

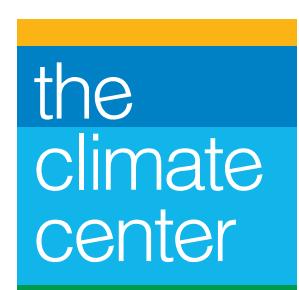


Climate-Safe California: The Path Net-Negative Emissions by 2030

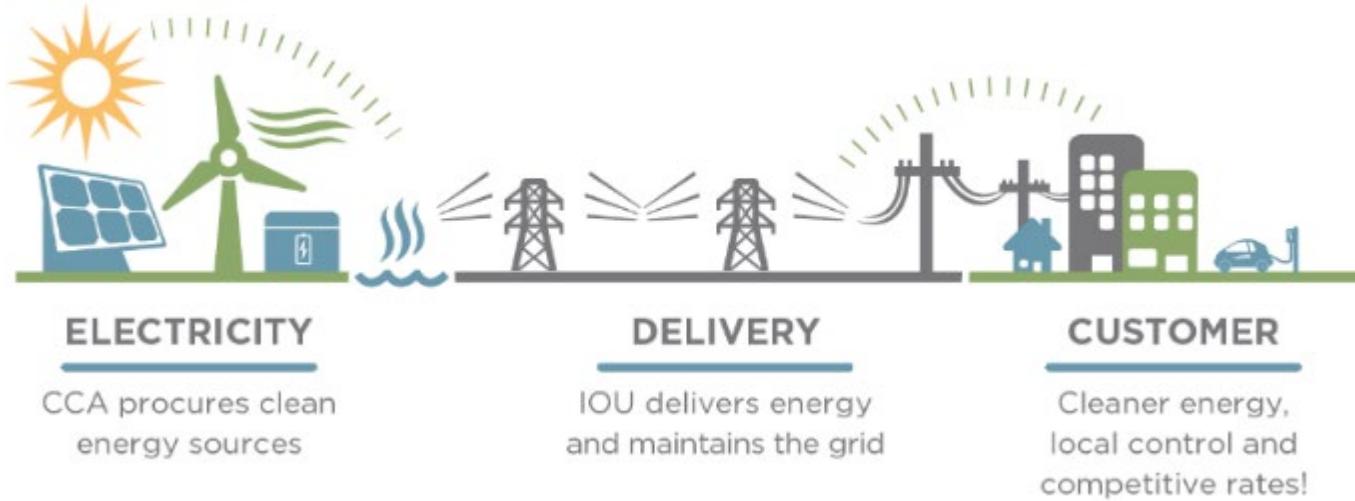
July 6, 2021

Barry Vesser

www.theclimatecenter.org; barry@theclimatecenter.org



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- ¼ of state!**

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

Sunday Los Angeles Times

\$3.66 DESIGNATED AREAS HIGHER © 2020 WST ++

SUNDAY, SEPTEMBER 13, 2020

latimes.com

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.

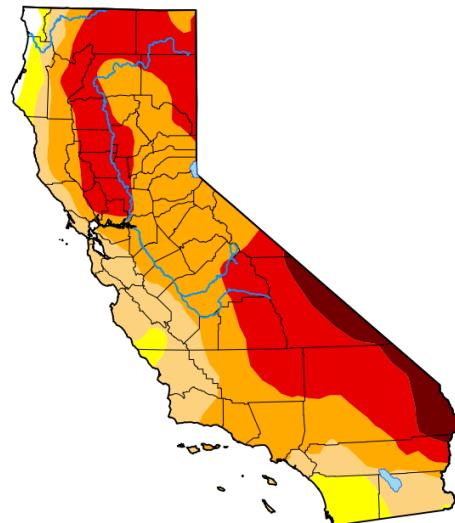
In just the past month, nearly two decades after the third United Nations Intergovernmental Panel on Climate Change report was issued, heat records were

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



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 \[eess.SY\]](#)
(or [arXiv: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>

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

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

Global warming will happen faster than we think

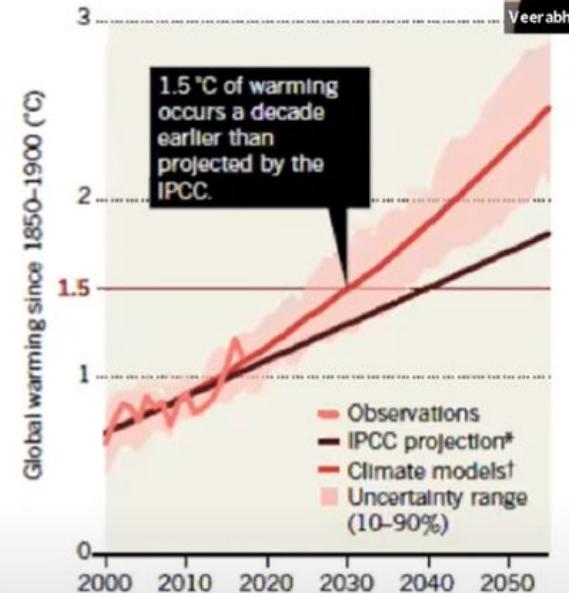
Three trends will combine to hasten it, warn Yangyang Xu, Veerabhadran Ramanathan and David G. Victor.

ACCELERATED WARMING

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



Veerabhadran Rama...



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

- 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/>

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

F. 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

@nature

**Update on what
we all know:**
**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, Schellnhuber.

Nature, Nov 27 2019

<https://www.nature.com/articles/d41586-019-03595-0>

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



**Fall fire weather days have doubled
since 1980 in California**

Goss et al Environmental Research Letters Mar 2020

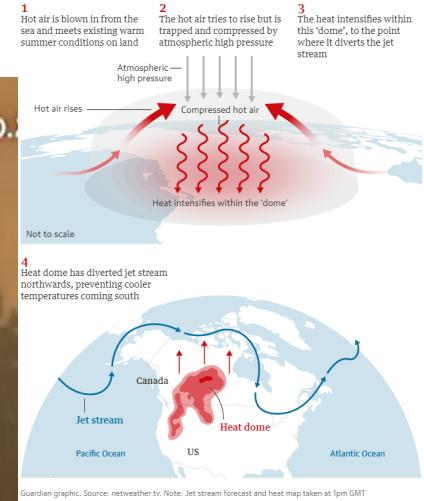
Present Reality

British Columbia

- Heat Wave: 46.6°C (116°F) on Sunday, 6/27, Saturday brought 47.9°C (118.2°F), and Tuesday 49.6°C (121°F) in Lytton, British Columbia
- Fire: Pyrocumulonimbus over 700,000 intracloud and cloud-to-ground lightning flashes recorded in 15 hours, more than 100,000 cloud-to-ground strikes.



Climate models- that governments rely on for climate decision making- don't include extreme events we are now experiencing



Extremes we are now experiencing not in worst case scenarios

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+



Inglewood Oil Field © Gary Kavanaugh 2017

<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

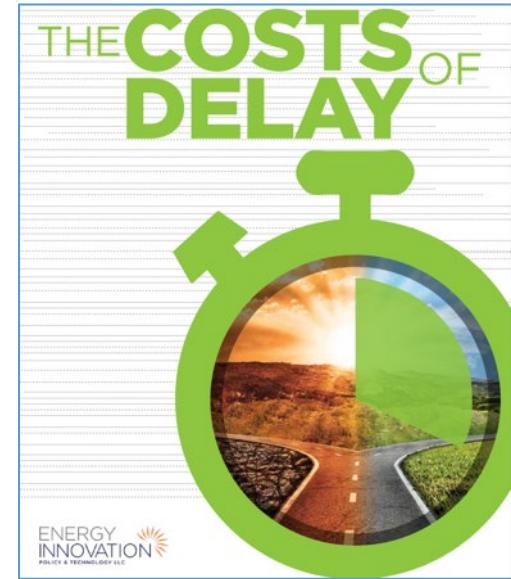
<https://www.nytimes.com/2020/06/18/climate/climate-change-pregnancy-study.html>

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

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

Climate delay costs trillions, bankrupting our economy

- **Fed Reserve:** banks must consider climate risks
- **\$150 Billion in damages from 2018 CA wildfires;** \$80 Billion in 2019
- **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)
- **\$80 billion invested in California will generate ~725,000 jobs**
- Investments in **clean energy** generate more than **2x the jobs as in fossil fuels**



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>

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
 - Get agriculture to net-zero
 - 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

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

GOAL: By 2025, CA will have enacted the bold policies required by science to dramatically reduce emissions, start drawdown and secure resilient communities by 2030, inspiring global action



CLIMATE-SAFE CALIFORNIA

includes accelerating existing state goals

- **Net-negative emissions by 2030** (sequestration greater than emissions, CA becomes net carbon sink) (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



Photo: Stand.LA, by KPCC AirTalk

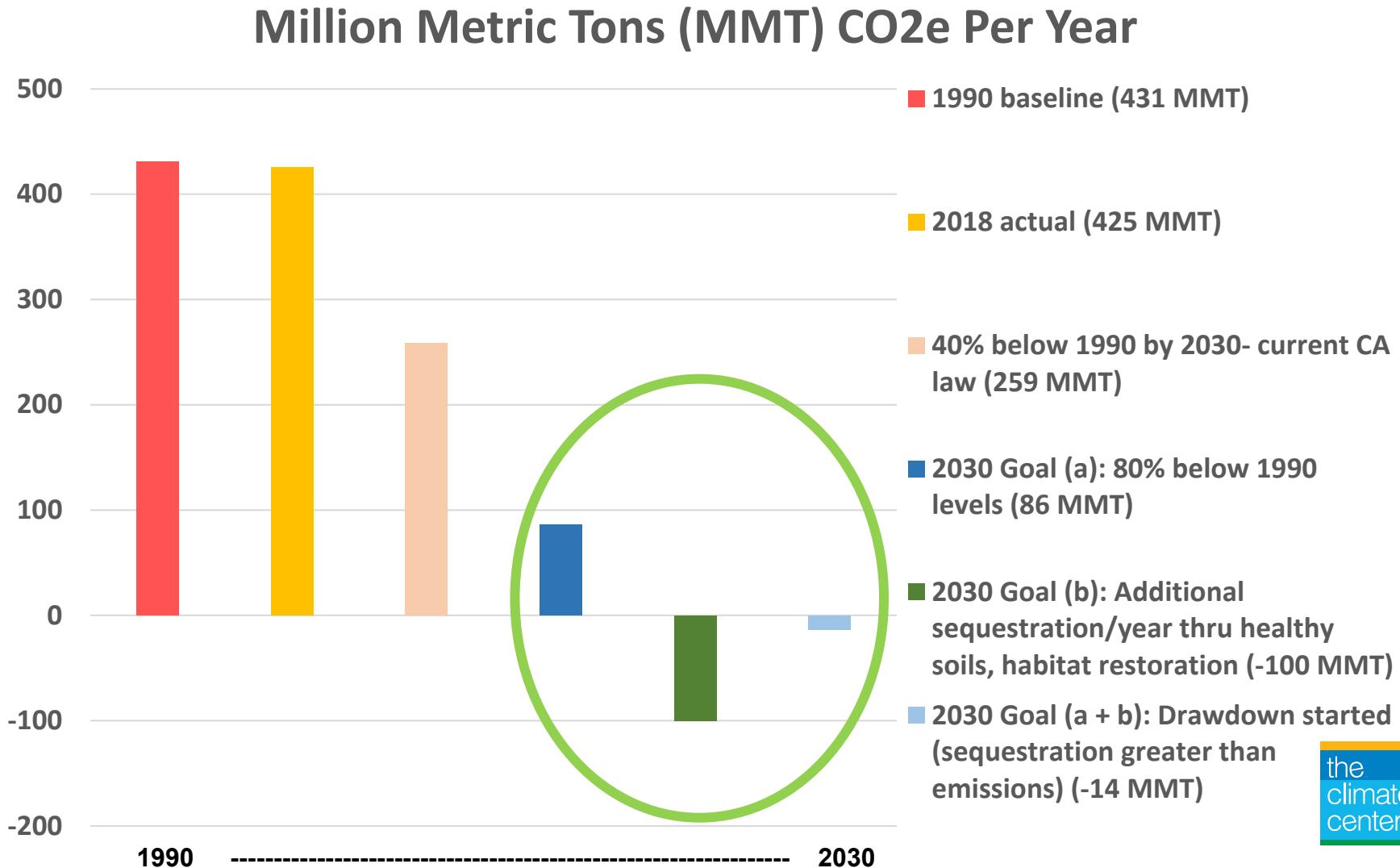
Zabin et al Sept 2020 <https://laborcenter.berkeley.edu/putting-california-on-the-high-road-a-jobs-and-climate-action-plan-for-2030/>

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**

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

www.climatesafeca.org



1- Accelerate phase out of fossil fuel development, production and use

- Immediately **halt new oil & gas drilling** and infrastructure development
- Invest in public-private efforts to **transition fossil fuel workers to good quality jobs** or early retirement
- **Start plugging abandoned wells**
- Establish **1 mile health and safety buffer zones** around active wells
- **Secure 100% GHG-free electricity with greatly expanded DER & energy storage by 2030**



Rapidly Transition to Sustainable Mobility

- **Begin phase out of fossil fuel powered vehicles--cars, trucks, buses, ships immediately- eg, cash for clunkers**
- **No new gas powered vehicle registrations by 2030**
- **Flip priorities: invest 80%+ of Caltrans \$ in non-GHG sustainable modes of transportation by 2025**
- **Invest in affordable housing near jobs**
- **Invest in clean mass transit**
- Need 2-3x more current CA goal to 15 million ZEVs by 2030
- Support Governor's budget **\$1.5 billion investment in EV chargers**



2- Increase Sequestration

- **Sequester addl. 100+ MMT CO₂e annually** in healthy soils, forests and vegetation annually by 2030-- starting no later than 2022
 - **Carbon farming** and gardening
 - **Climate-smart habitat restoration** and management on land/coast
 - **Enhance protected habitats**



Point Blue STRAW project



Carbon Farming, Marin



Kelp forests

<https://www.marincarbonproject.org/carbon-farming>
<https://www.carboncycle.org/carbon-farming/>
<https://www.pointblue.org/our-work/restoration/>

3- Invest in Community Resilience

- **Fund implementation of resilience plans** in all California counties and cities by 2025 (SB379)
- **Implement *clean* energy community microgrids with storage** including EV's, starting with critical facilities in lower income communities by 2021



<https://microgridknowledge.com/tribal-microgrid/>

4- Fund climate action

Institute equitable funding strategies to produce additional ~\$12-20+ billion/year specifically for climate action, such as:

- **Regulatory changes** that open markets *so private investments pay for much of what's needed & expedite use of federal green stimulus funds*
- **Per Passenger/Parcel Fee** e.g., \$2.4 billion/yr *from \$10 per passenger x 240 million (CA in 2018)*
- **Ballot measures** e.g., \$30 Billion 2022 climate ballot measure for transportation & other sectors over 10 years
- **Progressive Carbon Fees, Feebates**
- **Green climate bonds**
- **Close tax loopholes & upgrade tax code**



Advocating for Policy in Sacramento

“[The Climate Center] has emerged as a force this year in our public policy discussions. We know that this has been a long time coming, but this campaign for a Climate-Safe California is not only crucial but it is scalable.



State Senator Henry Stern

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

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



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**

the
climate
center

1,250 endorsements of Climate-Safe CA to build further support

- **ELECTEDS (78) and APPOINTED**

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

- **CITIES/GOVERNMENTAL AUTHORITIES**

- MCE Clean Energy
- Bay Area Air Quality Management District
- City of Petaluma, City of Sebastopol
- Regional Climate Protection Authority
- Town of Windsor and San Anselmo

- **SCIENTISTS and ECONOMISTS**

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

- **BUSINESS (87)**

- Enphase Energy
- Hobo Wines
- Terry Tamminen, 7th Generation Advisors*
- Guayaki
- Traditional Medicinals
- FullCyle
- Ygrene Energy
- Blue Planet Energy

- **NGOs (125)**

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



www.climatesafeca.org

*affiliations for identification purposes only

the
climate
center

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



CLIMATE-SAFE CALIFORNIA

**California can remove
more climate pollution
than we emit by 2030**

Learn more about our campaign
for a healthy, hopeful & equitable
future at www.climatesafeca.org

the
climate
center

Thank you!

barry@theclimatecenter.org