Advanced Community Energy (ACE)

A Statewide Program
to Achieve California's Environment and Energy Goals
Equitably and Cost Effectively

Overview

Effective decarbonization to achieve California's climate and energy goals will require local strategies to address the factors that drive fossil-fuel use. These factors include housing patterns that require lengthy daily commuting, a dearth of carbon-free mobility services, and inefficient buildings desperately in need of retrofits. And now resilience — the ability to sustain essential life services when serious disruptions occur — has become another urgent need that requires local measures.

Strategies to address these needs are within the traditional scope of city and county planning, yet there is no statewide structure to strengthen local government planning and coordinate it with energy system planning. Existing legislation and pending bills address some specific elements, but a comprehensive approach could align all the elements to advance decarbonization and build resilience for all communities and improve overall grid operation.

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Advanced Community Energy (ACE) is a proposed statewide program to develop local energy resources in all California cities and counties, to enable decarbonization and resilience projects while improving the performance of the state's electric power system.

Under the ACE program, the state would provide funding, technical guidance and other support for local governments to collaborate with electric service providers, distribution utilities, technology companies and diverse local stakeholders to plan and implement energy systems that serve local energy needs, advance state policy goals, and support a safe, reliable and efficient power grid.

Legislative and Regulatory Foundation

The proposed Advanced Community Energy program has two main components to be established through state legislation.

1. Statewide ACE planning structure. Legislation would direct the California Energy Commission (CEC) to establish a new statewide program that empowers and funds local governments to plan and implement ACE systems.

An ACE system is a set of energy resources and programs — such as community-scale solar + storage, electric vehicle charging stations, microgrids for critical facilities, as well as energy efficiency retrofits and dynamic demand management — designed as a whole system to meet a portion of local energy needs, support state policy goals and provide grid services.

An ACE system for a community would begin with an ACE plan, created by the relevant local government entity in collaboration with the distribution utility, load-serving entity, third-party energy and technology companies, and local stakeholders, following process guidelines established by the CEC and empowered by state funding and technical support.

The ACE plan would identify a set of local resources and program elements, describe how their coordinated functioning achieves desired outcomes, and estimate factors such as cost and time to implement.

State funding for ACE planning will ensure that no communities are left behind and will avoid any unfunded mandates. Financing to implement any specific plan element would depend on the element; for example, a community solar + storage facility could be financed through a bilateral power purchase agreement between the developer and the local load-serving entity.

The CEC would develop standards and templates for ACE systems and guidelines for stakeholder engagement in ACE planning, emphasizing decarbonization, resilience and social equity aligned with safe and efficient operation of the state and regional power grid.

2. Investor-owned utility collaboration framework. Legislation would direct the California Public Utility Commission (CPUC) to develop and adopt, through a regulatory proceeding, provisions that define the role of the investor-owned electric distribution utilities in the ACE program. These provisions would direct the utilities to collaborate with local governments and stakeholders to develop ACE plans that align with the criteria of the statewide ACE program, and would include performance metrics that change the basis of the utility's compensation.

Distribution utility collaboration in ACE planning is essential to design and locate the ACE resources so as to maximize power system benefits by offsetting needs for new grid infrastructure, meeting local capacity requirements, and providing real-time services

to support reliable grid operation. For the investor-owned utilities to play this role the state must revise their profit incentives to support implementation of cost-effective ACE systems rather than prioritizing the value of their rate-based assets.

The Need for the ACE Program

A statewide ACE program is needed today to enable:

- **Planning Coordination:** There currently is no state-level structure to coordinate energy system planning with city and county planning. Yet practical strategies for decarbonization and resilience will require local initiatives and will drive new energy demand profiles and supply options.
- **Statewide Access and Equity:** Local government resources and capabilities vary greatly across the state. Without a statewide program of funding and other practical support, the drive for decarbonization and resilience will leave some communities behind and worsen economic, health and other societal disparities.
- **Focus on Communities:** Programs to advance low-carbon technologies such as rooftop solar and electric vehicles depend almost entirely on uncoordinated individual customer adoption decisions, raising concerns about equity and reliable grid operation. Focusing on the level of municipal government and community can address local needs more equitably while managing grid impacts to ensure more cost-effective investment in new grid infrastructure.
- **Investor-owned Utility Collaboration:** The current operational and incentive structures of the investor-owned electric distribution utilities were designed for a centralized power system that serves large service areas. The ACE program would be complemented by regulatory reforms that direct and reward investor-owned utilities for local collaboration to bring decarbonization, resilience and economic benefits to all California cities and counties.
- **California's Policy Goals:** Effective decarbonization requires local strategies to change the structural conditions that currently drive fossil fuel use. Locally-developed ACE systems can support these strategies without adding massive new demand onto the regional grid, and without requiring enormous new investment in the bulk power system. ACE systems can reduce fire risks and reliability by allowing utilities to de-energize lines in dangerous conditions without cutting off downstream electric service, and when serious disruptions occur, ACE systems can provide resilient power supply for critical local services and first responders.

Benefits

The benefits of the proposed ACE program derive from the alignment of local city and county planning with energy planning, through collaboration of local governments with distribution utilities, load-serving entities, third-party energy and technology companies and local stakeholders. Local initiatives will play an essential role in achieving California's urgent climate and resilience goals. As energy technologies become more powerful, cost effective and scalable, the existing planning paradigms and regulatory structures created for the 20th century will be barriers to change unless they are updated.

The proposed ACE program builds on activities traditionally within the scope of city and county planning, including policies on zoning and land use, housing densification and affordable housing, building codes, mobility strategies and essential municipal services, all of which affect greenhouse gas emissions and require energy. Locally designed ACE systems will reflect the priorities and needs of the residents and businesses within a local government's geographic boundaries. The ACE program would align these local activities with major state policy goals and power system planning, so that ACE systems deliver the following benefits:

- **Energy resilience and security:** A local ACE system will provide continuous power to critical and priority locations in communities, to withstand and rapidly recover from natural disasters or cybersecurity events.
- **Reduced emissions:** ACE system design uses renewable energy to replace fossil fuels in support of state greenhouse gas reduction goals; and will provide cost-effective and secure energy for electrification of transportation, homes and buildings to fulfill local climate action and adaptation plans.
- **Lower costs:** A local ACE system will shape load and production profiles to lower peaks, flatten net load profiles and support grid operation, reducing grid impacts and related costs of centralized energy infrastructure. ACE system design would target optimal locations and sizes for local resources to reduce costs of interconnection and operation.
- **Local economic investment and high-quality jobs:** A local ACE system will stimulate investment in cities and communities, growing quality jobs in clean energy and smart grid solutions and rewarding participating property owners.

The ACE system model is replicable and scalable, applicable to any size city or county, and can be designed to optimize energy resources at the more granular neighborhood or block levels. With the proposed state-level program, each ACE implementation is able to learn from all the others, and system-wide scale economies are achieved by widely replicating the best ideas and practices.

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