Seattle City Light

SEATTLE CITY LIGHT: CLIMATE RESILIENCE AND ADAPTATION

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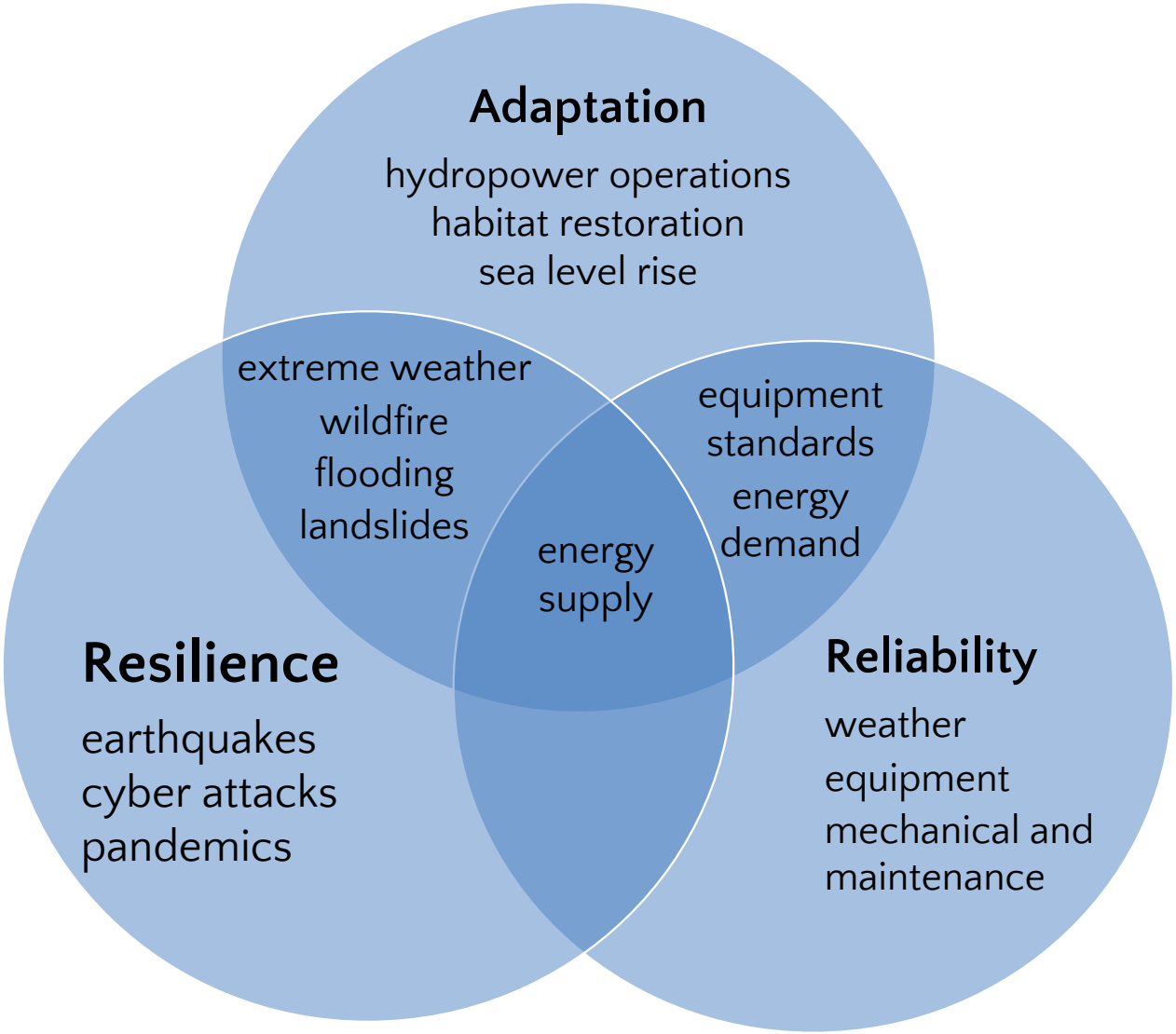
Environment, land and Licensing

THE NATION'S GREENEST UTILITY
SINCE 1905
SEATTLE CITY LIGHT

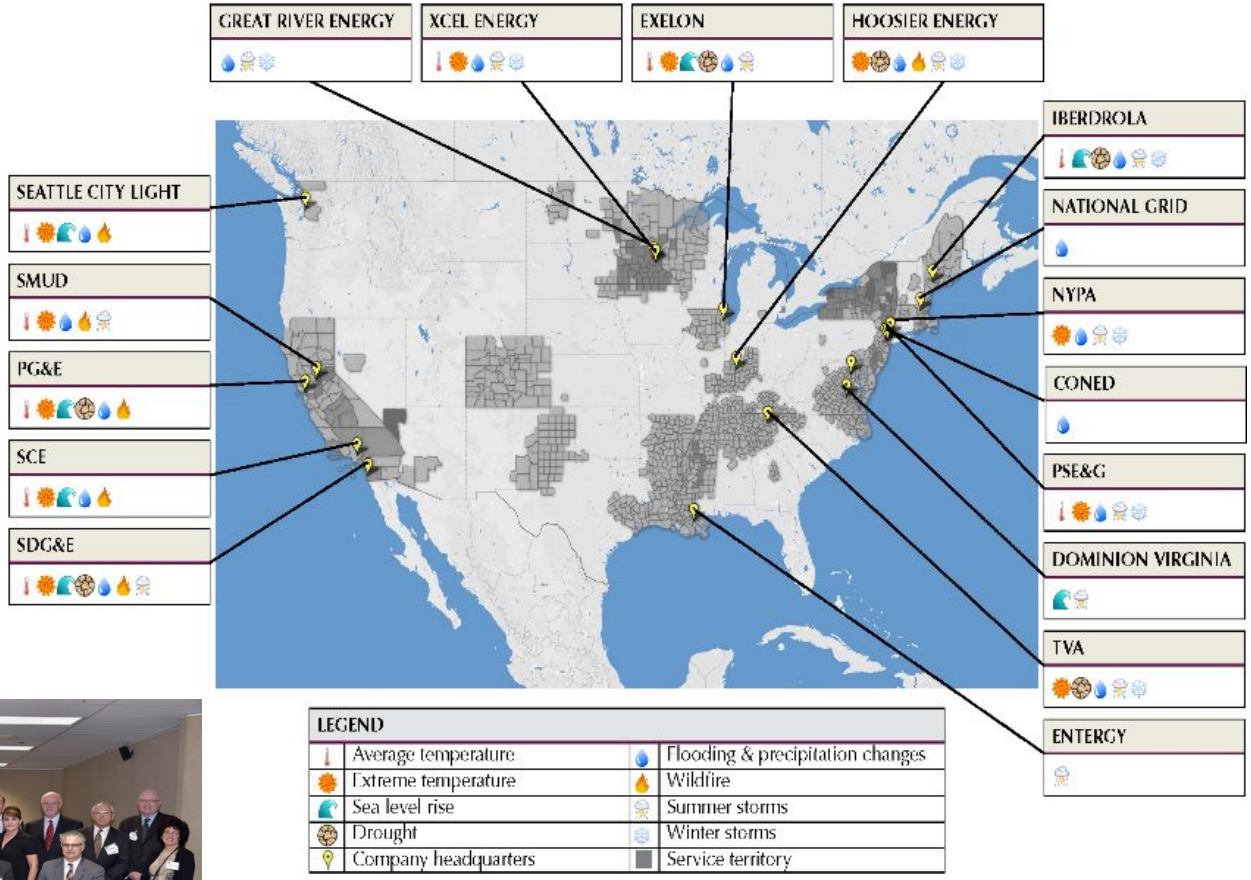
Resilience in the Energy Sector

	Reliability	Resilience	Adaptation
Definition	The ability to consistently deliver power.	The ability to recover from disturbance in a timely and effective manner.	Adjustment in natural or human systems in response to actual or expected climate effects.
Role of Climate	Assumes stationarity	Either stationary or not	Assumes non-stationarity
Metrics	industry standard, customer outages	Can include long-term outages but largely undefined.	Undefined


Adaptation
hydropower operations
habitat restoration
sea level rise
extreme weather
wildfire
flooding
landslides
equipment
standards
energy
demand
energy
supply
Resilience
earthquakes
cyber attacks
pandemics
Reliability
weather
equipment
mechanical and
maintenance

Department of Energy
Partnership for Energy Sector Climate Resilience

- Guidance on vulnerability assessments and resilience strategies
- Attributes of a resilient utility
- Cost-benefit analysis



Climate Change and the Energy Sector

Northwest

Regional Energy Sector Vulnerabilities and Resilience Strategies

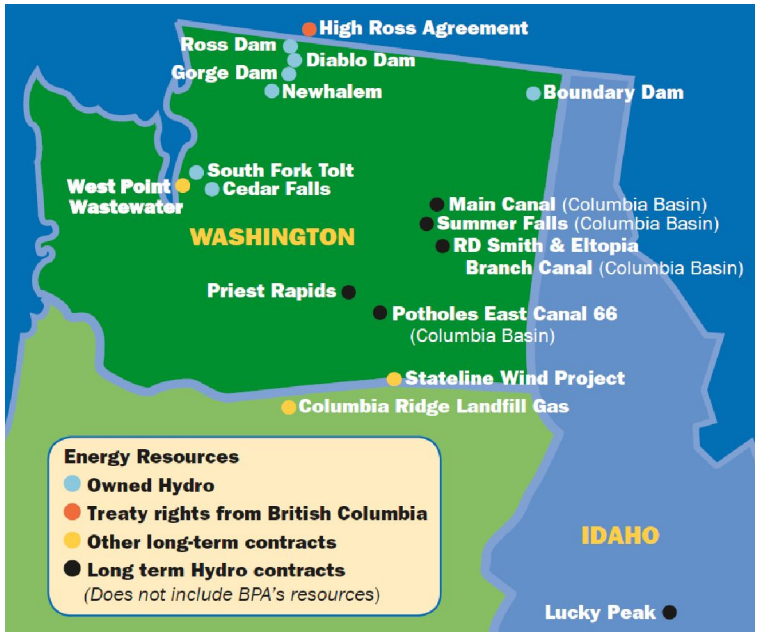
Declining summer streamflow

Increase summer energy demand

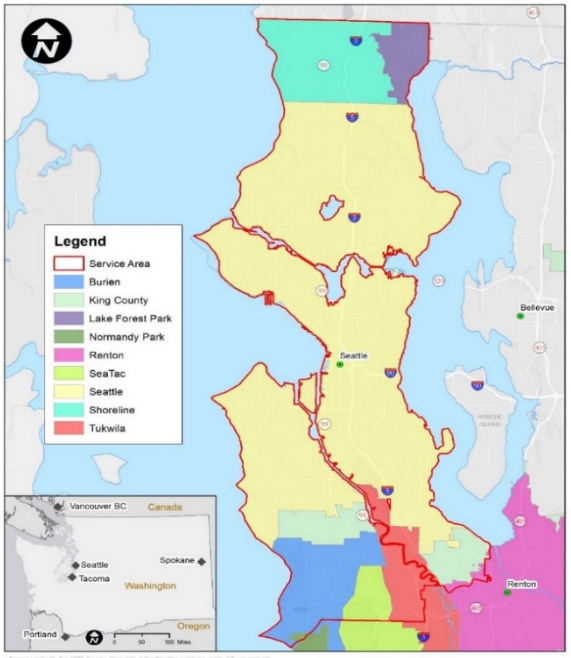
More frequent wildfire

Sea level rise

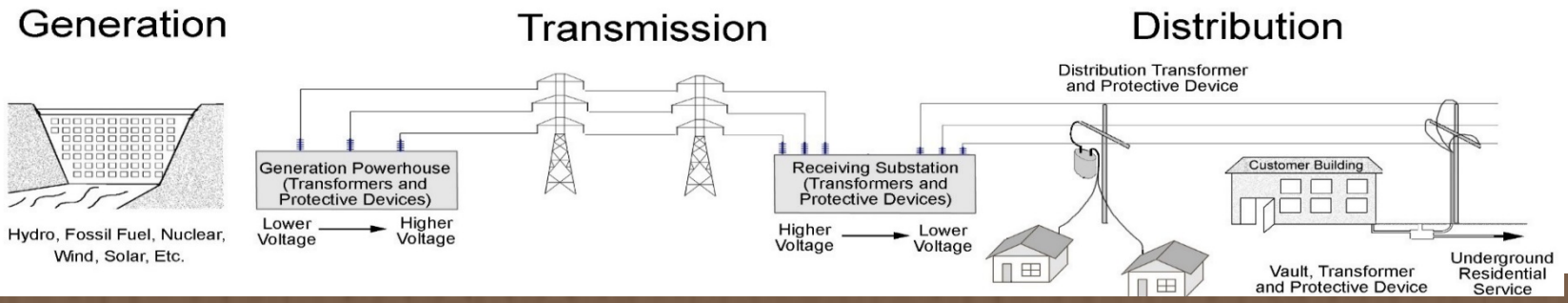
Seattle City Light



90% hydropower generation

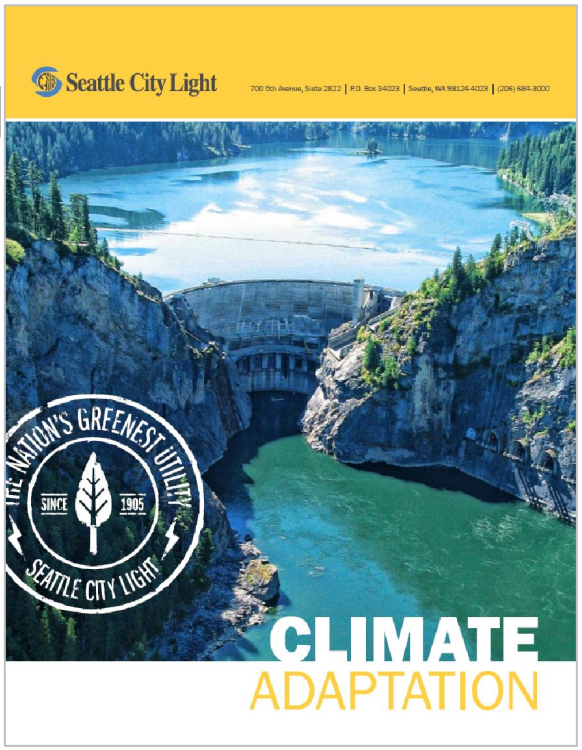


400,000 customers



Strategic Plan: Climate Change Initiative

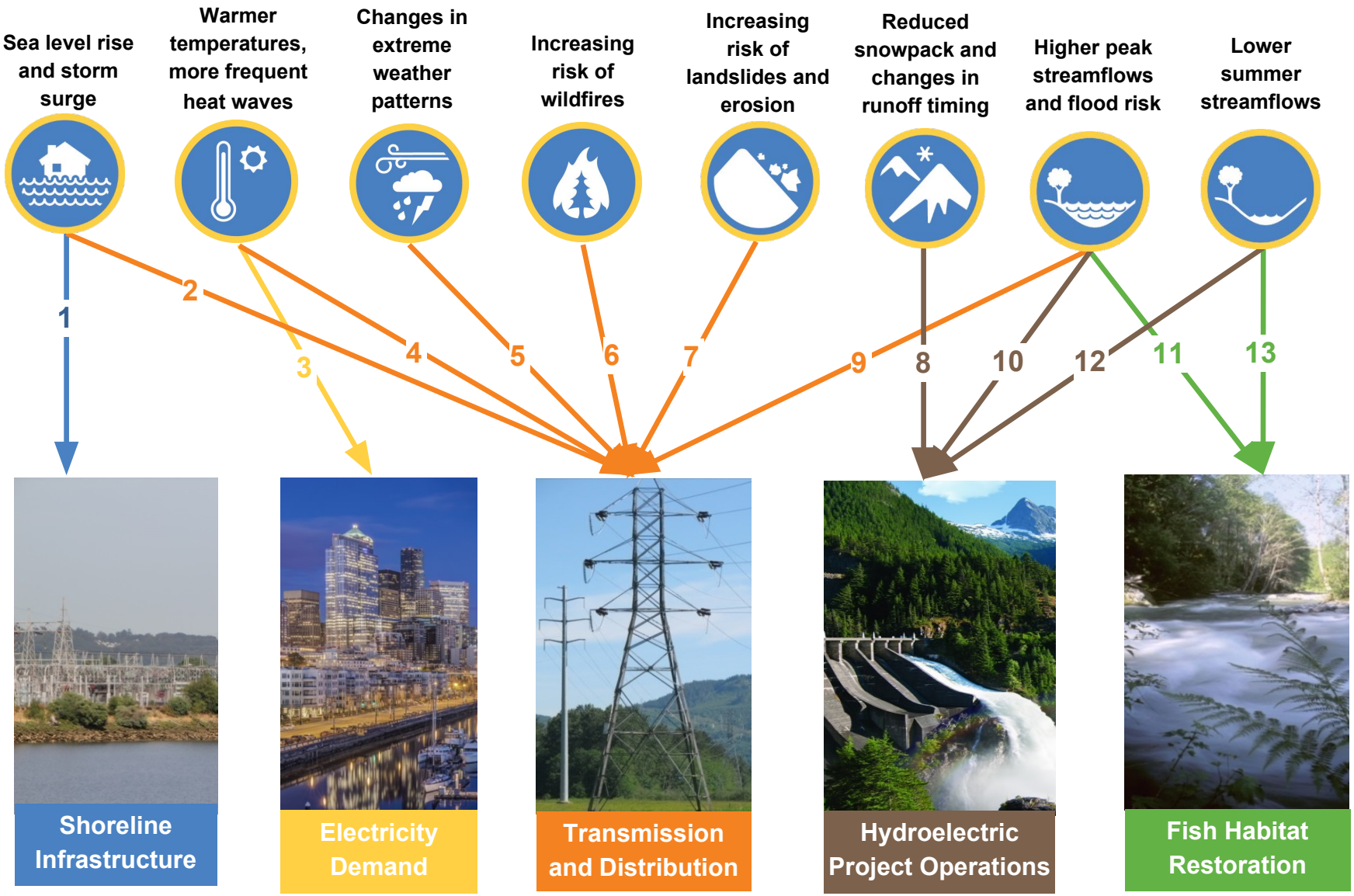
Completed a utility-wide Climate Change Vulnerability Assessment and Adaptation Plan



- Summary of expected changes
- Vulnerability assessment
- What SCL is already doing
- Potential adaptation actions

http://www.seattle.gov/light/enviro/climatechg.htm

Seattle City Light: Adaptation Plan Scope



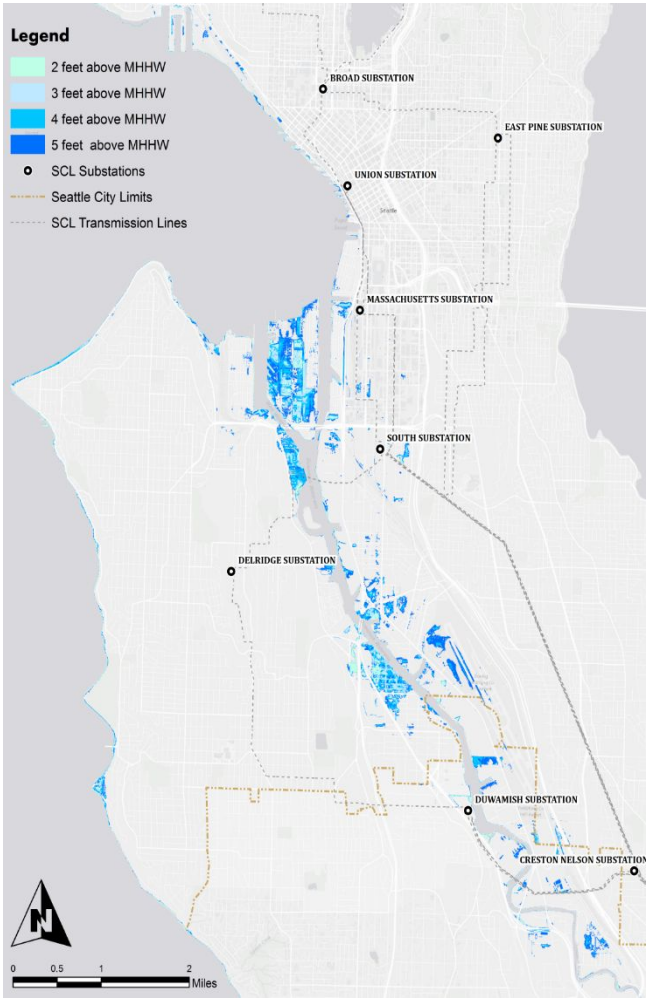
Shoreline Infrastructure: Key Impacts

- Increased risk of coastal flooding of shoreline properties.
- Increased risk of flooding and salt water corrosion of transmission and distribution assets.

Shoreline Infrastructure

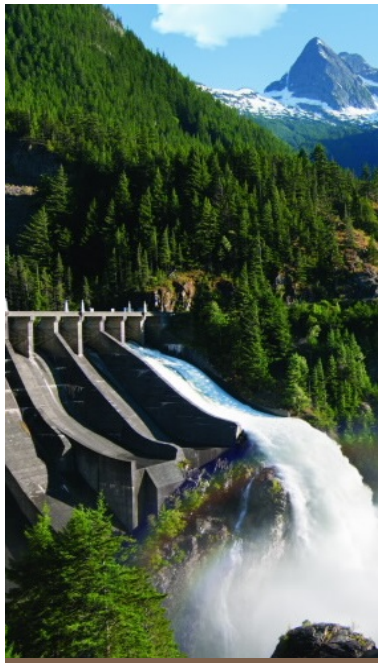
Shoreline Infrastructure: Adaptation Actions

- Collaborate with Seattle Public Utilities and other agencies to update sea level rise maps and projections.
- Consider greater risk of coastal flooding in capital projects.



Hydroelectric Project Operations: Key Impacts

- Less snowpack and earlier snowmelt will affect seasonal operations.
- Higher peak streamflow may increase spilling at hydroelectric projects – lost generation and impacts on fish.
- Lower streamflow in summer may make it more difficult to meet instream flows for fish and reservoir elevations for recreation.

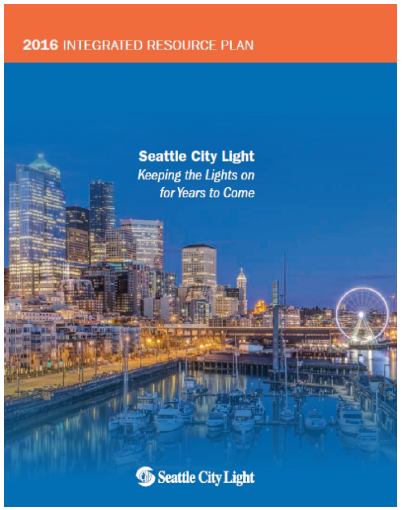


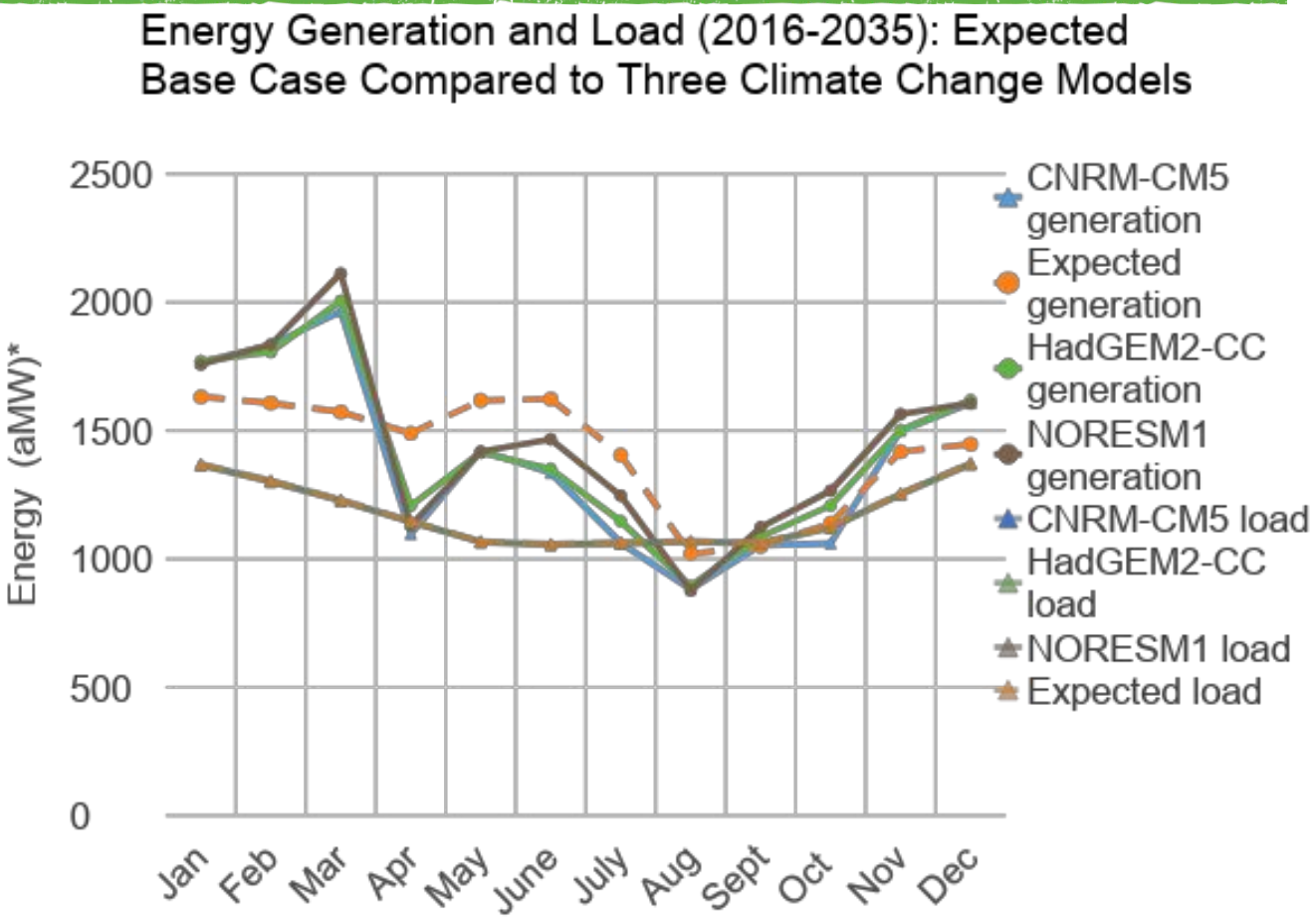
Hydroelectric Project Operations

Hydroelectric Project Operations: Adaptation Actions

- Support research to better understand projected changes in snowpack and streamflow at hydroelectric projects.
- Assess climate change impacts on hydropower supply in 20-year Integrated Resource Plan.
- Collaborate with partners and stakeholders to research and adapt to climate change impacts in watersheds.

Implementation: Integrated Resource Plan





*Note: Energy excludes new conservation, wholesale market purchases, and replacement contracts for resources other than BPA for the 20-year period.

Collaboration with Partners and Stakeholders

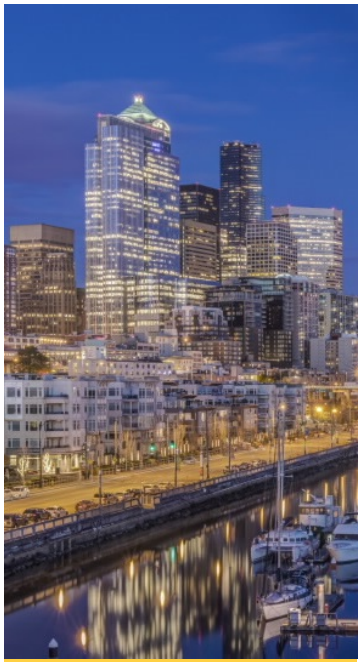
- National Park Service
- US Forest Service
- USGS
- Swinomish Tribe
- Western Washington
- University of Washington
- Seattle City Light

SC² SKAGIT CLIMATE SCIENCE CONSORTIUM

Electricity Demand: Key Impacts

Higher electricity demand for cooling in summer could cause summer peaks to approach winter peaks in areas with high commercial loads.

Lower electricity demand for heating in winter could reduce retail revenue with financial consequences for the utility.



Electricity Demand

Electricity Demand: Adaptation Actions

- Support research to understand temperature effects on summer demand and air-conditioning use
- Model climate change impacts ion 20-year demand forecast.

Transmission and Distribution: Key Impacts

- Slower outage restoration times due to heavy precipitation and urban flooding.
- Increased risk of wildfires causing damage to and interruptions of transmission lines and generation facilities.
- Increased risk of landslides damaging transmission towers and access roads.
- Increased risk of riverine flood damage to transmission towers and access roads located in floodplains.

Transmission and Distribution

Transmission and Distribution: Adaptation Actions to Increase Wildfire Resilience

- Upgrade infrastructure for wildfire resilience.
- Collaborate with landowners to reduce vegetation and wildfire risk near hydroelectric projects.
- Increase wildfire response and preparedness capability: mutual aid agreements staff training, evacuation plans, and Firewise programs.

FIREWISE COMMUNITIES

Implementation: Microgrid for Community Resilience

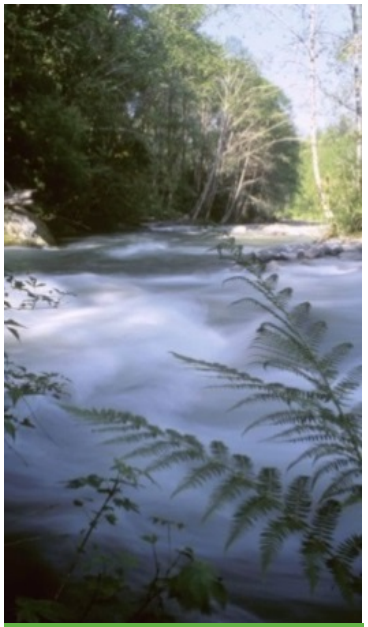
Seattle Parks & Recreation

Seattle City Light

Department of Commerce
Innovation is in our nature.

Fish Habitat Restoration and Protection: Key Impacts

- Increased risk of habitat damage and fish mortality due to higher peak flows
- Increased risk of habitat loss and fish mortality due to lower summer streamflow and warmer stream temperatures
- Increased difficulty successfully restoring vegetation and wildlife habitat.



Fish Habitat Restoration

Fish Habitat Restoration: Adaptation Actions

- Collaborate with stakeholders to consider climate change impacts in fish recovery plans.
- Modify acquisitions and restoration of mitigation lands to account for climate change effects.

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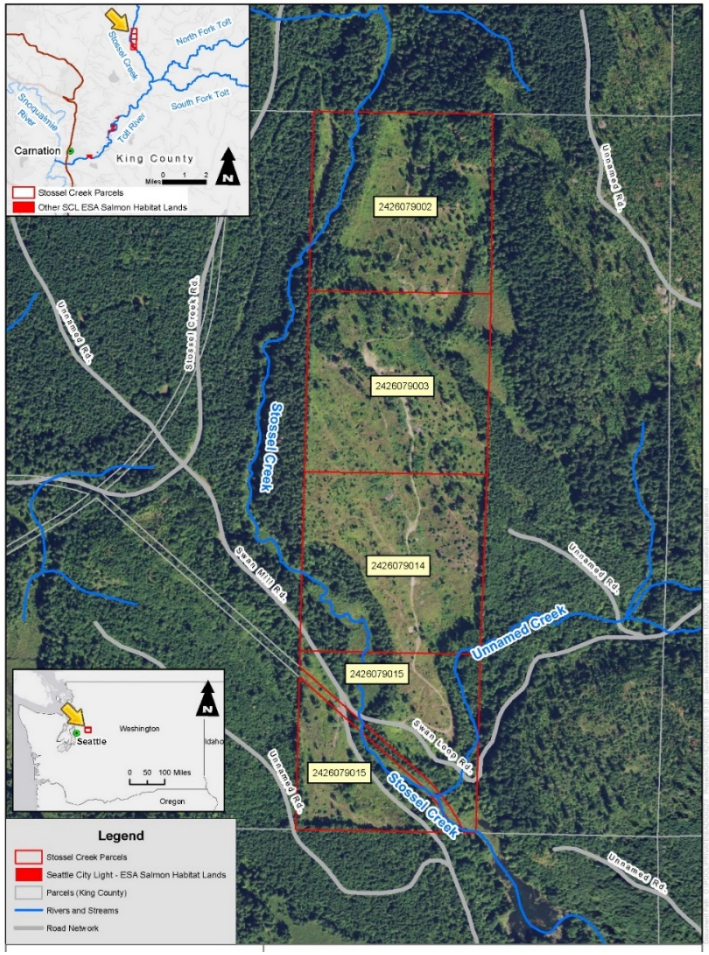
Fish Habitat Restoration: Implementation

- Reforestation of 154 acres of forest land along critical salmon and Steelhead habitat in the Tolt Watershed.
- Reforest with seed sources and species adapted to warmer, drier climates



Equity in Climate Adaptation Work

- Collaborate with other city departments to address disproportionate effects of climate change on minorities and low income population, including tribal communities.
- Support women and minorities in climate-related jobs.
- Creating climate change education opportunities.

OUR VISION

To set the standard—to deliver the best customer service experience of any utility in the nation.

OUR MISSION

Seattle City Light is dedicated to exceeding our customers' expectations in producing and delivering environmentally responsible, safe, low-cost and reliable power.

OUR VALUES

Excellence, Accountability, Trust and Stewardship.

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