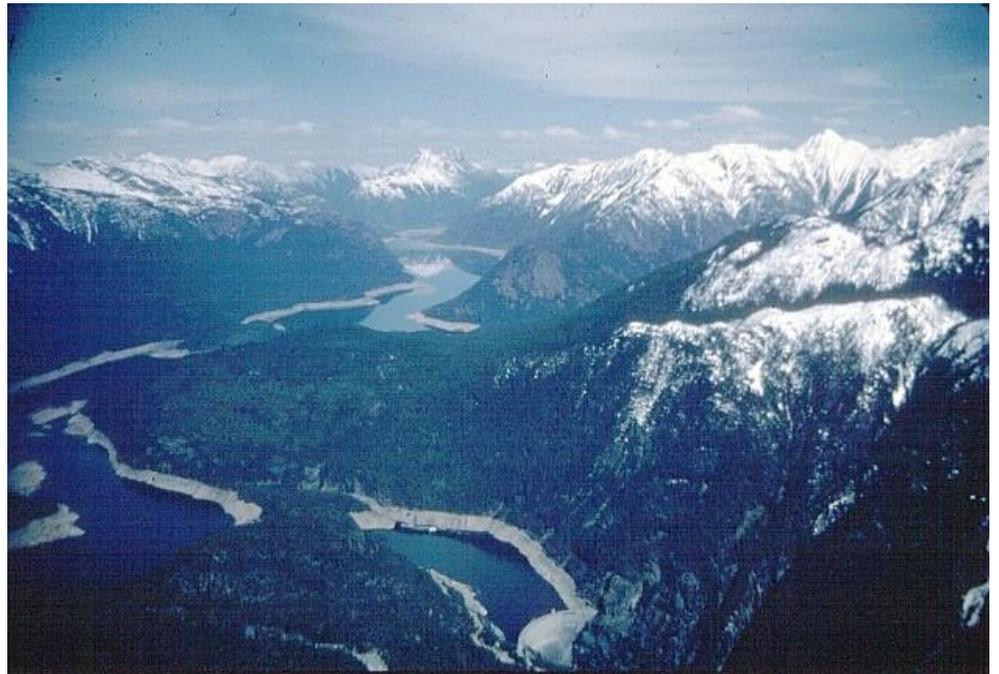
- Effect on hydro generation
- Customer Load
- Operations
- Fisheries Resources
- Infrastructure



Climate Change Adaptation

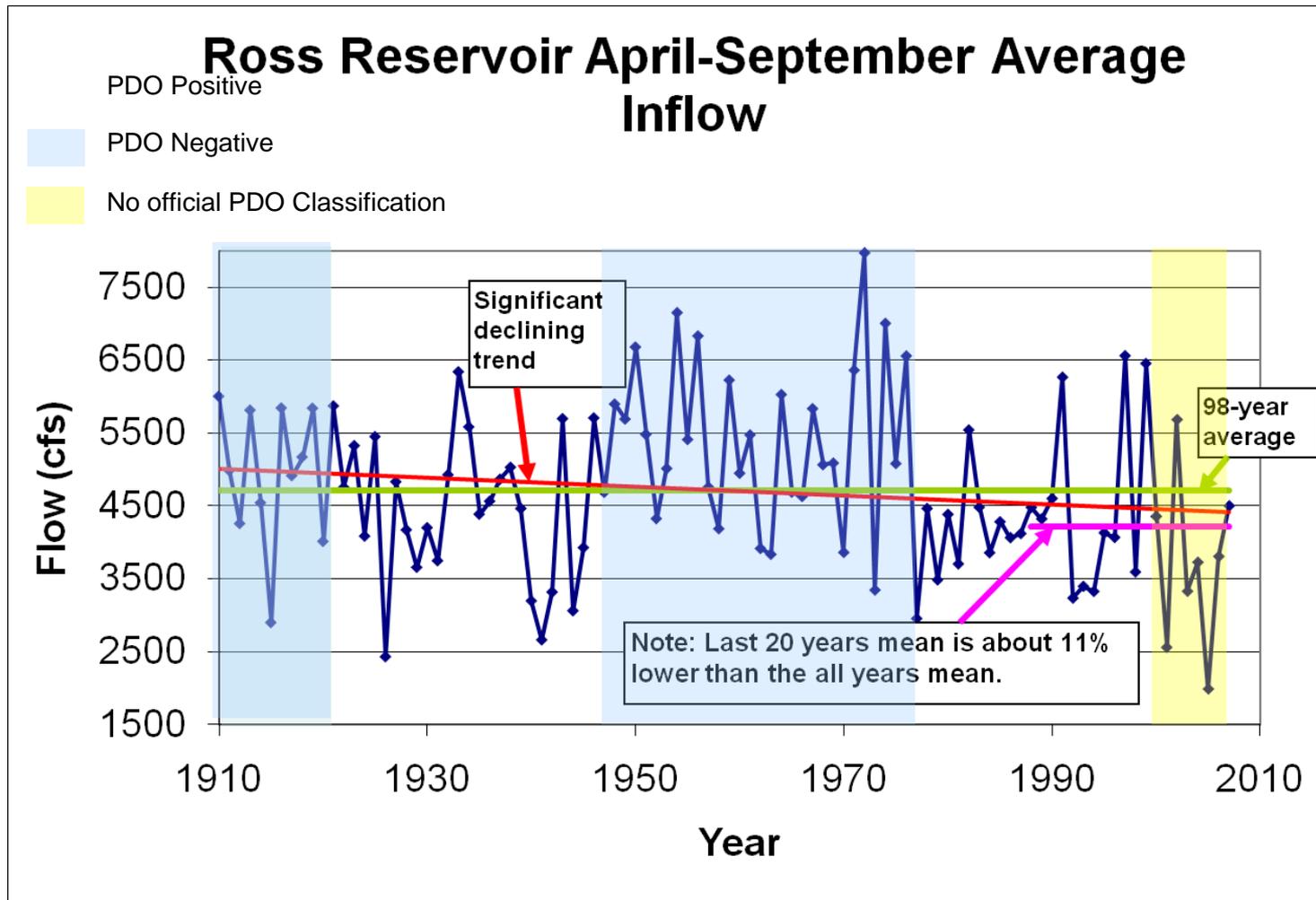
Skagit Historical Observations

- Last 20 years – 11% lower April-September Ross Inflows
- 2 week earlier spring runoff since 1970
- More frequent and larger floods



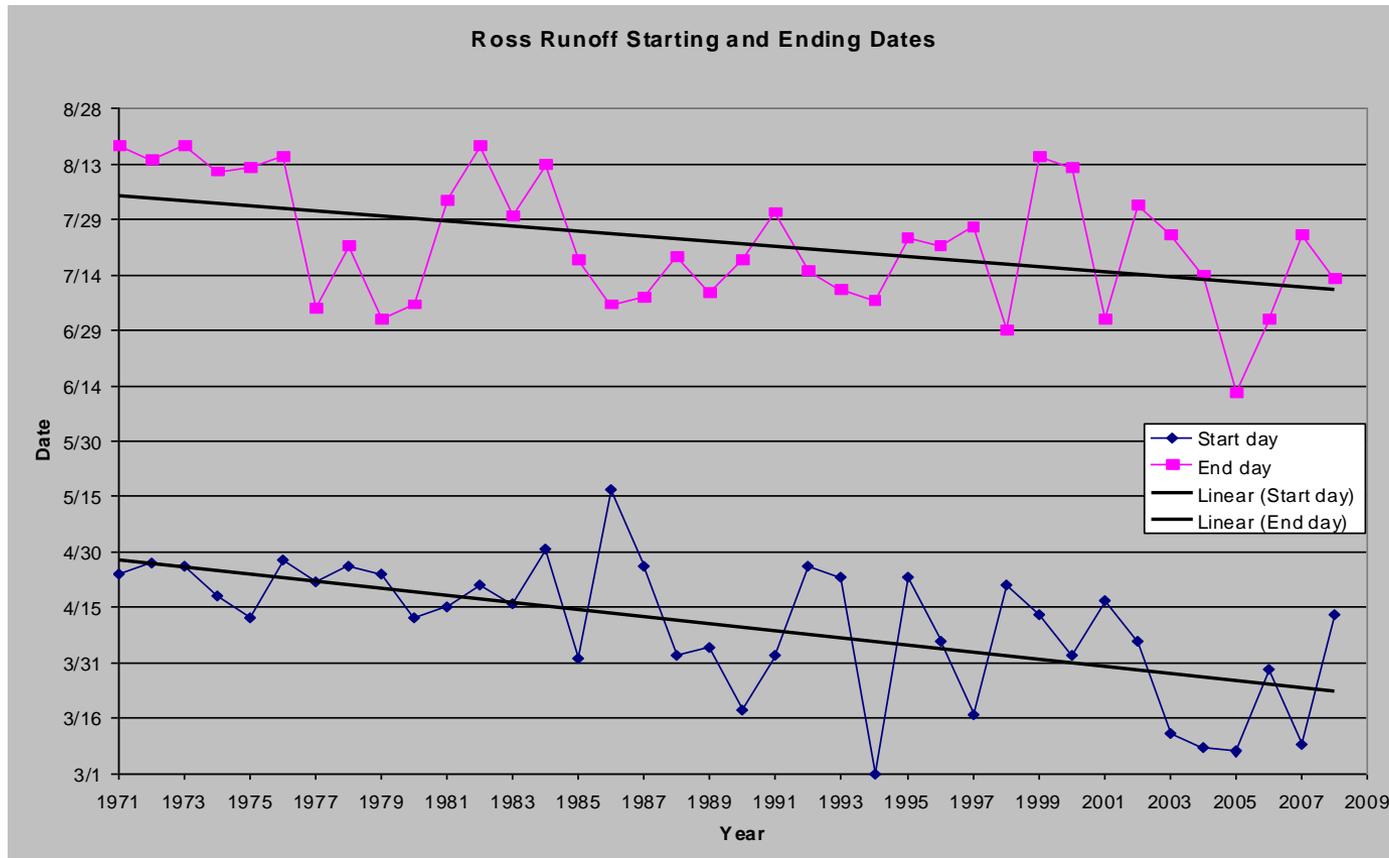
Ross Lake at the Skagit River Hydro Project

Climate Change Adaptation



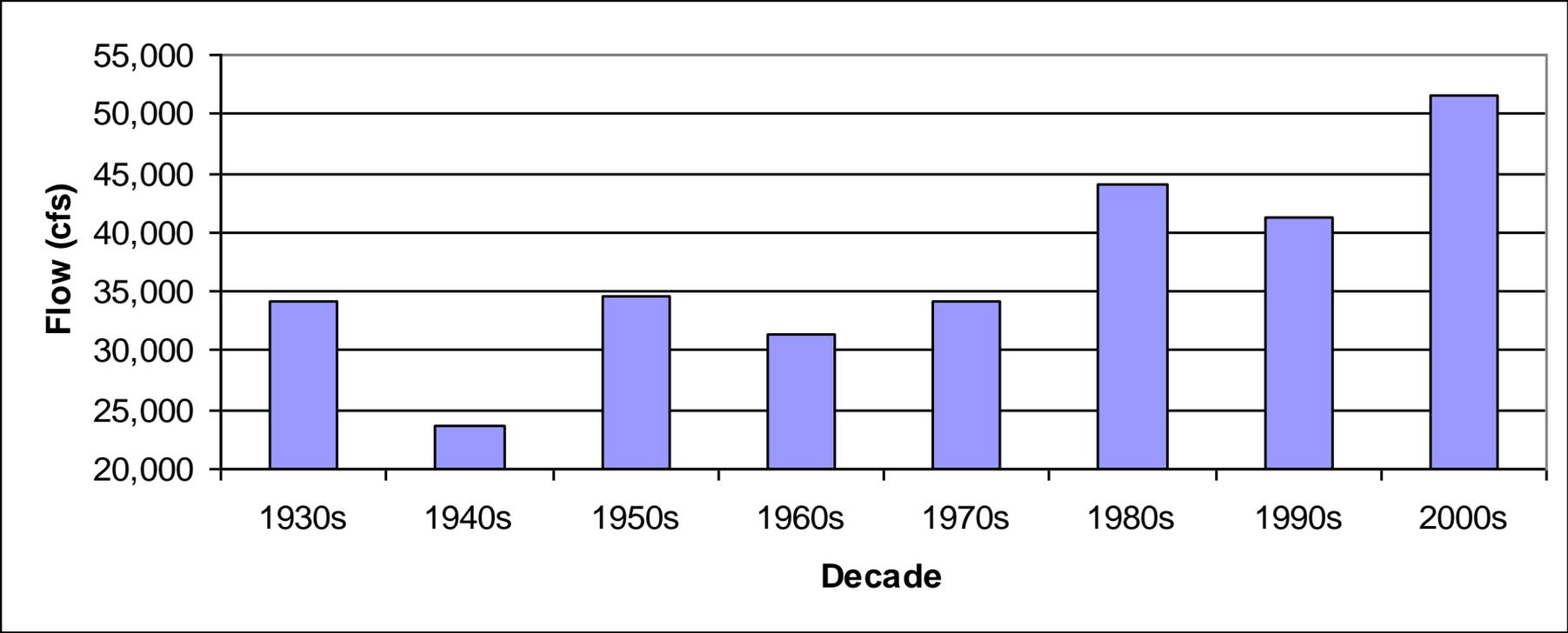
Climate Change Adaptation

Earlier Ross Lake Runoff



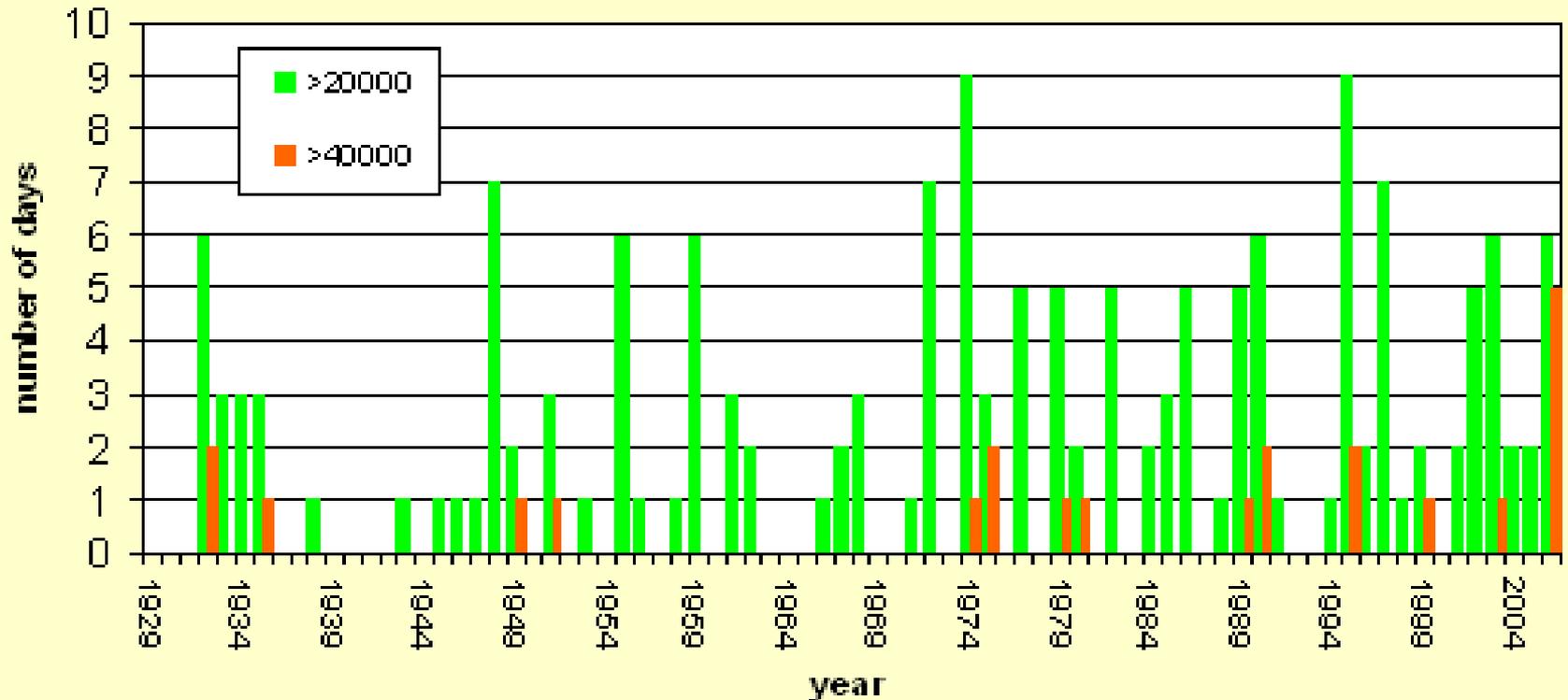
Climate Change Adaptation

Increased Sauk River Flood Magnitude



Climate Change Adaptation

Increased Sauk River Flood Frequency



Climate Change Adaptation

Skagit Projections for 2040s Climate Provided by UW Climate Impacts Group and National Park Service

- 20% further decline in snow pack
- More flow in late-fall and winter
- 17% Lower summer flows
- More warm wet days = greater spill and flood potential – 6% increase in 100-year flood
- Substantial increases in summer water temperatures affects fisheries
- Glacier recession – bedload deposits



Climate Change Adaptation

Future Work

- Climate Initiative in Strategic Plan
 - Study impacts in sufficient detail
 - Develop Adaptation Plan
- Improve modeling and linkage of climate change projections with operational tools
- Improve understanding of tributary and glacier contribution
- Develop operations optimization model
- Protect riverine ecosystem, endangered species, and anadromous fish
- Assess sea level rise impacts

