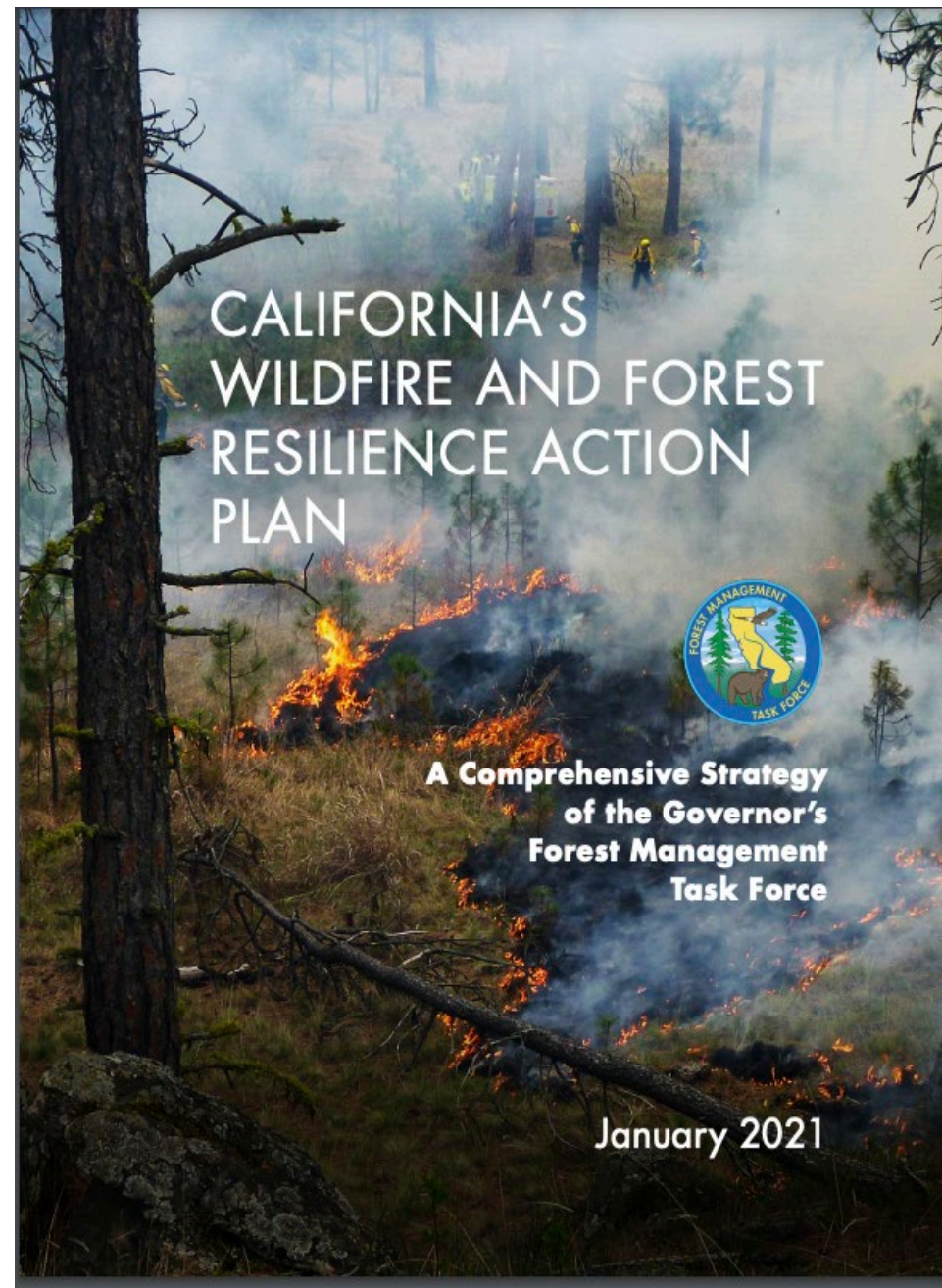


Renewable Gases – Market Development in California

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September 2021



Mapping California's Energy and Climate Policy Priorities



EXECUTIVE DEPARTMENT
STATE OF CALIFORNIA

PROCLAMATION OF A STATE OF EMERGENCY

WHEREAS Californians are experiencing the impacts of climate change firsthand, from droughts to wildfires to heatwaves to floods to rising seas to mudslides to vanishing snowpacks; and

WHEREAS the effects of climate change threaten the health and safety of Californians, as well as the State's access to clean and reliable energy; and

WHEREAS in April, May, and July 2021, I proclaimed states of emergency because of severe drought conditions in 50 counties; and

WHEREAS because of drought conditions, water supplies in California's reservoirs have dropped to levels so low that hydroelectric power plants have had to reduce or cease production, leading to a reduction of nearly 1,000 megawatts of capacity and further exacerbating the drought's impact on California; and

WHEREAS in June and July 2021, I proclaimed states of emergency because of record-breaking extreme heat events that hit California and other Western states, increasing residents' demand and putting significant demand and strain on California's energy grid; and

WHEREAS at the same time as the July 2021 Extreme Heat Event, the Bootleg Fire in Southern-Central Oregon threatened the California-Oregon Inter tie, which delivers power from the Pacific Northwest into California, and reduced electricity supply into California by almost 4,000 megawatts; and

WHEREAS many other transmission lines are located in high fire threat areas, including lines located in other states on which California depends, and thus wildfires are likely to continue impacting California's energy supply unpredictably during this wildfire season; and

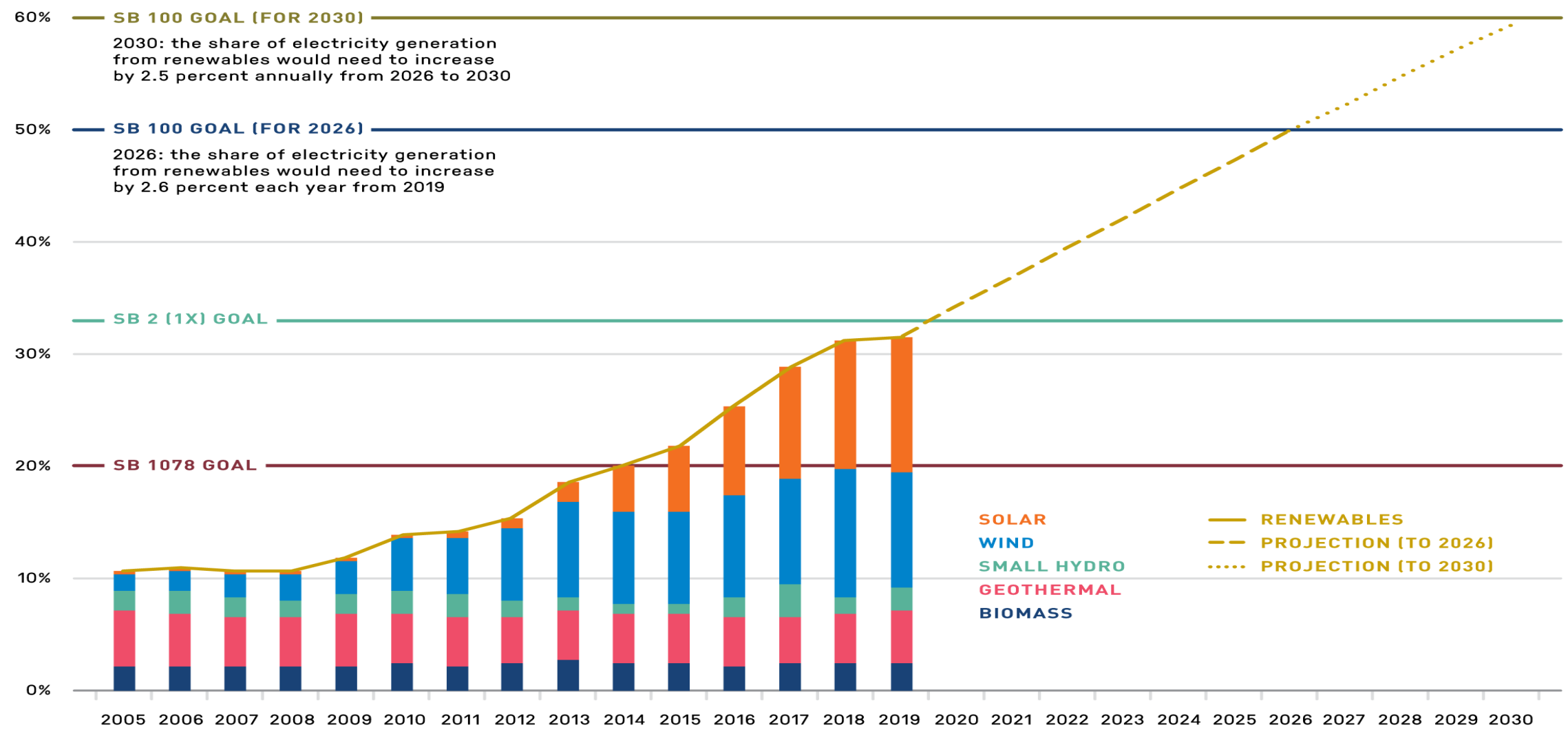
WHEREAS because of the accelerating and compounding effects of continuing wildfires, ongoing drought, and extreme heat conditions caused by climate change, California currently faces an additional projected energy supply shortage of up to 3,500 megawatts during the afternoon-evening "net-peak" period of high power demand on days when there are extreme weather conditions, which is even greater than projected in May 2021; and

WHEREAS in July 2021, the California Independent System Operator (CAISO) sought additional resources for summer 2021 through its Capacity Procurement Mechanism but sufficient resources were not available to make up for the projected shortfall; and



Lessons from the Growth of Clean Energy in California

Figure 38. California's Path to 60% RPS Goal by 2030
 ASSUMING LINEAR GROWTH



NEXT 10 CALIFORNIA GREEN INNOVATION INDEX. Note: Renewables do not include large hydros. Data Source: California Energy Commission; U.S. Department of Energy, Energy Information Administration.
 NEXT 10 / SF · CA · USA

Key Policy Drivers of California's Success:

- **Clear, Strong Commitments**
- **Open, Competitive Procurements**
- **Support for a Range of Technologies**
- **Attention to Investability – Fair Pricing and Long-Term Contracts**
- **Strong Corporate Commitments**

Source: 2020 California Green Innovation Index, Next10.org

CLIMATE CATALYST PROGRAM

Accelerating Climate Progress and the Growth of Sustainable Industries



California Infrastructure and
Economic Development Bank

Three Pillars of Catalyst

Cultivating Private Partnerships

- Nurture and grow technologies and businesses that deliver climate solutions
- Help companies and investors navigate the state system
- Convey market insights back to policy makers

Mobilizing Capital

- Catalyst Fund (IBank): Flexible, low-cost capital and credit support
- Leverage \$4+ private dollars per every public dollar invested
- Revolving fund: re-invest proceeds to grow sectors of tomorrow

Optimizing Government

- Coordinate agencies at all levels of government to deliver climate outcomes
- Improve public incentives to deliver greater impact
- “Red Tape-Green Scissors”: streamline regulations for priority sectors

Hydrogen – California Use Cases and Support Structures

Power Sector:



- Backup Power
- Distributed Generation
- Hydrogen Turbines
- Reciprocating Engines
- Grid Services
- Microgrids

Transportation:



- Trucks
- Passenger Vehicles
- Buses
- Trains
- Forklifts
- Regional Ferries
- Ocean-going Ships
- Aviation and Aerospace

Industry:



- Ammonia and Methanol
- Refining
- Steel Production
- Synthetic Fuel and Production
- Furnaces and Ovens

Buildings:



- Combined Heat and Power
- Hydrogen Boilers
- Blending of Hydrogen in Natural Gas Boilers

Source: Guidehouse

Since 2008, the CEC has invested \$242 million to support hydrogen research, development, and deployment projects.

- Clean Transportation Program Investments | \$224M
 - ◇ \$169.4M: Publicly available hydrogen refueling infrastructure deployment!
 - * 50 stations, as of May 2021
 - * 179 (of which 24 will be privately funded) by 2026
 - ◇ \$30.1M: Medium- and heavy-duty hydrogen refueling infrastructure deployment
 - * 5 stations in development, as of May 2021
 - * Infrastructure supports port, transit, and drayage applications

Proposed May Revise Investments

- ◇ \$110M: Scaling green hydrogen production and use
- ◇ \$250M: Industrial decarbonization, includes hydrogen
- ◇ \$350M: Long duration storage, includes hydrogen

Source: CEC “Hydrogen in California Fact Sheet 2021”

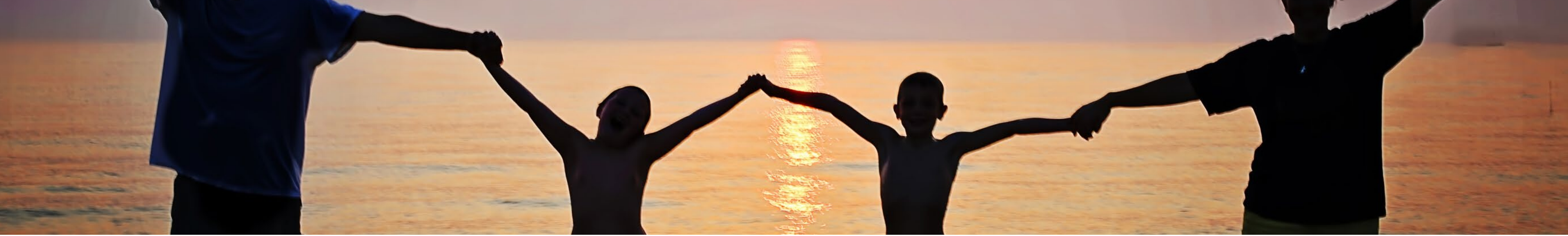
Forest Biomass and Renewable Gas: Building the Supply Chain

ADDRESSING FEEDSTOCK BARRIERS THROUGH PILOT PROJECTS

Under the Wildfire Resilience Action Plan, “the Office of Planning and Research will develop five pilot projects to test new mechanisms for developing long-term feedstock contracts. Information and templates from the pilot projects will be shared broadly to provide a menu of options for broader adoption.”

Problem statement: Sustainably managing California forests and promoting community fire resilience requires large investments beyond the capacity of public funding. Wood product market development and innovation provides a pathway to integrate private capital with public investment, to mobilize powerful economic drivers that create economic opportunity, reinforce sustainable forest practices, and support community vegetation management and fire resilience. New and existing wood product businesses across California are struggling to secure long-term feedstock contracts necessary to access financing and to assure business stability.

Project Objective: The pilot projects will develop regional strategies to establish reliable access to woody feedstock through a variety of feedstock aggregation mechanisms and organizational innovations.

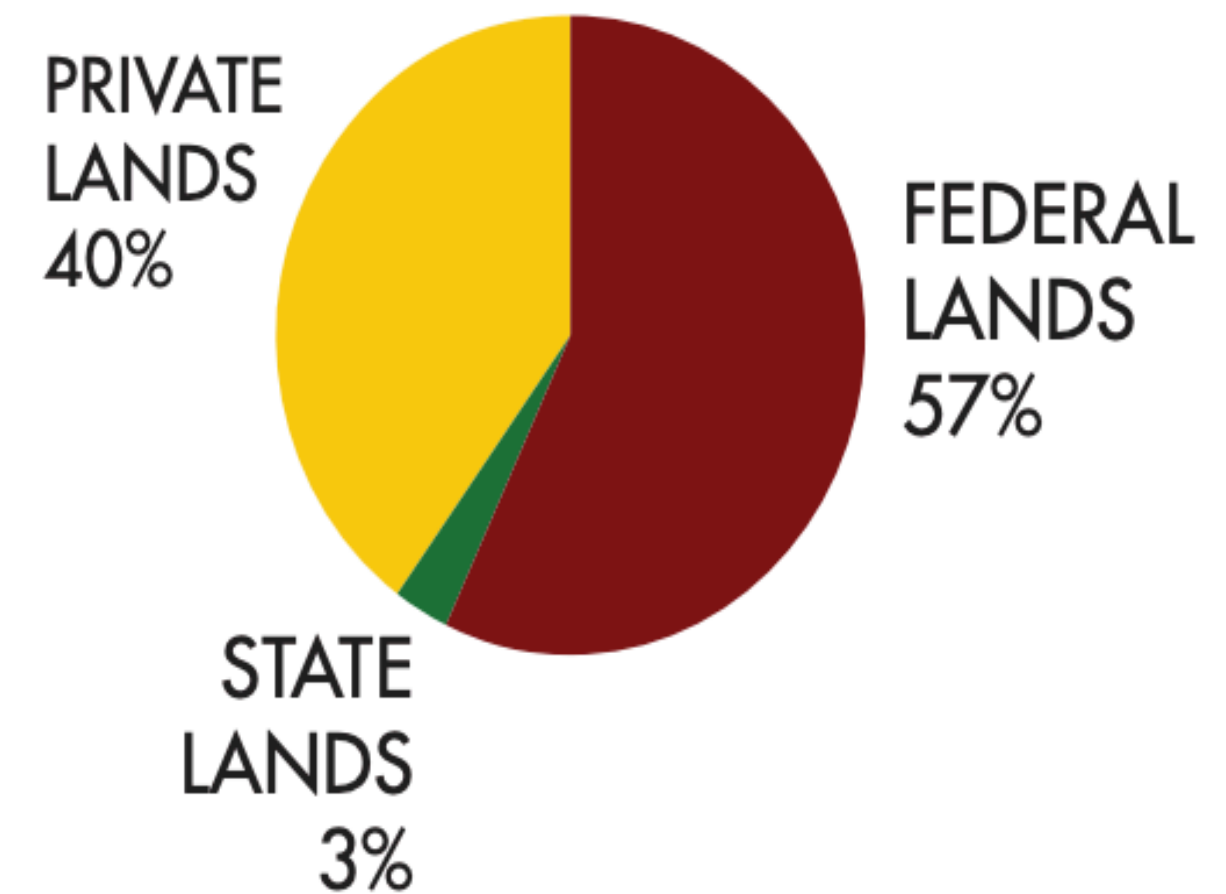


Pilot Project Deliverables

Each pilot will address the following in their plan:

- **Implement an innovative organizational structure with the authority and resources to aggregate and initiate long-term feedstock contracts.**
- **Explore and assess the market opportunities of potential woody biomass businesses in the region.**
- **Commit to increase feedstock aggregation on all relevant land types, including private and non-commercial land, especially where opportunity exists to produce community fire resilience benefits.**

Forest Lands Ownership in California



Catalyst Fund: Goals, Partners and Priorities

IBank's Catalyst Fund, via the Governor's Office of Business and Economic Development (GO-Biz) and its network of regional economic development partners, seeks to engage investment opportunities and provide technical assistance across all 58 California counties, emphasizing inclusive prosperity in the climate transition.

- Sustainable Agriculture and Forestry
- **Transportation Emissions Reduction**
- **Circular Economy/Waste-to-Value**
- **Climate Technology Supply Chain**
- **Clean Power Market Stability and Expansion**

\$72
MILLION

First capitalization of the Catalyst Fund this year, for Sustainable Agriculture and Forestry

Investing in Innovation – Public and Private

Carbon Cap-and-Trade Proceeds

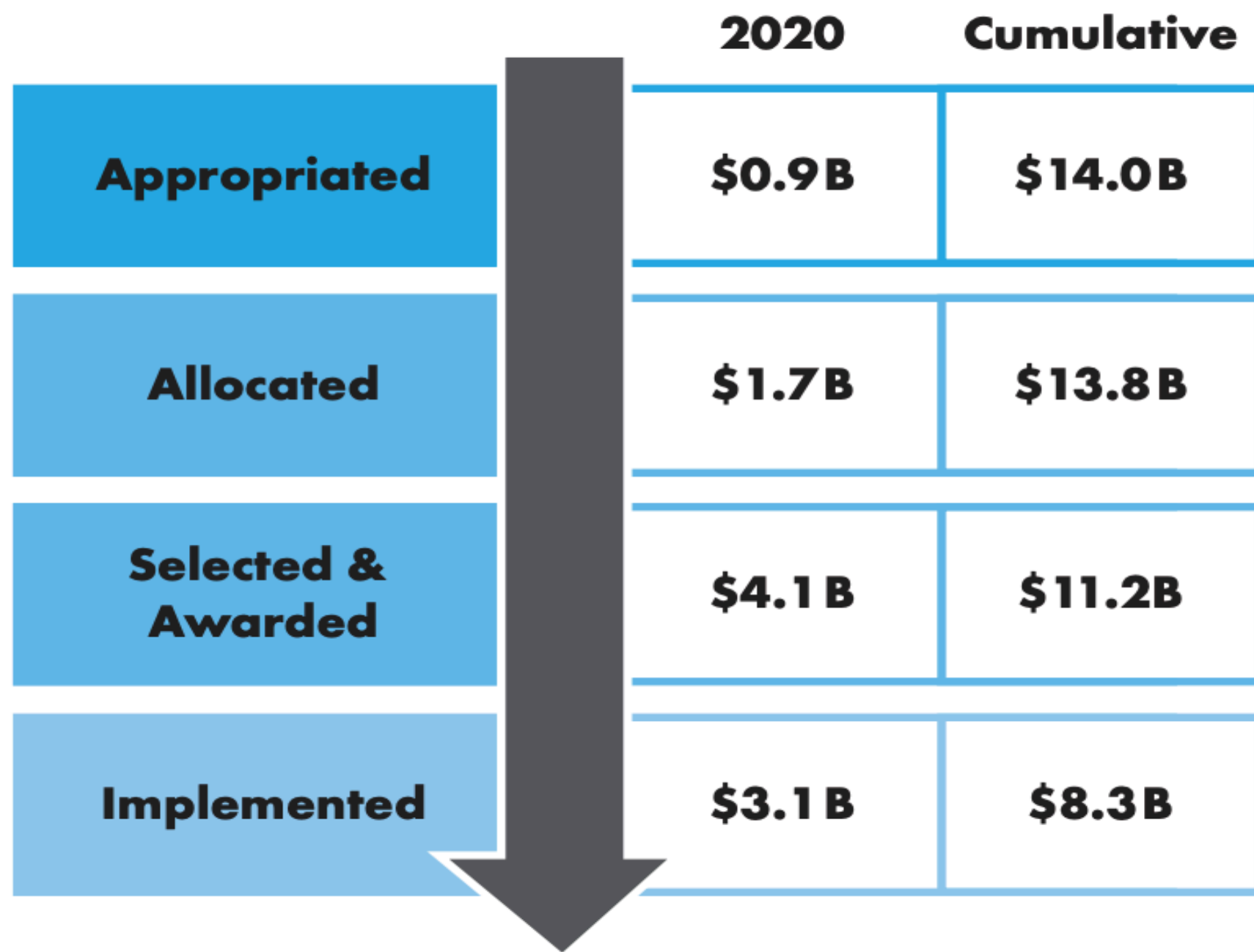
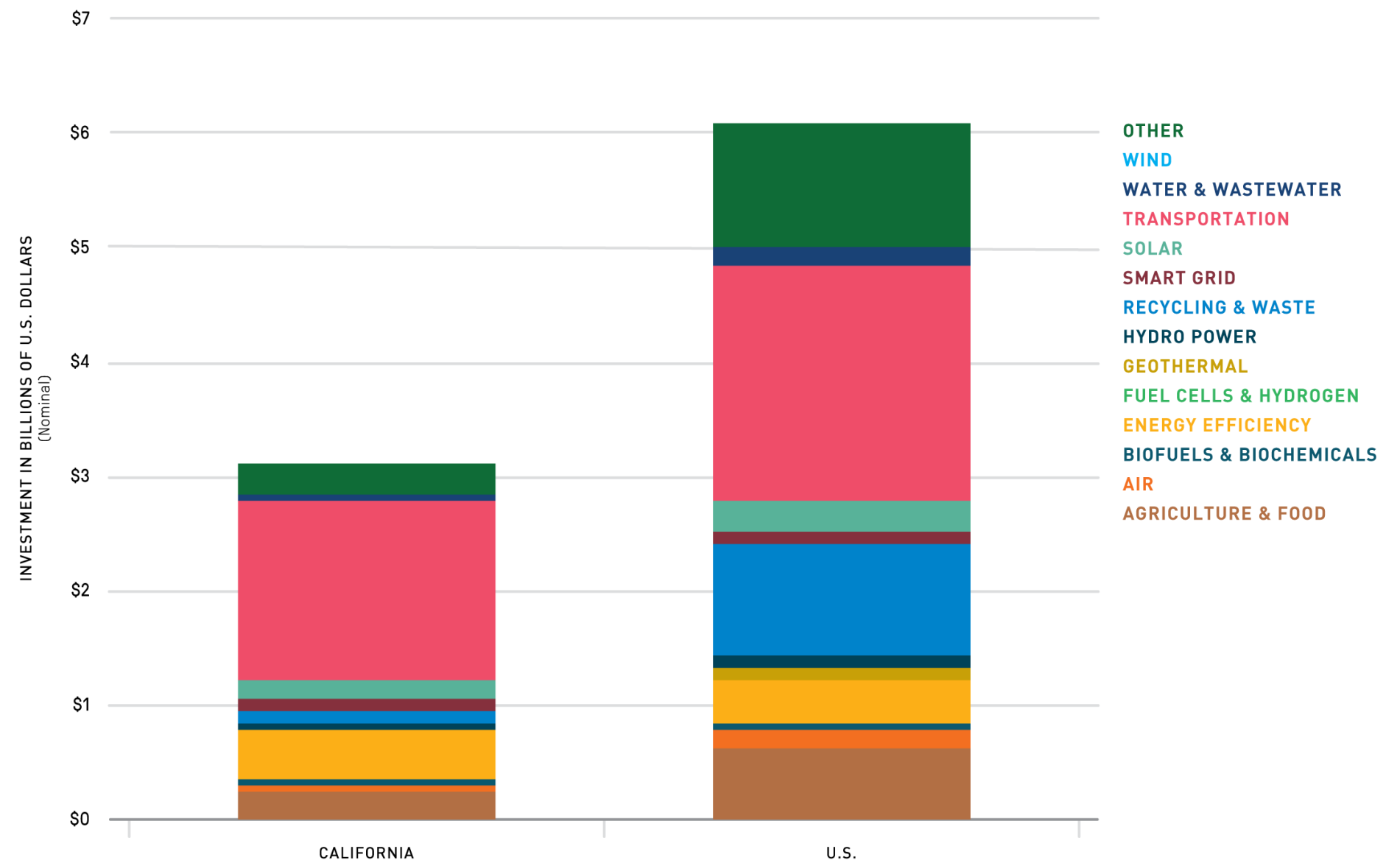


Figure 58. Venture Capital Investment in Clean Technology by Segment

CALIFORNIA VS. U.S., 2019



NEXT 10 CALIFORNIA GREEN INNOVATION INDEX. Note: Amount unadjusted for inflation. Data Source: Pitchbook, LLC NEXT 10 / SF - CA - USA

The image features a light blue background with several green leaves from a plant, possibly a shrub or tree, scattered across the top and right sides. The leaves are vibrant green and have a serrated edge. In the center of the image, the words "THANK YOU" are written in a white, serif font.

THANK YOU

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