April 20, 2022

Governor Gavin Newsom 1021 O Street, Suite 9000 Sacramento, CA 95814

Dear Governor Newsom,

As California and U.S. scientists, we commend you and your administration on taking key steps toward protecting California's communities and climate from fossil fuel pollution: proposing a health and safety setback between communities and new oil and gas wells, a ban on new fracking projects by 2024, and joining the Beyond Oil & Gas Alliance as an associate member.

But in this time of emergency, stronger action is needed now to stem the escalating climate, health and justice crises created by fossil fuel pollution. The oil industry drills in our neighborhoods, pollutes our air, soil, and water, and harms public health. It fuels the growing climate crisis that is taking lives, destroying homes, and jeopardizing our future—with harms falling on Latinx, Black, Indigenous, and low-income communities first and worst.

We implore you and your administration to use executive authority to lead the state in a rapid and just transition away from fossil fuels, oversee a clean renewable energy build-out, and put public health, safety, and a livable future first. Specifically, we urge you to:

- End neighborhood oil drilling by promptly finalizing a strong, comprehensive healthand-safety setbacks rule that prohibits all oil and gas operations within a minimum 3,200 feet of homes, schools, hospitals, and other sensitive sites, as advised by CalGEM's own public health experts. This rule would:
 - End new oil and gas extraction permits within the setback while the rule is pending;
 - Prohibit all new permits within the setback that enable continued production including redrilling, sidetracking, reworking, and returning idle or abandoned wells to active production or injection;
 - O Rapidly phase out existing wells and infrastructure within the setback; and
 - Enact pollution controls on all oil and gas operations outside the buffer.
- **Stop permitting new fossil fuel projects**, including new oil and gas extraction, fossil fuel infrastructure, and petrochemical projects in all of California.
- Phase out existing oil and gas production in line with the Paris Agreement's 1.5°C climate limit, with an equitable transition that protects workers, communities and economies.

- Reject fossil fuel industry delay tactics including carbon capture and storage, "blue" hydrogen made from fossil fuels, and carbon offsets, that allow the fossil-fuel era to continue and impede the rapid transition to clean renewable energy.
- Advance to full Beyond Oil & Gas Alliance membership and advocate with the Biden administration and other states for greater action and membership.

California's oil industry has created a public health and environmental justice crisis in our state. From Los Angeles to Kern County to the Bay Area, more than 7 million Californians, totaling 18 percent of the population, live within a mile of at least one oil or gas well.³ A long history of environmental racism has concentrated oil and gas wells, refineries, and other fossil fuel infrastructure—with all their adjacent harms—in Black, Brown and Indigenous communities.⁴ In California, the majority of residents living closest to oil and gas extraction sites are people of color.⁵

A large and growing body of public health data has established that exposure to toxic emissions and chemicals⁶ from oil and gas drilling leads to serious health harms.⁷ Research in California⁸ and other states shows that living near oil and gas wells increases the risks of cancer,⁹ asthma,¹⁰ birth defects,¹¹ preterm births and high-risk pregnancies,¹² low-birthweight babies,¹³ higher hospitalization rates,¹⁴ and upper respiratory problems and rashes.¹⁵

California cannot be a health and environmental justice leader while giving permits to the oil industry to dig, burn, and dump toxic pollution in communities of color and low-income communities.

Fossil fuel pollution is also driving a "code red" climate emergency in California and globally, where the chances for avoiding irreversible and uncontrollable climate chaos diminish daily. Fossil-fueled climate disasters are escalating across California. The damage from increasingly extreme heat waves, droughts and floods, as well as destruction from wildfires¹⁶ once again falls disproportionately on Brown, Black, Indigenous and low-income frontline communities.¹⁷ These climate disasters are certain to get worse – much worse – without emergency action to rapidly phase out fossil fuel extraction.

A robust body of scientific research has established that new fossil fuel production and infrastructure must be halted and much existing production must be phased out to limit global temperature rise to 1.5 degrees Celsius and avoid the worst climate catastrophe. Leaders around the world have acknowledged the urgency to end new fossil fuel project approvals. 19

Yet California is still one of the country's top oil producers. Further, due to the use of extreme, energy-intensive extraction techniques, oil produced in California is among the most climatedamaging in the world.²⁰ California cannot confront the climate crisis while continuing to

expand fossil fuel development and infrastructure. It must also reject ineffective and dangerous false solutions like carbon capture and storage (CCS), hydrogen produced from fossil fuels, and carbon offsets that enable the fossil fuel industry to prolong its polluting operations.²¹

We implore you and your administration, on behalf of California's communities and all life on Earth, to lead the necessary rapid transition away from fossil fuels, beginning with an immediate end to all neighborhood drilling and new fossil fuel project approvals, and oversee a rapid buildout of clean, renewable energy that truly protects people and the planet.

Sincerely,

Scientists joining this letter do so in their individual capacities and not on behalf of the institutions with which they are affiliated.

Original Signatories

Robert Bullard, PhD

Distinguished Professor of Urban Planning and Environmental Policy, Texas Southern University Director of the Bullard Center for Environmental and Climate Justice

Mijin Cha, JD, LLM, PhD

Assistant Professor, Urban and Environmental Policy, Occidental College

Rebecca Hernandez, PhD

Associate Professor of Ecology and Earth System Science, University of California, Davis Co-Founder/Co-Director of the Wild Energy Initiative at the John Muir Institute of the Environment

Peter Kalmus, PhD

Climate Scientist

UCLA Joint Institute for Regional Earth System Science and Engineering

Michael E. Mann, PhD
Distinguished Professor of Atmospheric Science
Pennsylvania State University

Manuel Pastor, PhD

Distinguished Professor of Sociology and American Studies & Ethnicity, Director of USC Dornsife Equity Research Institute, University of Southern California

Bhavna Shamasunder, PhD Associate Professor and Chair, Urban and Environmental Policy; Co-Chair, Public Health Occidental College

Aradhna Tripati, PhD
Professor, Institute of the Environment and Sustainability
Director, Center for Diverse Leadership in Science
University of California, Los Angeles

California Scientist Signatories

Cort Anastasio, PhD Clair Brown, PhD

Professor Professor, Department of Economics;

University of California, Davis Director, Center for Work, Technology and

Society

Andreas Andersson, PhD University of California, Berkeley

Professor, Scripps Institution of

Oceanography Margie Chen, MD

University of California, San Diego Clinical Professor Emeritus, Department of

Obstetrics, Gynecology and Reproductive

Naomi Bardach, MD Sciences

MAS Professor of Pediatrics and Health University of California, San Francisco

Policy

University of California, San Francisco Anne C. Cohen, PhD

Research Professor

Renato Braghiere, PhD University of California, Los Angeles

Climate Scientist, Joint Institute for Regional

Earth System Science and Engineering Jennifer Cotton, PhD University of California, Los Angeles Associate Professor

California State University, Northridge

Paula Braveman, MPH, MD

Professor of Family and Community Carlos Davidson, PhD

Medicine Professor Emeritus, Environmental Studies

University of California, San Francisco San Francisco State University

Matthew d'Alessio, PhD

Professor, Department of Geological

Sciences

California State University, Northridge

Jade d'Alpoim Guedes, PhD

Associate Professor

Scripps Institution of Oceanography

Kathryn Teigen De Master, PhD

Associate Professor of Agriculture, Society,

and Environment

University of California, Berkeley

Rabia Djellouli, PhD

Professor

California State University, Northridge

Paul Ralph Ehrlich, PhD

Bing Professor of Population Studies

Emeritus Department of Biology

Stanford University

Ann Feeney, PhD

Professor Emeritus

Scripps Research, San Diego

Nicholas Foster, PhD

Project Scientist

University of California, Los Angeles

Catherine Gautier, PhD

Professor Emerita

University of California, Santa Barbara

Peter H. Gleick, PhD

President-Emeritus, Pacific Institute

Member, US National Academy of Sciences

Robert M. Gould, MD

Program on Reproductive Health and the

Environment, Department of Obstetrics, Gynecology and Reproductive Sciences

University of California, San Francisco

John Harte, PhD

Distinguished Professor of the Graduate

School

University of California, Berkeley

Peter J Hernes, PhD

Professor of Hydrology and Aqueous

Geochemisty

University of California, Davis

Karen Holl, PhD

Professor, Environmental Studies

University of California, Santa Cruz

Elizabeth Hoover, PhD

Associate Professor, Department of Environmental Science, Policy and

Management

University of California, Berkeley

Alastair Iles, PhD

Associate Professor, Environmental Science,

Policy & Management

University of California, Berkeley

Mark Z. Jacobson, PhD

Professor

Stanford University

Glenn Jaecks, PhD

Professor

American River College

Kathleen Johnson, PhD

Associate Professor, Department of Earth

System Science

University of California, Irvine

Dustin Mulvaney, PhD

Roberta Millstein, PhD

University of California, Davis

Professor Emerit

Professor, Department of Environmental

Studies

San José State University

Marina Kalyuzhnaya, PhD Associate Professor

San Diego State University

Scott T Kelley, PhD Tran Nguyen, PhD

Professor of Biology Assistant Professor of Environmental

San Diego State University Chemistry

University of California, Davis

David Klein, PhD

Professor of Mathematics Sahar Nouredini, PhD

California State University, Northridge Assistant Professor, Department of Nursing

California State University East Bay

Jasper Kok, PhD

Professor Stacy Ochoa Mikrut, PhD

University of California, Los Angeles Lecturer

San Diego State University

Michael Kutilek, PhD

Professor Emeritus David N. Pellow, PhD

San Jose State University

Dehlsen Chair of Environmental Studies
University of California, Santa Barbara

Michael E. Loik, PhD

Professor, Environmental Studies Nancy Lee Peluso, PhD

Department Professor Department of Environmental

University of California, Santa Cruz Science, Policy, and Management
University of California, Berkeley

Ed Maurer, PhD

Professor and Chair, Civil, Environmental, Janet Perlman, MPH, MD

and Sustainable Engineering Dept. University of California, San Francisco

Santa Clara University

Stacy Philpott, PhD

Kathleen McAfee, PhD Professor

Professor University of California, Santa Cruz San Francisco State University

Ralph E Purdy, PhD

Professor Emeritus

University of California, Irvine

Laurie J Price, PhD, MPH

Professor Emeritus, Anthropology and

Public Health

California State University, East Bay

Isha Ray, PhD

Professor, Energy and Resources Group

University of California, Berkeley

Terry L. Root, PhD Senior Fellow Emerita

Stanford University

Jerry Rosen, PhD

Professor

California State University, Northridge

Kate Scow, PhD

Distinguished Professor of Soil Science and

Microbial Ecology

University of California, Davis

Ulrike Seibt, PhD

Associate Professor

University of California, Los Angeles

Leonard Sklar, PhD

Professor Emeritus, Earth and Climate

Sciences Department

San Francisco State University

Patrice Sutton, MPH

Collaborating Research Scientist, Program

on Reproductive Health and the

Environment

University of California, San Francisco

Andrew Szasz, PhD

Professor Emeritus of Environmental

Studies

University of California, Santa Cruz

Varykina Thackray, PhD

Professor

University of California, San Diego

Kathy Tran, PhD

Epidemiologist

University of California, Berkeley

Michael Tullius, PhD

Project Scientist, School of Medicine University of California, Los Angeles

William Breck Tyler, MS

Project Scientist, Institute of Marine

Sciences

University of California, Santa Cruz

Julia Walsh, MD, MSc

Senior Research Scientist, Bixby Center for Population, Health, and Sustainability Professor, Retired, Maternal and Child

Health and International Health, School of

Public Health

University of California, Berkeley

Anthony Wexler, PhD
Distinguished Professor

University of California, Davis

Stephen M. Wheeler, PhD

Professor, Department of Human Ecology

University of California, Davis

Elizabeth Allison, PhD

Associate Professor

California Institute of Integral Studies

Omar Clay, PhD

Research Director, Adjunct Faculty

Science for the People

Timothy Donaghy, PhD

Research Manager

Greenpeace USA

Kyle Ferrar, MPH

Western Program Coordinator

FracTracker Alliance

John Fleming, PhD

Senior Scientist, Climate Law Institute

Center for Biological Diversity

Jessica Lawrence, MS

Staff Scientist

Earthjustice

Amy Moas, PhD

Senior Climate Campaigner

Greenpeace USA

Chad Monk, MPH

Vice President, Programs & Public Policy

National Health Foundation

Linda Rudolph, MPH, MD

Senior Advisor, Public Health Institute Center for Climate Change and Health

Ted Schettler, MPH, MD

Science Director

Science and Environmental Health Network

Shaye Wolf, PhD

Climate Science Director, Climate Law

Institute

Center for Biological Diversity

Mateo Acosta, PhD

Researcher

California Institute of Technology

Lujain Al-Saleh, MPH

School of Public Health Alumni
University of California, Berkeley

Tyler Anthony, PhD

Postdoctoral Researcher

University of California, Berkeley

Eviatar Bach, PhD

Postdoctoral Research Associate

California Institute of Technology

Aida Behmard, PhD

NSF Graduate Fellow

California Institute of Technology

David Bezanson, PhD

Clinical Psychologist, Neuropsychologist

Rebecca Eliscu, BS Research Analyst

University of California, San Francisco

Ralf Buengener, PhD

Senior Staff, Process Engineer

Intel Corporation

Marc Futernick, MD

Emergency Physician

American College of Emergency Physicians

Ken Burgett, BS

Mechanical Engineering, Software

Consultant

Computer History Museum

Breahna Gillespie, MS

PhD Candidate

University of California, Davis

Michael W. Busch, PhD

Research Scientist

SETI Institute

Heath Goertzen, BS

Lab Assistant

University of California, Davis

Kevin Carter-Fenk, PhD Postdoctoral Scholar

University of California, Berkeley

Sue Hilton, MS

Hydrologist

Kimberly Carter-Fenk, PhD

Postdoctoral Scholar Stanford University Stefanie Holden, MS Graduate Student

University of California, San Diego

Arthur Charles-Orszag, PhD

Postdoctoral Scholar

Engineer, IEEE

University of California, San Francisco

Pat Holland, PhD, MS

Leo Holland, PhD, MS

Educator

Diana Curiel, MPH, MPH

Educator

Dillon Jones, MS

Graduate Student/Science Communicator

San Diego State University

Laura Marie Dahler Heinlein

PhD Student

University of California, Davis

Tobias Koehne, MS

PhD Candidate

California Institute of Technology

Hannah Dion-Kirschner, MS

PhD Candidate

California Institute of Technology

Celeste Labedz, MS PhD Candidate

California Institute of Technology

Jonathan Lu, MS Medical Student Stanford University

Azucena Lucatero, MA PhD Candidate, Environmental Studies University of California, Santa Cruz

Kyle Manley, PhD Graduate Student Researcher University of California, Irvine

Chris Milliner, PhD
Postdoctoral Scholar
California Institute of Technology

James Mullahoo, BS

California Institute of Technology

Daniela Osorio Rodriguez, MS PhD Student

California Institute of Technology

Harrison Parker, MS

PhD Student

Graduate Student

California Institute of Technology

Jessica Plein, MS

San Diego State University

Jacob Roberts, PhD Graduate Student Researcher University of California, Berkeley Andreana Rosnik, PhD Cheminformatics Scientist

Atomwise Inc

Calvin Rusley, BS PhD Student

California Institute of Technology

Juliet Ryan-Davis, MS PhD Student in Geology

California Institute of Technology

Luke Salvato, PhD, MS Graduate Student

University of California, Davis

Sandipan Samaddar, PhD
Postdoctoral Scholar

University of California, Davis

Vincent Santora, PhD

Director

Neurocrine Biosciences

Charles Schreiner, PhD Psychologist (Retired)

Tina Seeger, MS PhD Student

California Institute of Technology

Shaelyn Silverman, BS Graduate student

California Institute of Technology

Jaeeun Sohng, PhD PhD Candidate

University of California, Davis

Oliver Stephenson, MS Cora Went
PhD Candidate in Geophysics PhD Student

California Institute of Technology California Institute of Technology

Francia Tenorio, MS Brandie White Graduate Student PhD Candidate

San Diego State University University of California, San Diego

Benjamin James Thyer, BA Philip Woods, BS
PhD Student Graduate Student

California Institute of Technology California Institute of Technology

Jennifer Waters, BS Zewen Zheng
Doctoral Candidate PhD Student

San Diego State University University of California, Davis

U.S. Scientist Signatories Outside California

Rose Abramoff, PhD Peggy Ann Berry, PhD, COHN-S, CLE,

Associate Scientist FAAOHN

Oak Ridge National Laboratory Registered Nurse

Alliance of Nurses for Healthy Environments

Auma Arunachala, PhD

Retired Professor Claire V Broome, MD

Charles University Medical Faculty Adjunct Professor, School of Public Health

Emory University

Patrick Belmont, PhD

Professor and Department Head John Bruno, PhD

Utah State University Professor

University of North Carolina, Chapel Hill

Neil P Bernstein, PhD

Emeritus Professor David G Campbell, PhD

Mount Mercy University and University of Professor of Biology

Iowa Grinnell College

Dominick A DellaSala, PhD

Chief Scientist

Wild Heritage, a Project of the Earth Island

Institute

William J Gutowski, Jr., PhD Professor of Meteorology Iowa State University

Lara Hansen, PhD

Michael Dettinger, PhD Chief Scientist
Research Hydrologist/Climatologist EcoAdapt

Research Hydrologist/Climatologist Eco

Scripps Institution of Oceanography

Tarek A Hijaz, MD

Kassandra Einfelt, MA Associate Professor of Radiology

Associate Professor Northwestern University

Hawkeye Community College

Robert Howarth, PhD

Dargan M W Frierson, PhD The David R. Atkinson Professor of Ecology

Associate Professor, Atmospheric Sciences & Environmental Biology

University of Washington Cornell University

Paula Gellner, MS Anthony R Ingraffea, PhD

Nurse Leader Dwight C. Baum Professor of Engineering,

Rhode Island College Emeritus

Cornell University

Walter Gerstle, PhD

Professor Emeritus David W Inouye, PhD University of New Mexico Professor Emeritus

University of Maryland

Robyn Gilden, PhD

Associate Professor, School of Nursing Kyle Isaacson, PhD

University of Maryland Formulation Chemist

Phospholutions

William Gorham, PhD

Retired, Senior Biologist, Associate Vice Rachel Jabaily, PhD

President Associate Professor of Organismal Biology &

AECOM Ecology

Colorado College

Anshul Gupta, PhD

Principal Research Staff Member Larry Junck, MD

IBM Research Professor of Neurology
University of Michigan

Denae King, PhD

Associate Director, Bullard Center for Environmental and Climate Justice

Texas Southern University

Robert R. Klepper, PhD Professor Emeritus

Iowa Lakes Community College

Jennifer Krauel, PhD Adjunct Professor

South Dakota State University

Charles Kuster, MS Meteorologist

University of Oklahoma

Roger Luckmann, MPH, MD

Professor Emeritus, Family Medicine and

Community Health

University of Massachusetts Chan Medical

School

Edward Maibach, PhD, MPH

Professor and Director, Center for Climate

Change Communication George Mason University

Gibran Mancus, PhD, RN

Assistant Professor

Alliance of Nurses For Healthy

Environments

Scott A Mandia, MS

Assistant Chair, Professor - Physical

Sciences

Suffolk County Community College

Colleen McLean, PhD

Associate Professor, Geology and

Environmental Science

Youngstown State University

Elizabeth Mizelle, PhD

Assistant Professor

East Carolina University

Susanne C Moser, PhD

Director, Principal Researcher Susanne

Moser Research & Consulting

University of Massachusetts-Amherst and

Antioch University New England

Stephen S Mulkey, PhD

Lecturer in Biology

University of Florida

Peter Nightingale, PhD

Professor, Department of Physics

University of Rhode Island

Philip Nyhus, PhD

Professor of Environmental Studies

Colby College

Joseph D Ortiz, PhD

Professor, Department of Earth Sciences

Kent State University

Nathan Glen Phillips, PhD

Professor

Boston University

Pierre PICA, PhD

Invited Professor

University of Arizona

Cyndhia Ramatchandirane, MS

Staff Scientist Doreen Stabinsky, PhD

Professor Earthjustice

College of the Atlantic

Peter H Raven, PhD **President Emeritus** John F Stolz, PhD

Missouri Botanical Garden Professor **Duquesne University**

William J Ripple, PhD Distinguished Professor of Ecology Sarah Tuttle, PhD

Oregon State University Assistant Professor of Astronomy

University of Washington

Larry W Robertson, PhD **Professor Emeritus** Thomas T Veblen, PhD

University of Iowa Distinguished Professor University of Colorado, Boulder

Carl Safina, PhD President and Founder Dr. Adrienne Wald, EdD, MBA, RN

The Safina Center Associate Professor Mercy College

Gordon Shepherd, MD, PhD Professor B Stanley Willenbring, PhD

Northwestern University Professor of Physiology (Retired)

Dabney S Lancaster Community College

Policy Committee Dawn J Wright, PhD

Elders Climate Action Professor of Geography and Oceanography

Oregon State University

Daniel J Smith, PhD, RN

Assistant Professor Villanova University

Stephen J Simon, PhD

References

https://info.ornl.gov/sites/publications/files/Pub60561.pdf; PSE Healthy Energy, Natural gas power plants in California's disadvantaged communities (April 2017), https://www.psehealthyenergy.org/wp-content/uploads/2017/04/CA.EJ_.Gas_.Plants.pdf; Mikati, Ihab et al., Disparities in distribution of particulate matter emission sources by race and poverty status, 108 American Journal of Public Health 480 (2018), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5844406/; Zwickl, K. The demographics of fracking: A spatial analysis for four U.S. states, 161 Ecological Economics 202 (2019),

https://doi.org/10.1016/j.ecolecon.2019.02.001; Donaghy, Tim & Charlie Jiang for Greenpeace, Gulf Coast Center for Law & Policy, Red, Black & Green Movement, and Movement for Black Lives, Fossil Fuel Racism: How Phasing Out Oil, Gas, and Coal Can Protect Communities (2021),

https://www.greenpeace.org/usa/wp-content/uploads/2021/04/Fossil-Fuel-Racism.pdf; Terrell, K., Air pollution is linked to higher cancer rates among black or impoverished communities in Louisiana, 17 Environ. Res. Lett. 014033 (2022), https://iopscience.iop.org/article/10.1088/1748-9326/ac4360; Gonzalez, David J.X. et al., Historic redlining and the siting of oil and gas wells in the United States, Journal of Exposure Science and Environmental Epidemiology (2022),

https://www.nature.com/articles/s41370-022-00434-9

https://www.conservation.ca.gov/calgem/Documents/public-

health/Public%20Health%20Panel%20Responses FINAL%20ADA.pdf

https://www.gov.ca.gov/2021/10/22/what-theyre-saying-environmental-and-health-advocates-support-californias-move-to-prevent-new-oil-drilling-near-communities-expand-health-protections/
 https://www.gov.ca.gov/2021/04/23/governor-newsom-takes-action-to-phase-out-oil-extraction-in-california/

³ Ferrar, Kyle, Impact of a 2,500' Oil and Gas Well Setback in California, FracTracker Alliance (July 2, 2019), https://www.fractracker.org/2019/07/impact-of-a-2500-oil-and-gas-well-setback-in-california/
⁴ See Bullard, Robert D. et al., Toxic Wastes and Race at Twenty: 1987-2007 (March 2007), https://www.ejnet.org/ej/twart.pdf; James, W., Uneven Magnitude of Disparities in Cancer Risks from Air Toxics, 9 Int. J. Environ. Res. Public Health 4365 (2012), https://www.mdpi.com/1660-4601/9/12/4365/htm; Wilson, Adrian et al., Coal Blooded: Putting Profits Before People, NAACP, Indigenous Environmental Network & Little Village Environmental Justice Organization (2012), https://naacp.org/resources/coal-blooded-putting-profits-people; U.S. Environmental Protection Agency, EJ Screening Report for the Clean Power Plan (2015), https://archive.epa.gov/epa/sites/production/files/2016-04/documents/ejscreencpp.pdf; Massetti, Emanuele et al., Environmental Quality and the U.S. Power Sector: Air Quality, Water Quality, Land Use and Environmental Justice, ORNL/SPR-2016/772 (2017),

⁵ Ferrar, Kyle, Impact of a 2,500' Oil and Gas Well Setback in California, FracTracker Alliance (July 2, 2019), https://www.fractracker.org/2019/07/impact-of-a-2500-oil-and-gas-well-setback-in-california/

⁶ Harmful chemicals include crystalline silica, methanol, hydrochloric acid, 2-butoxy ethanol, hydrofluoric acid, formaldehyde, aluminum oxide, glutaral/pentanedial, xylene, isopropanol, ethylbenzene, and naphthalene. Other harmful chemicals are unknown due to industrial trade secret protections, allowing oil operators to avoid responsibility for the health and safety impacts associated with these chemicals.

⁷ Shonkoff, Seth B.C. et al., Response to CalGEM Questions for the California Oil and Gas Public Health Rulemaking Scientific Advisory Panel (October 1, 2021),

⁸ Studies in California include: Shamasunder, Bhavna et al., Community-based heath and exposure study around urban oil developments in South Los Angeles, 15 International Journal of Environmental Research and Public Health 138 (2018), 10.3390/ijerph15010138; Garcia-Gonzales, Diane A. et al.,

Distance decay gradients in hazardous air pollution concentrations around oil and natural gas facilities in the city of Los Angeles: A pilot study, 173 Environmental Research 232 (2019), https://doi.org/10.1016/j.envres.2019.03.027; Gonzalez, D.J.X., et al, Oil and gas production and spontaneous preterm birth in the San Joaquin Valley, CA, 4 Environmental Epidemiology e099 (2020), doi: 10.1097/EE9.0000000000000099; Tran, K.V. et al., Residential Proximity to Oil and Gas Development and Birth Outcomes in California: A Retrospective Cohort Study of 2006–2015 Births, 128 Environmental Health Perspectives No. 6 (2020), https://doi.org/10.1289/EHP5842; Casey, Joan A. et al., Climate justice and California's methane superemitters: Environmental equity assessment of community proximity and exposure intensity, 55 Environmental Science and Technology 14746 (2021), https://doi.org/10.1021/acs.est.1c04328; Elser, Holly et al., Air pollution, methane super-emitters and oil and gas wells in Northern California: the relationship with migraine headache prevalence and exacerbation, 20 Environmental Health 45 (2021), https://doi.org/10.1186/s12940-021-00727-w; Johnston, Jill E. et al., Changes in neighborhood air quality after idling of an urban oil production site, 23 Environmental Science Process Impacts 967 (2021), doi: 10.1039/d1em00048a; Johnston, Jill E. et al., Respiratory health, pulmonary function and local engagement in urban communities near oil development, 197 Environmental Research 111088 (2021), 10.1016/j.envres.2021.111088; Tran, Kathy V. et al., Residential proximity to hydraulically fractured oil and gas wells and adverse birth outcomes in urban and rural communities in California (2006-2015), 5 Environmental Epidemiology e172 (2021), doi: 10.1097/EE9.00000000000172; Gonzalez, David J.X. et al., Upstream oil and gas production and ambient air pollution in California, 806 Science of the Total Environment 150298 (2022), https://doi.org/10.1016/j.scitotenv.2021.150298; Gonzalez, David J.X. et al., Historic redlining and the siting of oil and gas wells in the United States, Journal of Exposure Science and Environmental Epidemiology (2022), https://www.nature.com/articles/s41370-022-00434-9 ⁹ McKenzie, Lisa M. et al., Ambient nonmethane hydrocarbon levels along Colorado's Northern Front Range: Acute and chronic health risks, 52 Environmental Science and Technology 4514 (2018), https://pubs.acs.org/doi/full/10.1021/acs.est.8b06179

¹⁰ Rasmussen, Sara G. et al., Association Between Unconventional Natural Gas Development in the Marcellus Shale and Asthma Exacerbations, 176 JAMA Internal Medicine 1334 (2016), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5424822/; Shamasunder, Bhavna et al., Community-based heath and exposure study around urban oil developments in South Los Angeles, 15 International Journal of Environmental Research and Public Health 138 (2018), https://pubmed.ncbi.nlm.nih.gov/29342985/

¹¹ McKenzie, Lisa M., Birth Outcomes and Maternal Residential Proximity to Natural Gas Development in Rural Colorado, 122 Environmental Health Perspectives 412 (2014), https://ehp.niehs.nih.gov/doi/pdf/10.1289/ehp.1306722

¹² Casey, Joan A., Unconventional Natural Gas Development and Birth Outcomes in Pennsylvania, USA, 27 Epidemiology 163 (2016), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4738074/pdf/nihms-728721.pdf; Whitworth, K.W. et al., Maternal residential proximity to unconventional gas development and perinatal outcomes among a diverse urban population in Texas, 12 PLoS One e0180966 (2017), https://doi.org/10.1371/journal.pone.0180966; Hill, Elaine L., Shale gas development and infant health: Evidence from Pennsylvania, 61 Journal of Health Economics 134 (2018), https://doi.org/10.1016/j.jhealeco.2018.07.004; Gonzalez, D.J.X., et al, Oil and gas production and spontaneous preterm birth in the San Joaquin Valley, CA, 4 Environmental Epidemiology e099 (2020), https://journals.lww.com/environepidem/Fulltext/2020/08000/Oil and gas production and spontaneous preterm.1.aspx?context=LatestArticles; Tran, Kathy V. et al., Residential proximity to hydraulically

fractured oil and gas wells and adverse birth outcomes in urban and rural communities in California (2006-2015), 5 Environmental Epidemiology e172 (2021), doi: 10.1097/EE9.00000000000000172

13 Stacy, Shaina L. et al., Perinatal Outcomes and Unconventional Natural Gas Operations in Southwest Pennsylvania (2015), https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0126425; Tran, K.V. et al., Residential Proximity to Oil and Gas Development and Birth Outcomes in California: A Retrospective Cohort Study of 2006–2015 Births, 128 Environmental Health Perspectives No. 6 (2020), https://doi.org/10.1289/EHP5842; Tran, Kathy V. et al., Residential proximity to hydraulically fractured oil and gas wells and adverse birth outcomes in urban and rural communities in California (2006-2015), 5 Environmental Epidemiology e172 (2021), doi: 10.1097/EE9.0000000000000172

14 Jemielita, Thomas et al., Unconventional Gas and Oil Drilling Is Associated with Increased Hospital Utilization Rates, 10 PLoS One 7 (2015),

https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0131093

- ¹⁵ Rabinowitz, Peter M. et al., Proximity to Natural Gas Wells and Reported Health Status: Results of a Household Survey in Washington County, Pennsylvania, 123 Environmental Health Perspectives 21 (2015), https://ehp.niehs.nih.gov/doi/pdf/10.1289/ehp.1307732
- ¹⁶ Bedsworth, Louise, et al. (California Governor's Office of Planning and Research, Scripps Institution of Oceanography, California Energy Commission, California Public Utilities Commission), Statewide Summary Report. California's Fourth Climate Change Assessment (2018), https://www.climateassessment.ca.gov/
- ¹⁷ Donaghy, Tim & Charlie Jiang for Greenpeace, Gulf Coast Center for Law & Policy, Red, Black & Green Movement, and Movement for Black Lives, Fossil Fuel Racism: How Phasing Out Oil, Gas, and Coal Can Protect Communities (2021), https://www.greenpeace.org/usa/wp-content/uploads/2021/04/Fossil-Fuel-Racism.pdf; U.S. Environmental Protection Agency, Climate Change and Social Vulnerability in the United States: A Focus on Six Impacts, EPA 430-R-21-003 (2021), www.epa.gov/cira/social-vulnerability-report
- ¹⁸ Oil Change International, The Sky's Limit: Why the Paris Climate Goals Require a Managed Decline of Fossil Fuel Production (September 2016), http://priceofoil.org/2016/09/22/the-skys-limit-report/; Intergovernmental Panel on Climate Change, Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty, (V. Masson-Delmotte, et al. eds., 2018), https://www.ipcc.ch/sr15/; Oil Change International, Drilling Toward Disaster: Why U.S. Oil and Gas Expansion Is Incompatible with Climate Limits (2019), http://priceofoil.org/drilling-towards-disaster; Tong, D. et al., Committed emissions from existing energy infrastructure jeopardize 1.5 °C climate target, 572 Nature 373-377 (2019); SEI, IISD, ODI, E3G, and UNEP, The Production Gap: The discrepancy between countries' planned fossil fuel production and global production levels consistent with limiting warming to 1.5°C or 2°C (2020), http://productiongap.org/; Achakulwisut, Ploy & Peter Erickson, Trends in fossil fuel extraction: Implications for a shared effort to align global fossil fuel production with climate limits, Stockholm Environment Institute Working Paper (April 2021), www.sei.org/publications/trendsin-fossil-fuel-extraction/; SEI, IISD, ODI, E3G, and UNEP, The Production Gap Report 2021 (2021), http://productiongap.org/2021report; Teske, Sven and Sarah Niklas, Fossil Fuel Exit Strategy: An orderly wind down of coal, oil and gas to meet the Paris Agreement (June 2021), https://fossilfueltreaty.org/exit-strategy; Calverley, Dan and Kevin Anderson, Phaseout Pathways for Fossil Fuel Production Within Paris-compliant Carbon Budgets, Tyndall Center for Climate Change Research (2022),

www.research.manchester.ac.uk/portal/files/213256008/Tyndall Production Phaseout Report final t ext 3 .pdf

¹⁹ United Nations Secretary-General, Secretary-General's statement on the IPCC Working Group 1 Report on the Physical Science Basis of the Sixth Assessment, Aug. 9, 2021, https://www.un.org/sg/en/content/secretary-generals-statement-the-ipcc-working-group-1-report-thephysical-science-basis-of-the-sixth-assessment; United Nations Secretary-General, Secretary-General Warns of Climate Emergency, Calling Intergovernmental Panel's Report 'a File of Shame", April 4, 2022, https://www.un.org/press/en/2022/sgsm21228.doc.htm; Harvey, Fiona, No new oil, gas or coal development if world is to reach net zero by 2050, says world energy body, Guardian, May 18, 2021, https://www.theguardian.com/environment/2021/may/18/no-new-investment-in-fossil-fuels-demandstop-energy-economist.

²⁰ Fleming, John C. PhD, Killer Crude: How California Produces Some Of The Dirtiest, Most Dangerous Oil In The World, Center for Biological Diversity (June 2021), https://www.biologicaldiversity.org/programs/climate_law_institute/pdfs/June-2021-Killer-Crude-Rpt.pdf

²¹ Jacobson, Mark Z., The health and climate impacts of carbon capture and direct air capture, 12 Energy & Environmental Science (2019),

https://pubs.rsc.org/en/content/articlelanding/2019/ee/c9ee02709b#!divAbstract; Badgley, Grayson et al., Systematic over-crediting in California's forest carbon offsets, 28 Global Change Biology 1433 (2021), https://onlinelibrary.wiley.com/doi/10.1111/gcb.15943; Howarth, R.W. and M.Z. Jacobson, How green is blue hydrogen? 9 Energy Science & Engineering 1676 (2021),

https://onlinelibrary.wiley.com/doi/full/10.1002/ese3.956