



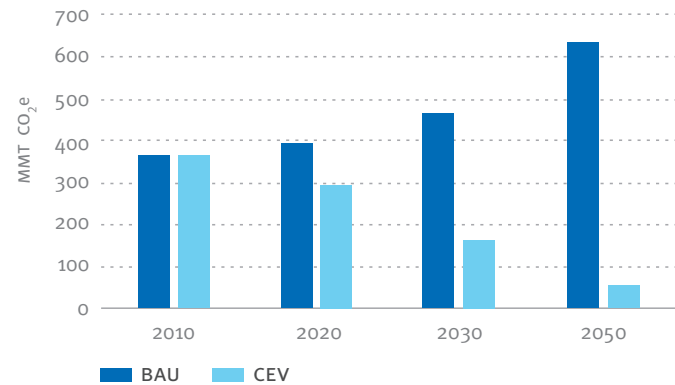
CLEAN ENERGY VISION Climate Disruption

The western U.S. will spend \$200 billion over the next 20 years to maintain and enhance our electric system. We can continue Business as Usual (BAU). Or instead, we can begin orderly transition to more secure and sustainable resources. The choices we make now will enormously affect our health, our economy and the planet.

The electric utility industry is one of the leading producers of carbon emissions. Power plants are responsible for approximately 39% of US CO₂ emissions, predominantly from coal and natural gas fired units.

Energy Business As Usual (BAU) will deliver increasing costs, emissions and vulnerabilities. Instead, greater investment in energy efficiency, renewable energy and grid modernization can put us on a Clean Energy Vision (CEV) trajectory to more secure, sustainable and lower cost electric service. The CEV will help the West do its part to **meet the greenhouse gas goal recommended by scientists—80% reduction below 1990 levels by 2050.**

BAU VS. CEV CARBON EMISSIONS



Unless we decrease emissions rapidly the increased green house gases (GHG) concentrations are expected to:

- Increase the scale and destructiveness of extreme weather events, such as hurricanes **Sandy** and **Irene**.
- Change patterns and amounts of precipitation, putting agriculture production at risk.
- Melt polar ice and reduce ice and snow cover, changing ocean current and global weather circulation patterns and putting arctic ecosystems at risk
- Raise sea levels, dislocating hundreds of millions of people
- Increase ocean acidity, with grave threats to fish and marine mammal populations
- Propagate new disease vectors
- Create hundreds of millions of climate refugees

BY THE NUMBERS: CLIMATE IMPACTS

Business as Usual

Temperature Failing to limit carbon emissions will lead to temperature increases between 2 and 11.5 degrees Celsius by 2100.

Precipitation For every degree Celsius above current average temperature, there is a 3-10% increase in extreme precipitation. Northern areas will become wetter and southern areas particularly in the Southwest will become drier.

Runoff For every degree Celsius above current average temperature, relative change in runoff would decrease 3.3% in CA, 6.1% in AZ, and 1.2% in NW.

Clean Energy Vision

Temperature Moving to clean energy technologies could help limit temperature increases to 2 additional degrees Celsius by 2100.

Precipitation Keeping the increase to 2 additional degrees, may help avoid increased extremes of wet winters and dry summers that elevate the risk of droughts and floods.

Runoff Reducing CO₂ emissions to 80% of 1990 levels, can help prevent excessive runoff and flooding from heavy rain events.

If warming of 3.5 to 5.5°F occurs as expected under a BAU scenario, 20 to 30% of species that have been studied would be in climate zones that are far outside of their current ranges, and would therefore likely be at risk of extinction. The rate of temperature change under a BAU scenario in the next few decades could be higher than most species have experienced over past millennia.

Temperature increases speed plant growth rates, decomposition rates, and nutrient cycling, although this is also influenced by availability of water. In the western U.S. where water is scarce, forest growth is expected to decrease and become increasingly vulnerable to insect infestation, which will adversely affect associated ecosystem processes.

WHY ARE THE CEV'S CLIMATE IMPACTS SO LOW COMPARED TO THE BAU?

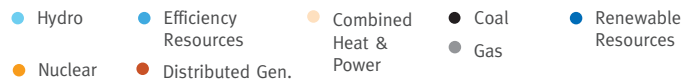
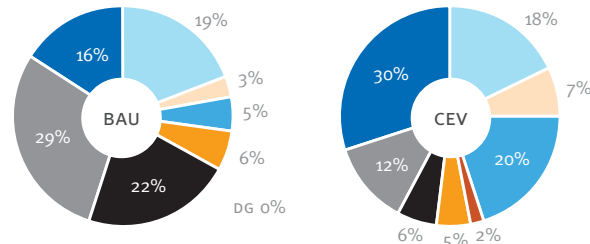
Greater reliance on energy efficiency and renewable energy reduces overall carbon emissions, thereby helping to limit temperature increases. Using conservative assumptions, adopting CEV targets reduces reliance on coal to 6% and gas to 12% of western electricity supply by 2030.

HOW CAN WE FURTHER MINIMIZE THE ELECTRICITY'S CLIMATE IMPACTS?

Increase state-level renewable energy targets. Focus on development of wind, solar, and geothermal resources. Demonstrate how diversifying utility portfolios reduces risk, and spurs job creation and economic development. Most states that have renewable energy targets have raised their targets over the past decade.

Ensure adequate transmission to deliver renewable energy to markets. Identify proposed transmission lines able to facilitate renewable energy generation and deliver these resources to markets. Use “smart from the start” planning to avoid, minimize, or mitigate environmental impacts of these lines.

Increase state-level energy efficiency targets. Ensure that energy efficiency resources are evaluated and procured the same way



as generation resources. De-couple utility kWh sales from profits. The Northwest Power & Conservation Council 6th Plan shows the region can meet 80% of growth in energy demand through 2020 with energy efficiency.

THE CLEAN ENERGY VISION PROJECT - A JOINT VENTURE

Western Grid Group (WGG) is a network of former state regulators working to modernize the grid and win access for clean resources. Western Clean Energy Advocates (WCEA) is a coalition of clean technology companies, environmental NGOs and others committed to making electricity supply more secure and sustainable.

CLEAN ENERGY VISION REPORTS AND DOCUMENTS INCLUDE:

Report. *Western Grid 2050: Contrasting Futures, Contrasting Fortunes* is a comprehensive comparison of CEV and BAU development trajectories for western electric service.

Fact Sheets on *Economy & Jobs, Energy Security, Climate, Public Health and Cost* outline differences between CEV and BAU.

Transition Plan

Grid - *Modernizing the Grid: How Our Electric System Can Welcome New Resources, Improve Reliability and Reduce Costs*

Policies - *Lower Risk, Lower Cost Electric Service: Policies Western States Can Build On.*

Investments - *Clean Energy Investments and Incentives: Choices for Investors, Utilities and Regulators.*

POLICY CHOICES

It is urgently in the public interest to better align power system operation with environmental and climate goals. Policies to do so include:

- Build mitigation measures for extreme weather events and other climate disruption effects into utility operations and procurement planning.
- Account for carbon liabilities and cost by including a carbon price in procurement planning.
- Ensure that ecosystem impacts are considered in utility decision-making.
- Support data collection to improve understanding of ecological impacts of energy development and use.
- Avoid areas where development is prohibited or constrained and environmental conflicts are likely to delay permit approval.

The CEV Policy Plan provides a complete description of policies already in place in western states that transition to clean energy can build on.



For other fact sheets, the Western Grid 2050 report, Transition Plans papers on the Grid, Policies and Investments and more information about the Clean Energy Vision Project, go to: www.cleanenergyvision.org