



Catalyst

Volume 21, Winter 2021

Bringing Back The Science

*UCS is helping restore
science-based federal
decisionmaking*

Time to Redefine National Security

**The Afterlife of
an EV Battery**

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The Union of Concerned Scientists puts rigorous, independent science to work to solve our planet's most pressing problems. Joining with people across the country, we combine technical analysis and effective advocacy to create innovative, practical solutions for a healthy, safe, and sustainable future.

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Looking Ahead, with Optimism



At the time of this writing, much still feels new: the year, the Biden administration, COVID-19 vaccines, hope. Perhaps you've been asking yourself, as we have at UCS, how to move on from the past year, when there wasn't much to remember fondly about it. From the crushing health and economic burdens of COVID-19 to the perversion of truth, the violent insurrection at the US Capitol, the sidelining of science, the stoking of societal division, and chipping away at democratic norms, we watched the previous administration abdicate its responsibility to protect and promote the health and safety of our nation, communities, and people.

Though I'm no Pollyanna, I'm an optimist; it's in my nature to identify silver linings and lessons learned as we look ahead and work for positive change. At the Union of Concerned Scientists, we are reflecting on the failures and injustices of our government, our economy, and our institutions, including our own. And we find hope and meaning in what we can do next.

As you'll see on the following pages, we are energized and committed to pushing for a just and sustainable recovery from the linked societal ills of structural racism, environmental injustice, and climate change. The cover story (p. 8) details our goal to restore the vital trust in science that has been damaged over the past four years, and return science to its rightful place in public policymaking, ahead of powerful interests. And the story that follows (p. 14) articulates a vision of equitable progress that UCS will work to achieve in the years ahead. I hope that these and our other stories of partnership, progress, and science in service of the public good help you share my optimism about the way forward and our work together.

It is humbling to be part of an organization that has fought so hard over the past four years to minimize the harms we could see coming, to keep careful record of the damage, and to make gains where we could.

Thank you for supporting the Union of Concerned Scientists. We couldn't have made it through 2020 without you. I am proud of our past work, and prouder still to show you, our members and supporters, what we have in store.

Kathleen Rest is executive director of UCS.



WHAT OUR SUPPORTERS ARE SAYING

Here's a sampling of recent feedback from the UCS Facebook page (www.facebook.com/unionofconcernedscientists), Instagram account (www.instagram.com/unionofconcernedscientists), and Twitter feed (www.twitter.com/ucsusa).

ON THE BIDEN ADMINISTRATION ELEVATING THE ROLE OF PRESIDENTIAL SCIENCE ADVISOR TO CABINET LEVEL

 Michael Byers:
Thank goodness, cabinet level no less. I can be proud to be a scientist again. Or at least [be] public about being a scientist!

 @KleyIDesign:
Hearing this is akin to someone telling me “Donuts delivered hot and fresh every morning. For life.”

ON THE IRRESPONSIBLE BEHAVIOR OF TYSON FOODS, WHOSE EMPLOYEES CONTRACTED COVID-19 AT RATES HIGHER THAN ANY OTHER FOOD PROCESSOR

 Mike Jiran:
Seems as good a time as any to point out [that] we usually talk about *The Jungle* as a book about food safety, but Upton Sinclair wrote it as a book about abusive labor practices.

 Dar Eckert:
This is why [the] decimation of USDA and OSHA is so damaging to workers. People need protection from big business often, and [have] no one to turn to without these agencies. They have recently tried to limit their liability so then you can't even sue them.

 JoAnne McIntire:
So sick of so many companies and agencies saying, “Our top priority is the safety of our workers” while their behavior has demonstrated the exact opposite.

 PJ Carness:
Reckless endangerment, craven indifference.

 Rusty Fenders:
Late-stage capitalism in a nutshell. Workers die while [management] bets on how they die, while giving themselves bonuses for cutting staff.

ON THE BIDEN ADMINISTRATION'S MEMORANDUM INTENDING TO STRENGTHEN FEDERAL SCIENCE

 Laura White:
Glad science and facts are valued again!

 Robert Roffman:
More forward progress . . . finally.

 christianrbaker:
About time we took some serious action!

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SciCAN: Connecting for Environmental Justice



SCICAN AIMS TO FOSTER CONVERSATIONS ABOUT THE WAYS THAT SCIENCE CAN SUPPORT ADVOCACY IN ADDRESSING COMMUNITY GOALS.

Imagine that some local activists come together to fight back against contaminants leaching into groundwater from a hazardous waste dump in their neighborhood. Full of passion and purpose, but perhaps scant on other resources, they begin organizing to protect the neighborhood. Starting from scratch, they may not know how to get their local elected officials' attention, how to provide scientific evidence for the potential harm to their community, or how to get the media to cover their work. They might not know how to access the expertise of scientists and others who could help—and similarly, those experts who would be willing

to help might not be aware of their cause.

The example is hypothetical, but the problem is very real—and the Union of Concerned Scientists has joined an effort to help solve it. Working with several of our environmental justice partners, we came up with a resources-sharing platform called the Science and Community Action Network (SciCAN). At www.scican.org, environmental justice organizations can connect with each other and with subject-matter experts to share resources and ideas. The platform is intended to bridge the divide between science and activism, so that scientists may learn from

and contribute their expertise to local grassroots movements, and grassroots movements can make an even stronger case with this scientific backing.

The SciCAN platform, now administered independently by an eponymous nonprofit, features an easily searchable resource library, a map of members so people can connect based on location, a “find an expert” feature, and a forum where users can interact for multidisciplinary collaborations.

“By inviting communities and other stakeholders to tell their stories and share their resources, it is my hope that participants will be eager to see others' stories as well as their own,” says Elizabeth Friedman of SciCAN. “I'm hopeful that over time, the site will develop and change into something truly cross-cultural, multidisciplinary and most importantly, useful to those individuals and groups who are already working as change agents within their communities.”

Victory Against New Nuclear Testing

Overshadowed in absurd controversy over vetoes and overrides, the 2021 National Defense Authorization Act became law on New Year's Day 2021 with one important result UCS had fought hard for: no funding for nuclear weapons tests in the United States.

Our analysts demonstrated that resuming nuclear testing—which has been banned for nearly 30 years—would cause more harm than good, and our outreach team partnered with Science Network members and people who have suffered the effects of testing in their communities to raise awareness of the issue. We also organized three letters to Congress making scientific, environmental, and public health cases against new testing. For the first, a dozen US scientists with expertise on nuclear weapons issues—

including UCS board member and Presidential Medal of Freedom winner Richard Garwin and UCS board member Steve Fetter—wrote that resuming explosive nuclear testing is unnecessary for technical or military reasons, and that doing so would have negative security consequences for the United States. Lawmakers decided not to authorize funds to prepare for such tests.



Faith, Climate, and Justice

Five faith leaders joined UCS leadership for a virtual discussion about climate and racial justice as interpreted in the texts and

teachings of Buddhism, Christianity, Islam, and Judaism, providing different perspectives on the imperative for action. The discussion, attended by hundreds of UCS members and supporters, acknowledged that many people of faith are also committed to science, and care deeply about climate change and equity. If you missed the conversation, you can watch it (and view full speaker bios) at www.ucsusa.org/conversation-faith-climate-justice.

ARE YOU READY TO MAKE CHANGE?

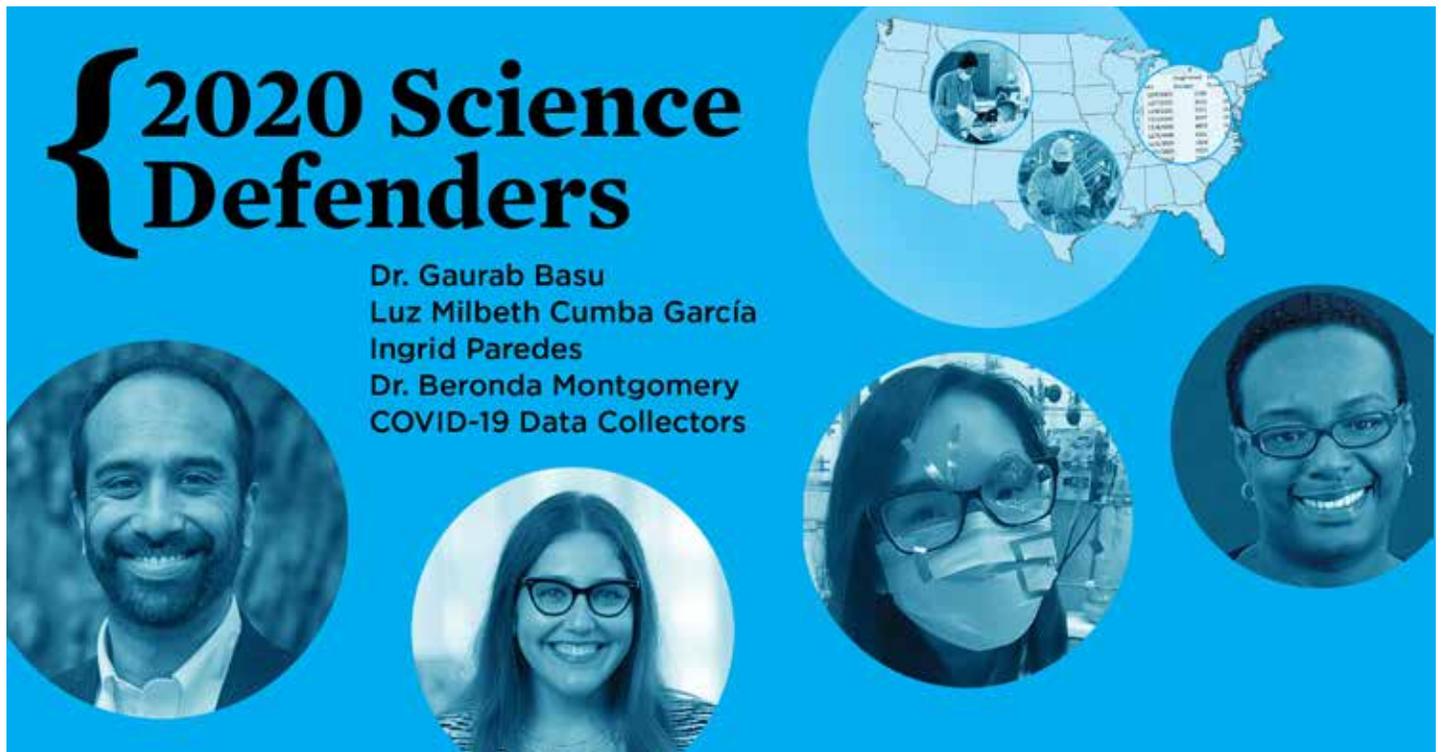
Don't miss a thing—visit <http://act.ucsusa.org/newyear> to be sure you stay up on the latest events and advocacy opportunities in the year ahead.

WHY MASK UP? BECAUSE SCIENCE.

Get this and other pro-science gear at the UCS store: STORE.UCSUSA.ORG

Enter **UCSMEMBER10** at checkout for 10% off your purchase!





{ 2020 Science Defenders

Dr. Gaurab Basu
Luz Milbeth Cumba García
Ingrid Paredes
Dr. Beronda Montgomery
COVID-19 Data Collectors



Fighting for Science and the Common Good

Each year, the Union of Concerned Scientists honors several individuals and groups who have taken a stand for science to protect the common good. Given the grim developments in 2020, it was especially important to honor those fighting for a better future and to celebrate their inspiring stories.

CARING FOR PATIENTS IN AND OUT OF THE CLINIC

Dr. Gaurab Basu: As Basu watched COVID-19 disproportionately strike his patients who were already struggling, he realized that in addition to treating them, he also needed to fight the systemic issues affecting their health. Basu helps train other clinicians to advocate for changes in their patients' broader circumstances. "We need to have fair systems

in place that take care of everyone," he says.

COVID-19 COMMUNICATOR

Luz Milbeth Cumba García: When COVID-19 arrived in Puerto Rico, disinformation about the virus also began spreading. Cumba García, a PhD student in immunology, volunteered to communicate life-saving information about the pandemic for people on the island. Through webinars, blogs, news stories, social media, radio shows, and podcasts, Cumba García translates information about COVID-19 from English to Spanish, and from medical jargon to understandable language.

HELPING STEM REPRESENT AT THE POLLS

Ingrid Paredes: Students majoring in STEM fields are less likely to vote in

elections, says Paredes, a PhD student in chemical engineering and co-founder of the March for Science NYC. Paredes and her team worked to get out the STEM vote in the 2020 election—making sure people were registered and committed to vote, and informing them about the issues at play locally and nationally. "Science is always on the ballot," she says.

#BLACKBOTANISTSWEEK CO-FOUNDER

Dr. Beronda Montgomery: "Social media has the power to bring together individuals historically underrepresented in academia," says Montgomery, co-organizer of the campaign #BlackBotanistsWeek. Hundreds of people have shared their stories and research interests via

#BlackBotanistsWeek on Twitter. "Often, we hear that diversity hasn't made greater strides because we can't find diverse scientists," Montgomery says. "This has really challenged that notion. Black scientists are out there."

VOLUNTEER PUBLIC HEALTH HEROES

COVID-19 data collectors: In the absence of consistent directives to accurately and reliably track COVID-19 infections, concerned people across the country began collecting, analyzing, and sharing these data themselves. The efforts of these teachers, students, public health officials, journalists, professors, and activists are helping establish a record of the pandemic that can inform public health decisions, and have likely kept countless people safe.

UCS Research Could Help Farmers Avoid Another Dust Bowl



Many of today's farming practices wear out the topsoil, leaving it vulnerable to erosion by wind and water (as shown in this agricultural land in Montana).

A new UCS report has found that, at current rates of erosion, in just 15 years the United States is at risk of losing more than eight times the amount of topsoil lost in

the Dust Bowl of the 1930s. Given that it takes a century or more for an inch of soil to form naturally, the nation will lose the equivalent of at least 300 years' worth of soil

by 2100 if today's trends prevail. Increasingly extreme weather caused by climate change could drive erosion rates even higher.

However, none of this is inevitable, according to Karen Perry Stillerman, UCS senior analyst and coauthor of the study *Eroding the Future*. "With smart, science-based practices and policies, farmers can slow erosion rates and rebuild the health of their soil," she says.

Healthy, living soil needs fewer chemical treatments, stores carbon, and acts as a sponge, protecting farmers and their communities against floods and droughts and keeping fertilizer from polluting waterways. But current agricultural policies encourage farm

practices that wear out soil and leave it vulnerable to widespread erosion.

In contrast, healthy-soil farming practices (such as planting cover crops between cash crops, growing deep-rooted perennial plants, using conservation tillage or no-till farming, rotating diverse crops, and better management of grazing lands) keep soil in place and increase its ability to drain and hold water. These practices could be encouraged and rewarded through smart public policies.

"Giving farmers the tools they need to conserve and restore their soil should be a priority of federal and state governments," Stillerman says. "The future of our food system depends on it."

UCS in the Community

UCS has joined forces with Greater Cleveland Congregations (GCC)—a coalition of faith organizations working for social justice—to help Cleveland residents lead conversations about COVID-19 vaccines within their communities. Community leaders are hoping to increase trust and decrease misinformation about the vaccines, especially among African Americans.

African Americans represent about half of Cleveland's population but nearly three-quarters of its COVID-19 cases. Misinformation about the vaccines is spreading, and

communities of color feel especially skeptical given the United States' legacy of systemic racism in medicine and medical research.

UCS collaborated with GCC on a series of "train-the-trainer" webinars to give members the latest information on COVID-19 vaccines while encouraging them to set up small group discussions—creating a network of trusted individuals who can address community members' questions and concerns.

As GCC Executive Director Keisha Krumm notes, "We felt like it was really important to create



In a webinar on February 4, UCS staff and GCC members discuss the current science on the COVID-19 vaccine, along with community questions and concerns.

the space for people to learn and be able to ask questions, without any pressure." The collaboration resulted in a document of frequently asked questions (in English

and Spanish) that UCS is now sharing with communities nationwide.

Learn more at www.ucusa.org/resources/covid-19-vaccine-faq.





BRINGING BACK THE SCIENCE

US voters gave the Biden administration a decisive mandate for a pro-science, pro-fact, pro-justice agenda. UCS is helping point the way.

BY SETH SHULMAN

Turning the page on a deadly year and a wretched period in US history, we're enthusiastically rolling up our sleeves at the Union of Concerned Scientists—and not just in the hope of getting vaccinated against COVID-19 when our chance comes.

There's a huge amount of work to be done.

The double whammy of the pandemic and the Trump administration's failure in response underscored that both science and science-based policies are vital to our health and safety. It's not just that scientific know-how is now saving lives following the rapid research and development of COVID-19 vaccines; the past four years have shown us all too clearly that the sidelining of science-based policies can also be a matter of life and death.

The tragic legacy of science denial in 2020 is a cautionary tale that will likely be studied for generations to come. By willfully ignoring science in its pandemic response from the start, censoring and dismissing scientific advice and encouraging the public to dismiss it as well, the previous administration made a bad situation far worse, contributing to hundreds of thousands of deaths that scientists estimate could have been avoided by heeding the scientific evidence, such as by issuing a mask mandate.

Early steps by the Biden administration, on the other hand, suggest a welcome commitment to heeding scientific advice on the pandemic, climate change, and other matters of public health and safety, most notably a suite of directives to strengthen evidence-based decisionmaking outlined in a presidential memo on scientific integrity (see sidebar at right). At UCS, we're heartened to see the administration express its intent to follow so many of our recommendations and we're committed to making sure it follows through with concrete actions in the months ahead. But there's no question there's some hard work ahead: restoring scientific capacity, scientific integrity, and evidence-based decisionmaking throughout the federal government will not be easy.

THE CHALLENGE OF REBUILDING

With science programs across the government undermined, slashed, and mismanaged for the past four years, the task ahead is similar to what a community faces after being battered by a hurricane or flood: there's wreckage to clean up, damage to be repaired, and a lot of infrastructure that needs to be rebuilt.

Consider the Environmental Protection Agency (EPA). Under President Trump's direction, it had a hand in quite a few of the 180 attacks on science UCS tracked over the past four years. And according to the *New York Times*, it rolled back more than 100 environmental rules that safeguard our health. Working to restore that damage alone will likely take years—not to mention the agency's dramatically reduced enforcement against polluters and its indifference toward the disproportionate environmental burdens borne by communities that are often poor and/or

predominantly made up of people of color. This inaction must be redressed as well.

And yet, all this work comes amidst significantly diminished capacity. The EPA suffered a net loss of roughly 1,200 staff members within the first 18 months of the Trump administration—nearly 8 percent of its workforce. Close to half of those departing were scientists. That's a trove of expertise and institutional knowledge that is difficult to replace; rebuilding it will take time in the best of circumstances. Right now, the agency's total staff around the country stands at 14,000 people—the smallest since the Reagan administration.

Of course, the EPA is just one agency among many requiring first-rate scientific analysis to protect our health and safety. And it's one among many whose scientific staff and expertise have been hollowed out. With the nation reeling from COVID-19, public health issues are paramount, and rapid remediation is needed at the Centers for Disease Control and Prevention, the Department of Health and Human Services, the Occupational Safety and Health Administration, and many others.

"The coronavirus pandemic has offered a vivid, tragic example of what can happen when the federal government doesn't have a good strategy for gathering and evaluating scientific input and sharing it with the public," says Jacob Carter, a research scientist with the Center for Science and Democracy at UCS and a key member of our team working to restore scientific integrity in the government. "The good news is we have a roadmap. We've surveyed thousands of federal scientists, studied agency policies, and we know what it takes to build back from where we find ourselves today."



UCS PRIORITIES REFLECTED IN LANDMARK BIDEN SCIENTIFIC INTEGRITY MEMO



Ever since UCS coined the term “scientific integrity” in 2004 with its seminal *Scientific Integrity in Policymaking: An Investigation into the [George W.] Bush Administration’s Misuse of Science*, the organization has been a leading voice on the need for independent, impartial science to inform federal policies to protect the nation’s health, safety, and environment. On January 27, the Biden administration released a presidential directive called “Memorandum on Restoring Trust in Government through Scientific Integrity and Evidence-Based Policymaking” that showcases the power of that nearly two decades’ worth of advocacy by adopting and codifying many of UCS’s top recommendations, including:

Strengthen scientific integrity policies, establishing a task force to review practices throughout the government and to appoint scientific integrity leads at each federal agency. As the memo puts it clearly, “Scientific findings should never be distorted or influenced by political considerations.”

Restore scientific advisory committees so government agencies receive advice from a diverse range of outside experts. In the memo’s words, members of these committees should “reflect the diversity of America in terms of gender, race, ethnicity, geography, and other characteristics.”

For more on UCS recommendations, find *A Roadmap for Science in Decisionmaking* and agency-specific recommendations at www.ucsus.org/resources/roadmap-science-decisionmaking. And the Biden administration’s memo is available at www.whitehouse.gov/briefing-room/presidential-actions/2021/01/27/memorandum-on-restoring-trust-in-government-through-scientific-integrity-and-evidence-based-policymaking/.

NEXT STEPS

The Center for Science and Democracy’s *Roadmap for Science in Decisionmaking* is a series of analyses offering concrete recommendations to make sure that science and evidence are fully considered in federal policy moving forward, and that findings from government scientists are insulated from political manipulation. It includes specific steps for key federal agencies, outlining which particular regulatory rollbacks are most urgent to undo and addressing issues such as how best to strengthen accountability mechanisms and the role of agencies’ inspectors general, prevent conflicts of interest, guarantee public participation in the rulemaking process, and work toward environmental justice for marginalized communities. As noted, the Biden administration’s memo on scientific integrity draws heavily on these analyses: establishing a federal task force to review scientific integrity policies at each federal agency, expanding access to federal data, and restoring scientific advisory committees as a vital tool for advising and informing policymakers. UCS staff have been in close contact with many of those planning for the new administration and there is ample evidence that our recommendations are being reviewed and heeded at many federal agencies as well.

As gratifying as this is, there’s much more to do and we’ll be monitoring progress closely in the months to come. On climate, for instance, there is no time to waste. The Biden administration’s first appointments are encouraging: the emerging climate team, including former Secretary of State John Kerry as international climate envoy and former EPA Administrator Gina McCarthy as national climate advisor, sends a clear signal that the administration intends to treat climate change as a top priority. On his first day in office, President Biden also signed an executive order to rejoin the Paris Agreement; now the United States must deliver concrete actions in line with its responsibility as one of the world’s largest economies.

The administration now needs to get to work on specific, science-informed climate goals that chart a path for the nation to reach net-zero carbon emissions across the economy no later than 2050, and that put us well on the way by 2030. Among many other things, this means: implementing a robust set of administrative and regulatory actions to curtail heat-trapping emissions and advance climate resilience, directing all federal agencies to develop climate action plans based on the best available science, implementing policies that can rapidly reduce emissions from transportation, and working with Congress to provide the funding and staffing to rebuild needed agency capacity to address the climate crisis.

And while it is essential to make sure the federal government takes the best available science into account, we also know that’s not enough. That science needs to be used to address the most urgent needs. As Research Analyst Anita Desikan with the Center for Science and Democracy puts it, “Despite the urgent need to undo damage from the past four years, we know we can’t just restore the status quo and expect

(continued on p. 21)

“Pseudo-Scientific Nonsense”: The Harmful Legacy of Race Science

INTERVIEW WITH ANGELA SAINI

Your most recent book, *Superior: The Return of Race Science*, examines racist theories in science. What is “race science,” and when did it emerge?

ANGELA SAINI: A lot of people imagine that the way we think about human difference now is the way we’ve always thought about it. Actually, nothing could be further from the truth. The racial categories we think of now were concocted not that long ago, around the time of the European Enlightenment. Thinkers and naturalists, as they were classifying the natural world, looked at humans and asked, “Can we classify humans in that same way?”

These Enlightenment thinkers often didn’t have much exposure to or understanding of how people elsewhere in the world lived or looked. They were informed instead by the social politics of their time: colonialism, slavery, and the idea that they were themselves superior to other groups of people, not just racially, but also in terms of gender and class. This wasn’t a scientific exercise in the way we understand science to be done now. And so, when we talk about race science, it is the exercise of trying to classify humanity in certain ways, and the belief that there are meaningful differences between those categories once you have done that classification.

The way these categories have been used for hundreds of years means that they feel very real—as real to us as other social constructs like money, or democracy, or the idea of the nation-state. They viscerally affect how we live. But race science itself was always bogus,

arbitrary, pseudo-scientific nonsense. As we know, of course, the human species is one race; we are one species.

It seems as though there’s some benefit or incentive for people at the top of an artificial hierarchy that they’ve created to treat it as though it’s real.

ANGELA SAINI: Many scientists were heavily invested in the idea that racial differences were real, not least because the politics of the time demanded [it]. This was the height of colonialism, the height of slavery. And this was used as a justification for so much.

The atrocities of the 19th and 20th centuries—the Holocaust, any other genocide, slavery, colonialism, imperialism, apartheid, segregation—many of these were justified by what

at that time were considered scientific arguments around racial difference. Of course, we know better now, but one of the questions I raise in *Superior* is: how much better do we really know? Have we completely purged science of this idea that race is real or meaningful? And I would argue that we haven’t.

Can you give an example of how science and scientists have done real harm by subscribing to the false premise of racial differences?

ANGELA SAINI: Over the last 10 years or so, there’s been a lot of research done into Neanderthals and their connections to modern-day humans. We’ve known for a long time about the existence of Neanderthals, and there was this belief that we did not mate with them—that



ANGELA SAINI is an independent science journalist and author. She presents radio and television programs on the BBC, and her writing has appeared in *National Geographic*, *Nature*, *New Scientist*, the *Sunday Times*, and *Wired*. She has won a number of national and international journalism awards. Her latest book, *Superior: The Return of Race Science*, was published in 2019 and named a book of the year by the *Financial Times*, *Guardian*, *Sunday Times*, and *Telegraph*.

“Have we completely purged science of this idea that race is real or meaningful? I would argue that we haven’t.”

this was a separate species that went extinct while we survived for some reason. In popular culture, we use the term to describe someone stupid, an oafish male.

When Neanderthal bones were first discovered in Europe [in the mid-1800s], one of the first things scientists did was compare them to the bones of living Aboriginal Australians. There was this belief that they were both lower down the evolutionary scale; that both were different breeds of people doomed to die out. And that belief drove racism in Australia. One of the first pieces of legislation to pass in Australia under its colonial government was the “White Australia” policy, which essentially tried to breed the color out of Australians. It’s absolutely horrific to read and hear from living people about the despicable ways in which they were treated. But we have to remember, at that time, science was supporting this idea.

Over the last 10 to 20 years, it has become clear that Neanderthals did mate with modern humans. Many of us alive today have a small proportion of Neanderthal DNA. Once it became clear that it was Europeans who might have the largest proportion of this Neanderthal DNA in them, it’s remarkable, when you look at scientific papers and popular culture, and the phrases used to describe Neanderthals, how they’ve changed. Neanderthals didn’t die out because they were stupid, scientists say now. They died out for some other unfortunate reason. They’ve been drawn into the human circle. And we forget that in the 19th century,

Neanderthals were used as a tool to push Aboriginal Australians out of the human circle.

It’s impossible not to see it in the scientific literature: this kind of change in the terms and frameworks around how we describe Neanderthals. And I think that speaks to the very subtle, yet real, ways in which racialized ideas about inferiority and superiority live on in modern-day science.

You’re not advocating for “colorblindness”—the notion that race doesn’t matter. As you

say, social constructs feel real. But how do we talk about race, with the understanding that it is an arbitrary classification?

ANGELA SAINI: This is fundamentally about how we think about human difference, how we think about the species, and the fact that we divide people up at all—why do we even do that? That’s not to say that human variation shouldn’t be studied. All I’m saying is that we need to think carefully about the ways in which we study it. {C}

EVERY SCIENTIST NEEDS PARTNERS

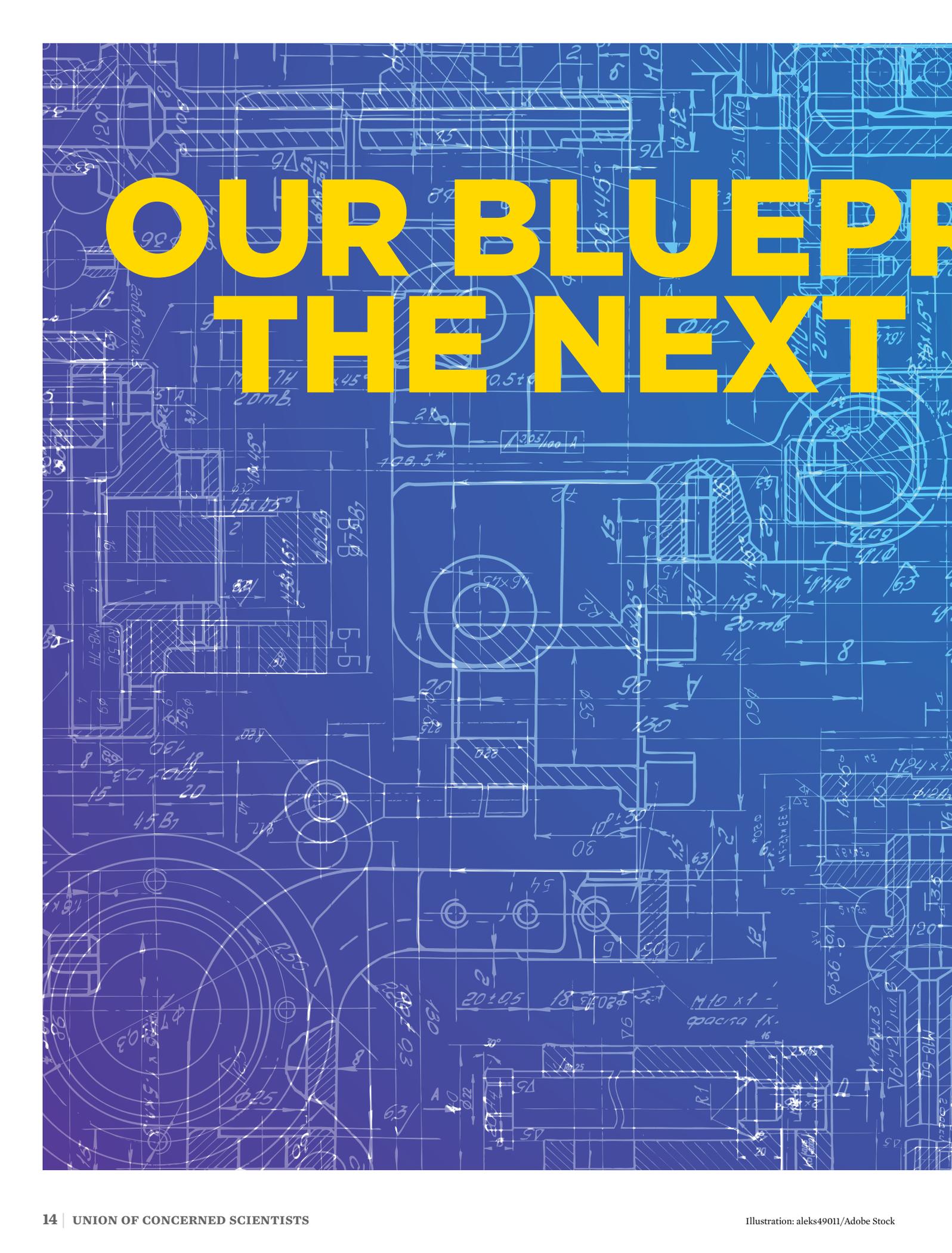
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OUR BLUEPRINT THE NEXT

PRINT FOR FOUR YEARS

The change in leadership in Washington, DC, allows UCS to return to advocating ambitious solutions on all our issues. Here's a sneak peek at the plans.

BY CLAUDIA WARD-DE LEON, MICHELLE RAMA-POCCIA, AND PAMELA WORTH

For the past four years, the Union of Concerned Scientists' staff members have worked hard to protect even the smallest gains on climate change, sustainable agriculture, and sensible nuclear weapons policies, fighting against the previous administration's harmful rollbacks to existing laws, unsuitable political appointments, damaging new laws and practices, and bad-faith rhetoric. We've fought in court, issued statements, tapped all our networks, and relied on supporters like you to keep government officials from sidelining science. In some cases, the best we've been able to do is compile a record of evidence for future court battles. In others, we've won, bringing enough publicity to bad policies or nominations that we forced them to be stalled or abandoned.

After four years of defense, we're more than ready to go back on offense. We're pushing the Biden administration not only to undo the damage done by four years of dangerous rhetoric around nuclear weapons and international relations, denying climate change, and ignoring science and scientists, but also to follow through on a bold vision for our country. We need to end our reliance on fossil fuels for power and transportation, rethink our national security policies, and build a food system that works for everyone.

What follow are blueprints for how UCS plans to achieve this vision. With your support, we're ready to do all we can to make this vision a reality.



DECARBONIZE TRANSPORTATION

JONNA HAMILTON
SENIOR WASHINGTON REPRESENTATIVE,
UCS CLEAN TRANSPORTATION PROGRAM

A big part of our job—as advocates, policy nerds, and scientists—is to make sure that the new administration and new Congress

have the information they need to make good decisions.

My own sphere of influence in this work is in transportation—the sector that is now the largest emitter of carbon pollution in the United States.

To reduce air pollution and carbon emissions from transportation, we must stop using petroleum as the primary fuel to move people and things around. Our team’s goal is to transform our transportation system into a web of options that works for everyone while simultaneously protecting our climate and cleaning up the air we breathe. To do this, we need to invest in cleaner fuels, increased public transit, and electric cars and trucks, and to ensure that the production of these things, and the related infrastructure that will support them, results in good-paying domestic jobs.

We will be calling on the Biden administration to start work immediately on the next round of vehicle efficiency standards—and to ensure that these standards push automakers to make much more efficient vehicles and bring more electric vehicles to market. We will work with the administration and Congress to ensure that charging stations for electric cars and trucks are deployed in places accessible and convenient to all communities.

Electrification alone is not a silver bullet, however. Investments in transit and transit-oriented development are key, especially for urban areas. While we increase access to transit, we also need to decarbonize it. Improving access to a multitude of clean transportation options—such as electric buses—while we transition to electric vehicles will ensure we are reducing pollution while increasing people’s mobility and the economic opportunities that enables.

Transitioning to a low-carbon and low-pollution transportation future will not happen naturally or overnight. We will be calling on you, our allies, to help us advocate for clean transportation for all.



MAKE OUR FOOD SYSTEM FAIR

KAREN PERRY STILLERMAN
SENIOR STRATEGIST/ANALYST,
UCS FOOD AND ENVIRONMENT PROGRAM

First of all, we need to make sure everyone has enough healthy food to eat. The previous administration proposed a series of rules to make it harder for low-income people to get benefits through the Supplemental Nutrition Assistance Program (SNAP)—even in the middle of a pandemic. Rolling back these cruel and nonsensical rules and increasing the maximum SNAP benefits that people can get are no-brainer policies that should be adopted immediately.

We’re also asking the administration to support efforts to make farms more resilient and sustainable, and to enable more people of color to get into farming. In particular, the new administration should support the Agriculture Resilience Act, which includes research and incentives to help farmers build healthy, living soil, and put US agriculture on a path to net-zero carbon emissions. And longstanding structural and institutional racism has robbed Black, Indigenous, and other people of color of land and denied them access to other resources, with the result that people of color represent nearly 40 percent of the US population but operate less than 5 percent of the nation’s farms. Making farming more sustainable *and* inclusive will take pressure from all sides; our members and supporters can join us in pressing Congress and the Biden administration to support both efforts.

My team is also working to ensure that food and farm policies are rooted in science, not corporate power. In the near term, we’re advocating for rebuilding two USDA science agencies that the Trump administration decimated; the loss of research capacity and expertise meant to inform policymaking has been consequential. Longer term, we need the new administration to take steps to reduce the power of agribusinesses such as meat and poultry giant Tyson Foods, which profit at the expense of worker safety, community health, and our environment.

Finally, we’ll be pushing for a renewed focus throughout the USDA on climate change. Former Secretary of Agriculture Sonny Perdue buried a near-final climate science plan for the department. That plan needs to be unearthed and carried out to help farmers, farm communities, and our food supply adapt and build resilience to climate impacts.



NO CLIMATE PLAN WITHOUT RACIAL JUSTICE

ADRIENNE HOLLIS
SENIOR CLIMATE JUSTICE AND HEALTH SCIENTIST, UCS CLIMATE AND ENERGY PROGRAM

This year marks the beginning of inevitable change. As I think about the new administration and the enormous tasks ahead of it, I am reminded of the song “A Change Is Gonna Come” by Sam Cooke.

*“It’s been a long, a long time coming,
But I know a change gonna come
Oh, yes it will”*

In the UCS Climate and Energy program, our priorities are similar to those identified by the Biden administration: bold and immediate action.

The disproportionate environmental, economic, and health effects adversely affecting communities of color, poor people, environmental justice communities, Indigenous peoples, and others is directly attributable to systemic racism. I believe that the very first action is to acknowledge that fact and begin addressing it to rectify the disastrous impact of racist practices and actions. I believe that by seriously addressing the first issue we will impact the remaining ones.

We will push the new administration to:

- Address racial injustice by funding the Low Income Home Energy Assistance Program, low-income economic development, worker training programs, and community economic development programs across the federal government
- Restore and prioritize the roles of science, topical expertise, and community voices in federal decisionmaking (see p. 8)
- Reverse the previous administration’s executive orders and regulatory rollbacks that have undermined or stopped action on climate, e.g., reestablishing the EPA Office of Environmental Justice; reversing changes to the National Environmental Policy Act that weaken communities’ ability to weigh in on construction or infrastructure projects that will affect them
- Champion legislation that will cut global warming emissions in half by 2030 through incentives and standards for renewable energy, investments in energy efficiency, electricity grid modernization, energy storage, and research and development in clean energy technologies—each informed by accessibility and affordability for low-income households and pollution-burdened communities
- Invest in climate resilience through a national adaptation strategy for communities to prepare for and protect themselves from the worsening impacts of climate change

It has been a long time coming, but change is imminent.



REDEFINE NATIONAL SECURITY

LAURA GREGO
SENIOR SCIENTIST AND RESEARCH DIRECTOR, UCS GLOBAL SECURITY PROGRAM

President Biden is inheriting a dangerous nuclear arms race, and should use his first 100 days to re-evaluate US nuclear weapons policy. Furthermore, he should rethink the entire US approach to “national security” by looking at the real threats we face—threats like climate change, pandemics, and cyberwarfare—and measure them against the \$740 billion annual defense budget and the Pentagon’s plan to spend \$1.2 trillion on nuclear weapons over the next 30 years (see p. 22). Those numbers are simply not justifiable. We will push the president to shift money to address more important threats, reduce reliance on nuclear weapons, and short-circuit the new arms race.

We will also call on the president to support the Treaty on the Prohibition of Nuclear Weapons, a.k.a. the ban treaty, which entered into force two days after his inauguration (having been ratified by more than 50 countries). This would address the concern the treaty reflects: that the United States is doing too little to live up to its commitments on nuclear disarmament.

UCS supporters and staff can also demand that President Biden hold true to his election campaign stance of supporting a “no first use” policy, in which the United States would vow to never use nuclear weapons first. The 2020 Democratic Party platform endorsed a similar policy, declaring that the “sole purpose of our nuclear arsenal should be to deter—and, if necessary, retaliate against—a nuclear attack.” In either case, the president should be clear that the United States will never start a nuclear war. Adopting either policy will require working with US allies to ensure they understand that declaring “no first use” or “sole purpose” would not weaken the United States’ commitment to their security. Completing these discussions will likely take longer than 100 days, but the Biden team should quickly get that ball rolling. (C)

Claudia Ward-de Leon and **Michelle Rama-Poccia** are UCS web content managers. **Pamela Worth** is the editor of Catalyst.

Recycling Electric Vehicle Batteries

By Jiayu Liang and Nick Iannaco

Vehicles are one of the largest sources of global warming pollution in the United States, accounting for nearly one-quarter of the country’s emissions. Fortunately, the growing number of electric vehicles (EVs) is already helping to reduce emissions. Over their lifetime, EVs produce significantly less global warming emissions than vehicles with internal combustion engines, even with the prevalence of fossil fuel-generated electricity.

Where the majority of the environmental impact from gasoline- and diesel-powered engines comes from their tailpipe emissions while driving, most of an EV’s associated global warming emissions occur “upstream”—that is, prior to the vehicle’s operation, in its manufacture and in the electricity generated to power it. This means efforts to make EV technology even cleaner should target these stages in an EV’s life cycle, by manufacturing batteries with recycled materials and adding more renewable energy to the power grid, which together can make a big difference in environmental impact over a vehicle’s lifetime.

Over the next 15 years, the number of EVs on US roads is expected to increase significantly, from roughly 1 million

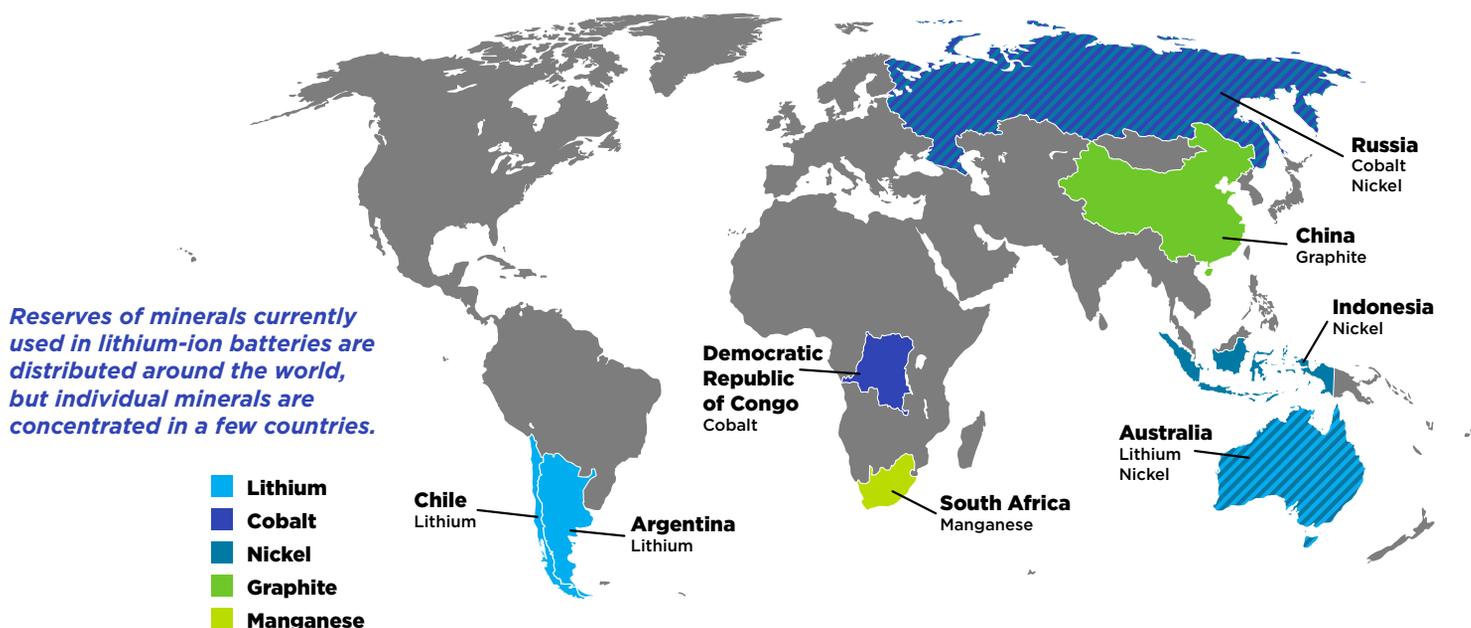
today to potentially tens of millions (depending on a number of factors). As demand ramps up for EVs, so will demand for batteries to power them—and to produce batteries in the necessary quantities, we must address many logistical, environmental, and ethical barriers.

PROBLEMS AT THE SOURCE

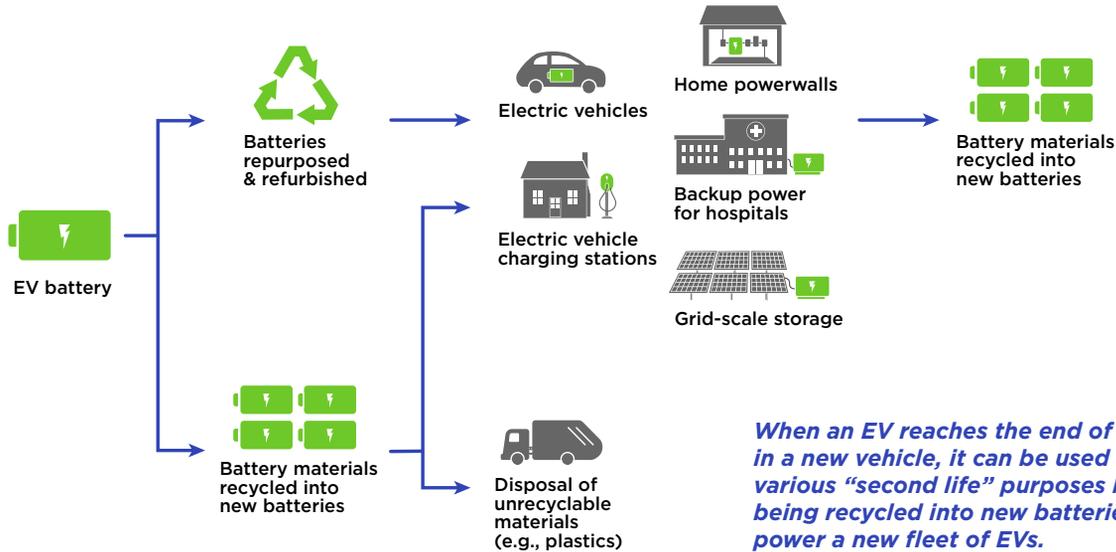
Powering every electric vehicle is a linked group of hundreds, and sometimes thousands, of lithium-ion battery cells. Each relies on minerals extracted from reserves around the world, where mining can present a trove of ethical and environmental challenges. Lithium extraction, for example, can consume significant amounts of water. In the Democratic Republic of Congo, where the majority of the world’s cobalt is produced, negative impacts on community health and human rights are well documented by Amnesty International and other organizations.

At the current rate of extraction, reserves of key minerals used in batteries could last up to 50 years, but as demand for EVs grows—a trend that will hopefully continue—so will the challenge of producing enough minerals to manufacture those batteries.

GLOBAL BATTERY MATERIAL RESERVES



GIVING EV BATTERIES NEW LIFE



When an EV reaches the end of its life in a new vehicle, it can be used for various “second life” purposes before being recycled into new batteries that power a new fleet of EVs.

Fortunately, recycling offers the possibility of establishing a long-lasting and sustainable supply of critical battery materials. By extracting these materials from retired batteries, manufacturers can avoid the ethical and environmental impacts of mining for new materials, and meet up to 30 percent of total demand in the next 15 years. As the EV market grows, so will the supply of materials that can eventually be recycled, making it easier to sustainably meet battery demand as time goes on.

UNTAPPED POTENTIAL— SITTING IN STORAGE

When an EV battery reaches the end of its life, it must be processed somehow: repurposed, recycled, or disposed of. Because there are no recycling facilities for EV batteries in the United States operating at a large scale today, many retired EV batteries end up sitting idle inside warehouse storage facilities. While this is frustrating, it also means there’s significant room for improvement.

Lithium-ion batteries can be expected to last many years, similar to the rate at which most people replace their cars—because of wear and tear on the vehicle, or because old age and use have caused the energy storage capacity of the battery to decrease below optimal performance for the car’s owner. At this point, however, two-thirds or more of the battery’s original capacity will likely remain: more than enough for operations such as powering charging stations or providing backup power for buildings.

Unfortunately, the lack of standardized packaging, labeling, and chemistries across EV brands today poses barriers to repurposing in this manner. And current waste management policies simply do not take EV batteries into account. Globally, fewer than a dozen recycling facilities are currently processing EV batteries. When fully operational, their combined capacity will only be able to recycle 300,000 batteries each year, or roughly 10 percent of today’s global EV sales. By the early 2030s, this recycling capacity is expected to account for only 1 percent of annual sales. Clearly, waste facilities need a major expansion if they are to keep up with the growth of EVs.

Reusing batteries, recycling materials, and increasing the amount of electricity generated by renewable energy hold great potential to lessen the environmental impact of EVs. As demand increases, policy can play a powerful role in preparing us for an EV future: by setting strong standards for recycled content in new batteries, establishing facilities to responsibly handle retired batteries, developing standards that make reusing batteries more feasible, and adopting strong environmental and labor standards for mining and material processing. Manufacturers, along with state, federal, and international policymakers, all have a role in ensuring EVs are as sustainable as they can be.

For more on EV battery materials and recycling, see www.ucsusa.org/resources/ev-battery-recycling.

Jiayu Liang is the communications assistant at UCS.

Nick Iannaco is the multimedia assistant at UCS.

Protecting Water—and a Way of Life



An environmental activist, retired engineer, Ely Shoshone tribal elder, and Union of Concerned Scientists supporter, Delaine Spilsbury made headlines in 2020 for her role in a long fight against a pipeline that would drain groundwater and rivers in rural Nevada, where she lives, to supply water to Las Vegas. Spilsbury is on the board of a coalition called the Great Basin Water Network that has worked for decades to protect the regional water supply: organizing, lobbying politicians, and tying the water authority up in legal battles. In May 2020, after 31 years, Spilsbury and the Great Basin Water Network prevailed: the

court found in their favor, and the water authority declined to appeal.

“I’m a member of the native people—the Newe—who have been in this area for 10,000 years,” she says. “What I would advise people facing similar struggles is: don’t give up the ship. You don’t take no for an answer when you know that yes is so much better.”

Spilsbury says she supports UCS because her heritage steers her to conservation and stewardship of the environment: “I’ve been an environmentalist almost all my life. My people live sustainably.” A former engineer who designed high-tension power lines at substations,

she’s kept up with developments in renewable energy, and is interested in solar power and battery storage.

Working in a male-dominated field as a Native American woman never gave her pause. “I always tried to do better than the guys,” she says. “I worked longer and harder and I had more ideas than they did, because they didn’t have to do better just to stay on. I guess I’m just one of those bulldogs.”

Although she and the Great Basin Water Network have won their battle for water rights for now, Spilsbury is still in the fight, opposing a plan for another ill-conceived pipeline through the desert, for use by a small number of residents. “They want 20 shower heads and two swimming pools and that sort of thing,” she says. “It’s just bonkers the amount of water that literally goes down the drain, because people don’t have the same respect for it.” She’s also working on a project more personal to her and her Newe heritage, to bring attention to a site—sacred to her family and other Shoshone tribal members—known as Bahsahwahbee, a former gathering spot that is now a memorial to massacred ancestors.

Spilsbury says she’ll keep working to protect Newe land and water as long as she can—and, she adds, “making trouble for the water hogs.” {C}

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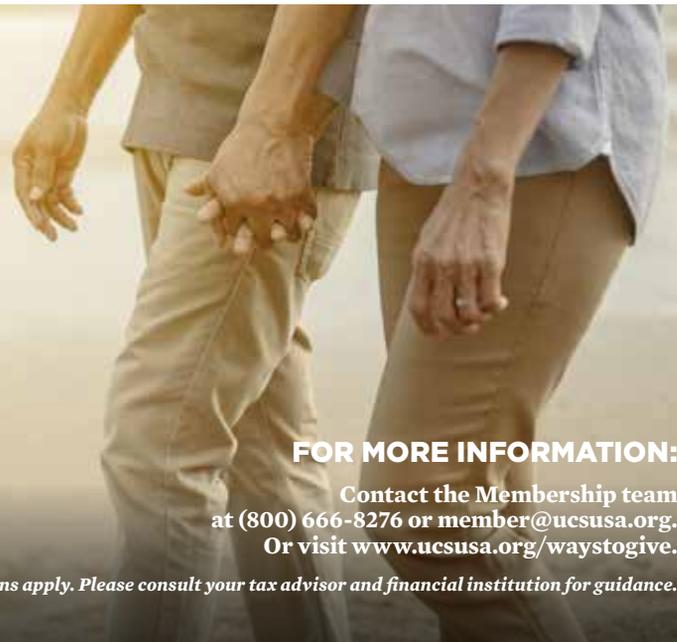
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Bringing Back the Science

(continued from p. 11)

it to be enough.” Desikan, a coauthor of the UCS roadmap, adds, “We can’t hope to solve problems unless we’re willing to look at the evidence and listen to the impacted communities, especially Black, Latinx, and Indigenous communities who are on the front lines of hazards like pollution, climate change, and COVID-19.”

CAUSE FOR OPTIMISM

We’re taking heart that, despite the arduous path ahead, the current moment seems full of opportunity. So far, the Biden administration’s top appointments have made good on the promise to build a cabinet that emphasizes experience and competence, and includes an unprecedented number of women and people of color—for example, New Mexico Representative Deb Haaland, the new administration’s nominee for Secretary of the Interior, would be the first Indigenous American to run the agency, while Michael Regan, former head of North Carolina’s Department of Environmental Quality and current nominee for EPA administrator, would be the first Black man to hold that position.

We’re encouraged by the potential that independent science advisory committees, after years of disuse and neglect, can once again bring expertise, new ideas, and quality control to the work of all science-based agencies across the government. The Biden administration has indicated its intention to create new advisory committees as needed and to include independent scientists from a range of perspectives, embracing diversity of all kinds: more gender diversity, more early-career scientists, and more scientists who are Black, Indigenous, and people of color. We’ll be pushing to make this a reality because we need new thinking from across society to confront the many challenges we face.

Along these lines, we are encouraged by the enormous pool of talent we see in up-and-coming generations and the prospect

that many highly qualified, visionary, talented young scientists can now be actively recruited to public service. We need their energy and the innovative ideas they can bring.

Equally important, we’re energized by the growing activism and engagement we witnessed among UCS members and supporters as we confronted the assaults of the previous administration. An impressive crop of engaged science leaders, including many early-career scientists, are laying to rest tired old debates about whether scientists can or should be advocates. And more of our many nonscientist members are engaging on issues at the federal, state, and local levels, in all parts of the country. We’ll be doing all we can to sustain their energy and resolve in the months and years to come.

Center for Science and Democracy Director Andrew Rosenberg sums up the optimism everyone at UCS is feeling in the current moment: “Working together and embracing science as a powerful tool to solve problems and lift up communities, we’re confident that we have a real opportunity to face and overcome many of our current challenges. We can end this pandemic. We can begin to meaningfully address decades of entrenched racial injustice to become a more equitable society. We can take steps to reduce the threat of climate change and rebuild a more sustainable economy.”

We hope you feel the same way—and will join us as a vital partner in our efforts ahead. {C}

\$700 Billion Doesn't Buy True Security

By Elliott Negin



In December, Congress rubber-stamped the Trump administration's request for a \$740.5 billion military budget—\$100 billion more than when President Trump took office, the most

abetted by years of lax congressional and administration oversight, have enabled it to waste tens of billions of dollars every year. In just the first decade of this century, the Pentagon was forced to cancel a dozen ill-conceived, ineffective weapons programs that cost taxpayers \$46 billion, and the last 20 years are littered with a parade of overpriced and bungled projects that are still in play, including the \$1.5 trillion F-35 Joint Strike Fighter, the \$67 billion Ground-

since World War II, and 50 percent higher than the Cold War average (in inflation-adjusted 2020 dollars). At a time when the country is faced with a pandemic and its economic fallout, not to mention a looming climate crisis, it is imperative to rethink our priorities.

The aggregate amount spent on the Pentagon in the first two decades of this century was a staggering \$13.34 trillion. No other country's military outlays come close. In fiscal year 2019, the Pentagon's budget was nearly three times bigger than China's and more than 10 times larger than Russia's. US military spending in 2019 exceeded the next 10 countries' defense budgets combined—singlehandedly accounting for 38 percent of military spending worldwide.

These trillions of dollars do not, however, buy true national security. For all of its might, the Pentagon is powerless against grave nonmilitary threats, from the pandemic to the fact that tens of millions of Americans still breathe foul air, drink tainted water, and struggle to pay for food, housing, and health care. If we fail to address those challenges, we will never have true national security.

The obscene amount the Pentagon spends is not the only compelling reason why its budget should be cut. Dysfunctional internal controls, aided and

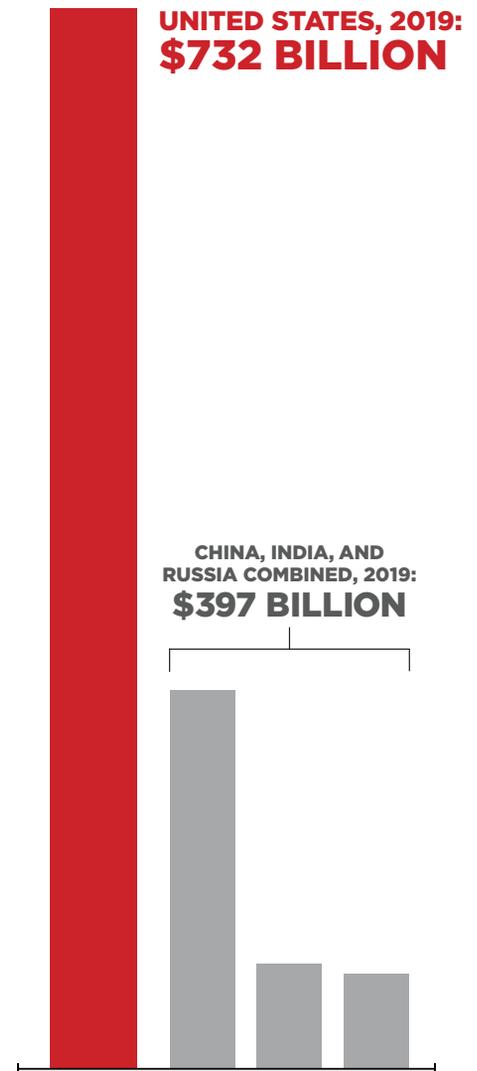
No other country's military outlays come close to the United States' annual budget: it singlehandedly accounted for 38 percent of the world's military spending in 2019.

based Midcourse [Missile] Defense system, and the \$43 billion KC-46 aerial refueling tanker.

Compared with the Pentagon, federal agencies charged with safeguarding public health and the environment are barely scraping by. The Environmental Protection Agency's budget in fiscal year 2020, for example, had shrunk to \$9 billion—slightly more than 1 percent of what the military will be getting this year.

As the United States begins the herculean task of digging itself out from the

AN OUTSIZED MILITARY BUDGET



worst economic downturn in generations, policymakers need to focus on rebuilding the economy in better, smarter ways, and that means cutting unnecessary spending whenever possible. As they do, one thing is clear: the time is ripe to rein in a level of military spending that has delivered little true security and stolen from critical domestic priorities for far too long. (C)

Elliott Negin is a senior writer at UCS. This piece was adapted from a much longer September 14, 2020, essay in *Scientific American*, available at <https://www.scientificamerican.com/article/its-time-to-rein-in-inflated-military-budgets>.



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