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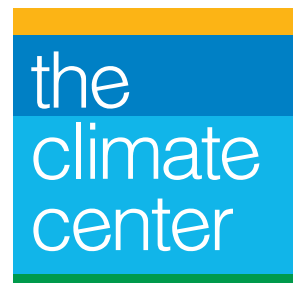
# Climate-Safe California: The Path to Net-Negative Emissions by 2030

Central Coast Elected Officials

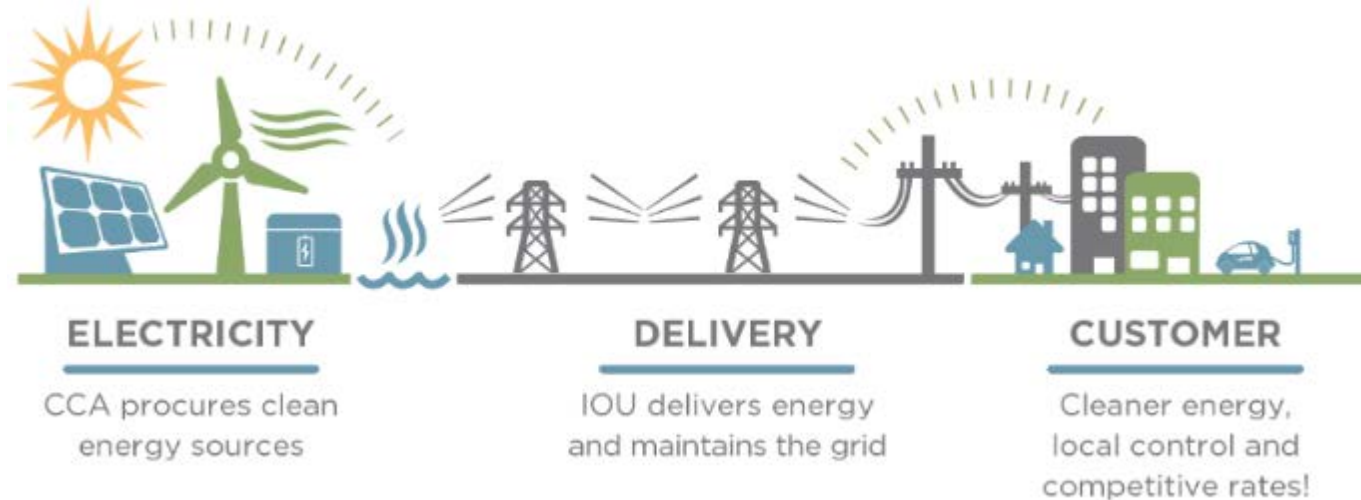
May 27, 2021

The Climate Center and partners

[www.theclimatecenter.org](http://www.theclimatecenter.org) [barry@theclimatecenter.org](mailto:barry@theclimatecenter.org)



# Mission: Speed and scale greenhouse gas reductions



**Key role in growing Community Choice Energy:  
24 CCAs serving 80-90% GHG-free electricity to  
11 million Californians- 1/4 of state!**

Sunday

# Los Angeles Times

\$3.66 DESIGNATED AREAS HIGHER © 2020 WST ++ latimes.com SUNDAY, SEPTEMBER 13, 2020

# 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 1.5C Report- Oct 2018

- Cut emissions by 45% by 2030

AND

- remove up to 1000 Gt CO<sub>2</sub>e 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.**

**We must do more sooner per new science...**



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

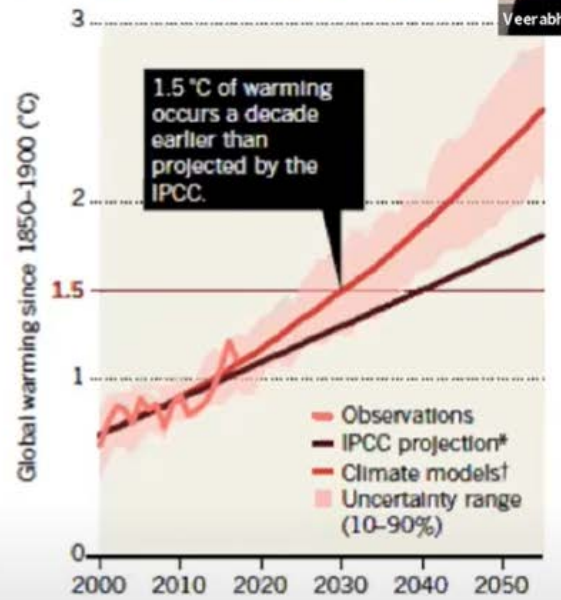
*World may breach 1.5C warming within 5 years - WMO*

## 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



<https://www.rte.ie/news/world/2021/0527/1224196-global-warming-wmo/>

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=T3lOX5ru0BI&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/>

# Increasing health impacts especially to most vulnerable communities

Fossil fuel air pollution => 1 in 5 deaths globally  
2020 CA smoke storm: ~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>

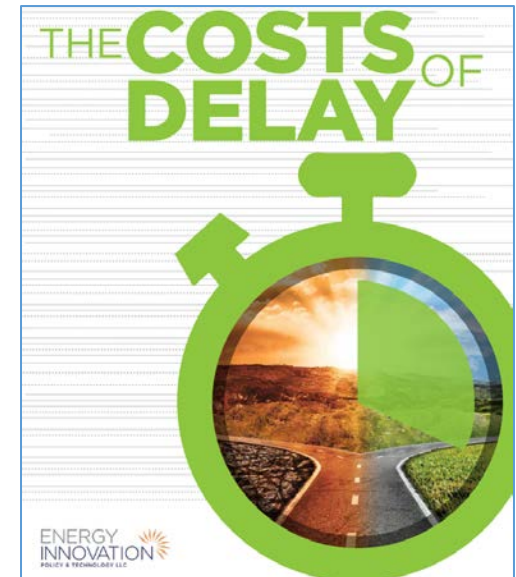
<https://amp-sacbee-com.cdn.ampproject.org/c/s/amp.sacbee.com/news/california/fires/article245947495.html>;

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



# Climate action delay costs trillions, bankrupting our economy

- **Fed Reserve: banks must consider climate risks**
- **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 wildfires costs but \$80 Billion invested in California 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](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>



# Investing in GHG reduction creates jobs and builds the economy

- Investments in clean energy generate >2x the jobs as in fossil fuels
- \$2.2 billion from CA's Cap-and-Trade Program supported direct employment of 36,106 job years from 2013-2016
  - 54% of the jobs were in building trades
  - 11% in architecture and engineering, 10% in transportation



World Resources Institute <https://www.wri.org/blog/2020/07/economic-benefits-climate-action-us>  
J.R. DeShazo et al. **Employment Benefits from California Climate Investments and Co-Investments.**  
UCLA Luskin Center for Innovation. Aug, 2018. <https://innovation.luskin.ucla.edu/publication/employment-benefits-from-california-climate-investments-and-co-investments/>

## 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 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/avsnitt/1425542>  
<https://medium.com/@rchrthy/johan-rockstr%C3%B6ms-10-point-agenda-for-saving-the-world-unofficial-transcript-431261f885c6>



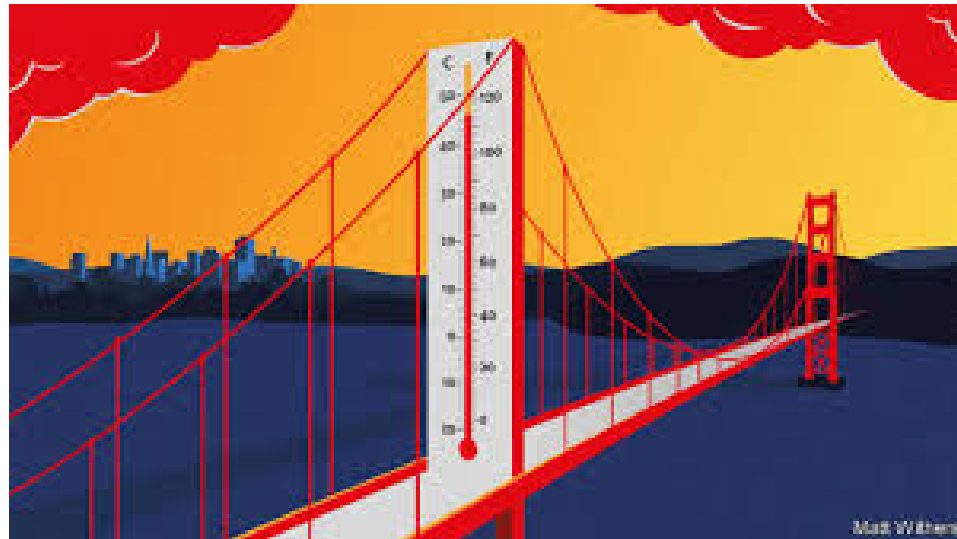
**The climate reality  
is outpacing  
outdated policy.**

**Some leaders are  
now stepping up,  
but...**

# ...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
- ✓ **RHODE ISLAND:** 100% GHG free electricity by 2030
- ✓ **PRESIDENT BIDEN**
  - Cut GHGs 50% below 2005 by 2030
  - 100% GHG free electricity by 2035
  - 40% investments to lower-income communities
  - Invest \$2 trillion (= ~\$292 Billion in CA @ 14.6% GDP)

# 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](http://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...

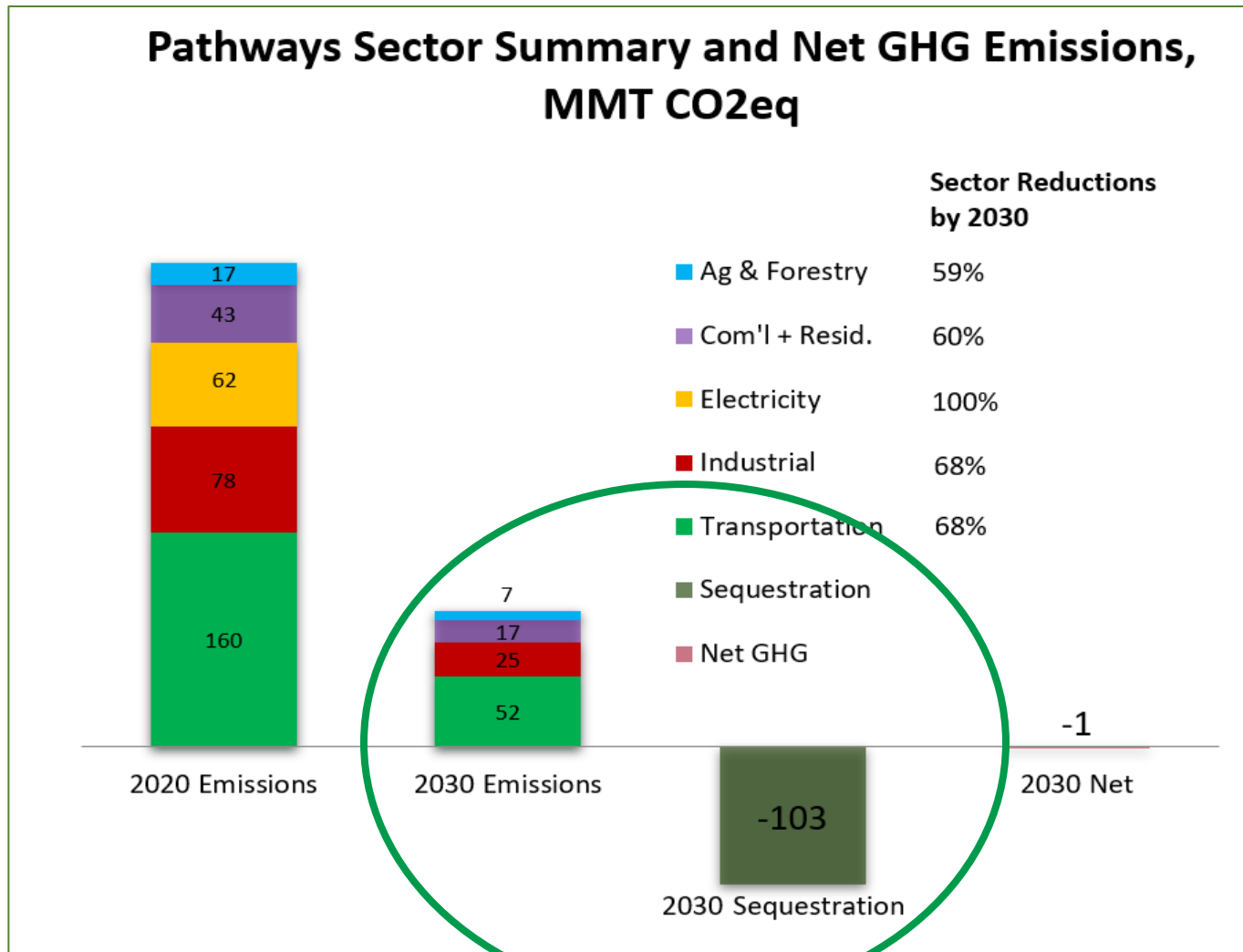
## 2045 is too late

- **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/>



# One pathway to Net Negative Emissions by 2030: *by sector*



Ed Myers, Jock Gilchrist for The Climate Center



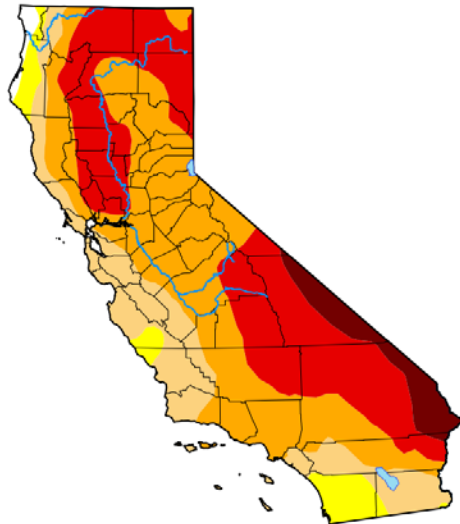
# Backed up by science:

## “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](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>

# 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



# Diablo Agreement for the State

Labor,  
environmentalists,  
industry and  
government come  
to an agreement  
on what is needed  
for a smooth  
transition – **and  
now to renewables**



# 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~~
- **Establish "carbon removal" goal before 2035**
- **CARB determines 40-80% by 2030**
- **Prioritize vulnerable communities**

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



CENTRAL CALIFORNIA  
ENVIRONMENTAL JUSTICE NETWORK

The Nature Conservancy



the  
climate  
center



# SB 99 (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!**



# Wind Energy off of Moro Bay

## Biden Administration Strikes A Deal To Bring Offshore Wind To California



### AB 525 (Asm. Chiu, Sen. Laird co-author)

Develop state plan for offshore wind

<https://www.npr.org/2021/05/25/1000210550/biden-administration-strikes-deal-to-bring-offshore-wind-to-california>  
[https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill\\_id=202120220AB525](https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=202120220AB525)

# AB 284 (Asm R. Rivas) & AB 27 (Sen Skinner)

Establish Climate Goals for Natural and  
Working Lands



## AB 125 (Asm R. Rivas)

Bond for climate solutions that support  
equitable and resilient food and farming  
system





# Governor Newsom May 2021: \$75.7B surplus

**\$11 billion climate down payment over ~3 yrs BUT  
we need more than that *each year!***

## Our Proposal:

**+\$12.2 billion**

(mostly in one year)

### Energy (+\$3.8 Billion):

Community Energy Resilience;  
Community Resilience Hubs; Grid of  
the Future

**Sustainable Transportation (+\$1  
Billion)** infrastructure; vehicle  
incentives

**Natural & Working Lands (+\$5.4  
billion)** nature-based sequestration

**Just Transition Fund (+\$2 billion)**



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





# Endorse Climate-Safe California

[www.climatesafeca.org](http://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](http://www.theclimatecenter.org)



# 1,218 endorsements of Climate-Safe CA

- **ELECTEDS and APPOINTED (75)**

- 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 Das Williams, Carmen Ramirez, Zach Friend, Wendy Root Askew
- Mayor Heidi Harmon, Councilmember Andy Pease

- **CITIES/GOVERNMENTAL AUTHORITIES (6)**

- 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 (87)**

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

- **NGOs (120)**

- 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](http://www.climatesafeca.org)

\*affiliations for  
identification purposes  
only

# 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/>

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



# WE HAVE CHOICES





# Exxon no longer on the Dow, likely past peak oil production (BP), and....

- **Royal Dutch Shell**- ordered by court to dramatically cut its emissions (45%) by 2030
- **Chevron**- 61% of shareholders demanded emissions cuts
- **ExxonMobil**- two activist shareholders elected to board for first time



*It's clear that the arguments that many have been making for a decade have finally sunk in at the highest levels: there is no way to evade the inexorable mathematics of climate change. Photograph by Erik McGregor / Sipa / Alamy*

<https://www.cnbc.com/2020/08/25/exxon-mobil-replaced-by-a-software-stock-after-92-years-in-the-dow-is-a-sign-of-the-times.html><https://www.forbes.com/sites/feliciajackson/2020/09/17/past-the-peak-a-new-reality-for-oil/?sh=b2d3fcd5fe2d>  
<https://www.newyorker.com/news/annals-of-a-warming-planet/big-oils-bad-bad-day>

# “Green finance goes mainstream”

WSJ 5/22/21

- >\$5 billion in bonds and loans to fund green initiatives are now issued every day
- Two biggest U.S. banks pledged \$4 trillion in climate-oriented financing over the next decade



# Climate Prosperity

**“Climate Change is the largest wealth-creation opportunity of our lifetime.”**

**--Jigar Shah, Dept. of Energy**

Jigar Shah founded SunEdison

- pioneered “no money down solar”
- unlocked a multi-billion-dollar solar market
- Created the largest solar services company worldwide

<https://www.energy.gov/lpo/person/jigar-shah>






# CA first state to reach net negative emissions

Kickstarts nation & world into equitable climate action

December 2030







# 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](http://www.climatesafeca.org)

the  
climate  
center

## Thank you!

[ellie@theclimatecenter.org](mailto:ellie@theclimatecenter.org)