



Climate-Safe California: The Path to Net-Negative Emissions by 2030

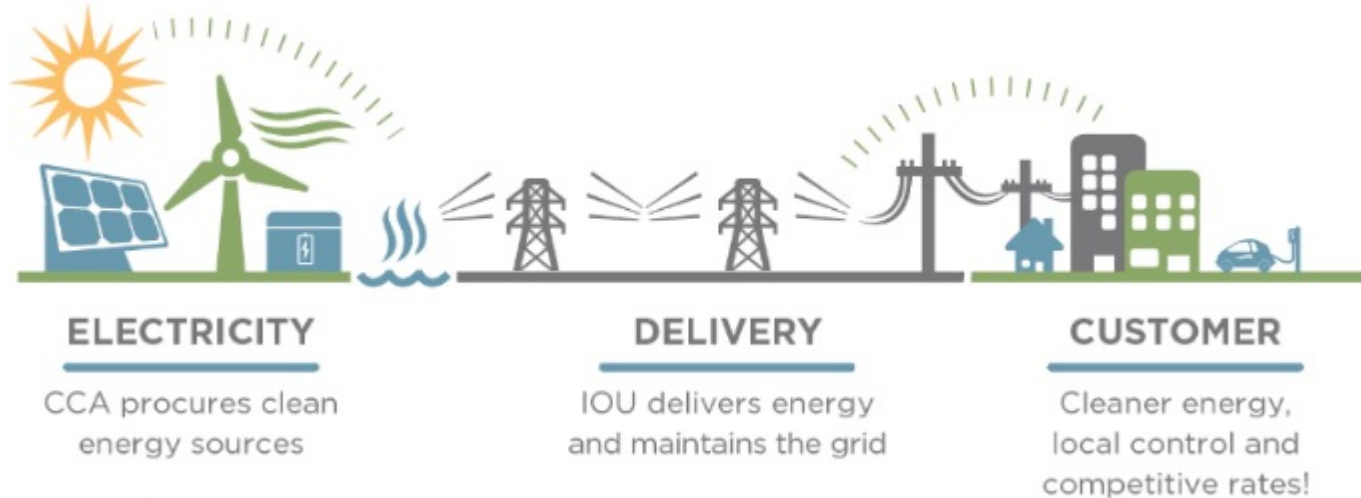
April 16, 2021

Ellie Cohen and Team, The Climate Center

www.theclimatecenter.org ellie@theclimatecenter.org

the
climate
center

Mission: Speed and scale greenhouse gas reductions



**Key role in growing Community Choice Energy:
24 CCAs serving 88% GHG-free electricity to
11 million Californians- 1/4 of state!**

<https://theclimatecenter.org/our-work/community-choice/>
<https://cal-cca.org/cca-impact/>

Sunday

Los Angeles Times

SUNDAY, SEPTEMBER 13, 2020

latimes.com

\$3.66 DESIGNATED AREAS HIGHER © 2020 WST ††

California's climate apocalypse

Fires, heat, air pollution: The calamity is no longer in the future — it's here, now

Oregon residents standing ground

BY RICHARD READ,
MOLLY HENNESSY-FISKE
AND MELISSA ETEHAD

MOLALLA, Ore. —
Christine VanOeveren grab-



BY SUSANNE RUST
AND TONY BARBOZA

In 2001, a team of international scientists projected that during the next 100 years, the planet's inhabitants would witness higher maximum temperatures, more hot days and heat waves, an increase in the risk of forest fires and "substantially degraded air quality" in large metropolitan areas as a result of climate change.

In just the past month, nearly two decades after the third United Nations Intergovernmental Panel on Climate Change report was issued, heat records were

Current global climate goals are inadequate

UN IPCC 1.5°C Report- Oct 2018

- Emissions must decline by 45% by 2030 to meet 1.5°C (2.7°F) limit
- Up to 1000 Gt CO₂e must be removed from atmosphere over the decades ahead
- Achieve net-zero emissions by 2050



UN operates by consensus so goals are conservative and not enough.

We must do more sooner per new science...

<https://www.ipcc.ch/sr15/>
<https://www.ipcc.ch/sr15/chapter/summary-for-policy-makers/>

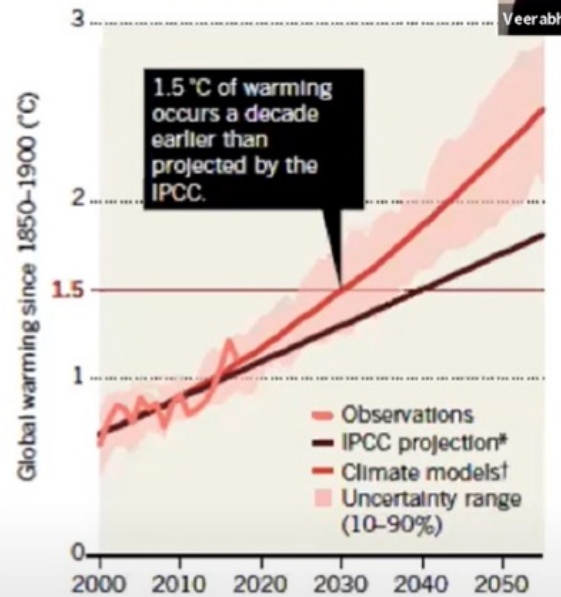
Will pass 1.5°C dangerous warming by 2030 10 years earlier than UN IPCC projected

Global warming will happen faster than we think

Three trends will combine to hasten it, warn Yangyang Xu, Veerabhadran Ramanathan and David G. Victor.

ACCELERATED WARMING

Climate simulations predict that global warming will rise exponentially if emissions go unchecked.



Xu, Y., et al, **Global Warming will Happen Faster than We Think**, Nature Dec 2018, 564(7734):30-32

DOI: [10.1038/d41586-018-07586-5](https://doi.org/10.1038/d41586-018-07586-5)

MoveCA Zoomposium, Jan 21 2021, <https://www.youtube.com/watch?v=T3IOX5ru0BI&t=12s> (at 16 min in)

Hébert, R. et al. *Climate Dynamics*, 2020; DOI: [10.1007/s00382-020-05521-x](https://doi.org/10.1007/s00382-020-05521-x)

CA impacts: personal communication with V. Ramanathan, Scripps/UC San Diego

Western US now in global warming-induced severe megadrought

- In CA as early as 2027- impacts on ag, economy, communities
- Threatens dustbowl & ag economy by as early as 2027 in CA
- 2015 drought cost ~\$2.7 billion and 20k lost ag jobs in California



<https://www.washingtonpost.com/weather/2020/04/16/southwest-megadrought-climate-change/>
[Williams et al. *Science* Apr 17 2020](https://www.scientificamerican.com/article/drought-takes-2-7-billion-toll-on-california-agriculture/)
<https://www.scientificamerican.com/article/drought-takes-2-7-billion-toll-on-california-agriculture/>

Increasing health impacts especially to most vulnerable communities

Fossil fuel air pollution => 1 in 5 deaths globally

2020 CA smoke storm: ~1200-3000 addl deaths among 65+

7.3 million Californians live within 1 mi. of oil & gas wells



<https://www.fractracker.org/2020/12/people-and-production/>

<https://www.seas.harvard.edu/news/2021/02/deaths-fossil-fuel-emissions-higher-previously-thought>

<https://www.latimes.com/california/story/2021-02-01/wildfire-smoke-microbes-in-the-air>

<http://www.who.int/globalchange/en/>; Leleiveld et al., Cardiovascular, March 2020; Hoffman et al. Climate Jan 2020
Bekkar et al JAMA June 2020

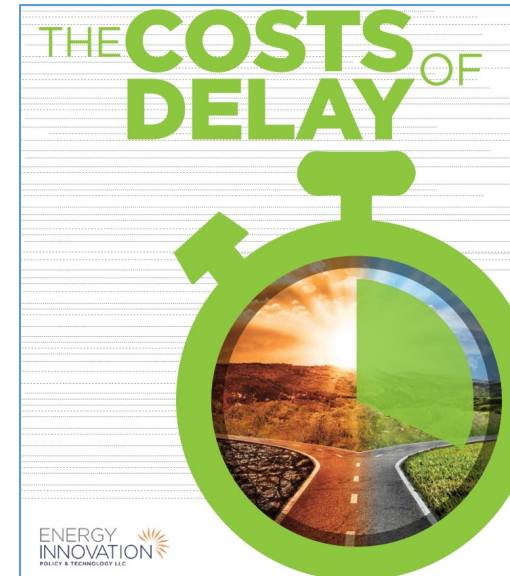
<https://www.nytimes.com/2020/06/18/climate/climate-change-pregnancy-study.html>

<https://amp-sacbee-com.cdn.ampproject.org/c/s/amp.sacbee.com/news/california/fires/article245947495.html>;

<http://www.g-feed.com/2020/09/indirect-mortality-from-recent.html>

Climate action delay costs trillions, bankrupting our economy

- **Costs much less investing big today rather than waiting until 2030** (For CA: est. \$47 billion/year now vs. \$110 billion/year starting in 2030 based on CA =14.6% of GDP)
- **\$150 Billion in damages from 2018 CA wildfires; \$80 Billion in 2019**
- **\$80 billion invested in California will generate ~725,000 jobs**



https://energyinnovation.org/wp-content/uploads/2021/01/Cost_of_Delay.pdf

<https://www.federalreserve.gov/publications/files/financial-stability-report-20201109.pdf>

<https://www.nytimes.com/2020/09/08/climate/climate-change-financial-markets.html>

Wang, D et al. **Economic footprint of California wildfires in 2018**. *Nature Sustainability*, 2020 DOI: [10.1038/s41893-020-00646-7](https://doi.org/10.1038/s41893-020-00646-7)

<https://www.accuweather.com/en/weather-news/california-wildfires-will-cost-tens-of-billions-accuweather-estimates/612548>

Political Economy Research Institute https://www.peri.umass.edu/images/CA-EconRecProgram-6-12-20_Final.pdf

World Resources Institute <https://www.wri.org/blog/2020/07/economic-benefits-climate-action-us>

RAISING THE ALARM

Evidence that tipping points are under way has mounted in the past decade. Domino effects have also been proposed.



A. Amazon rainforest
Frequent droughts

B. Arctic sea ice
Reduction in area

C. Atlantic circulation
In slowdown since 1950s

D. Boreal forest
Fires and pests changing

E. Coral reefs
Large-scale die-offs

G. Greenland ice sheet
Ice loss accelerating

H. Permafrost
Thawing

I. West Antarctic ice sheet
Ice loss accelerating

J. Wilkes Basin, East Antarctica
Ice loss accelerating

9 of 15 global tipping points underway now... domino effect to uninhabitable 'hothouse' climate if we don't act soon...

Lenton, Rockstrom, Gaffney, Rahmstorf, Richardson, Steffen, Schyellhuber.
Nature, Nov 27 2019
<https://www.nature.com/articles/d41586-019-03595-0>

<https://www.sciencedaily.com/releases/2019/11/191127161418.htm>

“We have underestimated the risks off **unleashing irreversible changes ... We are seeing strong evidence already for **declaring a state of planetary emergency**...**

The next decade is our window...with consequences for all future generations.”



- Johan Rockström, Director, Potsdam Institute for Climate Impacts Research, 2019

<https://www.sciencedaily.com/releases/2019/11/191127161418.htm>

<https://sverigesradio.se/avschnitt/1425542>

<https://medium.com/@rchrthy/johan-rockstr%C3%B6ms-10-point-agenda-for-saving-the-world-unofficial-transcript-431261f885c6>

“Humanity is causing a rapid loss of biodiversity and, with it, Earth's ability to support complex life. But the mainstream is having difficulty grasping the magnitude of this loss, despite the steady erosion of the fabric of human civilization.”



**The climate reality
is outpacing
outdated policy.**

**Leaders are now
stepping up**

Governor Newsom on Sept. 11, 2020: “We are in a climate emergency... Our goals are inadequate... We must fast-track goals”

New Exec Orders: 100% ZEV new car sales by 2035 & protect
30% of land and waters by 2030.... **But....**



<https://defenders.maps.arcgis.com/apps/webappviewer/index.html?id=8fa934ebbee54431bdcbc53d0873ab14>

<https://www.gov.ca.gov/2020/09/23/governor-newsom-announces-california-will-phase-out-gasoline-powered-cars-drastically-reduce-demand-for-fossil-fuel-in-californias-fight-against-climate-change/> Sept. 23 2020

<https://calmatters.org/environment/2020/09/california-governor-climate-emergency/> Sept. 11 2020

...California is behind: New International & National Climate Targets....

- ✓ **EUROPEAN UNION:** Cut GHGs by at least 55% by 2030 ... from 1990 levels to reach net zero emissions by 2050
- ✓ **UK:** Cut GHGs 68% by 2030 from 1990 levels & 100% ZEV sales by 2030
- ✓ **FINLAND:** Net-Zero emissions by 2035 without offsets
- ✓ **RHODE ISLAND:** 100% GHG free electricity by 2030
- ✓ **PRESIDENT BIDEN**
 - 100% GHG free electricity by 2035
 - 40% investments to lower-income communities
 - Invest \$2 trillion (= ~\$292 Billion in CA @ 14.6% GDP)

<https://www.theguardian.com/environment/2020/dec/03/uk-vows-outdo-other-major-economies-emissions-cuts-by-2030> Dec 3, 2020

<https://www.cbsnews.com/news/uk-ban-new-gasoline-diesel-cars-vehicles-by-2030-boris-johnson-green-industrial-revolution/> Nov 18 2020

<https://www.axios.com/eu-carbon-emissions-target-cut-2030-climate-063fa943-1af8-471f-a798-590bba10c7c4.html> Dec 11, 2020

[https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(20\)32290-X/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)32290-X/fulltext) December 2, 2020

<https://joebiden.com/wp-content/uploads/2020/07/UNITY-TASK-FORCE-RECOMMENDATIONS.pdf> July 8, 2020

<https://www.nytimes.com/2020/07/14/us/politics/biden-climate-plan.html> Feb 1, 2021

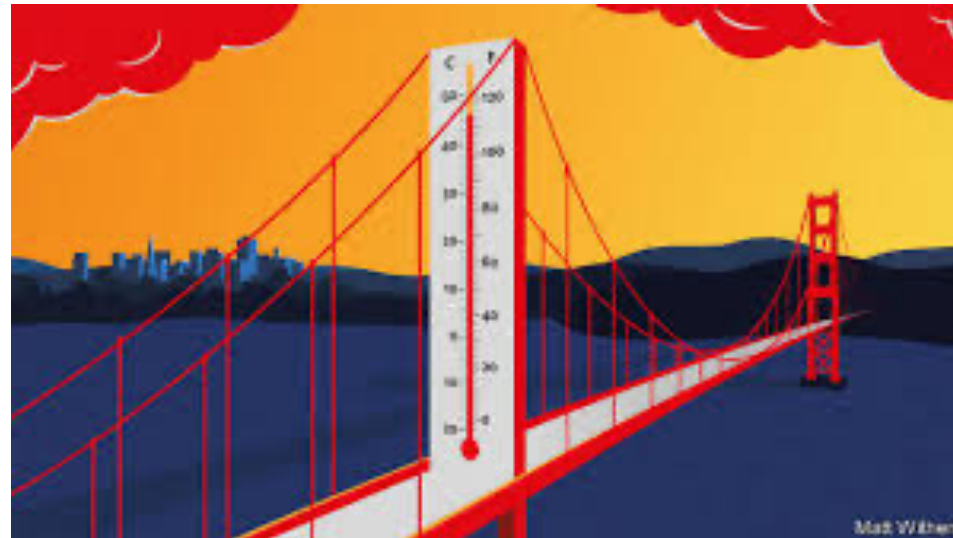
Bold targets work!

As goes California, goes the world

- AB1493 (2002) **tailpipe emissions cuts**; later adopted by 13 other states; basis for 2010 national clean car standards
- CA launched **Under2 Coalition** (2017); now includes 220 jurisdictions with 1.3 billion people and 43% of the world economy
- Gov. Newsom EO **100% ZEV car sales** by 2035 (Sept 2020); GM announces will sell only 100% ZEV cars (January 2021) by 2035, Volvo by 2030



California must lead for the country and the world to secure a climate-safe future



Need more aggressive policies and accelerated timelines in CA now!



Climate-Safe California Campaign for Rapid Decarbonization

www.theclimatecenter.org

VISION: CA will enact the bold policies required by science soon

to dramatically cut emissions, start drawdown and secure resilient communities by 2030, inspiring global action



CLIMATE-SAFE CALIFORNIA

accelerate existing state goals 15 years...

2045 is too late

- **Net-negative emissions by 2030** (drawdown greater than emissions) (Brown 2018 EO by 2045)
 - 80% below 1990 GHG levels by 2030 (Schwarzenegger 2005 EO by 2050)
 - Nature-based annual sequestration greater than emissions by 2030

Definition: net negative emissions is achieved when, as a result of human activities, more greenhouse gases are removed from the atmosphere than are emitted into it. – UN IPCC 1.5C Report <https://www.ipcc.ch/sr15/chapter/glossary/>



Guiding principles for Climate-Safe CA targets, policies and programs

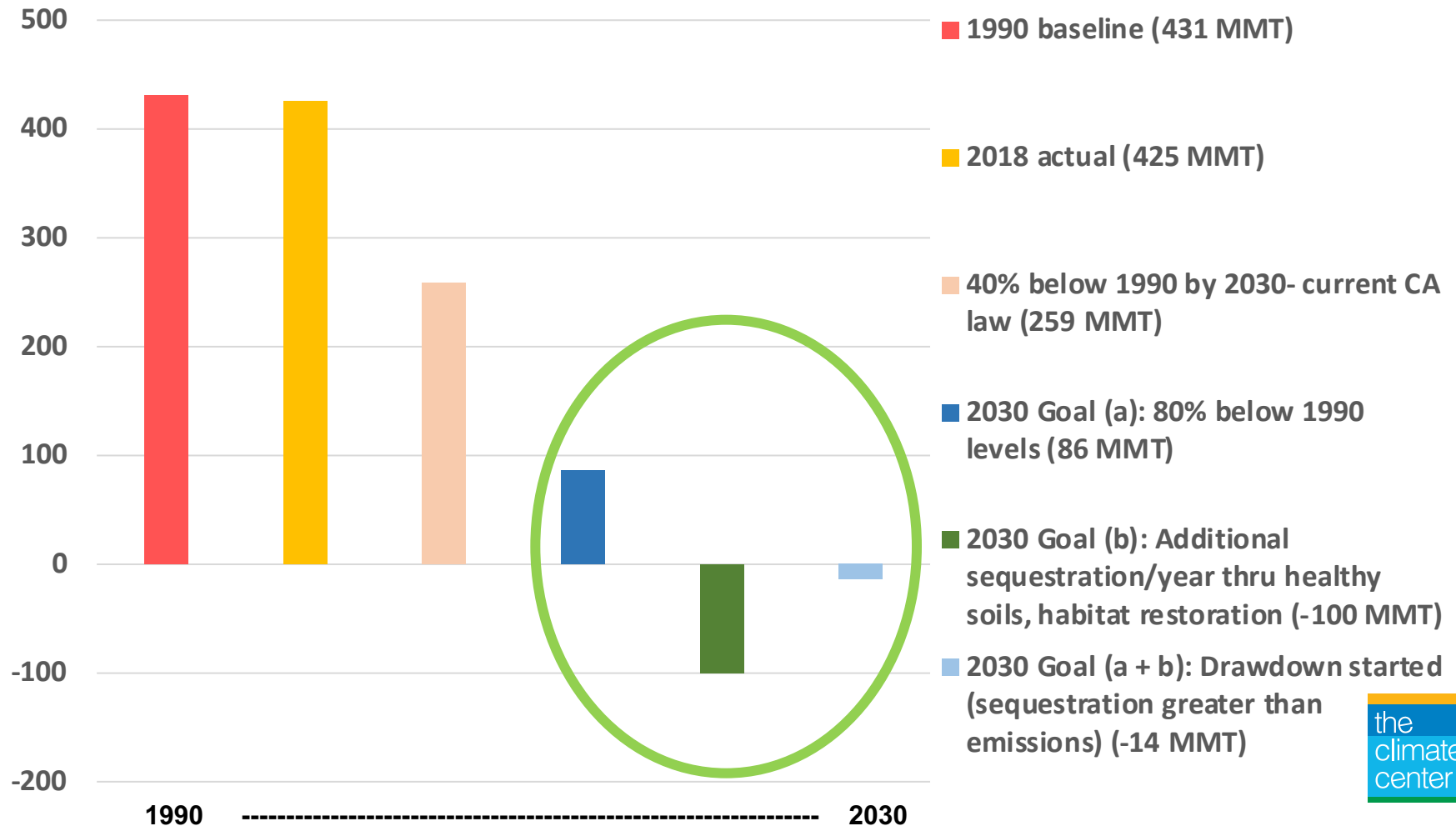
- 1- Based on the **latest science**
- 2- Ensure a **just transition** for fossil fuel workers
- 3- Prioritize **climate justice**: ensure lower-income & BIPOC communities are no longer disproportionately harmed by fossil fuels and have equitable access to climate-friendly solutions



California's measured GHG emissions: where we are & where we need to go by 2030

www.climatesafeca.org

Million Metric Tons (MMT) CO₂e Per Year



TYPES OF POLICIES REQUIRED BY SCIENCE TO REACH NET-NEGATIVE EMISSIONS BY 2030

1. Accelerate the phase-out of fossil fuel development, production and use
2. Scale-up nature-based sequestration to 100 MMT/year by 2030 on natural & working lands
3. Invest in community resilience, including clean energy microgrids & storage
4. Fund climate action with \$12-20 billion/year and leverage private sector money

SB 582 (Stern): Climate Emergency Mitigation, Safe Restoration, and Just Resilience Act of 2021

Would establish:

- state's first-ever statutory net-negative emissions goal, with a target date of 2035
- 80% below 1990 levels by 2030
- Just Resilience Plan to drive urgently needed investments in California's most vulnerable communities



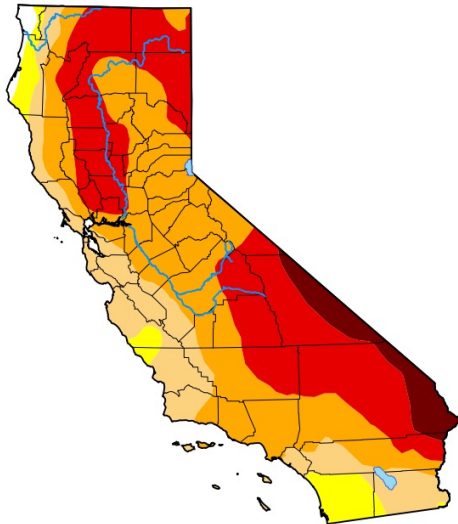
Driving policy with science:

“Accelerating the Timeline for Climate Action in California”

Kammen et al Mar 2021

April 13, 2021

U.S. Drought Monitor
California



https://droughtmonitor.unl.edu/data/pdf/current/current_ca_trd.pdf

Accelerating the timeline for climate action in California

[Daniel M Kammen](#), [Teenie Matlock](#), [Manuel Pastor](#), [David Pellow](#), [Veerabhadran Ramanathan](#), [Tom Steyer](#), [Leah Stokes](#), [Feliz Ventura](#)

The climate emergency increasingly threatens our communities, ecosystems, food production, health, and economy. It disproportionately impacts lower income communities, communities of color, and the elderly. Assessments since the 2018 IPCC 1.5 Celsius report show that current national and sub-national commitments and actions are insufficient. Fortunately, a suite of solutions exists now to mitigate the climate crisis if we initiate and sustain actions today. California, which has a strong set of current targets in place and is home to clean energy and high technology innovation, has fallen behind in its climate ambition compared to a number of major governments. California, a catalyst for climate action globally, can and should ramp up its leadership by aligning its climate goals with the most recent science, coordinating actions to make 2030 a point of significant accomplishment. This entails dramatically accelerating its carbon neutrality and net-negative emissions goal from 2045 to 2030, including advancing clean energy and clean transportation standards, and accelerating nature-based solutions on natural and working lands. It also means changing its current greenhouse gas reduction goals both in the percentage and the timing: cutting emissions by 80 percent (instead of 40 percent) below 1990 levels much closer to 2030 than 2050. These actions will enable California to save lives, benefit underserved and frontline communities, and save trillions of dollars. This rededication takes heed of the latest science, accelerating equitable, job-creating climate policies. While there are significant challenges to achieving these goals, California can establish policy now that will unleash innovation and channel market forces, as has happened with solar, and catalyze positive upward-scaling tipping points for accelerated global climate action.

Comments: 13 pages, 2 figures

Subjects: **Systems and Control** [eess.SY]

Cite as: [arXiv:2103.07801](https://arxiv.org/abs/2103.07801) [eess.SY]

(or [arXiv:2103.07801v1](https://arxiv.org/abs/2103.07801v1) [eess.SY] for this version)

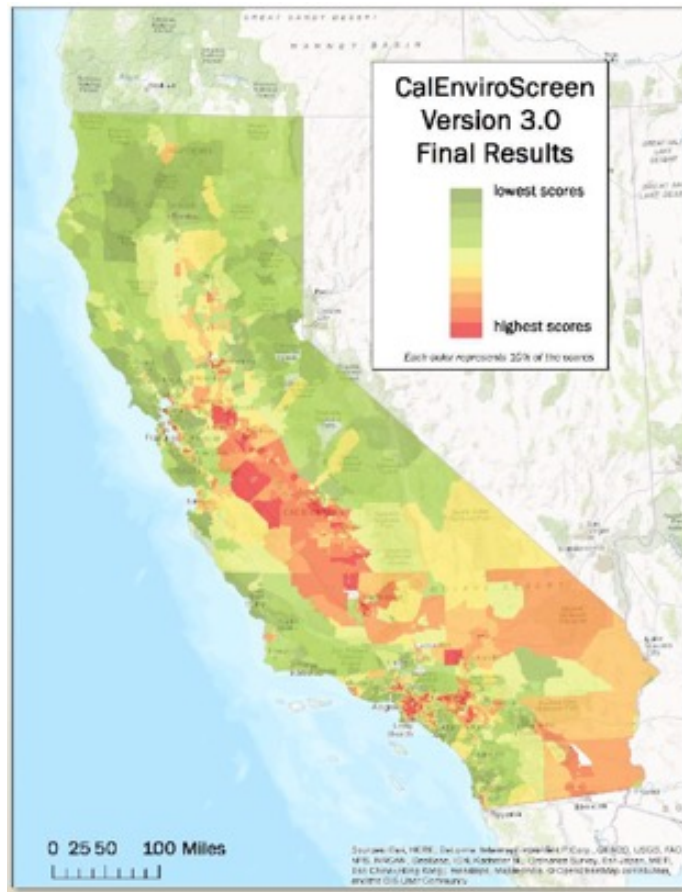
Submission history

From: Daniel Kammen [[view email](#)]

[v1] Sat, 13 Mar 2021 21:59:00 UTC (875 KB)

<https://arxiv.org/abs/2103.07801>

CA Microgrid Policy Must Prioritize Clean Energy Resilience for Communities That Suffer Most from Air Pollution and Power Outages



SB 99 (DODD): Plan and prioritize Clean Energy Resilience for Vulnerable Communities

Creates a new CEC program to support local governments in vulnerable communities to plan local energy systems for decarbonization, resilience, equity



2021 COMMUNITY RESILIENCE BILLS SUITE

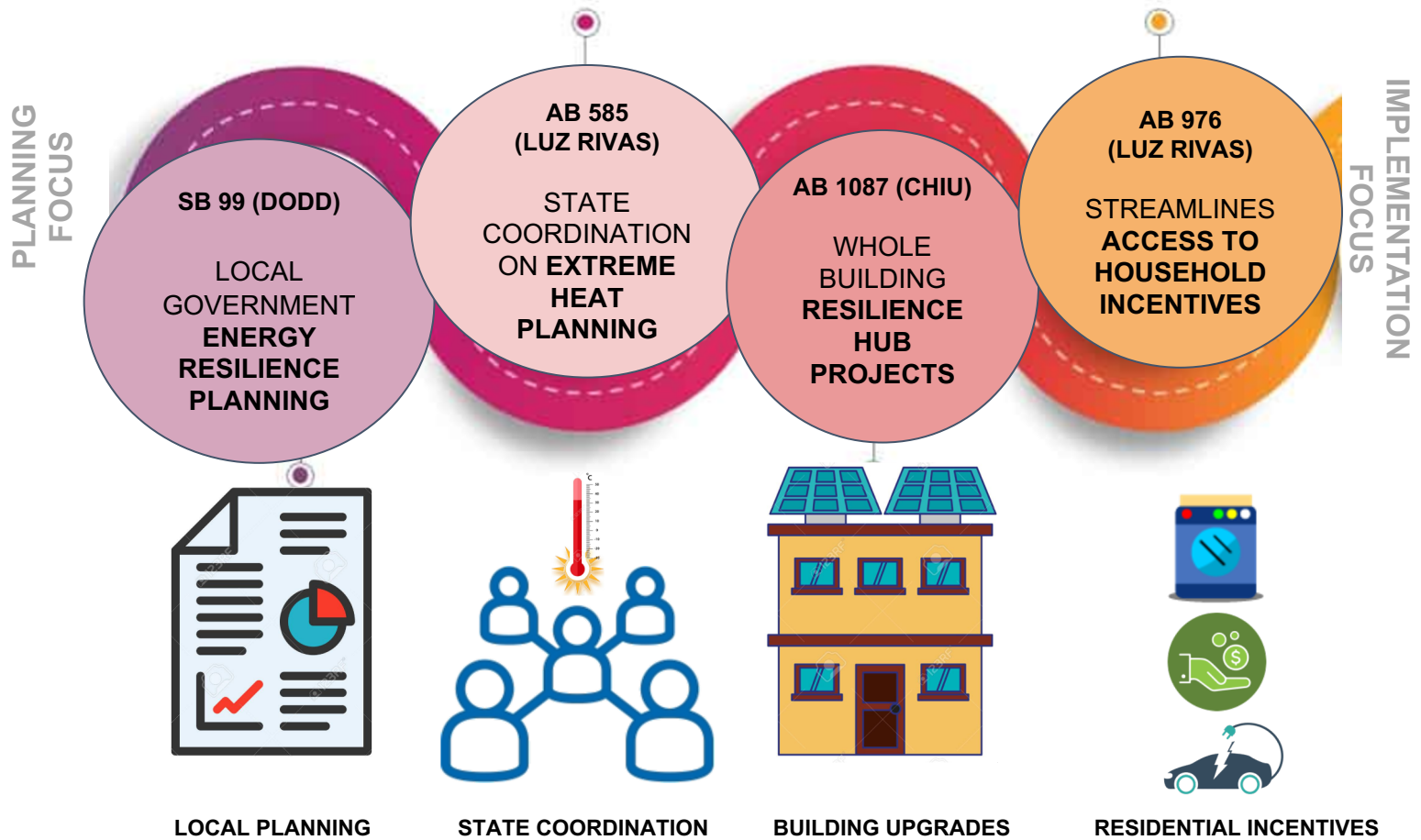


Image from Ameer Raval, APEN

The suite of solutions and technologies exists today for California to enact now



Our house is on fire. Ask at every level of government: are we doing enough?



“TIME TO GO BIG [ON CLIMATE]!”

-State Senator Wiener, March 1, 2021

Endorse Climate-Safe California

www.climatesafeca.org



Climate-Safe California
Rapid Decarbonization Campaign
Endorsement Platform

- A public pledge of support for California to accelerate aggressive climate policy
- Inspiring states and countries to greater action for a climate-safe Earth

www.theclimatecenter.org



Terry Tamminen

former CAL EPA Secretary under Governor Schwarzenegger



“I strongly endorse the goal of Climate-Safe California to achieve net-negative emissions by 2030; 2050 is too late. The campaign’s focus on science, urgency, and policy is exactly what’s needed – and California must lead the way.”

<https://theclimatecenter.org/endorsementlist/>

1,086 endorsements of Climate-Safe CA to build further support

• ELECTEDS (52) and APPOINTED

- Congressmen Jared Huffman, Mike Thompson
- State Senators Henry Stern, Scott Weiner, Mike McGuire, Josh Becker
- Asm Kevin Mullin, R. Rivas, Stone
- CA State Assoc of Counties,* Chair, James Gore
- Co. Supervisors Holly Mitchell, Carmen Ramirez
- Angelina Galiteva, CAISO Board member*

• CITIES/GOVERNMENTAL AUTHORITIES

- Bay Area Air Quality District
- City of Petaluma
- Regional Climate Protection Authority
- Town of San Anselmo

• SCIENTISTS and ECONOMISTS

- Carl Mears, PhD, UN IPCC
- Dan Kammen, PhD, UC Berkeley*
- Hunter Lovins
- Ben SanTERS, PhD, LLNL*
- Steve Weissman, PhD, UC Berkeley*
- David Pellow, PhD, UCSB*

• BUSINESS (74)

- FullCyle
- Hobo Wines
- Terry Tamminen, 7th Generation Advisors*
- Ygrene Energy

• NGOs (90)

- Alliance of Nurses for Healthy Environments
- CA League of Conservation Voters
- Carbon Cycle Institute
- Center for Sustainable Energy
- Central CA Environmental Justice Network
- Climate Mobilization
- Environment California
- Joint Venture Silicon Valley
- Labor Network for Sustainability
- Local Government Commission
- Mi Familia Vota

• FAITH

- Roman Catholic Diocese of Fresno
- Catholic Charities, Stockton



www.climatesafeca.org

*affiliations for identification purposes only

**Governments & policymakers
are like sailboats. They go nowhere without
wind. We are the wind in their sails!**



Climate-Safe California core partners



Alliance of Nurses for
Healthy Environments

Carbon Cycle Institute



VOTE SOLAR



LABOR NETWORK
FOR SUSTAINABILITY



Better World
Group



California League of
Conservation Voters



**Local
Government
Commission**

CA first state to reach net negative emissions

Kickstarts nation & world into equitable climate action

December 2030



Thank you!

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For more information, visit
www.theclimatecenter.org

Upcoming webinars:
www.theclimatecenter.org/webinars

