

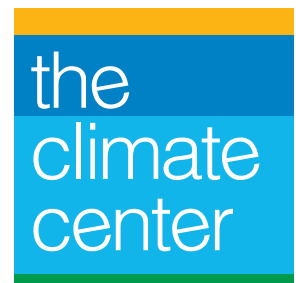


Climate-Safe California: accelerating climate action

Climate Action Subcommittee, City of Santa Rosa

Jan 12, 2022

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Update on COP 26 Glasgow Climate Summit

Good news:

- Agreements to cut **methane & stop deforestation** by 2030
- First-ever reference to **phase down of coal & fossil fuels subsidies**;
- **Beyond Oil & Gas Alliance (BOGA)**
Denmark & Costa Rica;
- Increase **financial commitments** to developing countries (BUT still haven't delivered on Paris agreement commitments)

Bad news:

- Not enough
- Kicked the can down the road for urgently needed reduction targets
- Current commitments would mean up to ~3C with devastating consequences, especially for frontline communities around the world



www.theclimatecenter.org



“I don’t at all feel that we [in California] are leading the world anymore.”

– Assembly Speaker Anthony Rendon, COP26, Glasgow



<https://calmatters.org/newsletters/whatmatters/2021/11/california-climate-change-newsom/>

At 1.1-1.2C now Without change we are on track for catastrophic climate chaos...

- *Sognaes et al (Nature Climate Change, Nov 22, 2021):*
 - **All pledges put together still result in 2.2 to 2.9 C of warming**
 - High end to 3.8°C including uncertainty in climate response
- *Climate Action Tracker (Nov 9, 2021):*
 - On track for 2.4 C warming
- *UNEP (Oct 27, 2021)*
 - Updated pledges on track for 2.7 C warming



The Need for Speed, Methane Pavilion, COP26:
Profession Tim Lenton, Univ of Exeter & Pam
Pearson, Intl Cryosphere Initiative
<https://www.youtube.com/watch?v=MoUcjGbSifM>

- <https://www.scientificamerican.com/article/climate-pledges-still-not-enough-to-keep-warming-below-2-degree-limit/>
- <https://www.nature.com/articles/s41558-021-01206-3.epdf>
- <https://climateactiontracker.org/publications/glasgows-2030-credibility-gap-net-zeros-lip-service-to-climate-action/>
- <https://www.unep.org/resources/emissions-gap-report-2021>

Non-linear difference between 1.5C and 2C warming

"For every increment of global warming, changes in extremes become larger"

"Warming has doubled since first COP"

"Warming will likely double over next two decades ..."

Current global climate goals are **inadequate**

UN IPCC 1.5C Report- Oct 2018

- Cut emissions by 45% by 2030

AND

- remove up to 1000 Gt CO₂e from atmosphere

to achieve net-zero emissions by 2050 and stay under 1.5C warming



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

Current COP26 pledges put together still result in 2.2 to 2.9 C of “catastrophic” warming

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

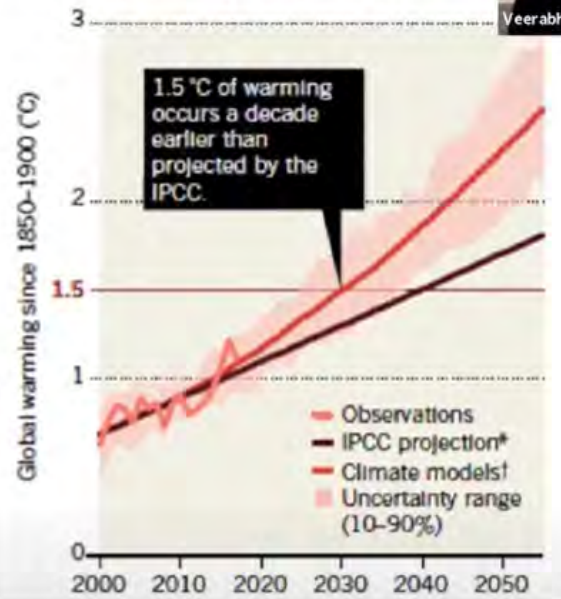
Will pass 1.5°C dangerous warming by 2030 in California it could be as early as 2027

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

“Code red for humanity....

This report must sound a death knell for coal and fossil fuels, before they destroy our planet.”

*-UN Secretary General António Guterres, Aug 9, 2021,
re: United Nation IPCC 6th Assessment Report*



Global climate models do not include regional extreme events we are now experiencing

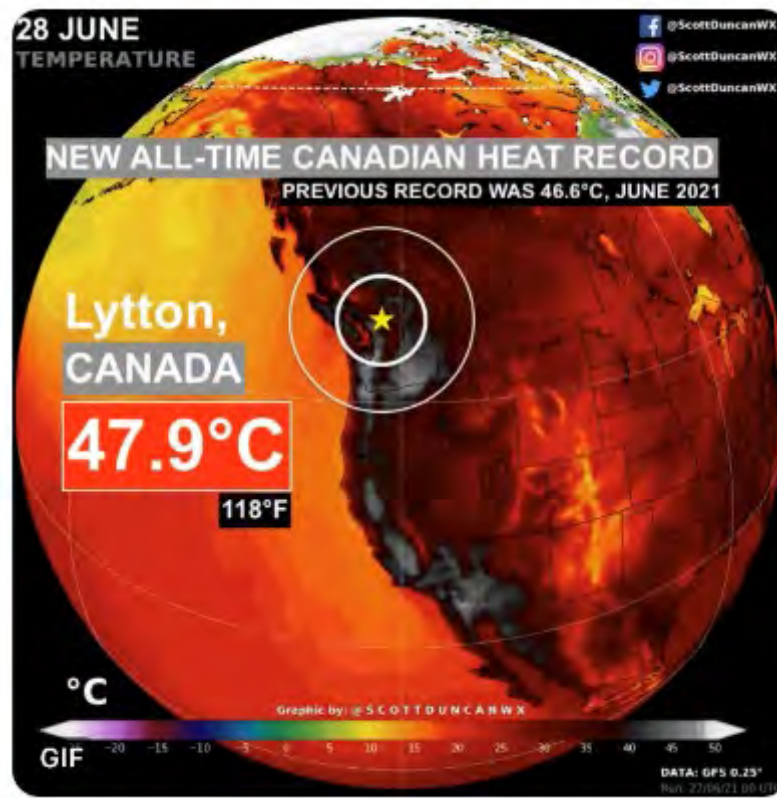
<https://www.reuters.com/business/environment/un-sounds-clarion-call-over-irreversible-climate-impacts-by-humans-2021-08-09/>

<https://www.theguardian.com/environment/2021/jul/02/canadian-inferno-northern-heat-exceeds-worst-case-climate-models>

<https://grist.org/science/is-climate-change-happening-faster-than-expected-a-climate-scientist-explains/>

“No temperature rise is safe”...rapidly warming climate is the "greatest threat" to global public health

- 220+ medical journal simultaneous editorial Sept. 7, 2021



[https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(21\)01915-2/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(21)01915-2/fulltext)

<https://www.npr.org/2021/09/07/1034670549/climate-change-is-the-greatest-threat-to-public-health-top-medical-journals-warn>

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

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, Schyellnhuber.

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 of **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.”

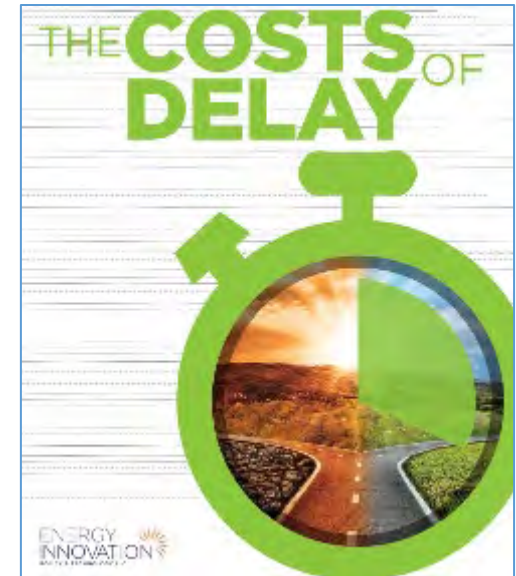


- Johan Rockström, Director, Potsdam Institute for Climate Impacts Research, 2019

<https://www.sciencedaily.com/releases/2019/11/191127161418.htm>
<https://sverigesradio.se/avsnitt/1425542>
<https://medium.com/@rchrthy/johan-rockstr%C3%B6ms-10-point-agenda-for-saving-the-world-unofficial-transcript-431261f885c6>

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**
- *But \$80 billion invested in California generate ~725,000 jobs*
- *~\$12-20 billion/year needed in CA*



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>

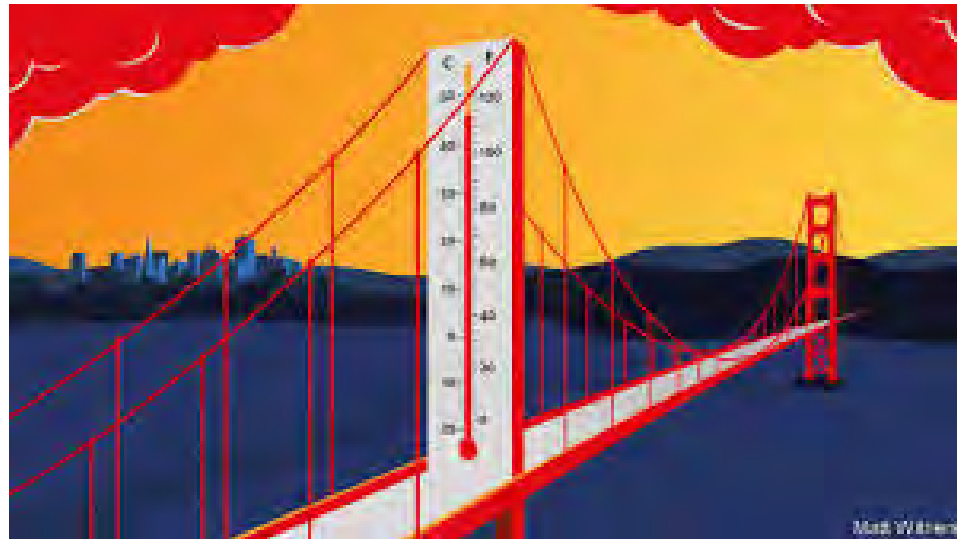
Wang, D et al. **Economic footprint of California wildfires in 2018.** *Nature Sustainability*, 2020 DOI: [10.1038/s41893-020-00646-7](https://doi.org/10.1038/s41893-020-00646-7)

<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>

The nation and the world are looking to California to lead for a climate-safe future



**Need more aggressive, equitable policies
& 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 cut emissions, start drawdown and secure resilient communities for all 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/>



TYPES OF POLICIES REQUIRED BY SCIENCE TO REACH CARBON NEGATIVE 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

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 and impacted communities
- 3- Prioritize **climate justice** and ensure lower-income/BIPOC communities are no longer disproportionately harmed by fossil fuels & equal access to climate solutions



Backed up by science:

“Accelerating the Timeline for Climate Action in California”

Kammen et al Mar 2021



Sept 9 2021

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 \[eess.SY\]](#)

(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>

Secured extensive media covering including in the LA Times: [An Earth Day message for California: Move faster on climate change.](#)

One pathway to 80%↓ by 2030: *by sector*

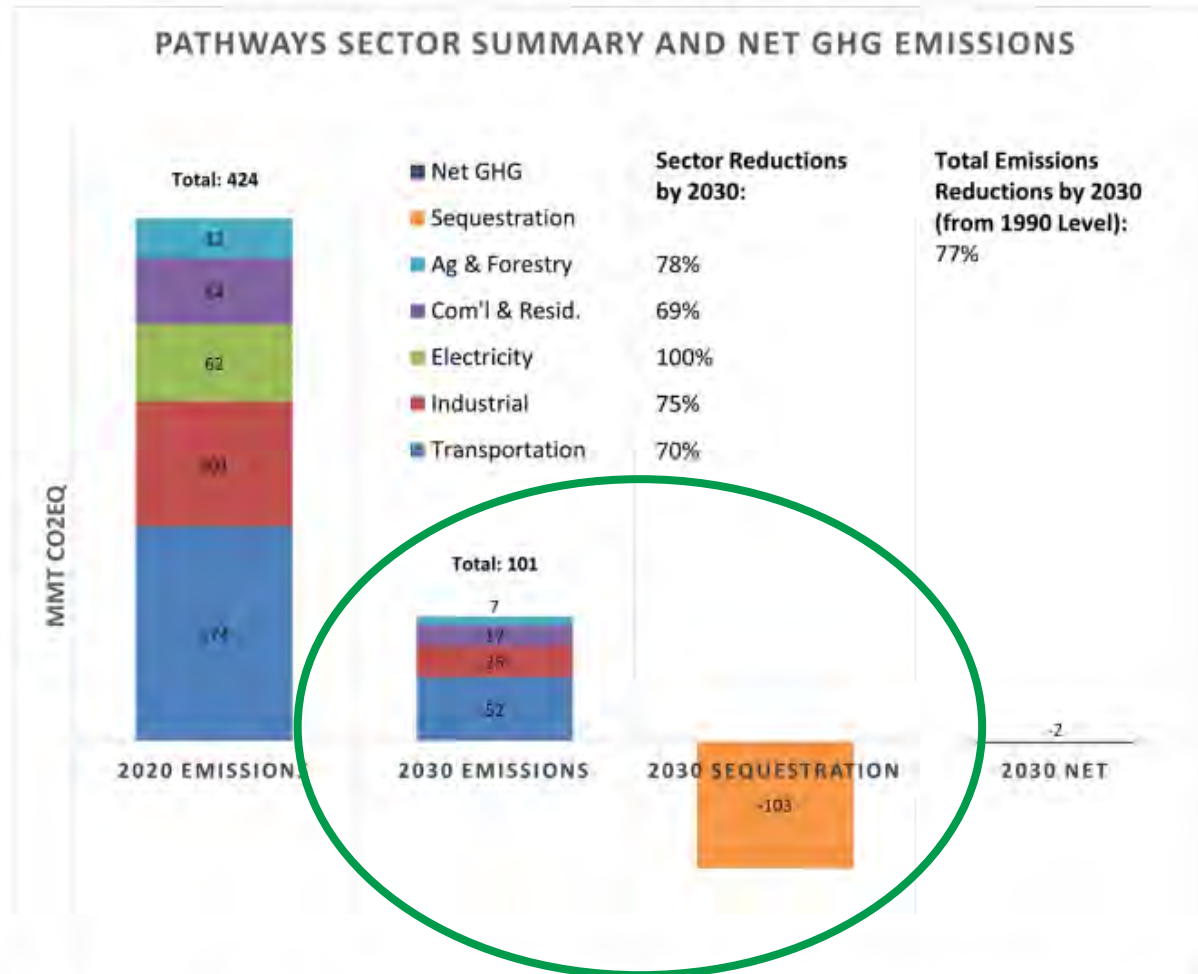


Figure 2. Pathway of emissions reductions by sector that result in net-negative emissions by 2030. Analysis using The Climate Center GHG Accounting Tool.

<https://theclimatecenter.org/our-open-source-pathways-model-offers-climate-action-blueprint/>
<https://arxiv.org/abs/2103.07801>

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~~
- **Establish "carbon removal" goal before 2035**

Gutted in Senate Approps



But Governor Newsom heard us: ordered Air Resources Board to evaluate pathways to carbon neutral by 2035, 10 years ahead of current law!

July 9, 2021



<https://www.gov.ca.gov/2021/07/09/governor-newsom-holds-virtual-discussion-with-leading-climate-scientists-on-states-progress-toward-carbon-neutrality/>

Also asked CPUC to establish a more ambitious greenhouse gas emissions target for electricity procurement by 2030

SB 833 (Dodd): Plan and prioritize Clean Energy Resilience for communities that suffer most from air pollution and outages

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

UNANIMOUS VOTE
in Senate in 2021



Microgrid Equity Coalition convened by The Climate Center



Scale up mobile power storage

CA's school bus fleet = 24,200

If all-electric, could store $\sim\frac{1}{4}$ of peak electricity usage & help clean the air



150 kW battery packs per bus; 24,200 times 150 kW = 3600 MW, i.e. about $\frac{1}{4}$ of the evening duck curve ramp

Dramatically Increase Sequestration

- **Sequester addl. 100+ MMT CO₂e annually** in healthy soils, forests and vegetation by 2030
- **Carbon farming** and gardening
- **Compost**, rotational grazing, agroforestry
- **Climate-smart habitat restoration** and management on land/coast
- **Enhance protected habitats**



Carbon Farming, Marin



Kelp forests



Point Blue STRAW project

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

SB 27 (Skinner) signed into law

Requires state to set natural & working lands sequestration goals for 2030 and beyond



CHALLENGE: Bold, Equitable Climate Legislation Stymied in Sacramento

<https://theclimatecenter.org/our-work/legislation/>



<https://capitalandmain.com/california-oil-industry-continues-to-thwart-climate-related-bills>

Over 1493 endorsements of Climate-Safe California including:

- **ELECTEDS and APPOINTED (89)**
 - Congressmen Jared Huffman, Mike Thompson
 - State Senators Henry Stern, Mike McGuire, Scott Wiener, Josh Becker
 - State Assemblymember Ash Kalra, Robert Rivas, Jim Wood, and Kevin Mullin
 - Petaluma, Windsor, Sebastopol, Cotati
 - County of Sonoma, RCPA
- **ACADEMICS and ECONOMISTS**
 - Dan Kammen, PhD, UC Berkeley*
 - Hunter Lovins
 - Ben Santer, PhD, Lawrence Livermore Labs
 - Carl Mears, PhD, UN IPCC
 - Steve Weissman, PhD, UC Berkeley*
- **BUSINESS (118)**
 - Enphase Energy
 - Guayaki
 - Terry Tamminen, Seventh Generation Advisors*
 - Ygrene Energy Fund
 - Simpliphi Power
 - Traditional Medicinals
- **NGOs (151)**
 - California League of Conservation Voters
 - Center for Sustainable Energy
 - Local Government Commission
 - Environment California
 - Clean Coalition
 - Climate Mobilization



Endorse Climate-Safe California today!

www.climatesafeca.org



**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

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89 elected/governments, 118 businesses, 151 organizations, 1,000+ individuals = 1493