CALIFORNIA COMEBACK PLAN

Governor Newsom's Approach to the Electricity System of the Future

July 2021

California is moving toward a 100% clean electric system.

The electricity system of the future must operate safely and reliably in the face of climate change, deliver clean energy to its customers, and minimize any harmful impacts on Californians – especially those living in underserved and low-income communities.

The electricity system of the future must address inequities & embrace these core principles:



Affordable

The vision of clean energy for every Californian will take an outside-the-box, aggressive approach. Moving away from natural gas now will take planning to ensure that we have the power we need, when we need it, to support our 100% clean electricity system.

> Not too long ago, most energy experts believed that solar was too expensive and battery energy storage was not a commercially mature technology due to costs.

Look how far we've come.

California must build the bridge to get off the fossil fuel road.

Californians have seen the impacts of climate change firsthand

and they are arriving more quickly and with greater force than predicted – record heat, extended drought, deadly wildfires, and rising sea levels.

By 2100 average annual daily temperature is projected to increase by 5.6 to 8.8°F.

Energy

Carbon emissions from fossil fuel energy sources continue to represent a significant portion of statewide greenhouse gas emissions. Despite significant growth in renewable energy in California, the intermittent nature of solar and wind presents a challenge to widescale adoption.

Wildfires

As conditions become hotter and drier due to climate change, increased wildfire risk threatens transmission lines in high fire-threat areas. Ignitions from electricity infrastructure have sparked some of the state's largest and most devastating wildfires.

Drought

Drought conditions threaten California grid reliability and have a substantial potential for serious public health and safety impacts. The depletion of water reservoirs during droughts leads to significant shortages in clean energy generation, such as hydroelectricity, when residents need it most.

"In California, we're not asserting our leadership — we've proven it. We've set audacious goals and actually figured out the how, exceeding our targets on renewables ahead of schedule. I want to maintain that leadership across the spectrum and I want to accelerate it, because we don't have time to delay."

- Covernor Gavin Newsom Discussion with Leading Climate Scientists on State's Progress Toward Carbon Neutrality, July 2021

Leading the Nation in Climate Policies



The state is on the right trajectory to achieve 100% clean energy by 2045 if not sooner





California has made tremendous strides toward realizing the electricity system of the future.

When the percentage of renewables is combined with other sources of carbon-free energy, such as large hydroelectric generation and nuclear power, the total percentage of clean energy is 63%.

The technology exists today to achieve California's clean energy goals, but we need to build new resources at an unprecedented pace and scale. The **clean energy transformation** is entirely within our reach and we must act quickly to reach it.

Roadmap to Clean Energy

Grid Modernization and Distributed Energy Resources

• Compared to a system powered by a few large coal and natural gas plants, the resources of the future will be more diverse in type and size and more distributed across the grid. Flexibility will be a key attribute for the grid of the future as the increasing amounts of intermittent renewable energy are integrated onto the grid.

Electrification

• The energy system generates carbon emissions across many different sectors including the electric, transportation, commercial, industrial, and agricultural industries. Electrification of all sectors of the California economy allows for significant reduction of carbon emissions.

Greenhouse gas emissions from cars and trucks are 41% of all California's emissions.

- California is exploring pathways to achieve carbon neutrality by 2035.
- All new passenger car & truck sales will be zero-emission by 2035. All medium and heavy-duty trucks and buses will be zero-emission by 2045.

Resource Diversity

- Increase solar energy, battery energy storage, wind energy, geothermal resources, pumped storage, and more to reduce reliance on natural gas-fired energy as quickly as possible.
- May 2021: California announced a historic agreement with the federal government to advance offshore wind along the California coast – a 399-square-mile development envelope.

Grid Hardening and Resiliency

- Make transmission and distribution lines more fire-resistant, and increase undergrounding of distribution lines.
- Monitoring technology to detect line faults, irregular operations, and early warning of fire risks.
- Strategically place remote grids in communities more vulnerable to wildfires.
- These investments will protect lives and property and cost less than the potential damages from future wildfires.

Energy Storage

 Acting now to build the longduration storage projects of the future is critical. To achieve
100% clean energy, California must consider a wide range of storage technology.