



# Climate-Safe California

## Rapid Decarbonization Campaign

### Endorsement Platform

*The COVID-19 pandemic is a stark reminder: we ignore science at our peril and early action saves lives. An endorsement of Climate-Safe California, based on the latest science, is a public pledge of support for accelerated, aggressive climate policy by the state of California, not support for specific legislation. Urgent action is required to ensure a safe and healthy future for all. The solutions exist today to reverse the climate crisis. By committing to and demonstrating the bold policies required in the world's fifth largest economy, we will inspire other states, our nation and countries around the world to greater action for a climate-safe Earth. We welcome organizations and individuals to [endorse here](#). Please share widely.*

#### A. THE CLIMATE CRISIS IS HERE NOW, WORSE THAN ANTICIPATED, AND ACCELERATING, THREATENING ALL LIFE

- **The climate crisis is more severe than projected.** Climate change increasingly threatens natural ecosystems, wildlife, fisheries, food production, economies, community health, and the fate of humanity. More than 11,000 scientist signatories from around the world “declared clearly and unequivocally that planet Earth is facing a climate emergency” that requires bold and prompt action to “sustain life on our planet, our only home.”<sup>i</sup>
- **Nine of fifteen global climate system tipping points are already activated.** The likelihood of abrupt, irreversible runaway climate chaos increases significantly if emissions are not significantly reduced soon. Even though the earth has warmed by approximately 1.1°C (2°F) since the start of the industrial era, we are losing the Amazon rainforest, potentially adding 1°C (1.8°F) of additional warming by itself. The West Antarctic and Greenland ice sheets are melting much faster than expected, changing ocean currents, accelerating sea level rise, and driving more extremes. Multiple other measurable, interconnected global impacts are likely to be triggered at lower warming thresholds than previously thought.<sup>ii</sup> [See more in [Appendix A.](#) ]

#### B. MASSIVE REDUCTIONS OF WARMING EMISSIONS, WITH INITIAL DRAWDOWN FROM THE ATMOSPHERE, ARE REQUIRED BY 2030 TO PREVENT CATASTROPHIC IMPACTS

- **UN IPCC scientists conservatively recommended that emissions globally must be cut 45% by 2030 from 2010 levels.** In addition, upwards of one trillion tons of greenhouse gases (GHGs) that humans have already released into the atmosphere must be removed over the decades ahead, to secure a safe future for all life.<sup>iii iv</sup> The countries of the world must triple their emissions reductions commitments (Nationally Determined Contributions pledges) to follow a 2°C (3.6°F) pathway and multiply them *five* times to follow a 1.5°C (2.7°F) pathway to achieve the goal of limiting global warming per the 2015 Paris Climate Agreement.<sup>v</sup> New science indicates these goals may be insufficient to avoid the worst. [See more in [Appendix B.](#) ]

## C. CALIFORNIA MUST ACCELERATE ITS CLIMATE LEADERSHIP TO AVOID INCREASINGLY DIRE CONSEQUENCES, DEMONSTRATE EQUITABLE, JUST SOLUTIONS, AND INSPIRE GREATER CLIMATE ACTION WORLDWIDE

- **The climate crisis is already negatively impacting California with record-breaking drought<sup>vi</sup>, extreme heat, floods, fires<sup>vii</sup>, smoke storms and winds.** This is resulting in loss of human life and significant expense to the state, businesses, local communities, and families.<sup>viii</sup> The costs of inaction are substantially greater than action.<sup>ix</sup> California's 2018 wildfires, less than half the size of the 2020 conflagrations, cost a staggering \$148.5 billion (about two thirds of California's pre-COVID 2020 budget) in capital losses, health costs and supply chain losses far from the actual wildfire footprint.<sup>x</sup> The 2020 wildfires and smoke storms took 32 lives directly and another 1200-3000 lives from increased particulate matter in the air.<sup>xi</sup>
- **California's oil and gas infrastructure,<sup>xii</sup> from freeways to oil rigs, is often sited in lower income communities and communities of color,** dangerously close to homes, schools, and hospitals, primarily due to historic redlining and redevelopment. Constantly exposed to polluted air, they suffer from significantly lower life expectancy,<sup>xiii</sup> and higher rates of asthma, cancer, and other diseases<sup>xiv</sup> than white people and those in wealthier neighborhoods.
- **California's current goals of achieving 40% below 1990 levels of GHG emissions and 60% GHG-free electricity by 2030 are inadequate and lag behind others.** The United Kingdom recently committed to increasing its GHG reduction goals to 68% below 1990 levels by 2030<sup>xv</sup> and called for 100% Zero Emission Vehicle (ZEV) car sales by 2030.<sup>xvi</sup> President-elect Biden's climate action plan calls for 100% GHG-free electricity by 2035.<sup>xvii</sup> Rhode Island has committed to 100% renewable electricity by 2030, fifteen years ahead of current California law.<sup>xviii</sup>
- **There are dozens of scalable solutions available now to reverse the climate crisis.** The solutions significantly reduce emissions, increase natural sequestration, provide jobs and other economic benefits, foster biodiverse ecosystems, and support a healthy, equitable society for all.<sup>xix</sup> Solar energy projects have fallen in cost by close to 90% over the past decade, and wind by 70%. Energy storage is now falling in cost as fast as solar and wind energy have.<sup>xx</sup> Investments in clean energy generate more than twice as many jobs as fossil fuel investments do.<sup>xxi</sup> In California, an \$80 billion investment in meeting the state's climate goals would create 725,000 jobs.<sup>xxii</sup> The potential exists to create hundreds of thousands good paying jobs while securing an equitable, clean energy future for all.<sup>xxiii</sup> [See more in [Appendix C.](#)]

**THEREFORE, WE/I ENDORSE THE CLIMATE-SAFE CALIFORNIA<sup>xxiv</sup> CAMPAIGN AND CALL ON THE STATE OF CALIFORNIA TO ENACT THE FOLLOWING SOLUTIONS:<sup>xxv</sup>**

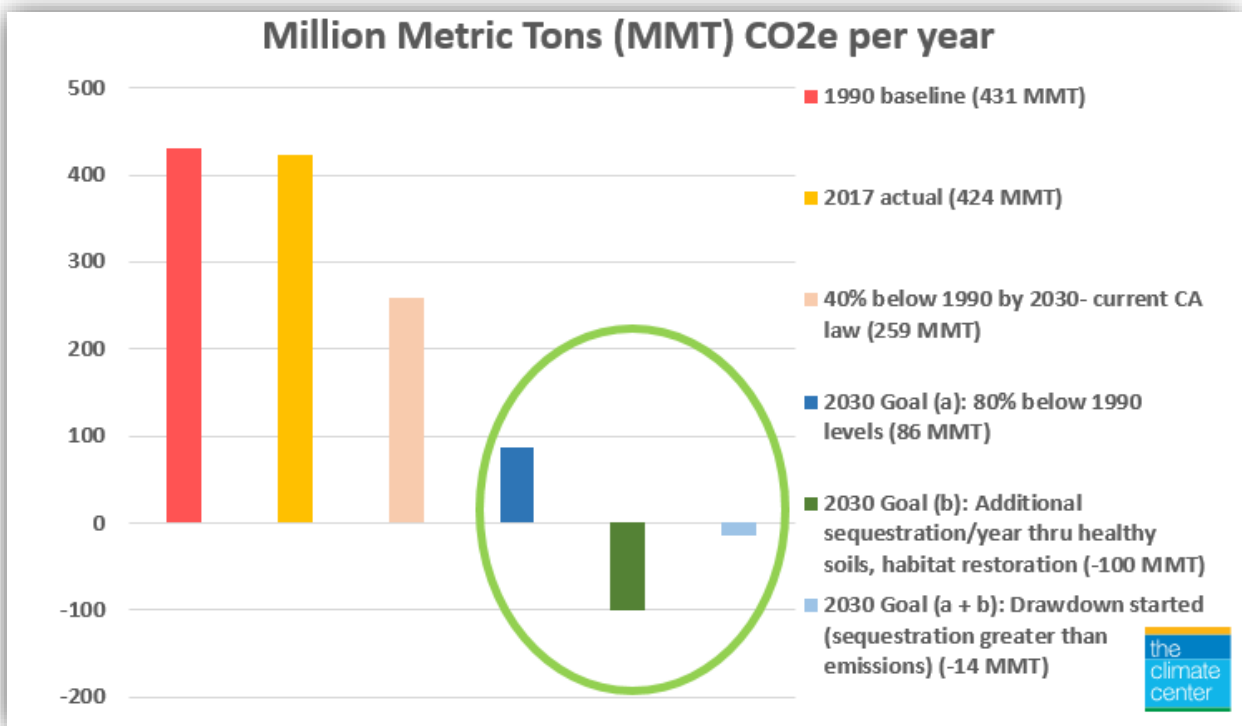
- 1. COMMIT TO 80% BELOW 1990 LEVELS OF GHG EMISSIONS<sup>xxvi</sup> AND NET NEGATIVE EMISSIONS BY 2030,<sup>xxvii</sup> accelerating existing state policy timelines.<sup>xxviii</sup>**
- 2. SECURE A JUST TRANSITION FOR WORKERS, THEIR FAMILIES AND COMMUNITIES WHO DEPEND ON FOSSIL FUEL INDUSTRIES,** ensuring their economic well-being.<sup>xxix</sup>
- 3. CLOSE THE CLIMATE GAP WHEN ENACTING CLIMATE POLICIES TO ENSURE LOWER-INCOME COMMUNITIES AND COMMUNITIES OF COLOR ARE NO LONGER DISPROPORTIONATELY HARMED** by the health and economic consequences of fossil fuel development, production, and use, and have equitable access to climate-friendly solutions.
- 4. ENACT BY 2025 THE SUITE OF POLICIES REQUIRED BY SCIENCE TO PUT US ON TRACK FOR NET-NEGATIVE EMISSIONS BY 2030**
  - a. ACCELERATE THE PHASE-OUT OF FOSSIL FUEL DEVELOPMENT, PRODUCTION, AND USE**
    - i. Immediately halt new oil and gas drilling and infrastructure development
    - ii. Invest now and ramp up public-private efforts to transition fossil fuel workers to good quality jobs or early retirement
    - iii. Ensure significantly greater GHG-free transportation and mobility, including no new internal combustion vehicles licensed by 2030
    - iv. Secure 100% clean, distributed, resilient electricity and storage, including mobile assets such as electric vehicles, by 2030
    - v. Ensure significantly greater GHG-reduction in buildings including 100% electric building requirements for all new buildings established by 2023
  - b. INCREASE NATURE-BASED CARBON SEQUESTRATION**
    - i. Protect and increase natural carbon sequestration from the atmosphere to secure an additional ~100+ MMT of CO<sub>2</sub>e annually by 2030 through major investments in healthy soils and improved agricultural practices; forest, wetland, and other habitat and vegetation protection and management; and climate-smart habitat restoration at scale in California starting no later than 2022
  - c. INVEST IN COMMUNITY RESILIENCE**
    - i. Fund and support every California community by 2025 to:
      1. Develop and implement resilience measures as currently required by state law<sup>xxx</sup> such as community resilience centers and resilience staffing to reduce deleterious climate impacts on human health, from increased heat, fire and smoke exposure to flooding, drought, and spread of disease

2. Establish clean energy community microgrids and battery storage linked to electric transportation, empowering communities to keep the lights on for critical facilities such as fire stations and hospitals during planned or unplanned outages<sup>xxxii</sup>

**d. GENERATE THE FUNDS NEEDED FOR SPEED AND SCALE CLIMATE ACTION**

- i. Generate by no later than 2025 an estimated \$12-20 billion per year in new state funds to pay for this urgently needed suite of policies from progressive and equitable financing mechanisms, such as frequent flyer fees,<sup>xxxii</sup> green bonds, and a carbon fee and dividend type program

*The chart below shows what is required to achieve a Climate-Safe California.*



We welcome your input, feedback and questions. Email us at [climatesafe@theclimatecenter.org](mailto:climatesafe@theclimatecenter.org).

**Please endorse the Climate-Safe California platform [here](#) and share with others.**

## Appendix: Additional References

### A. THE CLIMATE CRISIS IS HERE NOW, WORSE THAN ANTICIPATED, AND ACCELERATING, THREATENING ALL LIFE

- **Climate change is making air pollution, heat waves, the spread of disease, and other perils worse.** It is exposing more people in more places to dangerous weather extremes from flooding to drought. The health and well-being of older people, workers in agricultural and construction trades, and people in lower income communities are disproportionately affected.<sup>xxxiii</sup>
- **The last five years have been the world's hottest in recorded history.** Last year, 2019, capped the hottest decade on record and was a year when the oceans were the warmest ever recorded.<sup>xxxiv</sup>
- **Over 70 U.S. health organizations declared that climate change is a public health emergency** urging immediate action from all sectors of society to rapidly reverse the climate crisis.<sup>xxxv</sup>
- **The economic disruptions and instabilities caused by the climate crisis are already significant.** These events are likely to become even more frequent, widespread, and severe, undermining the security, well-being, and future prospects of communities, families, and individuals as well as institutions, public and private, requiring "immediate collective action."<sup>xxxvi</sup>
- **As climate change progresses, natural greenhouse gas sinks are increasingly losing their ability to slow climate change.** These include soils, wetlands, and the ocean, which remove about half of all emissions from human activities. To avoid "sweeping and severe" consequences for nature and humanity, we must drastically reduce emissions now.<sup>xxxvii</sup>
- **Abrupt permafrost thaw in the Arctic doubles previous estimates of emissions of carbon dioxide (CO<sub>2</sub>).** In addition, methane, which is 83 times more powerful as an agent of warming than CO<sub>2</sub> over its ~20-year lifespan in the atmosphere, is not included in any climate models, including those of the UN Intergovernmental Panel on Climate Change (IPCC).<sup>xxxviii</sup>
- **The top layer of the ocean is heating up and thickening, driving more drought, intense storms, fisheries impacts, deoxygenation and less CO<sub>2</sub> absorption.** Co-author of that study, Michael Mann said, "The impacts of climate change are proving to be worse than we predicted... driving a more vicious cycle of warming."<sup>xxxix</sup>
- **More than 3/4 of the world's oceans are speeding up due to global warming.** These changes, which were not expected until the end of the century, increase threats to marine ecosystems and the likelihood of more extreme weather events.<sup>xl</sup> At the same time, freshwater from melting ice is slowing down the Atlantic circulation, which moderates weather in Europe.<sup>xli</sup>
- **Climate change is causing abrupt changes in dryland regions of the world and projected to cause abrupt ecosystem collapse starting in tropical oceans this decade.** The changes are damaging ecosystems where over 2 billion people live and threatening the ability of soils and vegetation in those regions to produce food, sequester carbon, hold water, and sustain biodiversity.<sup>xlii</sup>
- **Western US is now in the early stages of a global warming-induced severe megadrought** threatening water supplies, agriculture and ecosystems<sup>xliii</sup>
- **Rapidly increasing loss of biodiversity and ecosystem function diminish humanity's ability to slow the economic and societal impacts of climate change.** These losses lessen our resilience to growing extremes by reducing food and job security and increasing health risks.<sup>xliv</sup>
- **Climate models have been generally ineffective at demonstrating the growing understanding by scientists of climate system sensitivities.** This limits policymakers' abilities to address the increasing magnitude of the global warming challenge.<sup>xlv</sup>
- As of early September 2020, California has been experiencing wildfires forecast in California's Fourth Climate Change Assessment not to hit until 2050.<sup>xlvi</sup>

## B. MASSIVE REDUCTIONS OF WARMING EMISSIONS WITH INITIAL DRAWDOWN OF ATMOSPHERIC GREENHOUSE GAS BY 2030 ARE REQUIRED TO PREVENT CATASTROPHIC IMPACTS

- **Scientists have concluded that to secure “a tolerable climate future,” we must immediately and aggressively pursue carbon neutral energy production by 2030.** They further concluded that we must “hope for some luck” that the global climate system’s sensitivity to the continued addition of warming greenhouse gas emissions is low. These conclusions were based on an assessment of more than 5 million future climate pathways.<sup>xlvii</sup>
- **The threshold for dangerous climate change (>1.5C) likely to be crossed between 2027 and 2042 globally,** sooner than anticipated by the IPCC in the 1.5C report.<sup>xlviii</sup>
- **An influential global environmental scientist explains that “the next decade is our window” to avoid “runaway global warming.”** Said Johan Rockström, “We have underestimated the risks of unleashing irreversible changes ...We are seeing strong evidence already for declaring a state of planetary emergency... We don't want to push the 'on' buttons of runaway global warming. The next decade is our window...with consequences for all future generations.”<sup>xlix</sup>

## C. CALIFORNIA MUST ACCELERATE ITS CLIMATE LEADERSHIP TO AVOID INCREASINGLY DIRE CONSEQUENCES AND INSPIRE CLIMATE ACTION WORLDWIDE

- **California, the world’s fifth largest economy, has been a global climate policy leader.** California has consistently demonstrated that investments in a clean energy economy can yield economic benefits.<sup>i</sup>
- **California has recognized that to avoid irreversible climate chaos, we must dramatically increase our efforts.** “The state must increase its efforts to conserve, restore, and manage California's forests, rangelands, farms, urban green spaces, wetlands, and soils.”<sup>ii</sup>
- **Governor Newsom acknowledged amid the 2020 fire and smoke storms, “We are in a climate damn emergency.”** He conceded that “**across the entire spectrum, our climate goals are inadequate. We have to step up our game. As we lead the nation in low carbon green growth, we’ll have to fast track our efforts.**”<sup>iii</sup>
- **Other regions show that bolder climate policies are possible.** Uruguay plans to become a net carbon sink by 2030; Copenhagen’s target for achieving net-zero emissions is 2025; Finland’s is 2035. Norway’s goal to end sales of new fossil fuel-powered vehicles is 2025. Rhode Island’s goal for achieving 100% renewable energy is 2030.<sup>iiii</sup>
- **A supermajority of Californians (80%) view global warming as a serious threat to the future economy and quality of life (July 2018).** Among Democratic primary votes, climate change was the highest priority (Dec 2019).<sup>lv</sup>

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<sup>i</sup> Ripple, et al. [World Scientists’ Warning of a Climate Emergency](#), *BioScience*, Volume 70, Issue 1, Jan 2020; [IPCC 2018](#)

<sup>ii</sup> Lenton, et al. [Climate tipping points — too risky to bet against: The growing threat of abrupt and irreversible climate changes must compel political and economic action on emissions](#). *Nature*. Nov 27, 2019; ScienceDaily, [Nine climate tipping points now 'active,' warn scientists](#) Nov 27, 2019

<sup>iii</sup> UN Intergovernmental Panel on Climate Change, [Global Warming of 1.5 °C](#), Oct 2018

<sup>iv</sup> Herrando-Pérez et al. [Statistical Language Backs Conservatism in Climate-Change Assessments](#). *BioScience*, March 2019, and [Study shows IPCC is underselling climate change](#); IPCC assessments are inherently conservative as they require scientific then political consensus from governments across the globe.

<sup>v</sup> United Nations Environment Program, [Emissions Gap Report 2020](#), Dec 2020; UN Framework Convention on Climate Change (UNFCCC), [The Paris Agreement](#), Dec 2015.

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- <sup>vi</sup> Williams, et al. [Large contribution from anthropogenic warming to an emerging North American megadrought](#). Science. 17 Apr 2020. [The western U.S. is locked in the grips of the first human-caused megadrought, study finds](#). Washington Post. 16 Apr 2020
- <sup>vii</sup> Goss et al. [Climate change is increasing the risk of extreme autumn wildfire conditions across California](#). Envir. Research Letters Mar 2020. [Climate Change Has Doubled Riskiest Fire Days in California](#), E&E News, Apr 2020
- <sup>viii</sup> Bedsworth et al. [California's Fourth Climate Change Assessment: Statewide Summary Report](#). Jan 2019.
- <sup>ix</sup> Roston and Bloomberg. [The Massive Cost of Not Adapting to Climate Change](#), Fortune, Sept 20, 2019; Gonzalez, [Huge Costs in Climate Inaction](#), Business Insurance, Jan 2019
- <sup>x</sup> Wang, D et al. **Economic footprint of California wildfires in 2018**. *Nature Sustainability*, 2020 DOI: [10.1038/s41893-020-00646-7](#)
- <sup>xi</sup> [Indirect mortality from recent wildfires in California](#), Stanford University, Center on Food Security and the Environment, Sept 2020
- <sup>xii</sup> <https://www.wilderness.org/articles/blog/new-drilling-and-fracking-california-will-hurt-latino-communities>
- <sup>xiii</sup> <https://insideclimatenews.org/news/04032020/air-pollution-shortens-life-expectancy-fossil-fuel/>; <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>
- <sup>xiv</sup> <https://www.lung.org/clean-air/outdoors/who-is-at-risk/disparities>
- <sup>xv</sup> <https://www.theguardian.com/environment/2020/dec/03/uk-vows-outdo-other-major-economies-emissions-cuts-by-2030>
- <sup>xvi</sup> <https://www.cbsnews.com/news/uk-ban-new-gasoline-diesel-cars-vehicles-by-2030-boris-johnson-green-industrial-revolution/>
- <sup>xvii</sup> <https://www.bbc.com/news/science-environment-54858638>
- <sup>xviii</sup> <https://www.reuters.com/article/us-usa-rhode-island-renewables/rhode-island-governor-aims-for-100-renewable-power-by-2030-idUSKBN1ZG2BI>
- <sup>xix</sup> [Drawdown 2020 Review](#), March 2020
- <sup>xx</sup> N. Kittner, F. Lil, and D. M. Kammen (2017) "Energy storage deployment and innovation for the clean energy transition," *Nature Energy*, **2**, 17125.
- <sup>xxi</sup> 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)
- <sup>xxii</sup> World Resources Institute <https://www.wri.org/blog/2020/07/economic-benefits-climate-action-us>
- <sup>xxiii</sup> <https://laborcenter.berkeley.edu/putting-california-on-the-high-road-a-jobs-and-climate-action-plan-for-2030/>
- <sup>xxiv</sup> Climate-Safe California is defined as CA becoming a net carbon sink with sequestration greater than emissions, achieving initial stages of drawdown by 2030.
- <sup>xxv</sup> Note that this suite of policies will be updated with the latest science, and input from experts and partners.
- <sup>xxvi</sup> 80% below 1990 levels of 431 MMT CO<sub>2</sub>e equals 86 MMT of CO<sub>2</sub>e annual emissions by 2030.
- <sup>xxvii</sup> With vastly increased investments in nature-based sequestration on natural and working lands starting no later than 2022 (also providing other benefits e.g., water, biodiversity and food security), California can sequester an additional 100+ MMT CO<sub>2</sub>e annually from the atmosphere by 2030. Combined with reaching measured emissions reductions of 80% below 1990 levels or 86 MMT of annual CO<sub>2</sub>e emissions by 2030, the state could reach -14 MMT CO<sub>2</sub>e annually, starting drawdown or net negative emissions. Nascent [negative emissions technologies](#) could likely scale up by the 2030's to further increase atmospheric drawdown of GHGs.
- <sup>xxviii</sup> Existing state policies call for achieving 80% below 1990 levels of GHGs by 2050 ([Governor Schwarzenegger Executive Order S-3-05 2005](#)) and "maintaining net-negative emissions" after achieving carbon neutrality by "no later than 2045" ([Governor Jerry Brown Executive Orders B-55-18](#) 2018).
- <sup>xxix</sup> World Resources Institute. [Leaving no worker behind in shifting to a low-carbon future](#). March 2019.
- <sup>xxx</sup> [California Senate Bill 379](#) (2015) requires that "all cities and counties to include climate adaptation and resiliency strategies in the Safety Elements of their General Plans upon the next revision beginning January 1, 2017" but provides no funds to pay for this.
- <sup>xxxi</sup> 2020 saw bills in the California state legislature to address this including [SB 1240](#) (Senator Nancy Skinner) Utility Reform Planning and [SB 1314](#) (Senator Bill Dodd) the Community Energy Resilience Act, prioritizing initial efforts in lower income communities.
- <sup>xxxii</sup> There were approximately 240 million passengers at California's top 8 airports in 2018. If most paid a \$10 climate-safe California fee, with exceptions for lower-income travelers, the state could secure almost ~\$2.4 billion annually.

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- <sup>xxxiii</sup> Raymond et al. [The emergence of heat and humidity too severe for human tolerance](#). *Science Advances*, May 2020; Leleiveld et al., [Loss of life expectancy from air pollution: a worldwide perspective](#). *Cardiovascular Research*, March 2020; Hoffman et al. [Effects of Historical Housing Policies on Resident Exposure to Intra-Urban Heat](#). *Climate*, 2020; K.L. Ebi, et al. [Human Health](#). In *Fourth Natl. Climate Assessment, Volume II*. U.S. Global Change Research Program, Washington, DC.
- <sup>xxxiv</sup> NOAA; [2019 Was the 2nd-Hottest Year Globally on Record, & Ocean Temperatures Are Hotter Than Ever](#), *Time Mag.*, Jan. 16, 2020; J. Samelow, [Congratulations, You Just Survived the 5 Hottest Years on Record](#), *Wash. Post*, Feb 2019
- <sup>xxxv</sup> Pullano. [U.S. Medical Groups Warn Candidates: Climate Change Is a 'Health Emergency'](#). *Inside Climate News*. June 2019; and [US Call to Action on Climate, Health and Equity](#) (pdf)
- <sup>xxxvi</sup> [Global Risks Report 2020: A decade left: Confronting Runaway Climate Threat](#). World Economic Forum. Jan 15 2020; Gonzalez, [Huge Costs in Climate Inaction](#), *Business Insurance*, Jan 2019
- <sup>xxxvii</sup> Hubau, et al. [Asynchronous carbon sink saturation in African and Amazonian tropical forests](#). *Nature*, March 2020; Tollefson, [World's oceans are losing power to stall climate change](#), *Nature*, Sept 2019; and, IPCC, [Special Report on the Ocean and Cryosphere in a Changing Climate](#), Sept 2019.
- <sup>xxxviii</sup> Turetsky et al. [Carbon release through abrupt permafrost thaw](#). *Nature Geoscience | VOL 13 | February 2020*, and *Science Daily*, [Arctic permafrost thaw plays greater role in climate change than previously estimated](#), Feb 3, 2020.
- <sup>xxxix</sup> Li, et al. [Increasing ocean stratification over the past half-century](#). *Nature Climate Change*, Sept. 2020 <https://doi.org/10.1038/s41558-020-00918-2>; and, New Study Shows a Vicious Circle of Climate Change Building on Thickening Layers of Warm Ocean Water <https://insideclimatenews.org/news/28092020/ocean-stratification-climate-change> |
- <sup>xl</sup> Hu et al. [Deep-reaching acceleration of global ocean circulation over the past two decades](#) *Science Advances*. 05 Feb 2020; C. Mooney. [Oceans speeding up: another mega-scale consequence of climate change](#). *Wash Post*, Feb. 5 2020.
- <sup>xli</sup> A. Woodward, [Melting ice is slowing down the Atlantic ocean's circulation system](#). *Business Insider*, Sept 26, 2019.
- <sup>xlii</sup> Berdugo, et al. [Global ecosystem thresholds driven by aridity](#). *Science*, 2020; 367 (6479): 787; [Major study shows climate change can cause abrupt changes to dryland ecosystems](#). *ScienceDaily*, Feb 2020. Trisos et al. [The projected timing of abrupt ecological disruption from climate change](#). *Nature*, 2020
- <sup>xliii</sup> <https://www.washingtonpost.com/weather/2020/04/16/southwest-megadrought-climate-change/>, Williams et al. [Science Apr 17 2020](#)
- <sup>xliv</sup> [Dangers of Accelerated Biodiversity Loss](#) in [Global Risks Report 2020](#). World Economic Forum. Jan 15 2020
- <sup>xlv</sup> Palmer, et al. [The scientific challenge of understanding and estimating climate change](#). *PNAS*. Dec 2019
- <sup>xlvi</sup> Kolden, @pyrogeog on Twitter, Sept 10, 2020
- <sup>xlvii</sup> Lamontagne et al. [Robust abatement pathways to tolerable climate futures require immediate global action](#). *Nature Climate Change*, 2019 and [Few pathways to an acceptable climate future without immediate action](#), March 11, 2019. Note the IPCC assesses only a handful of future climate pathways.
- <sup>xlviii</sup> <https://www.sciencedaily.com/releases/2020/12/201221160425.htm>
- <sup>xlix</sup> J. Rockström, [Swedish Radio](#), Dec. 2019.
- <sup>l</sup> Governor's office. [Climate Pollution continues to drop below 2020 target while state's economy grows](#). Aug 2019; Rogers, [California has 5 times more clean energy jobs than fossil fuel jobs](#). *SJ Mercury News*. Aug 20 2019.
- <sup>li</sup> California Air Resources Board, [Natural and Working Lands](#), 2020.
- <sup>lii</sup> <https://calmatters.org/environment/2020/09/california-governor-climate-emergency/>
- <sup>liii</sup> For more on these bold accelerated targets, see: [Copenhagen](#), [Norway](#), [Uruguay](#), [Finland](#), and [Rhode Island](#).
- <sup>liv</sup> [California voters call climate change their top priority](#), *LA Times*, Dec 6 2019; PPIC, [Californian's Views on Climate Change](#). July 2018.