CLIMATE LEADERSHIP

How California's Climate Policy Could Change The World

BIONEERS

REVOLUTION FROM THE HEART OF NATURE

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About Bioneers

Bioneers is a nonprofit educational organization that highlights breakthrough solutions for restoring people and planet. Since 1990, Bioneers has acted as a fertile hub of leading social and scientific innovators with practical and visionary solutions for the world's most pressing environmental and social challenges. As a celebration of the genius of nature and human creativity, Bioneers connects people with solutions and each other. Bioneers has been at the forefront of addressing the interdependence of natural systems and human organization with highly practical systemic solutions in a "revolution from the heart of nature." Bioneers is recognized as a highly unique, influential and dynamic communications organization and diverse network of networks. We produce an acclaimed annual national conference, award-winning media, local Bioneers Network conferences and initiatives, and leadership training programs. www.bioneers.org

Edited by Teo Grossman
Funding for this project was generously provided by an anonymous donor.

Acknowledgements

We offer our deep gratitude to the many people who were instrumental in the creation of this book and the preceding 2014 landmark Bioneers California Climate Leadership one-day conference from which it is drawn. We give our profound thanks to those speakers at the event who are published in this collection.

Special thanks to the ever innovative Bioneers CEO and Co-Founder Kenny Ausubel and to Tom Hayden who jointly conceived of, guided and produced the event. To J.P. Harpignies, Dan Jacobson, V. John White, Lisa Hoyos and Emma Taylor for the superlative 2014 event design, and to E2K for seamless event production. Thanks for the book's copy editing and production support from Mia Murrieta and Marita Prandoni, and the book design by Diane Rigoli.

We offer our enduring thanks to the anonymous donor who stepped up to underwrite the production of this book – what you are reading would not exist without this generous support.

There were also a number of speakers at the event with key contributions to the conversation whose talks aren't included here, for reasons having to do with space. Their perspectives also greatly informed and shaped the event, and you can see ripples from their presence in the essays presented here. We are profoundly grateful for the time, energy, deep care and commitment to the future of California and the wider world from all who spoke and shared their invaluable knowledge and wisdom, including:

Greg Dalton, Founder of Climate One, Commonwealth Club
Thomas Van Dyck, Senior Vice President, Royal Bank of Canada
Ann Edminster, Founder of Design AVEnues LLC
Max Gomberg, Climate Change Advisor, State Water Resources Control Board
Grant Davis, Director, Sonoma County Water Agency
Mary Ellen Hannibal, Journalist and Author
Paul Hawken, Social Entrepreneur, Author, Founder of Project Drawdown
Mark Hertsgaard, Journalist and Author
Lisa Hoyos, Director and Co-Founder of Climate Parents
Brian McDonald, Tribal Liaison for Southern California Edison,
Board of Tribal Alliance of Sovereign Indian Nations
Ann Notthoff, California Policy Director, NRDC
Sarah Shanley-Hope, Executive Director, The Solutions Project
Sissel Waage, Biodiversity & Ecosystem Services Director, Business for Social Responsibility
Dawn Weisz, Executive Officer, Marin Clean Energy

We encourage you to watch and listen to all their talks by visiting bioneers.org/climateleadership.

TABLE OF CONTENTS

INTRODUCTION: CALIFORNIA'S VISIONARY CLIMATE POLICY

Teo Grossman

Director of Strategic Initiatives
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As the world looks towards the December COP 21 gathering in Paris, questions abound regarding the likelihood of a global climate deal. Will nations agree to ambitious enough limits? Will the agreements brokered be honored back home and in time, or is it all too little, too late?

Regardless of the outcome in Paris, real, viable and encouraging action continues to swell across multiple scales below the federal level. States, regions, cities and citizen groups are rapidly developing collaborative networks and frameworks intended to take significant action on climate change.

In the United States, where comprehensive federal leadership on climate change has been notably absent for years, leadership has emerged on multiple scales and from various jurisdictions. In particular, the State of California, long known for innovative and cutting-edge environmental policy actions, has established a climate policy approach that may well end up as a workable model for the rest of the world.

Over the past decade, California has managed to decouple the growth of greenhouse gas emissions and the economy, reducing per capita emissions by 17% while maintaining one of the most robust economies in the U.S. While the cap and trade program often gets the most attention, the legislation behind that approach, AB 32, actually established a broad range of emissions-reducing policies, both regulatory and market-based.

For all the controversy associated with cap and trade, the program has begun to yield sizable funds that are beginning to flow right back towards more climate solutions, as required by the law. With nearly 200,000 clean energy jobs, a vibrant economy and poised to invest literally hundreds of billions of dollars into a low carbon economy, the world's eighth largest economic engine is positioning itself as a model for the world.

In the fall of 2014, as part of the 25th annual Bioneers Conference, Bioneers convened a very special gathering of key leaders to help start a conversation that seemed long overdue: California's leadership role in the global effort to combat climate change.

The California Climate Leadership Summit was inspired by a series of articles written by legendary political icon and writer Tom Hayden, in which he ties the variety of groundbreaking efforts taking place in the state into a single narrative. As he writes in *The Great Unifier: Californians Against Climate Change*,

"My dream is that California under Governor Jerry Brown's leadership will become a multi-cultural, world-class economy powered entirely by renewable resources and energy conservation, and a model to which President Barack Obama can point during the critical global talks on climate change in December 2015."

The 2014 California Climate Leadership Summit was designed to support the dissemination of this vision. Bioneers was honored to partner with a core team of wonderful and brilliant partners who helped design and produce the summit. Our thanks to Tom Hayden, Dan Jacobsen, V. John White, Lisa Hoyos and Emma Taylor.

There were also a number of speakers at the event with important contributions to the conversation whose talks didn't make it into this volume. Their talks helped to inform and shape the entire event, and you can see ripples from their presence in the essays presented here.

The entirety of the event, including contributions not transcribed here, is archived in video and audio on the Bioneers website: www.bioneers.org/climateleadership.

The California Model

A renowned activist, intellectual, writer and public servant, Tom Hayden began his career in public service in the late 70's by working on solar energy and environmental policies with Governor Jerry Brown in his first term in Sacramento. Three decades later, after a distinguished career as a State Senator, Hayden recognizes the unique role that California has the potential to play in the global effort to stave off climate disruption. As he mentions in his opening remarks, "The key idea is that California is a leverage point, a focal point. What starts in California can expand."

This, of course, is not a wholly original idea – California has long been ahead of the curve environmentally – but now that the state has some substantial success under its belt, the real value in leveraging and scaling this work is beginning to emerge. One of Hayden's unique contributions, beyond his relentless behind-the-scenes maneuvering and advocacy, has been the framing of the "California model" within the context of national and global social and political movements. A key plank of this model, Hayden posits, is highlighting the connection between achieving emissions reductions and environmental justice while building and maintaining a robust job market and economy.

With this coherent and reasonably well-functioning climate policy in hand, California under Governor Brown has embarked on a large-scale global green diplomacy mission. Signing bilateral climate and energy agreements with states, multi-national regions and foreign governments has been par for the course. According to Hayden, the joke is that a foreign diplomat can't leave Governor Brown's office without a signed partnership in hand. Not a joke, however, is the impact of such green diplomacy on global climate negotiations. Evidence indicates that California's early entreaties to the Chinese were of absolute importance to the larger US-China Climate Accords, signed in late 2014.

Mexico's recently announced climate policy efforts are almost completely based on California's example. Soffia Alarcón-Díaz, the Director of Climate Mitigation Policy for the Ministry of Environment and Natural Resources of Mexico, is quoted in a recent Environmental Defense Fund report as saying,

"The first step for us is to gather information about the best practices and lessons learned from California so that we can follow a model that from our standpoint has been successful. To the extent possible, Mexico is mirroring California's climate change-related actions based on the premise that there are similarities between both jurisdictions. Mexico is planning to take a comprehensive look at every policy California has designed in the past few years so we can consider developing our own policies."

Most recently, California was instrumental in the development of the Under 2 MOU, a landmark sub-national climate agreement signed by 14 major sub-national states and regions, part of an ongoing strategy to influence and support the establishment of a global climate treaty at the COP 21 in Paris at the end of 2015.

If foreign diplomats can't leave the Governor's office without a signed climate agreement, chances are that Wade Crowfoot is helping to make that deal happen. As Deputy Cabinet Secretary and Senior Advisor for Governor Brown, Crowfoot is a leader in California's efforts to continue to implement climate-related legislation as well as supporting the state's ambitious "green diplomacy" at home and abroad.

"From our perspective in California, if China and India and other "developing economies" are going to pursue a low-carbon pathway, we have to do that with them. It can't be something imposed on them, and it can't be a decision about economic growth versus environmental stewardship. We're very excited with what's happening. We think that California can continue to be a model that will show the world what we can do – and at the same time partner with other countries to actually help their efforts."

In his Bioneers talk, Crowfoot outlines three of the key strategies California is taking to achieve its ambitious 2050 goal of 80% reductions in greenhouse gas emissions: (1) unleashing technical innovation to drive energy efficiency, (2) squeezing the carbon out of energy generation and (3) electrifying transportation. Speaking to a diverse audience including policymakers, activists, students, philanthropists and more, Crowfoot also reinforced the reality that political progress is only made possible by continuous grassroots pressure and support.

Climate Justice and Coalition Building

While California's success in emissions reductions and economic growth tend to take front stage, equally important is that, with significant prodding from a broad coalition of constituency groups, the state has managed to place climate justice concerns front and center within the larger climate policy discussion. Globally, disagreements related to climate equity issues have repeatedly scuttled climate negotiations, for better or worse. In California, the cap and trade program was nearly overturned prior to implementation due to significant environmental justice concerns. Today, hundreds of millions of dollars from that very program are being funneled directly to communities, programs and people that need it most. SB 535, passed in 2012, established the pathway for fees from carbon pollution to be fed directly back towards the roots of the problem, a textbook piece of economic policymaking rarely achieved in the real world. Substantial challenges still exist, of course, but with the focused attention and priority being placed on the issue, there are absolutely reasons for optimism.

Much of this success would not have happened without innovative and sustained advocacy efforts driven by a large and not-necessarily-expected coalition of traditional environmental advocacy groups and environmental justice organizations. Vien Truong, Equity Director for the Greenlining Institute, was part of the effort to pass SB 535 and was a lead voice and coalition organizer during the campaign to pass the innovative Charge Ahead legislation, fast-forwarding the equitable adoption of zero-emission vehicles in California. In her talk, Truong reminds us, "Sixty percent of Californians are people of color. Seventy-three percent of people under 18 years old in California now are people of color. We have to recognize this, and we have to organize around it if we're going win."

Part of what makes California's approach to these issues so unique is that the dots between cultural diversity, equity and environmental quality are beginning to be connected on a broad level. As Truong and her allies worked to pass the Charge Ahead legislation, they asked, "How do we make sure that we are not just fighting for electric cars but fighting for transportation choices for everybody?" Their success in coalition building and issue framing will have ripple effects within California and beyond for years to come.

Advocacy alone can't win the day and Truong and others have had good working partners within state government. A strong voice for the role of government and good public policy, Arsenio Mataka is the Assistant Secretary for Environmental Justice and Tribal Affairs for the California Environmental Protection Agency. A rising star in both state government and the larger environmental justice movement, Mataka is combining the power of reframing and re-telling the climate change narrative with new cutting edge data on the geography of environmental inequity to truly build engagement and a demand for climate action among California's most disadvantaged communities. With all the new data and state resources at his disposal, he is quite clear on one thing: the climate movement needs to embrace a clear, effective and relevant story to engage with diverse communities who are experiencing the impacts of climate change but aren't yet being provided the language and framing to allow them to participate. He offers up some examples of themes and memes that might work, based on his own life experience growing up in the Central Valley of California.

Another powerful example of effective coalition building can be found in the work of the BlueGreen Alliance. Established in 2006, the Alliance supports multiple constituencies coming together to form a powerful nexus in support of the environment and strong climate policy. A unique partnership between the nation's largest unions and environmental organizations, the BlueGreen Alliance is evidence that good jobs and a clean environment are not only achievable goals but may, in fact, be reliant on each other. In California, labor unions associated with the BlueGreen Alliance were staunch supporters of AB 32 when it passed and continue to be vital allies as it is implemented. As Ross Nakasone, California Policy Organizer for the BlueGreen Alliance, lays out,

"We're guided by the principle that California doesn't have to choose between economic prosperity and environmental sustainability, that in fact we can have our cake and eat it too. We can have both. The way we think about it is as a Venn diagram, where labor is in one circle and environmental issues are in

another. The little football shape where they overlap is where we feel like BlueGreen Alliance is and we need to make that football bigger and bigger until it ultimately becomes one circle."

California's Energy Transition

A big part of the reason that California will be achieving its original Renewable Portfolio Standard 2020 goal of 33% renewable power ahead of schedule has to do with the state's relatively rapid adoption of solar power. As the Executive Director of the California Solar Energy Industry Association, Bernadette Del Chiaro presents a unique perspective on the future trajectory of the solar industry. While she has every reason to be bullish on its future and to push for supportive legislation, she is also quite realistic. The past two years have been an absolute boom for solar energy in California, with more solar installed in two years than the past 18 years combined. This is leading to increased renewable energy flowing both to the grid and directly to consumers as well as significant job growth.

"We now employ more people in the California solar industry than in all our traditional fossil fuel dependent electric utilities combined."

The flip side of that coin, however, is that there's a long way to go. Currently the state leads the nation in solar capacity, generating at least 5% of its electricity from solar energy ("at least" because federal statistics don't track rooftop solar generation yet). Germany, with much less sunshine than California, generates over 20%. The gap between California's energy system and Germany's boils down to the way our grid operates. V. John White, the Executive Director of the Center for Energy Efficiency and Renewable Technologies, speaks to precisely this challenge. He points out that we need a systems shift in how we think about and operate the grid, an area of critical infrastructure whose complexity tends to elude all but the most expert energy advocates.

"Up to now we've been adding renewables and solar onto the fossil fuel-based grid, sort of like a green side salad on the greasy fossil-fuel burger plate... It's not enough just to add on more solar and more wind and more geothermal. What we need to do is rely on these resources to run the grid, and that's going to require some imagination, it's going require a change in policy, and it's going to require renewable advocates to think about how the grid works."

Water and Climate

One important way that we need to stretch our imagination when it comes to developing plans for energy policy is to stop decoupling energy and water use. Many of us are familiar with the often cited fact that California's State Water Project, which moves and delivers water across the state, is, in total, the single largest user of electricity in the state. Water is necessary, heavy and increasingly scarce as the state continues to endue record-breaking droughts. Founder and president of TreePeople, Andy Lipkis has spent the past twenty years working tirelessly with city and county officials in Los Angeles to develop a more integrated approach to water, energy and natural systems – helping a city to think like a watershed. The current system is not just wasting water and energy resources, it is literally flushing billions of dollars down the drain each year. In an average year, LA receives rainfall equivalent to nearly half its needed water supply, yet spends around $1 billion to import water and around half of that again to "actively throw that rain water away," as Lipkis puts it.

"Department of Water and Power spends $750 million annually to bring in water, just to the city of LA. The price tag will be around $1.2 billion this year because it has to buy most of its water. $1.2 billion a year in that one city. Any rain that falls and runs off gets handled by a flood control agency whose job is to get rid of the water safely, to throw it away. This can cost three-quarters of a billion dollars a year in Los Angeles County. How much water are they having to move out of town? It turns out that half the water we need annually in Los Angeles falls as rain and runs off. That's roughly half a billion dollars of supply being thrown away at an additional cost of roughly half a billion dollars to actively throw that water away."

The solution? Think like a tree by capturing and storing water. Or, for that matter, think like a forest. Lipkis and TreePeople have been working to support integrated water management across departments and modeling water infiltration and storage on homes, schools and entire neighborhoods. Recently, Lipkis has been brokering collaboration between civic leaders California and in Australia, which had to survive a decade-long drought. The collaboration has yielded nascent plans for an integrated water storage and supply system across LA with potential for a real urban watershed system to emerge from the concrete jungle of southern California.

Natural Systems, Working Lands and Climate Change

TreePeople's work on the urban/ecological interface is a large-scale endeavor in applied biomimicry, looking to nature to inspire elegant solutions for complex human systems. For already urbanized and largely transformed landscapes, taking a biometic approach is a potent solution. However, there remains a significant role for natural systems in the overall approach to mitigating climate change. Large-scale investment in the potential of "natural and working lands" (the AB 32 nomenclature for forests, range and agricultural landscapes) to sequester and store carbon is expected to increase dramatically in coming years. These efforts will pay dividends far beyond their climate related outcomes. As the latest AB 32 scoping document outlines,

"Efforts to reduce GHG emissions and enhance carbon sequestration on natural and working lands also have significant economic, social and environmental co-benefits, and can aid progress on efforts to prepare for climate change risks. A few key co-benefits include protection of water supply and water quality, air quality, species habitat, recreation, jobs, wood and related products, flood protection, nutrient cycling and soil productivity, reduced heat-island effect and reduced energy use."

The California Climate and Agriculture Network (CalCAN) and the Marin Carbon Project represent two of the most cutting-edge policy advocacy and research organizations in the state when it comes to natural systems and working landscapes. There may not be any network quite like CalCAN, dedicated to supporting and connecting farmers while advocating for investments in climate smart agriculture and education. Seeing a huge gap between the need for sustainable agriculture, the potential climate benefits that this approach could yield and the lack of a collective advocacy and policy voice to support the growing interest in sustainable agriculture, even from large growers, CalCAN stepped in and hit the ground running. Jeanne Merrill, Policy Director for CalCAN, outlines this compelling work, including farmland conservation, on-farm energy conservation and generation, carbon sequestration and more.

Nearly a third of the entire landmass of California is comprised of active rangeland (roughly 34 million acres), a fact that the folks behind the Marin Carbon Project know quite well. Begun in 2006, the project set out to answer two basic questions: "Can our working landscapes be managed in a way to sequester carbon, and if so, how do we do that?" Not all simple questions have simple answers, but in this case, after the development of a unique collaboration between farmers, ranchers, scientists, NGO's and local government, the Marin Carbon Project has been able to answer these questions with a resounding, "Yes we can." As Torri Estrada, Managing Director of the Carbon Cycle Institute and member of the Steering Committee of the Marin Carbon Project, explains, the effort has yielded very promising results. The Marin Carbon Project is spearheading a growing Carbon Farming movement – describing, documenting and spreading basic, research-verified land management practices and plans that have the ability to rapidly scale up the carbon sequestration and storage across the state. According to Estrada, with additional funding and support (likely to arrive sooner or later by way of cap and trade dollars), the opportunity is substantial.

"The potential for agriculture and working landscapes in California to contribute to carbon sequestration is actually quite tremendous. The challenge is helping farmers and land managers actually make the transition and implement those practices, because there is a cost to them."

Climate Finance

Similar to early support for renewable energy, financing for climate-smart agriculture may be likely to depend on government support to get started. However, if renewable energy is any model, once the concept becomes established, there's a chance that the private sector might pick up the slack in short order. Marco Krapels would know. The former executive Vice President of the Dutch investment bank, Rabobank and partner in the private equity group Pegasus Capital, Krapels has made a very successful career out of investing in renewable energy. Speaking as the co-founder of the innovative NGO, The Solutions Project, he outlines what amounts to an ongoing slam-dunk in renewable energy financing. It turns out that as the cost of renewable technology drops, investing in an energy source with an input that is effectively free starts to look like a can't-miss opportunity. Renewable energy investments are beginning to look like the safer asset class compared to the traditional carbon economy, and as the divest/invest movement gains steam, guess where that carbon-based money will go.

"There are $20 trillion in US pension funds that are not invested in the asset class and, according to Bloomberg, this is going to be 50% of our energy infrastructure by 2030. Twenty trillion is not invested in something that is going to power half of this country by 2030. I think we need to see change happen here. There's a lot of money sitting on the sidelines, and we need to bring that money into the inevitable transition to a 100% renewable-powered economy."

One of the leaders in the movement to get institutional money out of the carbon economy and into the renewable economy is recent University of California at Berkeley graduate, Katie Hoffman. Hoffman helped start the UC Divestment Campaign, focused on redirecting some of the UC's $91 billion endowment out of fossil fuels. What started as six universities across the nation quickly scaled up into a literal flood of institutional divestment from fossil fuels. With support and encouragement from key allies, including folks like Marco Krapels, Hoffman and others are pushing straight ahead, through divestment into investment.

"In the future, we hope to shift from divestment to investment into solutions that are actually going to grow a just transition into a renewable energy economy, strong enough to lift people out of poverty and grow jobs that people my age actually want to do."

The UC has already committed to invest $1 billion in climate solutions over the next half decade, thanks to student advocacy, and there's very likely more to come. California's legislature is considering bills in the 2015 session that would require divestment from coal by the state's two largest pension funds, CalPERS and CalSTRS.

The Inside Game

Fundamental to all the inspiring and important work taking place across multiple topical areas is "the inside game." The political machinations required for any innovative policy to emerge relatively intact and be implemented correctly and efficiently are more than many of us might care to imagine. Some of this is pure politics, understanding who needs to be at the table, how to frame the issues, and how to literally get legislation passed. At its best, politics is about effective representation, negotiation and movement building. A veteran of Sacramento for several decades, Dan Jacobson might know as much about how to get environmental legislation passed as anyone in the California capitol. As Legislative Director for Environment California, Jacobson has a finely honed perspective on advocacy and movement building, both the current reality and where things need to move in order to achieve our ambitious goals. While there is significant, good news coming from California, the reality is that the fossil-fuel industry has been and continues to fight progress every step of the way. Since 2009 the oil industry has spent nearly $70 million on lobbying in California, according to a report by the American Lung Association in California. Jacobson takes a clear-eyed approach to the path forward, identifying key constituencies that need to come together in order to keep the ball rolling.

"We need to expand our Venn diagram, so it's a lot of these groups coming together with the center point being climate and clean energy. Those will be the places that we'll need to work for the next couple of years to create the wind at our elected officials' backs that they'll need to fight off the oil companies."

Clean energy, available jobs, significant investment in disadvantaged communities, all with extensive public and private investment along with a vibrant civil society community pushing, prodding and supporting key efforts along the way. If it sounds almost too good to be true, well, it is at some level. The current drought facing the state is deadly serious. For all its progressive intentions, the specter of large-scale fracking and contamination of limited water resources looms large over the Brown administration, which has yet to make any sort of definitive decision on the issue. A utopia, this is not. But good governance and policymaking are not about perfection. Progress is made in fits and starts, accounting for and adjusting to political winds and unpredictable events.

One of Tom Hayden's unique contributions to society is his ability to frame issues and place them in a historical context. His closing essay in this volume, a tour-de-force talk at the end of the day given largely without notes, steps back from the front lines to compare today's progress and movements with the development of the New Deal.

"Now, at the time it was being built, they did not call it the New Deal. They called it the movement. It didn't have a name. They didn't announce, "Now we are starting a movement for a New Deal."

Hayden's long-game analysis points towards the possibility for today's climate movement and, in particular, the public policy innovations coming out of California, serving as the underlying structure out of which a global Green New Deal might emerge.

Tom Hayden

Founder and Director
The Peace and Justice Resource Center

Our purpose today is to introduce some conceptual approaches to one question. The question is: What can we accomplish in California that moves clean energy forward as rapidly as possible and sets an example for other states and regions around the world as we approach the UN climate talks at the end of 2015?

No one is certain that the climate talks will go anywhere. No one. But if we follow the template, if we follow the model proposed here, all of us will make gains at the end of the process.

In the 1970s, when Jerry Brown announced that he was going try to de-carbonize California in his second term, I signed on to try to help. Today, in 2014, we have an amazing opportunity to move towards fulfillment of what began 40 years ago in California.

I remember the day of his election; he was roundly condemned by one and all, and it was a tough time. It was a time when the utilities said we'd need 65 nuclear power plants in California along the coast, or it would be lights out, when there had to be a liquid natural gas plant at Point Concepción at Santa Barbara, or it would be lights out. It was very, very difficult to argue that solar energy or renewable energy was anything but an idea without a base. Usually in politics there's a base of public opinion before an idea emerges, like the emergence of the New Deal following labor strikes, agitation and organizing in the 1930s. In this case, solar energy is an idea that preceded its base, and only now has the base really enlarged to the point where the state is really becoming a model. For instance, in the next four years, by 2020, we're spending $120 billion in California on many measures towards a goal of a clean energy economy – unlocking clean energy, as they say.

The key idea is that California is a leverage point, a focal point. What starts in California can expand. Historically, the state really has driven national and international progress, to some extent, on clean air, fuel efficiency, building design and renewables.

Our per capita greenhouse gas emissions are actually down 17% since 1990, despite the fact that our population and economy have grown. So we're on the way towards establishing the fact that it's possible to have an advanced economy on the scale of other countries with the decline of nuclear and with a decline of coal going forward.

The key to this is combining the legislative accomplishment of AB 32, which pushes for a reduction in emissions consistent with UN science goals, and at the same time highlighting advantages and delivering co-benefits for disadvantaged communities.

Working towards climate justice at the state level is so crucial precisely because it remains elusive at an international level. The debate between the 15 largest emitters of CO_2 and between the haves and the have-nots may well be intractable unless we take up the question of justice. You cannot simply impose emission reductions on other countries that have yet to fully enter the industrial age. You can do it, though, if there's an integrated concept of justice and emission reductions. And I think only California is poised with that vision and with that legal framework going forward.

I want to stop here just to say one thing about the fossil-fuel lobby. It's interesting, you go around the country and people still think that California is weird, and that explains why we're doing so much on renewables. In fact, California is as divided as any other state – it's simply that our majority is more progressive for now.

We are in a conflict mode with the oil and gas industry and their lobby group, the Western States Petroleum Association (WSPA). They came very close in the last legislative session to preventing California from extending the cap-and-trade law to the oil industry, even though they had agreed years ago

that they would come under the cap as it was phased in. When it came time, they instigated legislation and lobbied furiously, blaming the Governor for future gasoline price increases and the rest of it. And it took really, really determined leadership by the Senate and by the Governor's office to prevent them from getting their way. So, don't think that we're safely blue or green or whatever just because we are ahead in terms of this model.

The goal is doubling the pace of greenhouse gas reductions by 2030. Some would say that this is not even enough. I agree. We need to get to 100% by 2050 or sooner. But it's a hard sell to the public without a public campaign, a real grassroots movement that starts to talk about the importance of getting those reductions, the importance of getting 50% of our electric power from solar and renewables by 2030. A movement pointing out that without increasing the pace, quite simply, we won't make the UN's climate goals, and we'll be in a brave new world in which people will be arguing that we should just give up collaborative goals altogether – each nation/state for itself.

One of the emphases in the coming year with regard to co-benefits for disadvantaged communities will be a huge effort to slash methane, black carbon and so-called short-lived pollutants. Where those pollutants fall most heavily is on the people who are least able to cope, least able to mitigate, who have the highest levels of unemployment and experience the burdens of structural racism. Focusing on methane, black carbon and short-lived pollutants will enable the state to stay on track with emissions reduction targets while working to reduce pollution in disadvantaged communities.

There have to be efforts to tighten transportation and building standards. The state is on track to get to 75% recycling and composting in the next five years. There is supposed to be a forest carbon plan issued by 2016. However, it's not yet quite clear what's going be in that plan, especially given the fact that the state seems to be permanently on fire.

The divest-and-invest formula, I think, is extremely important, and I can pretty much predict that by January 2015 somebody in the legislature will introduce a package of bills in the direction of divestment from fossil fuels. For it to get any traction, it will have to start modestly, and, to get broad-based support, it will have to get coupled with investment for co-benefits for disadvantaged communities. But I think it will happen as a result of the extraordinary work by students from the University of California (UC) and elsewhere campaigning on this issue. In losing the initial fight to get the UC to divest, they actually gained a promise from UC to spend a billion dollars on clean energy in the next five years. Is that enough? Who can say? But without that effort by those students, the wheel of UC investments would not even be beginning to turn.

I want to summarize what I'm saying here. I see a green block arising and let me tell you what that means. Don't think about the US government or the UN as your main focus, but think of the communities where we live, and try to make a difference, whether it's Marin or next door in polluted, degraded Richmond. Where we live. That's where the green economy is rising. And by that I mean dedicated, serious efforts to establish a low-carbon/no-carbon future, modeled partly or largely on California. The model is spreading very widely.

There is the Pacific Coast Action Plan on Climate and Energy, made up of the western states, California, Oregon and Washington, plus British Columbia. British Columbia already has a carbon tax, which was a big controversy when it was debated originally and is now a settled matter of law.

In my homeland of the Great Lakes, six states and one Canadian province have signed on to the Midwest Greenhouse Gas Reduction Accords. We need to be aware that some of those states, like Minnesota, are even ahead of California in many respects. Additionally, the Great Lakes are really a great precious resource for the development of wind energy in the future.

On the East Coast, in New England, there is a similar pact: the Regional Greenhouse Gas Initiative. The RGGI has nine signatories and several observers, again including Canadian provinces. New Jersey left recently because of political pressure – Chris Christie pulled out as a form of allegiance apparently to the people who want him to be our next president.

The bloc I'm talking about here, even though it's infantile, is miles ahead of where it was 25 years ago. It represents a population of about 143 million Americans and a total combined GDP of $6-7 trillion.

Then we have California's green diplomatic efforts with countries including Germany, China, Mexico, Japan, Israel and Canada. These are countries where California actually has negotiated a pact or formal collaboration. The State of California even has a person in the Governor's office that negotiates agreements. I'm told if you're from another country, you can't leave the governor's office without a signed agreement. This bloc diffuses California's vision and technology and resources and includes many of the biggest polluters. It is aimed in the direction of what I would call a Green Global New Deal.

Let me end with just this one image. The Rosetta Stone is a European spacecraft that has been out there for a decade, and it is tracking a comet that is millions of miles away. The plan is to perish or fly off with the comet into the sun, the source of energy in the universe. This process has gone on for years and years and years. Now the comet has been reached and they're traveling together towards the future in the sun. The spacecraft is powered entirely by two 47-foot solar collectors. The point, I think, is where this all began 40 years ago, with the realization that the technology existed to do really great things. The problem was – and remains today – political, economic and cultural.

Wade Crowfoot

Deputy Cabinet Secretary, Senior Advisor
Office of California Governor Edmund G. Brown Jr.

I want to build on Tom Hayden's presentation and talk about where we've come on climate in California and where we're headed. Then I'll end with a couple of stories from this summer that really drive home the urgency and importance of taking action. Of course, my perspective is from the governor's office because I work for Governor Brown.

You all know that in 2007 California did what almost no other government in the world had done at that time, which was to put into law the reduction of greenhouse gas emissions. A lot of politicians stand up and say, "We're going to hit this target by 2050 or 2030," but the legislature and the governor at that time passed a law that mandated that California would reduce its greenhouse gas emissions to 1990 levels by the year 2020, which was a big deal. Part of that law was empowering the state agencies to actually put in place the regulations necessary to reduce greenhouse gas emissions. That law, AB 32, passed. The California Air Resources Board created a scoping plan with over 70 specific measures to reduce greenhouse gas emissions, and many of the programs that you know about today, whether it's the renewable portfolio standard or the cap and trade program, or the so-called low carbon fuel standard, were all pieces of AB 32.

Now, in 2014, we are seven years on, about halfway through the designated period of reducing greenhouse gas emissions for AB 32, and I'm pleased to say that in California we will hit that 1990 level target. It's a credit to government, and it's also a credit to the activism in the room.

But as we know, you could really use a metaphor of choosing two different pathways – the traditional pathway or a low-carbon pathway. And AB 32 was important because it put us on a new pathway where the paths diverged.

But we're only a few steps down that path, and ultimately our state policy goal is to reach an 80% reduction in greenhouse gas emissions by 2050. You all know that this transformation is necessary, say the scientists, to achieve climatic balance. So, what are we doing toward that end?

We really describe the effort towards the 2050 goal as three legs of the stool. There are other areas, such as agriculture, that I won't touch on today.

The first is vastly scaling up energy efficiency. Energy efficiency is not the sexiest of environmental technologies, and it's been around for a while. However, California has demonstrated remarkable effectiveness in energy efficiency. You may know that the average Californian consumes half of the energy of the average American, in large part because of the building standards that were put in 40 years ago. But we can and should do more. I have a smart phone like most of us in the room, and if we brought back Alexander Graham Bell, the inventor of the telephone, and showed him this instrument, he would have no idea what it was. If you brought back Thomas Edison, the inventor of the electrical grid, took him outside and showed him a power line or an electrical transformer, not only would he recognize it, he would be able to explain it.

Our perspective is that in order to enable energy efficiency we need to essentially unleash the amazing technology innovation that exists in California and in the world – through policy. And hopefully, part of what you'll talk about today is how you enable game-changing technologies in energy efficiency. So that's area number one.

Area number two: We need to squeeze the carbon out of energy generation, and we're down that path. The renewable portfolio standard will require that by 2020 one-third of the energy that we consume in California come from renewable resources. But our goal is, of course, an 80% reduction, so we have to vastly scale up that renewable energy. Until we actually achieve much cheaper, larger energy storage, part of our transition is relying on natural gas because solar and wind are intermittent forms of

energy, and we can't turn them off and on when we want to. So if we can't store them, we need other sources of power that can ramp up when needed. It's about expanding renewable energy, but it's also about creating a transmission and distribution grid that can take on more and more renewable energy.

The third major action we're focused on is electrifying transportation. Now, most of us drove here today in a car if we didn't take the bus or bike. I have a plug-in electric vehicle, but the fact is we rely on fossil fuels to drive, the same carbon-emitting energy source that we need to reduce in order to maintain life on this planet. So, in California we're very focused on actually building consumer choice for different energy sources to power transportation. Electric vehicles or fuel-cell electric vehicles are a major part of that solution.

We're very excited that 40% of the electric cars in the country are actually sold in California. We're considered by the automakers as the largest market for EVs in the world. But guess what? We just passed a milestone of 100,000 electric vehicles, EVs, in California. You know how many cars we have in California? Thirty-one million. We're just at the beginning of this transformation in terms of moving to a different energy source.

Of course, California has fuel efficiency standards and emission standards that now the Obama administration has adopted, so we're making conventional fuels more efficient, but ultimately we're not going to reach that 2050 goal until we've fully switched our transportation fuel to a cleaner source of energy.

Another key piece of electrification is high-speed rail, and frankly, I tell a lot of my friends who work for environmental organizations, we need more environmental support for high-speed rail. It's an easy project to criticize. It's a big, audacious, expensive, long-term project in an era where citizens don't trust the government to deliver such projects, but in the 22 countries where high-speed rail has been introduced, it has been an absolute game-changer, moving people out of cars and off planes and onto rail. And you may know that high-speed rail in California will be 100% renewable, so the idea is to have zero fossil fuel generation when moving from northern California to southern California and back.

Incidentally, it's already the busiest short-haul market for air travel in the United States. The way we explain it, it's not choosing between high-speed rail and the status quo. No. We will be a state of 50 million people in a matter of decades, and the question is: how are we going to expand our transportation infrastructure? Are we going to expand our airports? Think about the Bay Area at sea level. Would that make sense? Are we going to expand the I-5, the 99, possibly double-decker in some places? Or are we going to make a transformational change? That's why we're so passionate about high-speed rail.

There are key questions as we move towards 2050, and I'll be candid about this. In this room we may not all agree on the answers, but these are the questions. One is what's the next target?

So we have in law this target of 2020, and we feel good about it ourselves and pat each other on the back for meeting that target, but if we're going to reach this 2050 goal of an 80% reduction, what's the 2030 goal and when will we put it into law? And what programs and policies and incentives are we willing to take on to meet that 2030 goal[1]? That's one of the key questions for the next year or two.

Secondly, as Tom Hayden mentioned, this is not all sweetness and light in California. The oil industry and many oil companies are fighting back fiercely on even continuing the programs that we have in place. You may have heard about a so-called "hidden gas tax" that will take effect on January 1st 2015. That is because fuels, for the first time, are coming under the cap and trade program, which limits the amount of carbon generated. We're also instituting the low-carbon fuel standard that requires the carbon content of fuel to be reduced.

Not only do we need to envision and materialize the next step towards the 2050 path, we also need to fight this rear-guard action attempting stop progress even towards the 2020 target.

The other key question is a tough one, and frankly, I don't think that there's a lot of alignment around an answer. What do you do about the fossil fuel that's in the ground? This gets talked a lot about by folks that are part of the anti-fracking movement. I believe there was an article in *Rolling Stone* recently by Bill McKibben that essentially quantified the amount of fossil fuel underground on the

[1] In the spring of 2015 Gov. Brown set the 2030 target at 40% reductions below 1990 levels. SB 32 in the State Senate soon followed suit, establishing 40% reductions by 2030 as the midpoint goal on the way to 80% by 2050.

planet and said, look, it's fine that we're advancing all of these efforts to make energy usage more efficient, etc., but unless we keep some of this fossil fuel in the ground, there won't be a solution to climate change. How does that actually manifest in local policy or state policy or federal policy, or even international negotiations? Key question.

We're focused on continuing to build the California model: to be an economy that grows but grows on a new pathway that reduces carbon emissions. I worked for almost a decade in local government in San Francisco, and oftentimes what you heard was, "Oh, that's great, but you're San Francisco, or you're Berkeley, or you're Marin. Now, that's fine, but you're kind of a boutique city, or you're the Bay Area, you know, you live in a bubble."

Well, nobody can dismiss that if California can do it, other places can too, because it's the 8th largest economy in the world and it has many of the challenges that nations face. What we're showing is that while we're reducing greenhouse gas emissions like we have since 2007, our economic growth and prosperity can outpace the rest of the country and the rest of the world. That is keeping the momentum going towards the 2050 goal.

Governor Brown has been to China, he's been to Mexico, he's been to Germany. He was just at the United Nations in New York City for the big climate summit, and his message is that we can't wait. There are models, and there are solutions right now, and it's a matter of political will.

The governor has talked about going to Lima, Peru for the next stage of the international negotiations this December and then being present in Paris in 2015, which is really where the rubber meets the road. I probably shouldn't use that metaphor in this speech, but really, Paris will decide in large part whether there can be an international agreement on climate change.

I'll say this: I had the opportunity to staff the Governor in China and have done a lot of the follow-up work with the Chinese. The Chinese totally get it. What's refreshing is that you go to China, and there's no debate about whether climate change exists, or who is creating climate change. They're always very good about reminding us that we have that debate in our country. But as Tom Hayden said, they're trying to raise over a billion people out of poverty. And the prosperity that you and I enjoy on a daily basis was built, in part, on hundreds of years of fossil-fuel usage.

From our perspective in California, if China and India and other "developing economies" are going to pursue a low-carbon pathway, we have to do that with them. It can't be something imposed on them, and it can't be a decision about economic growth versus environmental stewardship. We're very excited with what's happening. We think that California can continue to be a model that will show the world what we can do – and at the same time partner with other countries to actually help their efforts.

I'll lastly say that this has been an alarming and somewhat sobering summer on the topic of climate change. Among other responsibilities, I coordinate our drought response in the Governor's office as well as wild fires – basically emergency management. You may know that just three and a half hours to the south and east of here, there are California residents without water, reminiscent of almost like the Dust Bowl 100 years ago. The governor received a really poignant letter from a woman named Jean Wilson in Madeira County and I actually called her back. Of course, not every constituent letter gets the response that I was able to give to Jean Wilson, but I talked to her and I kept in communication with her.

She wrote this desperate letter to the governor because she said, "My neighbors are knocking on my door, some of them elderly, with empty bottles, asking for water." This is in California in 2014. A lot of these families have lived in their homes for decades and have never experienced their domestic wells running dry. The drought, of course, has created this. With reduced surface water supplies there is increased groundwater pumping. The shortest straws in the milkshake are those domestic wells, those private wells in rural areas, and they've run out of water. There's no easy solution. We've been able to find disaster funding assistance to provide bottled water to these residents on a temporary basis, but the longer-term solution is much more expensive and difficult to figure out.

Ten years ago when we talked about climate change, people envisioned the proverbial polar bear and melting ice cap. We need to be able to explain to people in our communities that this is about protecting the future of the planet, but it's also about protecting people in the state. Right?

That's drought. That's the reality we're living. The science is very clear – warming temperatures in California mean more winter rain, less winter snow, more of that rain running off in the winter, less of it kept in the mountains to slowly melt and provide supply. So, climate change will drive more persistent drought in California. This will increasingly become the new normal.

On wild fires, you may have heard about the King Fire east of Sacramento, between Sacramento and Lake Tahoe last month. That fire gained 15 miles in one single day. Our CalFire leadership said they've never seen wild fires spread like that. In fact, some of the firefighters who were out there digging lines had to shelter in place, using a very rare technique where you basically dig yourself in the ground and let the fire pass over you, because the fire moved so quickly. This is not a bunch of environmentalists talking about climate change. What they're seeing are fires that are hotter and more aggressive than they ever have been as a result of the dry vegetation, the drought and the hot summer weather. Again, this is the new normal in California.

What's the human cost to the people who lost homes in that fire or other fires? What's the economic cost when we're pulling from the general fund month after month to fund emergency firefighting responses?

I think a sort of environmental stewardship of the planet motivates many of the people in this room, but I think these experiences in California will start to turn the tide. People are realizing that climate change is a planetary issue, it's a planetary challenge, but it has localized impacts, and we need to continue to take action on the long-term solution for our children and our grandchildren. It goes without saying that while we are reducing greenhouse-gas emissions, we need to take steps to protect our communities and our residences from the impacts of a changing climate.

I'm excited to be here. I think this is really a timely conversation. I think there is great opportunity, more opportunity than there has been in a decade to actually achieve an international agreement to reduce greenhouse gas emissions and I think it can't come too soon, as indicated by the experience here in California.

Vien Truong

Environmental Equity Director
The Greenlining Institute[2]

I want start by saying where I'm from: Oakland, California. Anybody else call this home? Yay! Oakland is in the house. We know, then, that Oakland is home to some of the worst pollution in the country. We have the Port of Oakland with trucks delivering cheap goods from the port to the rest of the country. This is the fourth largest port in the country. We have one out of four people in East and West Oakland with asthma. We have a 10% unemployment rate, double that for men of color. On top of that, six months ago, my husband and I were holding our twin one and a half year-old boys, rocking them to sleep, and outside our window our neighbor's 16-year-old kid lay dying. He had been shot multiple times. The paramedics were trying to save him. And it stopped me cold. I'm shaking now just thinking about it.

The memories of the first time I saw a murder came flooding back. I was eight. The memories of my friends in junior high school who were murdered came flooding back. My nephew, being murdered when I was in law school. A lot of the time we think environmentalism doesn't include this stuff. We think these are separate issues, particulate matter and 16-year-old kids getting murdered. But for me they're not. For me it's a question: What kind of world are we leaving to our kids?

For me, poverty and pollution are deeply connected. And it's not just for me. Leaders on this stage have been talking about the connection between the planet and the people for a long time. Van Jones has talked about creating green jobs not jails, an inclusive economy strong enough to lift people out of poverty.

Manuel Pastor has talked about the need for us to close the climate gap because low-income communities are disproportionately impacted by climate change. Majora Carter has talked about greening the ghettos, creating inclusive community for all people. john powell has talked about creating a beloved community, so that we are not governed by our divisive issues but are really creating a sane place called home.

So why haven't we created this shared movement, this massive movement that has potential? I think it's because we have to rethink our strategy. We have to ask who, how and what. Who are we working for? Who's really impacted by these issues? Who do we need to have at the table? How do we work with them? How do we create real, deep partnerships across our issues? And what are we fighting for? What are we dedicating our lives to? What are the core issues that brings us all to the table?

When I think about "Who," I think about this framing of solidarity: "If you came here to help me, you're wasting your time. And if you came for help, I don't have the time. But if you came here because you see your liberation bound up in mine, then let's work together." That's what we have to do.

Often, our environmental campaigns are focused on traditional environmental groups, and yes, that is important. We need to have people who are fighting for the environment at the table. We now also have to realize that sixty percent of Californians are people of color. Seventy-three percent of people under eighteen years old in California now are people of color. We have to recognize this, and we have to organize around it if we're going win.

The second question is "How." How are we working with the people who are most impacted? By asking this question, the Greenlining Institute has formed a deep coalition including Asian, African American and Latino communities. Beyond the ethnic diversity, our coalition represents ethnic chambers of commerce, churches, health advocates, traditional civil rights organizations, ethnic media outlets and community development corporations. We're connecting with others based on what Manuel Pastor

2 Vien Truong is currently the National Director of Green For All. See her contributor biography for details.

says, not on our transactions and quid pro quo, but on having a shared vision for the world.

Together – I want to make sure that I capture this – together we're working on things like electrifying the trucks and buses that come out of West Oakland with environmental justice advocates. We have worked with ethnic businesses to fight for supplier diversity in banks and in the California Public Utilities Commission. We have fought alongside consumer advocates to stop rate hikes against working families. It's important because sometimes solidarity means saying, "I'm fighting for the issues that are really key to you, even if they're not on my work plate, because we share the same vision for the world and we fight for the same people."

The second question is: How do we work together in a truly collaborative way? Too often we're calling on our partners at the last minute and saying, "Can you bring out fifty or two hundred people to this demonstration tomorrow?" "Can you sign on to this letter of support?" "Can you endorse our campaign strategy that we have created ten months ago?" We want to make sure that we're engaging and inviting as many people as possible, but what is more powerful is inviting people at the beginning of the idea, at the beginning of the strategy. That's how we make sure we're creating a comprehensive idea.

The Campaign to pass Charge Ahead (SB 1275) is an example of how this was done really well. When the idea first came together, funders, including the Energy Foundation, the 11th Hour Foundation and Hewlett, worked together with Dan Jacobson and NRDC to say: How do we make sure that this isn't just about electric cars? How do we make sure that this is about fighting for people all over California? They invited me to join, they invited some of our EJ partners at Communities for a Better Environment to join. And as a coalition we asked this one question: How do we make sure that we are not just fighting for electric cars but fighting for transportation choices for everybody?

This led to us successfully passing a law that actually makes electric cars affordable for working families, the creation of two car-share programs for underserved communities, a financing program for those with low or no credit score and fast-tracking car charging efforts in multi-family buildings.

We accelerated the market. We made sure that we're combining voucher programs together and allowing the combined voucher to be used for a used vehicle. That'll bring down the cost of the electric car by $3,000. We're also making sure that California's Cash for Clunkers program support public transportation and car sharing, because it's not just about getting a lot more cars on the road, right? We're environmentalists, after all.

We are making sure that we're creating two pilot programs across California for low-income households and hopefully, one for Central Valley for migrant farm workers.

The final question that we asked is What. What are the solutions that we're working for? The old school way of looking at environmentalism is parts-per-million, greenhouse gas emissions, renewable portfolio standards, mitigation and adaptation. Yes, those things are really important. I work on them. But we have to think larger and bigger if we're going stop climate change. These are the issues that Senator Tom Hayden talked about, that Wade Crowfoot has talked about, that Dan Jacobson has talked about, and I'm going go into a little bit deeper here.

When we think about this question, we think about how we can leverage and ensure that the solutions we are working on can address the deep-seated issues mentioned at the top of this talk. Given the size and urgency of this matter, we have looked at how we can create bold solutions. We know that exploited workers and an exploited planet are a package deal. So we work on how to heal our broken economies and our shattered communities.

California already has a cap-and-trade program, which makes polluters pay. A group of us scrappy folks came together and said, "How do we make sure that we're using this pot of money not only to solve pollution but also poverty?" So we passed a law – took us four years – that requires a quarter of that money to go into benefiting disadvantaged communities.

We said, "Alright, we've been working in the community, we're from the community, but we should not be deciding what happens for the community." So we did a year of meetings, town halls, workshops, webinars, online surveys. We talked to organizers, businesses, council members, mayors – we talked to everybody. We said, "What are the priorities in your town? What are the most effective programs that

you see?" And at the end of that effort, these were the emergent priorities that we fought and advocated for during the last two years (see Figure 1).

Figure 1

Funding for Disadvantaged Communities in the 2014-15 AB 32 Budget

Program	$ Millions
Transit and Intercity Rail Capital Program	$625
Low Carbon Transit Operations	$12.5
Affordable Housing /Sustainable Communities	$65
Low Carbon Transportation	$100
Weatherization	$75
Sustainable Forests/Urban Forestry	$18
Total	$272 (32% of total cap-and-trade proceeds)

We got transit, inner-city rail capital programs, low-carbon transit operations, affordable housing by transit hubs, low-carbon transportation, low-income energy efficiency and low-income renewable energy. The two pilot programs I talked about earlier that electrify trucks and buses were funded for $100 million this year. Additionally, we have sustainable forests and urban forestry funding so that the picture of West Oakland that you see next time will have a lot more trees. And that's what a win looks like – $272 million this year for low-income communities to clean up. This is the biggest pot ever for low-income communities.

It's projected to grow to $3 to $11 billion in the next six years. Think about that. That is how we stop homicide. That is how we create jobs in our community. That is how we reduce pollution. That is how we create triple bottom line benefits.

My simple ask to you is that you think about those three little questions anytime you start a campaign: Who, How, What. Who are we serving? Who is impacted by these issues? Who needs to be at the table? How are we working with them in a really deep and meaningful way, as true partners? How do we make sure that what we're working on has the most important impacts? What is it that we are fighting for?

I'm really excited and proud of the coalition, the partnership and my team for having delivered some amazing things. It really does give me hope, despite all the stuff that's happening outside my window. I also realize that no amount of policy is going to stop the murders on my streets if we don't get one thing straight. We need to really create peace in ourselves, peace with each other if we're going have peace on the streets. My kids are why I do what I do.

My kids. And isn't that why we all do what we do? Our kids. And the kids that we don't even know. Our friends' kids and future generations.

When I think about my work, I think about a quote from Tom Steyer. He and I don't have very much in common. I grew up in Oakland. I grew up in poverty. I still live in Oakland. He grew up in the Upper East Side on other side of the country and is a billionaire. But we do have at least one goal in common. He said in an interview, "My kids aren't inheriting my wealth. They're inheriting the world and the values that I'm leaving behind. What I'm passing onto my kids aren't going to be billions, it's clean air."

Arsenio Mataka

Assistant Secretary for Environmental Justice and Tribal Affairs
California Environmental Protection Agency

I spend most of my time at the CalEPA thinking about and trying to help what we call disadvantaged communities. That is not the term that I prefer, but that's the term that has taken its course in the legislature, so I will use the term, "disadvantaged communities."

When I speak of disadvantaged communities, I talk about those specific communities that have a relatively high pollution burden and a relatively high vulnerability to that pollution. We're no longer just looking at whether you're poor or not, we're looking at the effects of being poor and how it affecting your ability to deal with pollution. Some of these communities are facing really dire environmental conditions and can be filled with a sense of hopelessness in some cases.

I want to talk about the power of a story. I didn't learn about the real power of messaging and stories while I was in law school and I didn't learn it through CalEPA. I learned it as a young man back home. I learned about the importance of a story in the country part of California, the spine of California. I grew up in a small, farmworker community in the Central Valley, in Stanislaus County.

One of the most vivid memories that I have as a young man is of a just blistering hot summer day in the late 1980s when I was a kid. Some friends and I were playing in this dirt patch, playing marbles and munching on some snacks, and all of a sudden we stood up and saw lots of people lining the streets with trucks filled with appliances, filled with refrigerators, washing machines, water heaters, all kinds of supplies. These people were not from our community and, as kids, we're wondering what the hell's going on here, right? Now, in this small town there are only a couple hundred people that live there. You don't often see a lot of people come into your town. When a lot of people come, something's happening, and a lot of times, it's not good.

Next thing we knew, we saw men and women coming into all the homes in our communities and replacing our refrigerators. We had an old refrigerator, the type that actually had ice in it – you had to chip away the ice on the thing to make sure it still worked. They also replaced our old swamp cooler. If you've ever been in the valley, you know it gets hot there and a lot of folks can't afford air conditioning, so a swamp cooler is an economic way to cool down their house. Then they weatherized our home, putting weather stripping on our doors and our windows.

Even at a young age, I understood one thing. I understood the economic benefit of what was going on here. My mother would always scold us, like many mothers do throughout this nation and world probably, about leaving the light on when no one is in the room, or leaving the television on. I understood that these new appliances and upgrades would help us save money, and our infamous power bill would now be a little less.

Like many folks in my community, the broader environmental benefits associated with those upgrades (energy efficiency, for example) were like a third tier of importance for us. First came money, second came comfort, and third, if people caught it at the time, was the environment.

I like to say that through this experience, community members learned some basic things: The less energy we use, the less energy we need to produce. In my community at that particular time, we knew what it meant to produce electricity. We were quite familiar with the production of electricity, because we understood the real cost of generating electricity. We were experiencing it. At one point when I was around this age, we had the largest tire pile in the world, just around the corner. I could see it from my backyard, burning tires – 40 million tires, the largest tire pile in the world in an area that already had bad air, and we were burning it for electricity.

Not too far down the road, one of the three trash incinerators in the state of California was burning

our trash, creating electricity. So we understood in a visceral way the importance of electricity as well as some of its real costs.

Another improvement that arrived was aerator faucets that saved water. In my community we have never been able to drink our water. Nearly one million people in the state of California don't have clean, safe drinking water – and we have never been able to drink the water out of our tap. We understood the preciousness of saving water.

That all happened over 30 years ago, but if you survey my community today, folks can still tell you how much those investments meant to them. They could tell you how much those investments saved them and how much the collective efforts were making a change for a cleaner environment.

I share this story not to preach to all of you about weatherization and how that can help reduce climate change. You know that, of course. I say this because there's power in a story. There is a power in how we tell our story, and when we create powerful stories, we can get folks to do things that they didn't think they could do.

When I think about my community on that day, the story wasn't, "Get a swamp cooler and save the Earth." It was, "Get a swamp cooler to live more comfortably and save a little cash" – an economic benefit. But it was more for some residents. It allowed them to do something that they didn't think they could do. As I think of this event, I think about the learning curve that happened for some of my neighbors. I picture them saying, "So you're saying that my weather stripping and my swamp cooler is lessening the demand for us burning those tires." Making that connection. And I say, "Yes. Yes, absolutely. That's how we want to start." Only a powerful story can connect those two things. I think we need a new story for climate change – one that speaks more directly to all Californians, and specifically our most disadvantaged communities.

We know that climate change will have an especially negative impact on poor communities or communities of color. We know that. We know the effects of global warming, such as heat waves and increased air pollution, will have greater effects on disadvantaged communities. We know that. These communities, of course, may not have the resources to adapt.

Now, you would think that the immediate concerns of the people who live in these disadvantaged communities would be ones of basic elements of life – food, shelter, work, that these communities might be less inclined to worry about environmental issues because they have to worry about all these basics. However, through surveys conducted by the Public Policy Institute of California, we have found the opposite to be true. We know people of color and low-income residents are overwhelmingly concerned about global warming and are among the most ardent supporters of policies to mitigate greenhouse gases. These concerns further amplified support for policy intervention, especially amongst Blacks and Latinos, at 88% and 83%, respectively. Blacks and Latinos overwhelmingly support action now.

But, I think these numbers are a little bit fuzzy. I just do. I think they're a little bit fuzzy because saying that 88% of Latinos agree that something should be done is a little different than expecting something to be done.

Last week I went back home to celebrate my father's birthday, and the swamp cooler that I described is still there, and it's still working. At this gathering we had a few neighbors and family members, folks who normally represent, in my view, disadvantaged communities: poor folks, folks with no college degree, folks with some linguistic isolation (meaning they can't speak English), folks who may not have a job. I said, "Well, I'm going to speak at Bioneers next week and I kind of want to talk about this. I'm going to start a conversation about it."

So I started asking folks, "What does the term carbon mean to you? What do the terms global warming, climate change, reduction of greenhouse gases mean to you?" The answers that I got were predictable, I think, but they were troubling to me, because most folks didn't understand the term carbon. When I met Tom Hayden, he asked me that specific question. He asked, "Do people in disadvantaged communities understand the term carbon?" And I said no.

They aren't entirely familiar with greenhouse gases either, and if I received an answer about climate change or global warming, it would be something close to the typical story about melting ice caps and

sea level rise. Most people didn't feel like they could participate in these issues – melting ice caps and sea level rise. What was obvious to me was that they were not making any personal connection to these issues, even the ones that they identified.

For people living in disadvantaged communities, we are missing opportunities to show how climate change is – *is* – affecting poor folks and people of color right now. We are simply failing to identify a present and a direct impact to their everyday life.

What I needed that day was a powerful story. I needed a powerful story, a story that would not only link climate change to everyday life, but also a story that had the ability to move folks beyond the, "I agree with policy interventions" stance to, "We expect policy interventions," stance, shifting this sort of idle block of our state from agreement to expectation. Those are very different.

We need a powerful story and we'd better get one quick. I tend to gravitate towards a health lens. Many of my colleagues focus on both health and economics, but I seem to see the most promise in a public health lens.

I understand that this is not a new concept. I understand a lot of people have been working on this. Even in state government we have an office of health equity now that is looking at this, but when I travel throughout the state, before I can even start to talk about any environmental pollution, families or residents want to jump right to the issue of health, mainly asthma. By far and away, asthma. It makes sense. It's present. It can affect whether or not a kid is going to school that day. It can affect how they're sleeping at night. It's directly related to their everyday life.

Now, are these folks thinking about carbon or climate change when they talk to me about asthma? Some are almost there – they see a smokestack, or they see polluting cars or trucks and they say, "Look, that's our problem." They're almost there.

In many disadvantaged communities throughout the state there are existing networks of health educators. In Spanish we call them *promotoras*. These are people who have already been trained to explain very complex issues to the people who live in these communities. There's already a network. There's already an infrastructure for this sort of education and information. They can help explain the relationship between public health and climate change, and within these networks we have transformative opportunities to create and share a powerful story.

I want to leave you with this: In the program for this event, I saw the quote from Senator de León about needing to teach the electric car to speak Spanish. The idea is that we want all segments of our society to take part in any advancements we make as a result of responding to climate change. We want all segments of our society to prosper and experience the benefits of this work, because they sure as hell have been experiencing the burdens.

But I think there's something else there, too. Trying to get zero-emission vehicles into low-income or communities of color is important work, but that only gets us halfway. It gets us to empowering people to help reduce pollution in their community, but we're not connecting it to the bigger and broader issues of climate change, which we need those folks engaged in. Developing and telling a powerful story that enables everyone to identify climate change as an issue relevant to their lives is a very important part of this work.

Ross Nakasone

California Policy Organizer
BlueGreen Alliance

The BlueGreen Alliance is a national coalition of labor and environmental groups committed to the idea that we can address today's environmental challenges in ways that create and maintain family-sustaining jobs in a stronger, fair economy. We're guided by the principle that California doesn't have to choose between economic prosperity and environmental sustainability, that in fact we can have our cake and eat it too. We can have both.

The way we think about it is as a Venn diagram, where labor is in one circle and environmental issues are in another. The little football shape where they overlap is where we feel like BlueGreen Alliance is and we need to make that football bigger and bigger until it ultimately becomes one circle.

It's certainly not just the BlueGreen Alliance. A lot of folks – NRDC, Sierra Club, Union of Concerned Scientists, all partners of the BlueGreen Alliance – are working very hard to reach out to labor groups to build these coalitions.

We have really great examples where circles overlap. SB 1371 by Senator Leno, which is a fairly nuanced bill, has as its ultimate goal to speed up and reduce fugitive methane emissions coming from our natural gas distribution pipeline. It's really good on the jobs front, really important for the environmental justice community, and of course reduces methane, a very potent greenhouse gas.

Another really good example of strong coalitions overlapping is with the low-carbon fuels standard. You might think that the United Steel Workers, who represent a good slug of refinery workers here in California, would be naturally allergic to reducing our reliance on fossil fuels, particularly as it relates to transportation. But in fact they've embraced AB 32 generally, and specifically the low-carbon fuel standard. They see it as an opportunity to transform and evolve their industry over time.

Other examples include the Renewable Portfolio Standard. A number of our labor partners have really benefited from that, utility scale solar in particular, and we've generated hundreds of thousands of jobs hours, thousands of jobs that are family-sustaining, really great, great jobs. High-speed rail, also again controversial but really intended to create prevailing wage jobs in the Central Valley where they are needed most.

Coalitions are good and important, and, for the BlueGreen Alliance, it's just the right thing to do. We are talking about adding labor to the existing coalition between environmental justice and mainstream environmental groups. But frankly, the political analysis finds that labor support for AB 32 is necessary. In order to build the political power to combat manufacturers in the oil industry who are really trying to undo a lot of the work or ultimately end our work in 2020, having labor on board is necessary just from the political landscape.

We've had pretty good success engaging unions just on the broad notion of AB 32. They supported the passage of AB 32 way at the beginning. They were really strongly opposed to Proposition 23 back in 2010 that would have undone clean energy and climate law. And we've seen just this year their serious engagement on the AB69, the effort to actually repeal or delay or exempt the oil industry from the cap and trade program. Unions really came out in strong opposition to any efforts to do that, so that was really nice.

But the challenge, I think, is how to develop deeper, more significant union engagement on AB 32. So, back to that Venn diagram. Unions are a very diverse group of people and they are not monolithic by any stretch of the imagination. In order to build effective coalitions and collaborations, it's important to try to understand where union motivations come from. I think on balance, you're going to get a lot of unions nodding their heads, climate change bad, addressing climate change good, but where does it fall in that circle? I think for some of our union partners and allies, it really does fall in the outer perimeters

of that labor/environment overlap, right at the boundaries of AB 32. It is something that they will agree with, but not at the core. Proverbially speaking up in Sacramento, you might get a "me too," but really, is it a place where it is deep in their hearts? I'm not sure, and I think there's a lot of work still to be done.

We've seen other instances where that shift has actually occurred, on immigration and healthcare, even healthcare not related to healthcare workers. These are things that are really at the core of a lot of labor movements, even though it's not necessarily their raison d'être, the core of which is about family-sustaining jobs.

I think the challenge is trying to get these circles to overlap more and to have each of these kind of communities really start to embrace new and different ideas as we start to move forward towards 2015 and beyond.

Bernadette del Chiaro

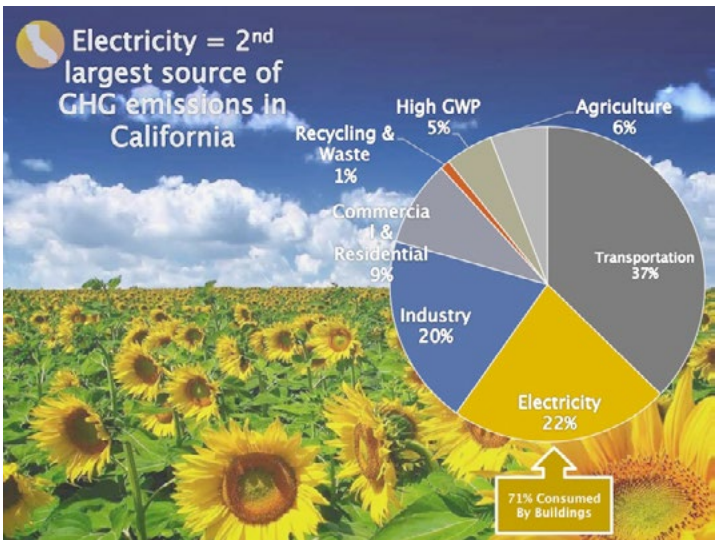
Executive Director
California Solar Energy Industry Association

My name is Bernadette del Chiaro. I'm the executive director of the California Solar Energy Industry Association (CALSEIA), and I've been at this for a little over a year now. Prior to this position, I spent about 16 years advocating and agitating within the environmental movement. One of the reasons I took this job with CALSEIA is that right now is a tremendous opportunity for us politically to start organizing people of all different stripes. When I look at my membership, which consists of over 200 companies up and down the state, inland, coastal, north, south – they're really diverse politically. To me that's the power of helping to mobilize businesses to be part of building "the Yes," as Senator Hayden writes.

I should also mention that I was about two years old when CALSEIA was formed. We're the nation's oldest and largest state-based solar industry association, formed in the late 1970s during the first Brown administration. We have obviously changed a lot over the past 40 years and hope to grow and take this technology to new levels under the next Brown administration.

I want to share one of my favorite quotes to frame this talk. Kahlil Gibran says, "The eye of a human being is a microscope, which makes the world seem bigger than it really is." To me, this quote captures both the naiveté and hubris of human beings, literally mowing down mountains to get every little last clump of coal. It also captures the ease and quickness with which I think some of our fellow humans have been willing to think that the problem of climate change is too big for us to solve – that we are too small. We have more solutions at our fingertips today than we are taking advantage of. This is a daunting problem, but we absolutely can solve it by working together. And we're already off to a good start.

One of the reasons that I've really focused my activism on electricity is shown in this graph.



We spent a lot of time thinking about the transportation sector, and rightly so. But as you can see, electricity is actually the second largest source of carbon pollution in California. Unless we green up the grid while we do it, electrifying the transportation sector is only going to be shifting things around.

Over 70% of our electricity consumed in California is consumed in buildings, so if we can green up our buildings, if we can make them more energy efficient, add distributed generation, and green up the grid as a whole, we can really take steps towards solving the climate problem.

One of the things I want to share with you is that there are a lot of dark horses in this race to the top in clean energy, particularly in the rooftop solar market. A report from *Environment America* shows that just 20 cities, representing .1% of the US land mass, host 7% of our solar capacity.

Even more revealing is that if you look at these dots up-close, Phoenix has more solar than San Jose, Indianapolis has more solar than San Francisco. We're seeing places all around the country, not just left coast and right coast, but in between – red, blue and purple – embrace this technology as an obvious solution for America, for American consumers, and for our children

Here's another solar fact that you probably don't know about. I was shocked when I heard it. The United States has the world's largest solar heating market for swimming pools. We have a bigger market on solar swimming pool heaters than the next 24 markets combined. While you might point out that this is not exactly getting at the heart of climate change, I think it's really important actually to recognize solar water heating and solar thermal as a really important technology for us to dig deeper into reducing carbon emissions in the building sector. This is actually keeping a hundred-year-old industry afloat, keeping the business know-how there and stable, so that they're going to be ready to build those green buildings that we need them to help us build.

I want to share four quick facts on the California solar market, because it's important to know where we are so that we can figure out where to go. First, we've installed more solar in the last 18 months than the previous 18 years combined.

Secondly, we have more rooftop solar capacity installed today than the now defunct San Onofre nuclear power plant used to generate. This is just the rooftop market. This is not the large, utility-scale project out in the desert. It's phenomenal how meaningful this market has become.

Third, in 2017, I estimate we're going to hit the real bona fide million solar roofs goal in California. If we continue with our healthy growth, we'll hit the two million solar roof mark sometime around 2020.

Finally, my favorite new fact is that we now employ more people in the California solar industry than in all of our traditional, fossil-fuel dependent electric utilities combined.

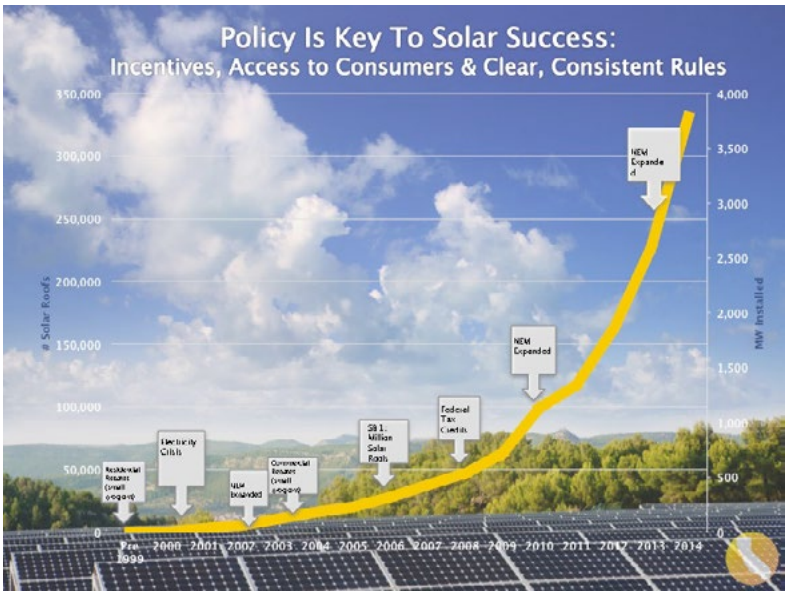
What's driving our success? What has put us where we are today? California has three main ingredients, we have 'em in spades, and we need to keep harnessing them.

One is strong public support that can be harnessed into political action. That is the foundation of all of our progress.

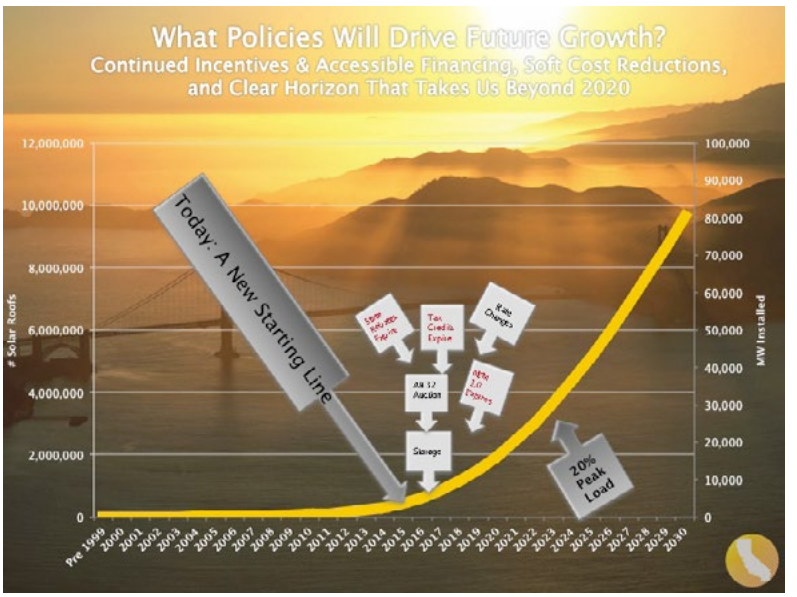
Second, we have a really strong industry. This is the industry with know-how. Nobody has it better than California. We can build this future. We have that ability if we can get the policy right.

Third, we have supportive political leadership. We've had two gubernatorial administrations strongly embrace renewable energy, particularly rooftop solar, and this has given us the foundation that we've been able to build upon.

While governors are incredibly important to have on our side, we have fifty supportive commissioners, all with critical authority to make decisions about our future. We have 120 legislators and we have literally thousands of administrative staff whose job is to take these visionary ideas, like the Million Electric Cars campaign, and actually convert it into real policy that gets converted into real action. Even a perfect policy requires effective implementation – getting the details right can make all the difference in the world.



This chart is a simple plot of cumulative solar power installed in California over the past 14 years. It is amazing, but when you're at near zero, it's not hard to see tremendous growth, right? It shows the major policy initiatives that have been put in place that have literally been lifting this growth line up. It started with the awareness of the electricity crisis that really lit people on fire throughout California as they realized that we needed energy independence, that the current system was not working for us. This created the political will for these policies, beginning with net metering, which gives consumers access to the grid, rebates like the Million Solar Roofs initiative to drive down the price of solar and drive up demand, and the federal tax credit that was critical to our growth by continuing to expand net metering.



Unfortunately, this is now taking that same growth curve and spanning it out to 2030, if you assume actually pretty modest levels of growth. Right now, we're looking at 40% annual growth in the solar rooftop market in California. If you actually assume that slows down a little bit, then you would get this growth curve. But unfortunately, we're at a new starting line right now because a whole set of policies that have been built over the past decade are all expiring in the next two years. The California Rebate Program is basically all but wound down, net metering is set to change in the next two years, and the federal tax credit expires at the end of 2016.

Meanwhile, we have some other promising movements. We have more interest in storage, and policies that promote storage will help stabilize the grid and allow more solar to come online. Because of AB 32, this is the first time we're able to capture that pollution source and funnel those proceeds into carbon-reducing technologies and solutions.We're at a critical juncture right now when it comes to the clean energy policies that have driven the market. We are not yet flying. Today, we are barely above zero – less than 2% of California's rooftops host a solar system. We're really proud of where we've come, but we have a long way to go, and the policy initiatives that are going to be put in place in the next two years will be critical to determining whether we actually take on and see that flight path.

Some of our priorities for the coming year are going to be continuing to give consumers access. Net metering, the ability to send electrons back to the grid and interconnect to the grid, is critical. This is under fire from all over the state and all over the country by utilities that see it as their death.

Also, there is going to be a complete overhaul of rates, how we as consumers interact with our utility company, what we pay, whether our rates are actually promoting and encouraging conservation, efficiency and renewable energy or not. This is all on the table right now at the California Public Utilities Commission.

Continued access. Do renters have access to solar? Do low-income and multi-family housing units have access to solar? Do we take those AB 32 proceeds that come from natural gas and electricity and funnel them in the most productive manner to green up those buildings? Remember that 71% of GHG emissions come from the building sector. Are we pushing in the right way in order to be inclusive, give everybody access and drive a real market?

Lastly, are we extending the investment tax credit at the federal level to continue to provide that base of support for making solar affordable and reducing soft costs? This is just something industry cares a lot about: How can we get our costs lower and lower?

Governor Brown went to Germany in the summer of 2013 and he saw that they were installing solar twice as fast as we were at half the price. When he took a closer look, he realized that the biggest difference wasn't the modules and hardware; it wasn't even the installation and labor costs. It was primarily what is called soft costs. These are costs associated with just simply doing business – acquiring customers. In our case, of one of the most stubborn costs is just getting a permit from a local building department.

So, we said, "Okay, Governor, you're on. We'll take this on with your blessing." And we did. We launched a bill this past year – AB 2188 by Al Muratsuchi from Torrance – and we passed the country's first ever mandated, streamlined, standardized solar permitting program for the entire state of California. This initiative, if it's implemented well, should cut the cost of a solar system anywhere between $1,000-$4,000 for a residential home system. It's a significant savings and will take a giant chunk out of the cost of going solar, not to mention save local governments money as they use things like the Internet and other no-brainer ways to make government more efficient.

I want to spend just a minute on the concept of the "20% peak load." There is a lot of concern out there that we can't grow solar too quickly because "the grid's going to collapse." Well, let me just leave you with one fact on this: Hawaii has the highest concentration of solar in the country. They're at around 20% of their electricity grid, mostly from little rooftop solar systems. They're just now starting to see some of the problems with integrating, and they're an island with a lot fewer resources than we have here, obviously. They're already at 20%. California is about halfway to 5%. So we need to grow our market another five to six-fold before we even come anywhere near where Hawaii is right now.

The beauty of California is we have, again, the ingenuity, the intelligent business resources as well as good policy makers. We have the foresight. We can see what's coming. We can start to put in place today what's going to be needed to integrate the grid.

There is technology on the market today that acts basically like autonomous yet connected little mini-brains within our solar systems. They can help direct the electrons, the frequency, the voltage, all that's needed to keep the grid happy and alive and healthy. This all exists today and it's a pairing. Solar is actually what's going to allow us to reach our vision and keep the grid alive and healthy and modernized. It's not the problem.

I want to point out that we are facing a great American paradox when it comes to climate change because we are, of course, the source, the main root of the problem, right? But through our political activism, ingenuity, entrepreneurialism and our creativity, and by joining with other like-minded regions and countries, we will be the source of both the optimism and the engine of change.

In closing, Bioneers is celebrating its 25th anniversary, and the PV cell is celebrating its 60th. Sixty years ago, not too far away from here in Silicon Valley, Bell Labs invented the modern PV cell. I was at an event a few months ago with a man named Morton Prince, one of the original scientists working at Bell Labs back in the '50s. I was able to pull him aside and ask him, "What do you think about our progress? What's your assessment? You were there from day one." He said that he was incredibly disappointed that it has taken us this long to domesticate what was already ready to plug-n-play 60 years ago. He said it wasn't because the technology wasn't ready or that the costs were just too high but that, frankly, the fossil-fuel lobby stood in the way of our progress back then.

I thought that was a call to action. It took us 60 years to get to two gigawatts of solar. If we continue on our path of growth, if we continue to pave the way with good solid policy, if we continue as Californians and as the public to call forward this change and demand this change, we can do what we did in 60 years, multiply it by ten, and do it in six.

Renewable energy and solar is not the entire pie, but it is a critical component. If we continue to grow, we will get to 100% renewable energy. We will get to it in time that the climate requires, and we'll do it by small groups of people like this working together one house at a time, one community at a time, one state at a time.

V. John White

Executive Director
Center for Energy Efficiency and Renewable Technologies (CEERT)

I'm grateful to be here to talk about clean energy and the work that we do. I'm a native of Southern California, went to school at UC Riverside, grew up in Pasadena, so I've had more than 60 years of exposure to air pollution. Fortunately, it's gotten better. I began my career working on reducing air pollution and from that fight is how we came to clean energy. I actually think that it's important to remember that climate change really is an air pollution problem and not something completely separate.

One of the things that Bernadette Del Chiaro touched on is that we've had a lot of success in our clean energy efforts. But we've had a lot of success in relatively modest terms, and I think now we're starting to deal with the consequences of our success, needing to shift our focus and our strategies. Up to now we've been adding renewables and solar onto the fossil fuel-based grid, sort of like a green side salad on the greasy fossil-fuel burger plate. What we've now got to do is make clean energy resources the main part of the grid on the demand and the supply side.

The way the grid is organized now, the fossil fuels have priority, de facto. So, we are importing substantial amounts of fossil fuel from out of state, less coal than we used to, but a lot of gas, what is called system power. It's not enough just to add on more solar and more wind and more geothermal. What we need to do is rely on these resources to run the grid, and that's going to require some imagination, it's going require a change in policy, and it's going to require renewable advocates to think about how the grid works.

We have to recognize that while we love solar, it has a profile that matches nicely with the daytime loads but not so much when the sun goes down. The challenge is that we have to take these clean energy resources, bundle them, organize them and fit them together with other technologies like demand response. Alternately, we can attempt to bend the load towards the generation profile, which means we're charging our electric vehicles in the middle of the day, preheat and precool, use that clean energy, export some to avoid curtailment (and Nevada can certainly use some of our solar power to run its casinos). Adding more renewables shouldn't be seen as the problem, it should be seen as the way forward, but we have some mindsets to overcome.

With the exception of Germany, there's nobody that has put as much renewables onto the grid as we have. We're in uncharted territory, a little bit. And unfortunately, our grid operators and our regulators are conservative in their orientation. Their orientation is to rely on the natural gas plants to keep the lights on because the renewables on the demand side are untested and unproven.

We have to also recognize the need to plan this next phase. Everything we've done up to now has been kind of first in line: who's got a contract, who's got a transmission application, who's got a solar roof. This is less of a problem on the distribution grid, but at the large-scale level we've got to have better planning. We have to match where the transmission goes with where the resources are and think about how these pieces fit together. So, even though solar is the least expensive resource that we can buy at the moment, it's not the only one that we should be thinking about.

Geothermal, down in the Imperial Valley, is enormously valuable because it's 24/7, runs just like a coal plant, but it's more expensive than other renewables. Solar thermal with storage is magnificently suited to the task of turning on when the sun goes down, but also more expensive.

So, when we think about the work of the grid of the future, we have to think about how we can mix and match and use all of the attributes on the demand side and on the supply side to fit together with a grid getting steadily cleaner. We had an opportunity forced upon us when the San Onofre nuclear plant went down, but we weren't prepared. The utility never wanted us to plan for going without San

Onofre. Because of where it's located in southern Orange County, it was a very big deal when it went away because things like voltage and local generation were suddenly missing.

Our response has been the conservative one. We're building more gas. We haven't yet figured out how to rely on the green resources to keep the lights on as the primary base, and that's the challenge of the next ten years: to mobilize and utilize our green resources, and our demand-side resources, to optimize the grid to run on less carbon.

This has regional implications and lessons for other places as well. Because we import a lot of fossil fuel from other states, we are part of their compliance problem under the EPA rule. If we start buying renewables instead of gas and coal, that will help clean up the regional emissions and, I think, creates an opportunity for a broader Western grid that gets cleaned up.

I'm grateful that California is in the forefront, but we have a lot of work to do, and unfortunately, because of the drought and because of this increased reliance on natural gas, in the near term our greenhouse-gas emissions from the electric sector may be going up. So we need to double down. We need to double the rate of emission reductions and that means relying on these renewable resources as the central way we run the grid. I think we have an opportunity to do that.

Andy Lipkis

Founder and President
TreePeople

The mission I was charged with today was to talk about how to scale and accelerate solutions. The reason why is 1.) Because we are under threat now, and 2.) Because we've all been talking about the fact that we've been in denial for way, way, way too long, and the problems that we have been denying are now right on our doorstep. Tom Hayden said today that we really are in an emergency situation and we are not responding appropriately as such. I absolutely concur.

Two months ago I was at a meeting at TreePeople's office in the Santa Monica Mountains in an old fire station. It was 105 degrees out, heading higher, and this massive fire truck comes barreling into our driveway, red lights on. I went out to greet it and they said, "We heard you have water." This fire truck's job, this massive tanker, was to support helicopters with the initial attack on a fire. They were deployed there because of the extremely dry conditions and the concern that, at 105 degrees, we could have an explosion of fire at any point.

The water that they heard about was what we had stored in a cistern in the ground at TreePeople headquarters, something we put in nearly 10 years ago after a great battle with bureaucracy to let us do it. The cistern is 100 feet in diameter. It's ten feet deep. It collects the water from our parking lot and the rooftop of our LEED platinum center.

It was dry in January. In February it rained four inches in Los Angeles, and that gave us 81,000 gallons from our parking lot and rooftop, which provided enough water to support that tanker. I said, "Come and get the water, please." And they immediately call another fire station and they started pumping and practicing. That one rainfall gave us enough water in the tank for 450 helicopters for an initial attack of emergency firefighting water.

TreePeople and a number of us on the front lines have been in full-on emergency response mode since we learned of what was coming with the drought. There hasn't been a week that I haven't been meeting with state leaders or city water leaders, helping them collaborate and move in a direction of new water resilience. The challenge is upon us. We are living in the days that climate scientists said would become the new normal, as you heard. It's here, and it's real.

The purpose in my work is to actually focus on the positive side about what we can do, not to be in denial but to actually power us through what can be tremendously scary and fearful when you really confront this stuff. Generally, the dark side actually disempowers people and makes the public want to just shut down and stay in denial. We can't do that anymore, and there's some really, really good news about the changes that are happening at the local level and the state level.

Trees, just like people, are these incredibly multi-functional beings. I like to call them our multi-tasking superhero partners. TreePeople is one word because we are inseparable. What they share with us is that people think that we're useless. We've been told that we're consumers and that we're the problem, and we don't understand that nature has fed us a tremendous amount of intelligence, energy and capacity to make miracles happen. That's the part of you that I'm speaking to today.

We see a giant sequoia, a few thousand years old and think it's so massive and we're so tiny. It has watched the world for thousands of years. The interesting thing is that the giant sequoia comes from one of the tiniest seeds on the planet. The seed is very, very small. The sprout is nearly microscopic. And somehow it becomes this largest living being on the planet, pretty invulnerable to fire, except for what we're throwing at them now. But it got there by being bruised, stepped on by bears, by going through hard, challenging times, and growing. And we are no different. Our dreams, our intuitions and our caring are that vulnerable and yet that potent. These trees give me inspiration, and I thank them. Here we are serving them.

We tend not to see or pay attention to what is underground, which is the habitat, the root system, the incredible infrastructure that's been built over hundreds of years of leaves and sticks and things falling out of the tree, forming the soil, making mulch that becomes compost, and somewhere in between humus.

It is the home for things that drill and dig and tunnel. What is created in that space, all the way from microscopic organisms and fungi up to the big guys, is an effective sponge and a tank. It is nature's treatment plant.

The canopy is also a water-capture device. When it rains, the first tenth of an inch of rainfall is caught in the canopy. It's a lot of water that never even makes it to the ground. After the first tenth of an inch, the water begins to drop to the ground through the canopy, protecting the soil from being pounded by the rain. The space under the tree is really loaded with rich, composted soil and a living environment. According to the US Forest Service, a five-foot deep oak root system can capture and hold 57,000 gallons during a 10 to 12-inch flash flood.

Once in the root system, critters clean the water that was in it, and then send it down to the aquifer. That's a part of the water cycle we were never taught in school. You know, somehow rain fell on the land and made it into the soil. But what happens if you remove this tree? It takes the soil with it, meaning the water runs off and sends a flood downstream. A couple of floods and you've lost enough soil capacity for the water to ever make it back to the aquifer. So, there's a big cost to losing that one tree. And when you start losing two or three or ten or dozens or hundreds of thousands and begin sealing off the soil, you create the conditions that we have today.

The important question is what do we replace the tree with? And what have we replaced the tree with? We replace the tree with bureaucracy. Now, in order to do what that tree did, fully integrated as a watershed function of the ecosystem, we created a system of agencies in Los Angeles to do. Our Department of Water and Power spends $750 million annually to bring in water, just to the city of LA. The price tag will be around $1.2 billion this year because it has to buy most of its water. $1.2 billion a year in that one city.

Any rain that falls and runs off gets handled by a flood control agency whose job is to get rid of the water safely, to throw it away. This can cost three-quarters of a billion dollars a year in Los Angeles County. How much water are they having to move out of town? It turns out that half the water we need annually in Los Angeles falls as rain and runs off. That's roughly half a billion dollars of supply being thrown away at an additional cost of roughly half a billion dollars to actively throw that water away.

The stormwater runoff is often contaminated by what has also fallen on the ground, pollutants from cars, urban debris, trash – and it flows to the ocean. The City and the County of Los Angeles and most of our cities are paying fines for contaminated water, or they're building infrastructure to clean the water. Usually this is yet another separate agency. In the City of Los Angeles it is around $25 million a year plus capital investment of around $100 million a year to try to clean up stormwater pollution.

We spend a lot of energy on economic development and jobs while we're hemorrhaging all this cash, which could be jobs. Of the water that Los Angeles uses, roughly half is spent to grow grass and residential landscapes, and we mow that, blow that, and haul it to the landfill. This can cost up to $100 million a year. There are all kinds of air quality implications, from trees cooling cities down and filtering the air to the impacts of the trash trucks that pick up all that green waste and haul it to the landfill.

These are only a couple of the many, many other bureaucracies that are engaged in trying to manage, in a disintegrated way, what was a whole living system. This is a model of unsustainability, a hemorrhage of water, cash, health, lives, empowerment and justice because of the way we've structured it.

It wasn't structured this way out of evil purposes, but now every one of these silos is regulated. In many cases there are environmental organizations that will sue them if they step out, violate, don't deliver. They have liability issues and it's very hard for them to change.

It's not economically viable for any one of these single silos to start really getting serious about water conservation. They're stuck where they are. If they work alone, they can't afford it, so they have to keep choosing solutions that don't actually make economic sense and don't make sense for the rest of

us. They only make sense because the regulators say you're only allowed to spend for water quality and you can't spend on water supply. That's how cities are hampered.

Our goal for the last 20 years at TreePeople has been to bring these disparate parts back together so they can start collaborating. They find out that where they overlap are resource solutions and core economic development opportunities in a big, big way.

The single largest user of electricity in the entire state of California, the eighth largest economy on the planet, is the system that pumps water to LA. That's a lot of electricity, a lot of energy and a lot of money. If we shift the basis of our water to local and manage the city as what I would call an urban forest watershed, we can be investing those carbon petroleum dollars we use to pump water into as many as 50,000 new jobs.

The arc of the past 20 years at TreePeople was proving that this was feasible. The first 10 years I spent proving to agencies that it was technically feasible, economically feasible and most importantly socially feasible, that people would do it. We raised a bunch of money from various sources, didn't plant a tree with a million and a half dollars, but did the economics and did the engineering. I nearly got fired for that, dealt with a lot of pissed off donors saying, "We pay you money to plant trees." I was responding, "We've so messed up the system that our trees are dying because they're not valued and because city infrastructure agencies don't have the money to maintain a piece of beauty, and we think that if we can help agencies to see trees as part of our water supply, air supply and critical infrastructure, then they will help pay to maintain them instead of kill them."

It took 10 years to do it, but it changed everything. We showed, in a very public way via a staged press event and demonstration, how a home could be completely retrofitted to function as part of a watershed, to capture vast amounts of rainfall into a cistern instead of funneling it to the street.

Watch 90 seconds of the press conference where we showed that it was possible to retrofit homes everywhere to function as watershed.

This changed the game with the head of Flood Control and for the county who had been resisting this notion, saying there was no watershed in the city, it was only in the mountains. The real breakthrough was that they saw that people would do it. We showed them that the economics could work. When we hosted that rainstorm event, the head of Flood Control basically said, "We think you've cracked this thing, and we need to look to how we can retrofit the whole county as quickly as possible."

It set in motion a bunch of changes that include the Sun Valley watershed, which is LA's first environmental justice zone. Flooding neighborhoods with contaminated water was part of a set of cumulative impacts identified in the neighborhood. The head of Flood Control was going spend $45 million to put in a storm drain and said that if we could prove it, you could have the money to put in your forest watershed. It took two years to prove feasibility, and the county actually invested $6 million in a community watershed plan. The result was a $200 million budget approved because the economics showed that a distributed rainwater harvesting system would generate $300 million in savings and payback to the city and the county of LA. This is now under construction and has been for ten years. It may take another ten to finish it, delayed by the recession, but it has triggered more and more integrated planning around Southern California. It did trigger the creation of the state's integrated regional water management program through Sen. Fran Pavley, who has watched this.

International Collaboration: Australia

Australia had to respond to a twelve-year-long drought. At year ten and a half, they were so freaked out that they spent billions on desalinization and it has failed them. I tell you about that because Californians think that there's all this water sitting out there, we can just desalinate it, and we'll have all we need. Australia literally spent billions, the plants were built, they came online after the drought was over, and nobody needed the water. The Sydney plant was mothballed and sold, the plants in Brisbane, mothballed. They're there if they need them.

But where they succeeded is that by year three of their drought, they started really educating and incentivizing people to conserve and also to capture the rain. If they had living landscapes, everyone was proudly saying, "I've got a tank." Millions and millions of cisterns were deployed in a matter of a few years, and it saved the country.

Two things happened. In the city of Brisbane, they dropped their water use from eighty gallons per person per day to thirty. It's risen to forty since the drought ended. They changed their lifestyles. Now, this happened for a bunch of reasons. They changed their water bills and showed them how much they were saving and using compared to their neighbors. Charges increased based on water usage. They restricted water use. Eventually you couldn't water with hoses and sprinklers from the pipe. But the most important thing is that they empowered people. People who installed a tank had a visible water bank account, like a checkbook. And when it's yours and it's in your hands, you spend it really, really differently. And it changed everybody.

I was blown away when I first went down there thirty years ago and found neighbors talking to neighbors. They would greet each other on the street, on the sidewalk, and they asked each other, "How are your tanks?" It wasn't, "How's the weather?" or "How are you doing?" It was, "How are your tanks?" I had them translate that for me, because I had no idea what it was. But think about it. Their connection was, "How are you doing? How are you getting by? How's the weather treated you? How are you managing? Do you need some help?" What an expression of community and connection. It was that spirit that went forward and brought them through.

We are now taking eighteen of California's and the region's water leaders to Australia to see firsthand how they solved it via mass distribution of rainwater cisterns and tanks, millions and millions of them. We have designed for Los Angeles the nation's – maybe the world's – first smart water grid, electronically networked cisterns. We can get them up and running so they can be there for flood protection and water supply, storm water quality. Using the model that Australia provided, we have a chance to completely redesign the way we think about and use water in southern California.

NATURAL SYSTEMS, WORKING LANDS AND CLIMATE CHANGE

Jeanne Merrill

Policy Director
California Climate and Agriculture Network (CalCAN)

The California Climate and Agriculture Network is a coalition of sustainable agriculture and farmer member groups that got started in 2009 for several reasons. We were concerned about climate change impacts on California agriculture and we wanted to put forward sustainable agriculture solutions focused on reducing greenhouse gas emissions, increasing carbon sequestration and adapting to climate change. At the time California was in the early stages of implementation of AB 32, the Global Warming Solutions Act, and the only agricultural groups at the table were those who had opposed the bill – the Farm Bureau and others – and we wanted to provide a different perspective.

So we reached out via our farmer member organizations, many of whom you're probably familiar with – Community Alliance with Family Farmers, California Certified Organic Farmers, the Ecological Farming Association, and others – to identify farmer leaders who were willing to speak up and talk about not only climate change and its importance to California agriculture but that as farmers and ranchers that they were interested in innovative changes that would provide agricultural solutions to climate change.

The premise of my talk today is that we absolutely cannot address climate change without offering natural working lands solutions. We're part of a natural working lands coalition in Sacramento focused collectively on cap and trade revenue investments in activities that will support natural and working lands in achieving climate change solutions.

We all know that we're in a severe drought, the third worst drought on record in California. With rising temperatures we're already seeing the Central Valley experiencing a reduction in winter chill hours, which is fundamental for tree crop production. California recently experienced a 60% drop in cherry production. Cherries are sort of like the canary in the coalmine when it comes to tree crops. We may not be able to produce cherries much longer in parts of the Central Valley.

There are a number of other concerns related to climate impacts on agriculture – crop yields, reductions, the shifts in the kinds of crop pressures that we see. Heat stress is a really critical issue for California agriculture, both for people, for workers in the fields, as well as for livestock. We've experienced incredible shocks for both farm workers and for the livestock that they tend.

Other concerns include more erratic extreme weather events. We're in drought now, but there's a potential for floods. Generally, climate change leads to less predictability. Farmers are historically excellent at adapting to changing climates. What's challenging about the period that we're in now and that we're entering is the need for that adaptation to speed up. Right now California is really lacking the resources to support farmers to be able to adequately adapt to a changing climate.

Someone spoke earlier about declining snow-pack projections in California. How much of our drinking water do we get from the Sierras? It's about three quarters of our drinking water. We store it right now in the form of snow in the Sierras, but in future years we may not be able to store it as snow anymore because it'll come down as rain – more erratic and intense periods of rain and drier periods at other times. That's hard for all sectors of California, but specifically for agriculture because it means our water availability will be unpredictable and much more constrained.

I want to talk about the importance of a number of strategies in agriculture to reduce greenhouse gas emissions and increase carbon sequestration. Critical to all of this is soil health. Building soil health can increase the amount of carbon that we pull from the air and store in soils. We have a variety of strategies for building soil health: compost, cover crops, crop rotation to reduce the amount of synthetic fertilizer, composted manure.

An increase in biodiversity is another critical piece that sustainable agriculture offers. By incorporating trees and shrubs and other types of woody vegetation into your rangeland or cropland you can increase carbon sequestration. We know from studies done in California that riparian zones can store nearly twice as much carbon as rangeland, which is quite good at storing carbon, and even more so compared to cropland.

We also need to reduce off-farm inputs and support more low-input biologically oriented agriculture. California is the number one organic state in terms of total number of farms. It's where the organic revolution started and is now over a $1 billion industry here in the state. There was a study in California that looked at carbon sequestration for 12 years and found that carbon sequestration increased 36% with the use of organic practices like cover crops and the animal manures, despite the increased tillage that can occur related to dealing with weeds in organic agriculture.

I think another important story is that California farmers produce more on-farm renewable energy than farmers in any other state. In 2009 about 2,000 farms reported on-farm renewable energy, mainly in the form of solar, but also some small-scale, bio-energy wind systems, geothermal. By 2012 that number went from 2,000 to nearly 6,000 farms reporting on-farm renewable energy systems.

A critical component to all of this is that we have to protect the land base itself. An important study done in Yolo County by UC Davis researchers that found an acre of urban land emitted 70 times more greenhouse gas emissions than an acre of irrigated conventional cropland. When compared to an acre of rangeland, it's 100 times more GHG emissions for that urban acre.

Our work has really been around the nexus of agriculture and climate change in state policy. We're interested in making sure that farmers have the resources that they need to:

- Be able to reduce greenhouse gas emissions
- Increase carbon sequestration
- Be more resilient
- Have the benefits of reduced energy and water savings
- Be more economically viable as well as providing benefits to our communities in the form of improved air and water quality.

Since 2009, our focus has been less on the carbon market and much more on the investment side of cap and trade. California has generated over $100 million so far in money that has to be invested in activities that reduce greenhouse gas emissions, and we've been part of the effort to make sure a portion of those dollars go towards supporting agricultural solutions to climate change. As part of that, California is now launching the country's first climate change farmland conservation program that looks at efforts to support urban infill development, developing the core of our cities and towns, and protecting the agricultural land on that urban/suburban edge in order to decrease the vehicle miles traveled and the greenhouse-gas emissions related to transportation. We can also support the carbon sequestration benefits of that agricultural land.

Through a first modest investment of $5 million in the first year, California will fund agricultural conservation easements that look at protecting agricultural land on that urban/suburban edge to support infill development. No other state is considering that. I'm not sure there are many countries really considering that.

In 2014, we saw cap and trade dollars going towards emergency drought relief. Some of that money came in the form of working directly with growers, providing them with some financial assistance to move towards more water-use efficient agricultural systems. These efforts combined efficient irrigation systems with soil moisture monitoring in order to understand when and how much water was necessary.

We worked closely with our partner, the Community Alliance with Family Farmers (CAFF), on the water bond. We decided to get involved in the water bond even though the politics were really complicated. There's money in there for dams that is somewhat controversial. But I would say the majority of the dollars are going towards much needed projects in California in order to maintain our water infra-

structure and get us down to a path to better conservation. CAFF had done an analysis looking at past bonds, and guess what? Past water bonds had really done not much of anything in terms of providing financial resources for on-farm water use efficiency. Most of the dollars in past bonds had gone to large infrastructure projects, but had forgotten about what would happen when the water gets to the farm. We wanted to make sure that there was money available for farmers and for nonprofits and public agencies to work directly with growers to ensure that we get the most innovative projects going on our farms to support water stewardship. So there's $100 million in the water bond for both urban and agricultural water conservation.

We also supported the groundwater management legislation that Governor Brown signed into law. California hasn't managed groundwater very well for some decades, and we're now in a significant crisis. We have communities where drinking water wells have gone dry, and we work with farmers who are sucking air in their wells right now.

We've also focused a lot around on-farm renewable energy. I mentioned that California farmers have been increasing the amount of on-farm renewable generation, but we think more can even happen. We sponsored legislation to make it easier to remove some of the policy barriers, which should help to make small-scale distributed generation possible on farms.

Finally, we continue to work on issues of farmland conservation, making sure that there are investments in sustainable agricultural solutions including agriculture research, technical assistance for growers, and financial incentives to move agriculture along a path of climate friendly farming.

I want to wrap up by saying that we've heard a lot today about the good news and bad news story of climate change in California. There's a lot happening in California right now around climate change. The administration released the update to the AB 32 scoping plan, which lays out all the different ways to get us to reduce greenhouse gas emissions to meet those 1990 targets and beyond. But there are a lot of questions still about the kinds of strategies that ultimately will prevail. In agriculture we have the opportunity to support low-input, biologically oriented, organic and non-organic farming systems. On the other hand, we could just tweak around the edges of current industrial farming systems, which wouldn't really get many of the co-benefits that we could achieve through a more sustainable approach.

Engagement matters. At the California Climate and Agriculture Network we send out regular monthly updates and provide opportunities for people in their communities to engage on these wonky issues in Sacramento by translating them into more tangible examples in their own communities. There are lots of opportunities for you to sign on to letters and attend public workshops, and if you're part of organizations, help spread the word through your own newsletters and social media. More directly, if you haven't done it, meet with your elected representatives. To the extent that you can, provide some guidance there and encourage them to think about climate change and the actions that they can take. I would encourage you to think about how agriculture and natural working lands can be part of those solutions

NATURAL SYSTEMS, WORKING LANDS AND CLIMATE CHANGE

Torri Estrada

Managing Director, Carbon Cycle Institute
Steering Committee, Marin Carbon Project

I'm here today representing the Marin Carbon Project, which is a collaborative of agricultural agencies, organizations, nonprofits, the local land trust, and resource conservation district, it formed in 2006 to ask a fundamental question: Can our working landscapes be managed in a way to sequester carbon, and if so, how do we do that?

But before I start, we need to back up a bit and understand the system that we're working in. Who here is familiar with the Keeling Curve, made famous by Mr. Gore? The Keeling Curve is a graph, which plots atmospheric carbon dioxide concentrations from 1958 onwards, and documents the important upward trend in CO_2 concentrations from fossil fuel and biomass burning.

A part of the story I want to tell you today has to do with the annual oscillation in that curve. The reason the curve goes down about six parts per million every year is photosynthesis. It's the forests in the northern hemisphere pulling carbon in through photosynthesis during the growing season. In the winter, during the dormant period, soil microbes actually let off CO_2 and it gently balances. But you see the oscillation every year. It's an important piece of what we're going to be talking about today: the role of natural systems, particularly vegetation sequestering carbon in the biomass above the soil as well as the biomass and carbon below the soil.

As somebody who actually started in the energy and transportation sector working on climate, I came to agriculture because I felt we needed a fairly large and robust portfolio of strategies and the one we've been missing is the biosphere, which is what we live in and what we interact with. It actually plays a huge role, serving as a carbon sink right now, and can play a larger role in sequestering carbon, but we don't really talk about it, particularly in California climate policy. We're beginning to get there, but the policy is not really written around sequestration and the role of natural systems. But it's important. It is part of the system that we're working in.

If there's one thing to take away from today, it is that climate activists really have to understand the whole system we're working in – and it's not carbon in the atmosphere. Carbon moves through five pools, and it gets changed into different forms. When it's in vegetation or in the soil, it's in a very different form than it is as a gas.

Why is this important? We're over 400 parts per million (ppm) carbon dioxide in the atmposphere. If you actually add up all the greenhouse gases, we're over 470 ppm. And while it's really important to look at emissions reductions, if we want to get down to 350 ppm, we have to actually start talking about strategies that take carbon dioxide out of the atmosphere. Emission reductions will not do it alone. I hate to tell you, but even if we stopped all emissions today, we're still going to have a warming climate and we're still going have a legacy load in the atmosphere. That's reality. That's ahead of us.

What comes next is really dumbed down, but it's where I start. When we talk about natural lands and systems, we have to talk about photosynthesis. It's very simple – everybody learns it in fourth or fifth grade, but we tend to forget it. So, CO_2 comes in through tiny stomata in the bottom of plants leaves. When those stomata open up, they give us oxygen, which is really important, right? Plants give us oxygen. CO_2 rushes in, combines with sunlight and nutrients in the soil to produce carbohydrates, which are plants, it's everything – it's our clothing, wood, food – it's everything that's created. The carbon that is created in carbohydrates all comes from the atmosphere via plants. It doesn't come from the soil.

Some of this CO_2 is respired back into the atmosphere as soil microbes break down the organic material. CO_2 is a natural byproduct along with methane and other things. Some of the carbon that comes

through plants actually goes in the roots and into the soil and is sustained there as soil carbon. Most of the agricultural land that we rely on now is built upon millions of years of carbon deposition. People in the Midwest think about a prairie's 12-foot-deep soil and carbon-rich agricultural environment.

For our work in Marin, we started with grasslands because we're largely a rangeland system. Thirty percent of global land area is rangeland, forty percent in the US. In the Bay Area alone we have 1.5 million acres of classified rangeland. That currently is not even considered an asset in the climate conversation of the Bay Area. A third of the people in the world are actually employed in managing animals/plants on rangeland systems. So, it's not insignificant. And a third of all the soil carbon that we count on to stay in the ground is actually in rangeland systems.

I want to give you a snapshot of the potential of natural systems and working lands through the lens of the Marin Carbon Project. Back in 2008 we asked this fundamental question: Can we manage our rangeland systems in Marin in a way that will actually sequester carbon, and how do we do that?

We first had to go out and measure soil carbon in the system. We did that by taking samples on thirty-five sites throughout Marin, and we did it as a blind study to see what we'd find. There were two things we came away with. One, there was a huge range of carbon in those soils. There are very soil carbon-depleted soils and there are very high-carbon sites. Secondly, when we went back to the high-carbon sites, we found out those sites had been managed. They'd largely been managed by applying manure as a waste disposal method on those rangelands. But because those manures were applied, there was significant amount more carbon in those soils than in the ones with no application.

Now, manure deposition on agricultural land may not be our best strategy, as it has a lot of other downsides related to water quality and runoff. We designed a study to test an idea: Could organic matter be added to soils in the form of compost, which is a much more stable compound, and would that increase soil carbon? We did that.

We set up two large-scale test sites in bracketing the Mediterranean climate in California. One at the Sierra Foothills Research Extension Center, a UC Research Center, and one in Nicasio, California – just over the hill here. We applied one-half inch of compost on our trial sites. We also had sites where we didn't apply compost as our control. We measured, with a high degree of accuracy, the greenhouse gas fluxes on those soils – tracking everything you can imagine on those plots. We applied it once in the fall of 2008 and returned in the spring to test those results.

We saw some amazing things. On average, there were 40% to 70% more grasses on the applied sites versus the control sites. Interestingly enough, the 70% increase was actually on the Sierra soils, which are much drier, less carbon-rich and less productive. For farmers and people interested in production, this was a home run.

We also found that water storage in soil increased when soil carbon increased. The treated soil had 25% more water than the ones that weren't treated. We've actually done some additional modeling in the Russian River watershed incorporating these water retention increases. If we can achieve the water-holding capacity increases we saw in our trial sites with compost application and other practices, we actually could reduce the water demand in regional agriculture by up to 30%, which is not insignificant, along with all the other benefits.

The big finding for us, after six years of measurement, is that we've seen a ton of carbon. We know that the additional amount of carbon in the compost and the soil is additional atmospheric, photosynthetic carbon coming out of the atmosphere, through plants into the soils. It averages a ton of carbon per year coming into that system. When we plug that into the models that the Intergovernmental Panel on Climate Change (IPCC) uses to model soil carbon, we see that effect happening from a one-time application of compost. We did not go back into these systems and add compost. With a one-time application we see a ton of carbon every year coming into the system for at least thirty years, if not a hundred years. So what we've done is we've actually bumped the soil system up to a new state.

We've now transitioned from experimentation to implementation with our partners on three ranches. We're basically doing whole-farm energy audits where we're looking at carbon flows. We are identifying all the practices and ways of capturing carbon on a farm, quantifying it, and putting that into a map.

Natural Resources Conservation Service (NRCS) and the US Department of Agriculture (USDA) probably have 33 practices that are known to be carbon beneficial, that actually sequester carbon in soils, and we're looking at the whole range of available practices.

We're now working with Colorado State University to quantify both the above-ground carbon capture and below-ground capture from these practices so that we can stack all the potential practices up and see what could be done on each of these farms.

The potential for agriculture and working landscapes in California to contribute to carbon sequestration is actually quite tremendous. The challenge is helping farmers and land managers actually make the transition and implement those practices, because there is a cost to them.

Not all agriculture is homogenous. There are different scales and different types of farmers out there. I've been amazed by how many stewards of the land are out there. I've been all over the state and met many folks who are really committed to land stewardship but really are struggling just to make ends meet. If we want bring those land managers into the conversations, we have to think about providing them the kind of economic incentives, the type of market for the food that we can produce to support those efforts.

Marco Krapels

Co-Founder
The Solutions Project

I believe that the transition to an economy powered 100% by renewable energy is inevitable and we are seeing nonlinear progression towards that economic future. This is one of the reasons why I co-founded the Solutions Project. I am also a partner with Pegasus Capital, a private equity firm, and we're 100% focused on investing in renewable energy solutions.

It turns out that this transition is a profitable one too. There's no need to invest in a carbon economy because what I'm about to show you is a $1.3 trillion opportunity right here at home.

The cost of solar has dropped and what continues to rise is the cost of utility power. It rises consistently, equal or above the rate of inflation and has done so for the last 60 years. That's after $600 billion of taxpayer money has gone towards subsidizing an industry that makes dirty power for which we now pay six times more than we did 30 years ago. As I told Grover Norquist once, this is a horrible return for the taxpayer, and he agreed.

Solar energy is exponentially growing. One of the reasons for this growth in the US is third-party demand where solar is available on a zero-down basis. Whether you're Wal-Mart or Ikea or Costco or a homeowner, you can go solar zero-down, sign a long-term contract with a third party that uses your real estate, and you can buy the power for a fixed term for a fixed price. By the way, I believe that the third-party ownership market is going to change to an ownership market in which the residential homeowner will own their power after getting a 20 or 30-year loan from a long-term provider of capital. The leasing market is going shift from third party to more ownership with long-term loans. The loans will be provided by the solar companies and other creative institutions like Mosaic. The packages will be bundled and firms like mine will invest and monetize them.

The demand for renewable energy in the US is really driven by two key developments. First, corporate demand. Why is an Ikea or a Wal-Mart signing up for solar? Why are they making their own real estate available for a third party to develop solar on and then sell them power on a long-term fixed rate basis? Well, there is no 20-year curve for gas, there is no 20-year curve to hedge any fossil fuel. The only way that you can fix your long-term energy costs if you're a corporation is by signing up for renewable energy because the input is free. *The input is free.* It is not subject to a commodity market. You know exactly what the amortized cost is of a solar farm or wind farm the minute it's built and the tax credits have been monetized. Because of that free input, providers can sell power under a 20-year fixed term basis at a fixed rate equal or below the cost of what utilities are offering – and this is beginning to grow exponentially. It used to be competitive in six states, now it's competitive in fourteen states. By about 2016, solar will compete against utilities on a retail level in more than thirty states. This is happening and it's going happen fast.

Not all these companies are green and not all of them are necessarily environmentally sensitive. What I do know is that one of those companies – I shall not mention it by name – has a $2 billion electricity bill each year. That $2 billion electricity bill has historically been rising by at least 4% a year because utilities continue to raise their costs.

Utilities must raise their costs because their infrastructure is weak. People say, "Well, how about fracked gas? Isn't that the greatest thing, and it's so cheap?" No, it's not, for all the environmental reasons we already know, but also because the transmission and distribution infrastructure in the US is very, very weak. In most cases, transmission and distribution represents about two-thirds of your power bill. Transmission/distribution continues to be upgraded on a regular basis. PG&E is everywhere, drilling holes in my street – and we're ultimately going to pay for that on our power bills.

Corporations are going renewable. Why? Because it makes economic sense. It's a long-term hedge against volatile costs of power.

The second reason that demand for renewable energy is increasing is the development of Renewable Portfolio Standards (RPS). Here in California, where I live, we have an RPS, which requires utilities to buy a certain amount of green power. California is aiming for 33% and we're going to meet that in a couple years. I would like to encourage Governor Brown to up that 33% to 50%. It's perfectly possible.

By the way, utility-scale solar farms employ union labor. So unions should get behind this. I had a very fascinating conversation with one of those leaders recently. Unions, I think, can get behind the renewable energy movement because it represents a massive job growth opportunity because utility-scale solar farms, by and large, are built by union labor.

What does this all mean in terms of job growth? The solar industry alone has got more people employed than the entire coal industry, and this happened in the last five years – 160,000 people work in the solar industry, and if you include ancillary jobs around that nucleus of solar work then it's about 400,000 new jobs created in the last five years. I spent a few hours last week at The White House, and this is something they are taking very keen notice of.

It was a very interesting discussion, and I'll let you in on some of it. The premise of the meeting was, "How are we going to prepare for the solar energy tax credits to step down from 30% to 10%." It's impressive that they care about helping to prepare for this. But the oil and gas industry would never have this meeting. They would never have to have a meeting that is about preparing for a step down in a subsidy of any kind. And so, that was interesting.

In terms of the inevitable transition to renewable energy, today 7% of our energy mix in the US is renewable. People may argue, well, it's a rounding error. Who cares? Bloomberg came out with a report and said they believe that by 2030, 50% of our power infrastructure will be renewable. Why is that? Last year and this year, to date, more than 50% of all new energy assets deployed in the US were actually wind and solar. If you extrapolate that trend, renewable energy will continue to grow and replace fossil fuels. This is driven by both regulatory demand (e.g. California's RPS program) and economic demand from retail, homeowners and from corporations who do not want the utility to raise their rate again by 4 to 5.8%, which I believe is what PG&E's rate increase is going to be for California in 2014.

So, there's economic demand and there is regulatory demand for this asset class. In the Americas alone, this represents a $1.3 trillion investor opportunity by 2026. Now, what do those investments look like? What do I do for a living?

This starts with "power off-takers." These are the Costco's, the Wal-Mart's, the large corporations who decide to fix their long-term costs of power by contracting with companies like Solar City, Sun Edison, and Sun Power. By the way, those solar companies didn't exist seven years ago. These companies literally did not exist seven years ago and are now multi-billion dollar market cap companies. These solar companies are going on the roofs, they're building the solar, and they're selling that power under long-term contractual basis to the power off-taker (Costco, Wal-Mart, etc.).

A special purpose company is then created called the Project Co. They own the assets that sit on the Wal-Mart roofs or on the Costco roofs. They come to me and say, look, I've got these 20-year contracts from very credit-worthy off-takers, whether they be homeowners or corporations that are buying power on a long-term fixed rate basis. These fixed rate contracts mean we can size exactly what we're going to be lending against in terms of loan to value. So my role is to help capitalize these projects. The capital structure has a layer of debt, which is often somewhere between 50% and 70% of the total cost of the underlying project. There's tax equity that can be monetized and sold to the likes of Google, who want to manage their tax bill, and who want to buy these solar tax credits just like they can buy low-income housing tax credits. So you have large corporations who can invest in tax credits and on the debt side, we bundle the power purchase agreements and monetize the long-term contractual arrangements.

Why is this such an amazing asset class, and why, after investing $3 billion, have I never lost a penny in this space? Here's why. First, there isn't an economic incentive to default. The credit risk is the off-taker and the off-taker's ability to pay. The off-taker has two choices. I'm going pay you under this

fixed-rate contract, or I'm going to pay the utility more – every year. Which one do you want? Do you want to pay me a fixed rate for 20 years, or are you going pay the utility more?

Second, the contractual life of the asset is very long – 20 years – so there are long-term cash flows that we can monetize. The useful economic life of the asset, the solar farm, the wind farm, is well beyond the contractual life of the asset. It's not a matter of *if* you're going to get your money back, it's *when*. In the end, in event of default, you own a solar farm in a desert and there will be power off-takers. The power can be sold wholesale. Basically, there is a long-term useful economic life asset with a highly predictable cost of input (free), a long-term off-taker for that asset and an asset that performs well beyond the contractual off-taker agreements. This is an asset class that is very investable and it's one that was the best performing portfolio in the entire bank during my banking days when we accumulated the portfolio. The best performing portfolio in the entire bank was renewable energy infrastructure finance.

How do our returns compare to more traditional energy sector investments? You can buy a utility bond and, as we all know, some of those utilities are going to face challenging times. You can buy a long-term duration utility bond, getting somewhere between 4 or 5% right now. These are 20-year bonds. You're taking 20-year risk against an entity that may or may not be viable in its current form. Or you can invest in renewable energy, which produces returns somewhere between 5% and 7% for the same duration on the debt side. On the equity side it's a little bit more. As far as we're concerned, these are very stable fixed-income return assets that we would like to see more money come into.

There are $20 trillion in US pension funds that are not invested in the asset class, and according to Bloomberg, this is going to be 50% of our energy infrastructure by 2030. Twenty trillion is not invested in something that is going to power half of this country by 2030. I think we need to see change happen here. There's a lot of money sitting on the sidelines, and we need to bring that money into the inevitable transition to a 100% renewable powered economy.

Katie Hoffman

Campaign Director
California Student Sustainability Coalition

I'm a recent graduate from UC Berkeley, and when I was going to Cal, I helped start the UC divestment campaign at Berkeley. In 2011, we were among six schools across the nation that were focusing on using the tactic of divestment to target the fossil-fuel companies and essentially remove their social license to operate by generating and creating a political movement. We've been pretty darn successful.

As of 2014, there are more than 400 campuses across the United States focusing on the divest/invest campaign. We are targeting not just coal but oil and natural gas because we can't continue to invest in fracking. At the University of California, which is a $91 billion portfolio, we've been active in the campaign for three years and we now span across the entire state, with 10 out of the 11 campuses running active campaigns.

It's been a hard fight, and there's been a lot of learning involved. I am not a finance expert, but a lot of what this campaign has done is to actually open up the black box of finance, exposing the relationship between finance and fossil fuels and how that is driving and fueling climate change. At the Divestment campaign at the University of California we have been pushing for full divestment from the top 200 fossil fuel companies with the largest carbon reserves. These companies have, in their proven reserves, five times more carbon than the safe limit that we know we can burn in order to avoid two degrees of warming. These companies are collectively spending roughly $686 billion dollars a year to continue looking for new reserves, even though we know their proven reserves can't be burned if we want to have a livable planet.

As young people, we're really concerned about this, and we're using the tactics at our disposal, like divestment, to really shift the debate for the present. In the future, we hope to shift from divestment to investment into solutions that are actually going to grow a just transition into a renewable energy economy, strong enough to lift people out of poverty and grow jobs that people my age actually want to do.

At UC we have had some recent success, even though we did not get all the way to divestment. We were able to get them to get anti-divestment language out of the policy recommendation that they put forth because at the time it was investment professionals actually that were tasked with looking into the issue of climate change. We actually had someone on that task force who denied whether climate change was human caused. That was very interesting, and it was definitely a long struggle to really work the investment office as young people and say, "Hey, this is a financial issue, it's also a moral issue, and we need this institution, which is here to serve the public good, to really take a stand on this issue and stand on the right side of history."

What we got was a policy that is moving forward $1 billion of investment in climate solutions over the next five years and a promise to create an environmental and social governance policy that will guide the investment office in the future. We're still pushing for divestment. That is a hard line in the sand. We hold, as a UC campaign across the entire nation, that you cannot continue investing in the source of the problem while not actually addressing the political reality, which is that we have to take on the fossil fuel industry.

Our goal is to have a policy that provides a base for the UC to evaluate the impact on the environment and on society of every single investment across all elements of its portfolio as well having clear, principled criteria for those companies and industries that cannot be invested. We're in that process of shaping those principles into the development of an environmental social governance policy. The visioning is actually a way to start building a coalition with folks outside of the institution who have a stake in the UC as a flagship public institution. We can really help shape how a billion dollars can be invested in climate solutions

and how that can actually grow the vision put forth by the 535 Coalition, by the communities that are most impacted by the industry right now. We can really shift into an economy that we want in which our institutions should be producing research and then investing in those solutions.

It's a really exciting time to be involved in this campaign and to see it grow. We recently saw the Rockefeller Family Fund divest, and we got 700 high-net-worth individuals and 67 foundations totaling roughly $50 billion to commit to the divest/invest initiative before the UN climate summit in New York. We hope that as we push to Paris, the University of California will really lead the way, will show other states that flagship public institutions take investing in climate solutions seriously and will not continue to invest their portfolios in the root causes of the problem.

Dan Jacobson

Legislative Director
Environment California

We've spent some time talking today about how lucky we are to have Governor Brown as our governor, Senator de León as the pro tem, and Speaker Atkins as our new speaker. I agree, the three of them have a real vision on the environment, and I think they want us to be able to push for campaigns that will keep carbon in the ground and to move us to a clean-energy economy. The problem is that while Brown wants to do this, and those other two leaders want to do that, they face a lot of headwind, and it is going to be up to us to supply them with the wind at their backs in order for us to move.

2015 is the year that fuels come under the cap. What that means, in less than a minute, is that the law that we passed in 2006, AB 32, requires that if you're a polluter, you have to pay to be able to pollute. That's the cap and trade system. The first groups to go under that were the utilities, and then in 2015 the oil companies go under that cap. In order for them to sell oil in the state of California, they're going to need to buy these permits, and that cost of those permits will go up. They're supposed to reduce the amount of CO_2 that they're putting into the air every single year.

This is the first time that fuels will come under the cap, and as Annie Notthoff from NRDC and others have been saying, the oil companies are using this as an opportunity to extend the fight that they have put into place since 2006. They not only fought us every step of the way in passing that bill, but they've launched at least two or three lawsuits where they've challenged the legitimacy of AB 32 and they've put bills in almost every single year that say we should delay AB 32. People will remember Prop 23, where they were trying to repeal AB 32 outright. This is yet another step for them, but it has the potential to be a very powerful one because as fuels come under the cap, they will blame any increase in the gas prices on that issue.

Blaming the increase in gas prices on environmental programs hits one of our key constituencies in Sacramento that we need to be able to have on our side, which is the moderate Democrats. As much as we can say that Brown is with us, that de León is with us, and that Atkins is with us, the moderate Democrats in their rise to power over the past ten years have, at some level, taken the place of the Republican party in the balance of power. While we've seen a decline in the relevance of the Republican party, that doesn't mean that the people that influence the Republican party have lost any of their influence, they've just switched from the Republican party now to these moderate Democratic seats in California.

The decrease in the Republican Party's significance and power in Sacramento has led to a rise of these moderate Democrats, and what we're seeing now is very well funded political campaigns on behalf of the oil companies and the other fossil-fuel companies into some of these key areas. If you look at some of the key races that'll be coming up in the next three or four weeks, you're seeing millions of dollars being spent by those groups to try to influence, even in some of the races where it's a D versus D, in order to influence who will be the better Democrat for the fossil-fuel industry. Whether it's ads, research or elections, it's the money that the fossil-fuel groups will spend that will create the headwind against us and our political leaders who are on our side. That's what we ultimately need to be fighting.

I think the way that we need to do that is to build on what Ross Nakasone from BlueGreen Alliance laid out in his Venn diagram with labor and environment intersecting. What we're going to need to do is to create a lot more intersecting. Having the student movement re-engaged will be critical. Environmental justice has been critical, and the work that Vien Truong from Greenlining Institute and others have done is critical. As Ross is saying, we have labor support, probably better in California than anywhere else in the country. Three groups that we need to see more overlap with and support from are:

First, agriculture, a powerful constituency in the state of California, and almost nothing gets done without them.

Second, what I'll call the Silicon Valley billionaires. They're out there doing stuff but sometimes you kind of go, "Well, it'd be a little more helpful if you were in this direction."

Third, is figuring out a way in which to continue to engage the Hollywood community. Say what you will about it, but many of those people in the Hollywood community have two things: an understanding of how to communicate complicated ideas like climate change and carbon pollution very effectively, and many of these people have 11, 12 million followers on Twitter or Facebook or email or what-have-you.

Take Neil Patrick Harris, the guy who just got asked to host the Oscars. At Environment California we have about 8,000 Twitter followers, and when I was reading about that guy in the news, it turns out he has 11 million Twitter followers. The billionaires have the resources. Agriculture has the political power. We need to expand our Venn diagram, so it's a lot of these groups coming together with the center point being climate and clean energy. Those will be the places that we'll need to work for the next couple of years to create the wind at our elected officials' backs that they'll need to fight off the oil companies.

For the past couple of years the oil guys have had a big party in essence and everyone goes to their events. What we're trying to do through programs and campaigns and policies that we run at the state level, city level and on the college campuses is to bring those other powerful political constituencies in the state of California to the side of a clean environment and to put the oil guys at their own party by themselves.

Tom Hayden

Founder and Director
The Peace and Justice Resource Center

I learned during a couple of experiences in my life a kind of an answer to the complicated question of where ideas come from. In this movement we're prone to think ideas come from scientists, and that is correct up to a point. I've always thought that ideas came from listening. A lot of people listening to each other is what we've been doing today, and it's not easy to immediately synthesize what you've heard, because the listening is a process. We have to be open-minded and remember to not tell people your story unless you're willing to hear theirs. From an organizer's viewpoint, you're always trying to detect: What are people feeling, thinking? What words do they use? It's a very unscientific approach to language, but it's been a very powerful force in social movements like liberation theology in Latin America.

The first of the two experiences I want to discuss is the Port Huron statement, the founding document of Students for a Democratic Society, which the history books say I wrote. It was 27,000 words long. It tried to express a vision of our generation in 1961-1962. We had come through the freedom rides and the beginning of what would become the Free Speech movement. About 62 people gathered in Port Huron, Michigan, thanks to the UAW that gave us a room. I wrote the document, it's true, but in order to write the document, I interviewed tons of people. I wrote it and then it was somehow rewritten in a five-day period. Looking back, I certainly get credit for having set the typewriter and pounded it out and made sure that it was in the mail and all that, but the way I feel about it in retrospect is that the Port Huron statement wrote us – that there was a spirit in the air, it was a consensus in the air. James Joyce said the same thing about his writing 50 years earlier. James Joyce said that what he was trying to write was the unwritten consciousness of his generation.

So, the knowledge, the feeling, the mix is in the generational experience. It's not in the writer's head, that's an old left model where the organizer comes and tells you the line and tries to make it narrow enough to rally you to a certain demand and then moves on. This is more about attempting to get at the actual feelings that people have not yet articulated. I think we're in the process of articulating those feelings.

Today is one day, a few hours in a process that has been going on since I first heard of solar energy from someone in the Brown administration 40 years ago. It goes way back. It's deep. There are many ancestors and many previous attempts to express it. I've learned that these things do take time and there's no rushing them even though we have to do things urgently.

The other example that I think is a good one is my reading of the New Deal. The reason I think of the New Deal is because I am a writer first and foremost, a movement activist, a 20-year participant in the legislative process and I was born at a moment when the New Deal saved my family.

What happened is that my grandfather died in a cannery accident, the fault of the Carnation Milk Company in Milwaukee, Wisconsin. He fell in a vat and was chopped up. He left my grandma with 11 kids. This was during the Depression and she survived and took care of those kids. During that time she was sustained by a $5,000 check from the company with regret for the death of her husband. There was no pension, there was no Social Security, there were no rights for organized labor. Her world fell apart in the late '20s, early '30s, and I don't remember all that much about her, but I remember her as being sort of the quintessential nanny, the grandmother and all these kids.

What they were doing in the Depression was huddling up together like students do today, five to an apartment, living through a semester at NYU or wherever. They were selling apples and they were doing odd jobs together and pooling what little they made every day in order to buy food and pay the bills to get to the next day.

They were not political. This is a key point in my sharing with you. I believe, along with C. Wright Mills, that we have to reach people who are in their personal milieu and their problem is that they're detached from history and social structure; they don't know what has happened to them; they are in a catastrophe and they are prone, if they're working people, to think there's something wrong with them – their ethnicity, their class, their lack of education. They're not prone to automatically blame an outside aggressor. That would take a level of pride and insolence and insubordination, so to speak, a mutinous mentality that they don't have. They're survivors, and they know a lot. I'm not saying they lack knowledge. They know a lot. I learned that too, after leaving the university and going to Mississippi and Georgia and Newark. I learned that poor people know a lot that middle class people do not know unless they come from that background.

But anyway, in the middle of this process of the collapse of capitalism, the collapse of what government we had, there were the stirrings of the New Deal. There were social movements, Communist Party-led organizing drives in manufacturing plants. Got nowhere. People got fired, got clubbed down, beat up, shot. Anarchists tried to do it in their horizontal way, to borrow the current language of the current movement. Trotskyists kept attacking everyone on both sides for not following the correct line. Farmers – I don't remember if they picked up pitchforks – but they went to work against the banks and the grange.

This started a period of turbulent working class expression and middle class expression at having been sold out by somebody. It began with finding ways to make enough to buy food to eat, and it ended up with doing everything possible to obstruct the business as usual unless they were fed, unless their children were fed, unless they could go to school, unless there was somebody to say there was hope on the horizon, to borrow a more recent phrase.

I remember my mom went through this, the orphan of a father she hardly knew. When I was growing up at the end of the '30s and the beginning of the Great War, I remember sitting on her lap a lot, and she'd always talk to me about how she loved Roosevelt. I didn't know who Roosevelt was. I just thought, "Roosevelt, that's God. My mother loves God and Roosevelt is taking care of us." She would keep saying that, because by that time, after the revolutionary inciting of working people and average everyday people, they had achieved Social Security. I can't tell you what that would have meant for my mother when she's thinking about Grandpa.

They achieved bargaining rights for organized labor. Unheard of. Seemingly impossible. They achieved pensions and all the rest of it, and they had achieved what was known as the New Deal. Now, at the time it was being built, they did not call it the New Deal. They called it the movement. It didn't have a name. They didn't announce, "Now we are starting a movement for a New Deal."

What happened was this strange mix of a revolutionary impulse on the one hand, a liberal impulse from do-gooders who wanted a better government, people in the center who were very frightened at the possibility of social disorder and were timid about raising their head, and then people on the right like my priest, Father Charles Coughlin, who was busy organizing an anti-Semitic response to the very same conditions, working closely with Henry Ford on the idea of a new Nazi party based in my hometown of Royal Oak or Hamtramck.

The people on the far right thought Roosevelt was a Communist. I don't remember if they questioned his place of birth. But he was leading us to a Soviet America. Some of the people on the left thought that was a great idea – a Soviet America – and they were in little discussion circles constantly reading textbooks from Marx and Engels about the future of Soviet America. Most people that I would identify with were organizers. They were selfless people who didn't work for much money, didn't think far ahead, to the careers that they would hold as future labor bureaucrats or Democratic party administrators. They wanted to know if they'd have their heads crushed by a policeman's baton. They were willing to do that. There's sort of a lost generation there in history.

There was another group, maybe a little like some people you know or today's climate scientists. They were known as the brain trust of the New Deal and they were a very eclectic group of people who were brainy intellectuals. They were probably part of the most important American tradition that I've

ever studied and I consider myself part of, the American pragmatic tradition. I know that pragmatism is now a dirty word, but if you look under it, it means: listen first, see how far people are willing to go, and improvise a step forward, a program that will take you a little bit towards survival or a little bit towards a better life as rapidly as you can.

The New Deal brain trust invented all these amazing programs. One parallel today would be like if somebody said, "We need a Renewables Work Administration, like the National Recovery Administration. We need to put every person in this country and on this planet who's out of a job or underemployed into a great employment project, publicly funded, privately funded, but it has to happen, because there's a great work to be done." The great work was to save us from the Depression in those days. The great work today is to save us from climate catastrophe and the end of civilization as we know it. No one had the idea for The New Deal in 1929. They were gripped with that idea by 1937.

The whole idea of industrial workers being organized, the whole idea of old age pensions, of delivering people Social Security, having to sit at a table and argue about whether we could also do healthcare, being told by the president we don't have the votes, we can't do that, some future generation will fight for healthcare – that's how the New Deal was pounded out.

It was improvised by very creative people who dared to take it on and who simply believed that their current lives were unlivable and they didn't have to be poor to know that. It was just an unlivable situation with fascism approaching and with the Depression never seeming to end. And out of that pragmatic determination they decided the government had to hire people, the government had to protect people, the government is what saved my mother, and why she loved Franklin Roosevelt.

It was a close call. We could have gone to the right. We could have gone into chaos. The answer to what might have happened we'll never know because then came World War II, and everybody thought, "Problem solved." Everybody's working down the street in the empty plant. They're building planes and tanks and trucks and jeeps and cars. The car industry was formed out of that experience.

My father went to work as an accountant for a car company. Detroit was booming. My mother loved Roosevelt for those reasons, not ideological. When we come to that point when people aren't trapped in ideology but are willing to do what works, that's the time when I think we'll have the equivalent of a New Deal for the climate catastrophe.

There are people who argue that there's no climate problem. There are people who are fascistic in their inclinations. There are people who, unfortunately, are ideologically driven – they believe in a market even though there really is no pure market, it's all government supported through incentives or taxes or mandates. They're mad, mad in a good way. They're really angry, but there's a madness that's ideological; they don't have a picture. And I'm talking about the Tea Party and people that I thought would fade away, but seem to get more ferocious as the threat grows.

There were people who said, "Okay, we're going to invest in the rebuilding of America and, after the war, in a Marshall Plan for the world." They cut a deal without a handshake, as far as I know. The finance capitalists were divided over whether their obligation was to reform the system in order to stabilize their profit or crack down on these insurgents and stop them in their tracks and go all the way to drive them off the political map towards God knows what kind of system we would have had.

On the other hand you had labor and social movements and populist movements where the argument was, "Should we take the right to collective bargaining or go all the way to Socialism?" It was kind of like 1919 when the Socialists told the Suffragists, "All the way with Socialism first, then you women will get your right to vote." And the women said, "Not taking that offer, thank you very much; some of us are Socialists, some are not, but we all want the right to vote." And we're at a similar crossroads. If you read Naomi Klein's excellent new book, *This Changes Everything,* she outlines a similar debate today.

I come from experience, not ideology, not theory. I do my reading. I try my best. But my sense is the most we're going to accomplish here is a global green New Deal, which is quite a lot when you think of the state of the planet. We need the green billionaires and we need the younger generation.

However, somebody has to cut a deal. Unless you believe that we have to have revolution first and then save the planet. If you believe that, I advise you to listen. Just go to meetings in your community,

in your PTA, in your neighborhood and ask—get up, actually, and say, "I want a revolution first, what do you people think?" You'll see that they're not there now. They might be thinking about it, but it's a simple fact that we need to have this green infrastructure, a green financing mechanism, and at the same time, just as labor needed to be organized and respected in their dignity, we need all the people of color, the disenfranchised communities of California to feel that they have been invited to the table and that they're going to get somewhere.

We need to double the rate of reducing greenhouse gas emissions by 2030. We need to get the brain trust to understand that that is necessary because if we don't do it, it will even get worse. We need to go to at least 50% or 60% solar and renewables as part of our electrical system. We need to reject the idea that the grid is some holy place like a medieval church that needs to be respected.

Remember that it took people power to knock out the nuclear plant in Sacramento. We were told if there was no nuclear plant built in Sacramento we'd be dead, because it's so hot there. Go to Sacramento now. Last time I was there it was one-hundred and ten degrees and they had an electricity surplus. A surplus. Why isn't that model a larger part of our story? One-hundred and ten degrees and running an energy surplus through a publicly owned utility whose board members are elected, with investors still making lots of money off it.

We need to put out of commission this infernal Dracula of the nuclear power lobby that seems to continue running on fumes. Where is capitalism when it comes to nuclear power? They never stop. They say we have to have a robust nuclear industry to achieve our climate goals. It comes from madness, arguing that it's either a Chernobyl future or a climate catastrophe future.

California's a very precious place, not because somebody designed it that way originally but because we are an advanced economy with 199,000 jobs in the clean energy industry, and we're getting rid of coal and getting rid of nuclear. There are a lot of people that don't want to see that. They used to say, "Well, Governor Moonbeam, who listens to him?" They can't call him Moonbeam any longer, but they can wait him out. He's only got one more term, and they can try to avoid the California model, the idea that you can have an advanced economy run on 100% renewables, step by step, without nuclear and without coal. They don't want this idea floated out there, because some of them think their interests would be harmed. They don't know that it may really be in their best interest.

Nobody knows what the California story is. It could be because people in California are too busy with their projects to identify where they're going or the governor's afraid of Republicans. It's not that the story is perfect. We know from today that we need to be on all out alert to stop fracking, and we need to tell the governor if he wants climate leadership on the planet, fracking will be his Achilles heel.

I think it's a complicated course that we have to navigate, and we need organizers. We need people to drill down on this. I think we have had enough of the science elite. They have delivered us such great material on how to get to 100%, but they don't know how to get to it politically. You know, the desert is covered with giant parabolic collectors, and the Sierra Club is worried about birds, and you say that's the only way we can get to 100% renewables? By destroying a desert and the wildlife? That leads you into endless committee hearings and litigation and the only thing that can avoid that confusion is more consensus, more dialogue. How are we going get there?

We have precious little time to get there, but we know from the science that it is inevitable that things will get worse. It is also inevitable based on my experience that people will fight back. It's all one step at a time. The starting point is to combine the notions of reducing emissions and achieving jobs and environment justice. The finance capitalists will have to accept the jobs argument and the empowerment of poor people. That's not in their normal picture. The environmental justice advocates will have to convince themselves that this emissions catastrophe is real and is really going to wipe us out, and that we have five or ten years to get through it as safely as we can.

There are 33 states that are controlled by coal interests. There's only about 25, 26, 27 states where we've got a shot. But that's the green bloc that has to be organized state by state, community by community, to have such power that they can push back until the inevitable gets worse and we see the investments flowing. The investments have to flow in an equitable way, in a fair way. That's what happened

with the New Deal. The poor got better off. The workers got rights. Business got rich by stabilizing capitalism. That's where we are and I think that's where we probably have to go.

If you read Thoreau's book of essays that was published after his life, *The Dispersion of Seeds*, it's about the growth of communities and the rise of new generations. At one point, Thoreau says, and I'm quoting: "We find ourselves in a world that is already planted, but is also being planted as at first." That's the transition we're in. That's the planting and cultivating that we're doing. We see in these panels today, we see in these presentations, a new world rising that has been cultivated but is again being planted as at first. The title of Thoreau's essay was *I Have Faith in a Seed*. So do I.

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Tom Hayden, one of the leading figures of the student, civil rights, anti-war and environmental movements of the 1960s, went on to serve 18 years in the California legislature, where he chaired labor, higher education and natural resources committees. Director of the Peace and Justice Resource Center in Culver City, CA, he continues to be a leading voice for peace, erasing sweatshops, saving the environment, and reforming politics. Tom is the author and editor of 20 books and has taught at several universities, including UCLA, Pitzer, and Harvard.

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Andy Lipkis, founder (at age 18 in 1973) and President of TreePeople, which has mobilized volunteers to plant and care for over two million trees in the Los Angeles region, is a highly influential, award-winning activist and social entrepreneur, renowned for developing urban watershed management solutions to protect cities against droughts and floods, prevent water and air pollution, and mitigate and adapt to climate change.

Arsenio Mataka is Assistant Secretary for Environmental Justice and Tribal Affairs at the California Environmental Protection Agency. Prior to CalEPA, Arsenio served as directing attorney for California Rural Legal Assistance, Inc. from 2010-2012, where he fought for justice alongside some of the most exploited communities in our society. His involvement with environmental justice issues began at home with his parents and later with the Great Valley Center, where he provided extensive outreach and capacity building services to rural and underserved communities. In 2008 he served as an American Bar Association diversity fellow in environmental law in the office of Los Angeles Mayor Antonio Villaraigosa.

Jeanne Merrill is the Policy Director of the California Climate and Agriculture Network (CalCAN), a coalition of sustainable agriculture organizations that advances policy solutions at the nexus of climate change and agriculture. She has 20 years of experience in agricultural, environmental and energy policy advocacy at the state and national levels. Prior to her time with CalCAN, she was the Associate Policy Director with the Michael Fields Agricultural Institute in Wisconsin. She is a member of the Organizational Council of the National Sustainable Agriculture Coalition and the California Invasive Species Advisory Committee. She holds a B.A. in political science from U.C. San Diego and a M.S. in land resources from the University of Wisconsin-Madison. She lives with her husband in Alameda, CA.

Ross Nakasone joined the BlueGreen Alliance in 2012. As the California Policy Organizer, he works with the California Director on legislative and campaign advocacy work as well as coalition building priorities throughout the state and in Sacramento. Prior to joining the BlueGreen Alliance, Ross was the Sustainable Housing Policy Manager for the California Housing Partnership Corporation, where he led policy efforts to increase energy efficiency resources for low-income multifamily rental housing including passage of AB 1124 (Skinner, 2012). He has also served as the Legislative Coordinator and Director for San Mateo County for over six years working on a variety of subject areas.

Vien Truong, Environmental Equity Director at the Greenlining Institute, working with the state legislature, California Public Utilities Commission, and in localities around the state to create solutions for poverty and pollution. She has created nationally recognized programs to support communities most vulnerable to climate change, and has received congressional, state, regional and local awards for her work on behalf of low-income communities and communities of color.

V. John White has been a writer, commentator, advocate, and leader of the green energy movement in California for 35 years. He is executive director of the Center for Energy Efficiency and Renewable Technologies (CEERT) in Sacramento, Legislative Director for Clean Power Campaign (CPC), and principal of the environmental and energy lobbying practice, V. John White Associates, representing public interest environmental and local government organizations, and new energy technology companies.