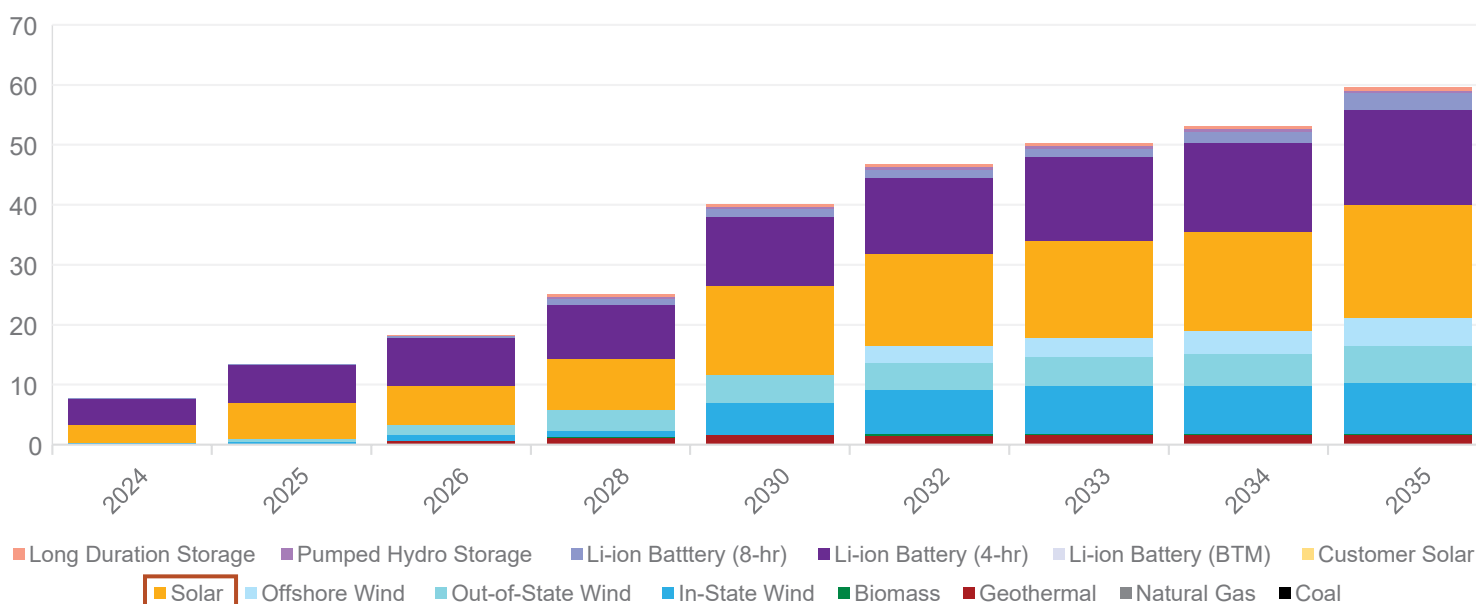




Solar photovoltaic (PV) systems generate electricity by converting sunlight into power. California's sunny climate and flat and open terrain make its projects among the most productive in the country. On average, a 1 MW solar installation in California produces enough electricity each year to power 200 to 300 homes, and requires roughly 2 to 8 acres of land depending on panel efficiency, site layout, and use of tracking systems.

Utility-scale installations, which can range from tens to hundreds of megawatts (MW) in capacity, connect directly to the transmission grid, in contrast to rooftop or smaller ground-mounted systems that operate behind-the-meter of individual homes or businesses. Because of their larger scale and siting, utility-scale solar facilities achieve significantly lower Levelized Cost of Electricity (LCOE) compared to distributed systems. These characteristics enable reliable, grid-connected, zero-emission electricity, which helps meet California's Renewable Portfolio Standard (RPS) and greenhouse gas reduction targets while delivering affordable power.

New Resource Buildout in the California Public Utility Commission's Resource Plan



Source: California Public Utilities Commission. (2024). Fact sheet: Decision Adopting 2023 Preferred System Plan (R.20-05-003).

Benefits of Solar



Clean Energy – Unlike fossil fuels, solar power has a smaller environmental footprint and can help mitigate climate change.



Energy Security – In-state solar power can reduce reliance on out-of-state resources and fossil fuels, strengthening energy security, reliability, and resilience.



Local and Economic Benefits – Solar projects provide direct and indirect benefits to communities through sales and use taxes and other community benefits. The low cost of solar energy also keeps electricity rates low.



Jobs – Solar projects create in-state construction and installation jobs. Every \$1 million invested could create up to roughly four full-time-equivalent construction jobs.

Solar Development Considerations

Environmental Review – Solar projects undergo a rigorous environmental review process, led by either the state or local government.

Siting – Solar can be sited in a variety of topography and locations (open flat areas, desert and rural land, brownfield sites, rooftops), and including fallow or underutilized agricultural lands or former industrial sites.

Wildlife and Protected Species – Developers must mitigate impacts to state or federally protected species and habitats. Additionally, the developer and permitting authorities are responsible for coordinating on mitigation strategies for wildlife impacts in compliance with applicable state and federal laws and regulations.

Agrivoltaics

To preserve productive farmland, solar projects can be built on fields that aren't currently being farmed (such as fallowed land), on farmland where water supplies are severely depleted, or on degraded areas like landfills and former industrial sites

In some cases, farmland can serve two purposes at once by producing food and generating solar power – this is known as agrivoltaics and can include:

- Sheep or other small animal grazing under panels.
- Crop cultivation between or beneath panels.
- Planting flowers and grasses that support pollinators.
- Setting up hives for beekeeping.

Use of agrivoltaics is limited to farms with specific crops and animals, where farm configurations allow for solar panels without significantly reducing productivity. Solar panels can benefit farms by reducing irrigation needs and in other ways, such as providing shade that lowers heat stress on crops and livestock.

The use of agricultural land for solar development is limited by statutes such as the Williamson Act, which provides tax benefits for maintaining land in agricultural production. Pending legislation, such as AB 1156, would enable solar projects on agricultural lands significantly constrained by water availability.



Installation and Decommissioning

- Ground-mounted solar can be designed as single-axis tracking or dual-axis tracking systems that follow the sun.
- Solar decommissioning presents opportunities to restore land and recycle valuable materials. Some local governments require developers to return land to pre-project conditions and ensure that up to 95% of solar panel materials are recycled, turning end-of-life projects into a pathway for land renewal and resource recovery.



Portion of a large building with behind-the-meter solar on the roof (top) versus utility-scale solar mounted on the ground (bottom).

Additional Resources for Solar



[Solar Explained. U.S. Energy Information Administration](#)

[Butte Utility-Scale Solar Guide. Butte County](#)

[AgriSolar Alliance](#)

[Williamson Act Program, SGMA Factsheet](#)

[CEC Solar Energy Info Page](#)

[ACP Solar Power Siting Brief](#)

Utility-scale solar PV delivers electricity to customers through the transmission and distribution grid. Unlike small-scale rooftop or behind-the-meter systems that supply power directly on-site, utility-scale solar plants operate like other large generating facilities. Electricity generated by the panels is converted from direct current (DC) to alternating current (AC), stepped up in voltage, and injected into the transmission system, which carries it long distances at high voltage. The electricity then flows into the distribution system, where it is stepped down and delivered through local power lines to homes and businesses.

