JUNE 2016

CLIMATE WHITE SPACES

CEA California Environmental Associates

the David & Lucile Packard Foundation

Despite a determined effort by many governments and civil society to reduce greenhouse gas emissions, the IPCC Fifth Assessment confirms that the atmospheric concentration of carbon dioxide continues to mount near a ***business as usual*** trajectory. The window for action to avoid catastrophic climate change is closing. The David and Lucile Packard Foundation is a major participant in the philanthropic effort to mount a coordinated global response to climate change. In order to help identify additional promising areas for philanthropic work, the Packard Foundation commissioned California Environmental Associates (CEA) to conduct interviews with several dozen experts in the summer of 2015.

The purpose of these conversations was to develop a general sense of whether there are significant "white spaces," or strategic gaps, within the climate mitigation field.

This analysis was ultimately used to inform the foundation's internal deliberations on how to promote innovation and breakthrough strategies in the climate response. The following report is a high level, public synthesis of those conversations with experts. We would like to thank all of those who participated in this process and hope that this document can be of value to the field.

Climate White Spaces

California Environmental Associates
June 2016

CONTENTS

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PROCESS

To orient this work, CEA first conducted a basic literature review of major analyses on greenhouse gas emissions and potential climate mitigation strategies. The review focused on developing a basic understanding of the following:

- Where greenhouse gas reductions are most needed,
- What strategies are currently being pursued to achieve emission reductions, and
- Expert opinions regarding the major gaps in those strategies.

CEA collaborated with the Packard Foundation to identify experts to interview for their thoughts on promising emission reduction strategies or major approaches that are missing from the current global effort. Interviewees were selected based on their strategic expertise, and we sought to achieve both geographic and sectoral diversity. Ultimately, CEA completed interviews with over 50 experts from around the world. We did not seek to vet or validate their responses on white spaces. Instead, this work attempted to create a taxonomy of the more than 250 suggestions that we collected.

FINDINGS

The solution depends on the definition of the problem. At the beginning of each interview, we explained that the Packard Foundation and others were interested in starting a new initiative to address white spaces and that we were looking for their suggestions for white spaces worth pursuing. We defined "white spaces" simply as areas where there are strategic gaps in current climate philanthropy. In sharing their ideas, many interviewees also took the opportunity to reflect on what they perceived as the limitations of current philanthropic efforts to tackle climate change. For this reason, many of the experts talked not only about specific white spaces, but also offered their thoughts on why those white spaces had come to exist, and, furthermore, what ought to be done to attend to the cause of those strategic gaps in climate philanthropy.

Many of our interviewees felt that the existing gaps, (i.e., white spaces), in climate philanthropy are the result of shortcomings in current philanthropic selection processes. While we heard a range of views, many interviewees' comments on the pitfalls of current selection processes fell into one of four frameworks. Broadly, the four frameworks comprise perceived climate philanthropy shortcomings with regard to how individuals or organizations are selected for funding, funders' tolerance for risk, and funders' bias for particular strategic approaches. Those frameworks both reflect distinct points of view with regard to the shortcomings of current funding selection processes, and thereby how funding for climate white spaces should be directed to address that shortcoming. In other words, if strategic gaps in climate philanthropy exist because of specific problems in the selection process, then the function of a new initiative to fund climate white spaces should be to overcome those problems. See the table on page 5 for details on each of the four frameworks.

Notwithstanding varied viewpoints on the cause for strategic gaps in climate philanthropy and acknowledging some variations in the definition of a climate white space, we received a range of interesting suggestions for new ideas and strategies to fund.

Diversity of Responses

One of the main reflections across these conversations was that there is a wide array of perceived gaps in our current response to climate change and no shortage of new potential avenues to pursue. The experts we interviewed identified many different types of gaps, based in part on their own expertise and areas of focus. For example, some focused on technological challenges we need to overcome (e.g., carbon removal, advanced nuclear), some focused on important geographies where there has not been sufficient

FOUR FRAMEWORKS

Functions of proposed white spaces and problems potentially being addressed

NEW FACES

The function of white space funding should be to identify new people and organizations.

- → Foundations are missing good ideas because the request for proposals process doesn't solicit proposals from a broad enough range of individuals and organizations.
- → Foundations are attracted to low-risk grantees and grantees with top-down (e.g., grasstops, policy-focused) strategies to the exclusion of other approaches.
- → Foundations are exclusive; it's hard to break in as a new or unknown grantee.

NEXT TIER OF PRIORITIES

The function of white space funding should be to identify the next tier of priorities.

- → Current funding doesn't address the 40 percent of emissions outside the core geographies and sectors.
- → Small pulses of funding in existing core priorities have declining marginal benefit relative to expanding current efforts into a new set of projects or geographies.
- → Current funding focuses on a relatively short time horizon.
- → At this point, even if all of our bets paid off, it wouldn't be enough.

GAME CHANGERS

The function of white space funding should be to identify high-risk, high-reward strategies that have not been pursued at scale.

- → Our current efforts are not sufficient and are not succeeding fast enough.
- → At this point, even if all of our bets paid off, it wouldn't be enough.
- → Foundations are too risk averse.

NEW WAY TO SKIN A CAT

The function of white space funding should be to identify new strategies for our current goals within existing geographies and sectors.

- → Current grantmaking has the right priorities but isn't moving fast enough.
- → The foundation model is too top-down and doesn't identify innovative, bottom-up strategies.
- → With increased coordination among funders, there is a danger of group-think and grantee lock-in.
- → There are concerns with specific grantmakers.

investment (e.g., Eastern Europe, Africa), and several keyed in on new approaches or strategies to pursue our existing emission reduction goals, such as new movement building strategies or political alliances. This diversity of responses highlighted the breadth of ongoing activity around climate and made meaningful classification of the ideas challenging.

Common Themes

Within the diversity of responses, there were several recurring themes or categories of white spaces that emerged from these conversations:

- **Movement building:** Many of the interviewees identified strategies or initiatives to build longer-term support for climate work that they felt have fallen outside the traditional purview of mainstream climate philanthropy. These included efforts to create new leaders (e.g., youth leaders, philanthropic leaders), to sharpen communications and corporate campaigns, and to extend the boundaries of the climate fight into health and equality.
- **Crosscutting and emerging approaches:** To date, most philanthropically funded mitigation efforts have focused on the primary source of emissions (i.e., supply-side production). Several interviewees felt that there were a range of demand-side approaches that have not been pursued at scale. These included efforts to change consumer behavior, promote community-level renewable energy access to shift the trajectory of development, and work on finance, trade, and institutional reform.
- **Targeting fuels and forestry:** Philanthropy has heavily supported efforts to reduce the use of fossil fuels and stop deforestation. However, most of those efforts have employed top-down (e.g., policy-focused) strategies and have concentrated on high-emitting priority regions (e.g., the US, China, Brazil). We received many suggestions for extending current mitigation efforts around coal, gas, and deforestation to new geographies or applying new strategic approaches, for example, pursuing aggressive grassroots anti-coal campaigns in Eastern Europe and Southeast Asia.

White Spaces or Gray Spaces?

While our interviews revealed some recurring themes, there were several limitations to our approach that should be mentioned. It is a difficult task to identify both current gaps in climate efforts *and* workable strategies to address those gaps. Most experts spoke primarily to their specific area of expertise or their geography, or spoke to gaps but not new solutions. Similarly, perceptions of what is a gap and what is well covered varied considerably.

The Challenge of Evaluation

By its nature, evaluating the feasibility and emissions reduction potential of the long list of ideas we received would be difficult. Several of the suggested ideas are tied to large emitting sectors, but estimating the achievability of even one idea would require a thorough vetting process. Similarly, many of the ideas suggested involve indirect approaches to tackling emissions (e.g., movement building, communications), complicating efforts to estimate their impact.

The following report outlines the methodology and process that CEA pursued to compile climate white spaces suggestions and categorizes the suggested ideas. In compiling these ideas in the pages that follow we have neither ranked nor removed ideas from the list based on either an evaluation of their emissions reduction potential or their merit as a white space. All the ideas we gathered have been included; however, as there were many similar or duplicate ideas among the more than 250 individual suggestions we gathered, to allow for a more systematic and streamlined categorization, we have consolidated and distilled ideas where applicable.

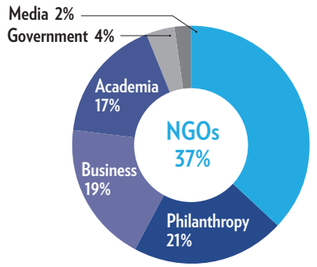
Conclusion

Interviewees were eager to see new, innovative ideas and strategies funded. While it is hard to define a consensus on what is truly a climate white space, and even harder to assess which white space ideas are ripe for pursuit, the broad array of suggestions we received demonstrates there are many opportunities to reduce emissions that aren't currently receiving philanthropic funding or being pursued at scale.

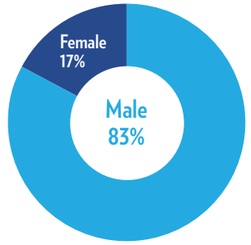
INTERVIEW DEMOGRAPHICS

With the help of the Packard Foundation team, as well as their partners the Oak Foundation and Good Energies Foundation, CEA requested interviews with 70 climate experts and was able to complete **54 interviews** over the course of this project. The list of interviewees is included on page 25. Interviewees skewed toward the developed world (over 40 percent of the interviewees are based in the United States) and most interviewees represented NGOs, philanthropy, academia, and business, with some from government or media. Even still, the interviewees were diverse, representing six continents. Graphics below further explain the geographical, gender and sectoral diversity of the interviewees.

SECTOR DIVERSITY



GENDER DIVERSITY



INTERVIEWEES BY COUNTRY

Number of Interviewees by Country

USA	24	Brazil	3	Australia	1	Norway	1	anonymous	1
China	4	S Africa	3	Austria	1	Poland	1		
India	4	UK	3	Hong Kong	1	Senegal	1		
				Kenya	1	Switzerland	1		
				Netherlands	1	Thailand	1		

WHITE SPACES

Interviewees identified over 250 white space ideas. There are multiple ways to frame and categorize these white space ideas. In this section, we provide two different examples of potential frameworks and categorization: ***Topical Categorization***, and ***Categorization By Intervention Type***.

The suggestions we received have been consolidated and distilled where feasible and appropriate to allow for a more structured synthesis of ideas.

TOPICAL CATEGORIZATION

CEA's first attempt to categorize the white space ideas was to group these ideas into twenty clusters in three broad categories:

MOVEMENT BUILDING

Breaking political gridlock	New philanthropists
Enhancing communications	Corporate engagement
Health campaigns	Leadership and movement building

CROSSCUTTING AND EMERGING APPROACHES

Shifting consumption and behavior	Energy access
Climate finance	Trade, aid, and institutional reform
Geoengineering	Adaptation and goal setting

TARGETING FUELS AND OTHER SECTORS

Killing coal	Bringing down dirty oil
Questioning gas	Promoting nuclear
Power sector niches	Next tier priorities
Addressing agriculture	Forestry priorities

MOVEMENT BUILDING

Breaking Political Gridlock

- Use a federated, non-environmental organization like the League of Women Voters to advance the climate agenda.
- Engage conservatives on climate; amplify climate realist voices; use a faith frame to engage theologically conservative groups; change how questions about climate are framed in the Republican primary.
- Develop Republican-friendly climate taxes or tax-and-dividend policies.
- Target key conservative states in the US that benefit economically from renewables to break political deadlock; Promote renewables and DG as an individual rights, Libertarian approach to break political deadlock (e.g., Green Tea Coalition).
- Promote new agent-based economic models to calculate climate damages in key treasury departments.
- Buy out coal jobs in key states to reduce support for the coal industry.
- Target key states in India to create political momentum to take action on climate.
- Organize roundtables to showcase to the Chinese government what Western countries are doing to combat climate change with the goal of showing China that they can be a leader without harming economic growth.
- Globalize and localize Risky Business Project–like climate impact damage assessments.

New Philanthropists

- Lead a global tour of major heads of foundations to recruit new high-net-worth individuals as climate funders.
- Identify and recruit new philanthropists in India.
- Advocate for tax exemptions for philanthropic giving.
- Develop domestic philanthropy in developing countries to tackle air pollution.

Enhancing Communications

- Leverage the Pope's encyclical on climate to build climate awareness and desire to take action.
- Increase energy efficiency in Catholic properties to promote energy use and climate awareness among congregations.
- Buy a media outlet to counter Koch brothers' influence.
- Develop source for simplified, accurate communications on climate science and policy updates.
- Tackle misperception in India that Western NGOs and philanthropies are an extension of Western diplomatic efforts.
- Educate on-air meteorologists about climate change and have climate incorporated into their segments.
- Personalize climate communications and make climate tangible (e.g., Sustainability Victoria black balloons).
- Launch communications campaign on rich Indians who are actually heavy polluters but are hiding behind India's low per capita emissions.

Corporate Engagement

- Watchdog top ten companies on their climate commitments and action.
- Launch global campaign against energy inefficient IT companies to build awareness and stronger commitments.
- Apply Carbon Tracker model to Asian companies and markets.
- Help supply chain/agriculture companies bridge gap between commitments and actual emissions.
- Build an advocacy campaign to address the exportation of carbon footprints through international supply chains.
- Develop campaigns around climate impacts of Chinese, Indian, and Brazilian multinationals.
- Target hospitals as high emitting institutions and convince them to reduce their carbon emissions.

MOVEMENT BUILDING *(continued)*

Health Campaigns

- Research and campaign on health impacts of ultra-fine particulate matter coming from coal-fired power plants (e.g., PM 0.1).
- Perform air pollution research and launch a campaign around the health effects of air pollution in India.
- Develop a communications campaign on the health effects of coal in multiple countries.

Leadership and Movement Building

- Build an international climate leadership development network.
- Generally invest in movement building to create a mobilized constituency in favor of climate action.
- Organize diaspora communities to lobby in their home countries, specifically India and China.
- Cultivate independent thinkers and practitioners in China outside of government to take action on climate.
- Create a platform for young entrepreneurs to develop technologies that benefit climate.
- Redouble the focus on green jobs and blue green alliance.
- Create a new entity or work with the existing C+ (China Civil Climate Action) Network to advocate to the Chinese government about speeding up the UNFCCC negotiations.
- Organize a youth campaign in Europe to encourage European youth to purchase the excess/rollover carbon credits that are going unused and keeping the carbon price down, then publically burn the excess credits.

CROSSCUTTING AND EMERGING APPROACHES

Shifting Consumption and Behavior

- Reduce beef consumption in China.
- Shift dietary choice globally.
- Study how to motivate people to invest in electric vehicles.
- Shift behavior toward autonomous, EV, and shared vehicles.
- Fight tax breaks for material consumption, such as home ownership.
- Support the sharing economy (e.g., Airbnb, Uber).
- Focus generally on consumerism and the shared economy.
- Use big data and social pressure to "out your neighbor" on high-emitting behaviors/infrastructure.
- Replicate and expand demand response models (e.g., Opower).

Energy Access

- Develop DG and storage in India.
- Establish clean energy (mobile) finance in India.
- Provide vocational training for solar installation in India.
- Develop and distribute solar irrigation pumps in India and Pakistan.
- Enhance energy access through renewables in Africa.
- Support Indian Prime Minister's solar energy goal.
- Establish clean tech incubators in Africa and India.
- Pursue distributed biogas/biofuel in Africa.
- Utilizing mobile money programs (e.g., JAM — Jan Dhan, Aadhaar, Mobile), to digitize the country's kerosene subsidies and provide them directly to consumers who could use the funds on renewable energy (e.g., rooftop solar) investments.
- Direct money from India's National Clean Energy Fund to support development of small and medium-sized enterprises promoting DG.

Climate Finance

- Create green banks.
- Develop climate performance bonds for corporate commitments.
- Develop a climate finance innovation platform.
- Engage Muslim financial institutions, which are prohibited from collecting interest, to provide capital finance for small-scale renewable energy projects in developing countries.
- Create an IMF special fund to de-risk climate investments.
- Align grants with development finance institutions.
- Focus on decarbonizing Chinese investments abroad.
- Develop a bridge support mechanism for renewables for the next decade until the price becomes cost competitive.

Trade, Aid, and Institutional Reform

- Promote border adjustments to reflect the climate/carbon pricing policies of exporting countries.
- Advocate for climate protections in trade agreements.
- Develop more effective climate policy implementing entities at a national level in every country (e.g., UK, China).
- Facilitate Global South to Global South cooperation/learning, including sharing of best practices, technology, etc.
- Support advocacy groups to ensure that overseas aid (particularly Chinese aid) to African power development is for clean energy.

CROSSCUTTING AND EMERGING APPROACHES *(continued)*

Geoengineering

- Advocate for R&D budgets for geoengineering.
- Create an international management framework to prevent unilateral geoengineering efforts.
- Promote air capture technology alongside carbon capture and storage (CCS).
- Develop and pilot new CCS technologies for point source emissions.
- Further science and communications on negative emissions projects.

Adaptation and Goal Setting

- Honestly prioritize which are the most important places for adaptation and species protection funding, and determine how to balance adaptation with environmental justice and other agendas.
- Broker the conversation about what a new target should be if not two degrees.
- Broker multinational agreements to pool adaptation risk.
- Come to consensus on adaptation and corridor priorities.

TARGETING FUELS AND OTHER SECTORS

Killing Coal

- Target coal in Indonesia and Southeast Asia.
- Target coal in South Korea.
- Conduct a public buy-out of excess US coal capacity.
- Target China's financing of coal development overseas including the Asian Infrastructure Investment Bank.
- Mount legal challenges to the permitting process for coal mines.
- Fund legal efforts to fight coal.
- Prevent excess Chinese coal construction capacity from being used to build coal generation facilities in other countries.
- Mount an international campaign to target fossil fuel companies for insufficient bonds for mine reclamation.

Bringing Down Dirty Oil

- Ban US pet-coke exports.
- Launch a campaign in Brazil and Venezuela to stop dirty oil production.
- Gather better data on the GHG-intensity of oil producers to incorporate into trade measures and Low-Carbon Fuel Standard programs.
- Launch campaign against oil refineries, modeled off of Beyond Coal, to use EPA's ozone standards to organize oil refinery fence-line communities and file lawsuits.

Questioning Gas

- Launch a global effort to account for and address methane leaks and fugitive gas.
- Focus on developing CCS for gas.
- Run a campaign to challenge the long-term utility of gas as a bridge fuel.

Promoting Nuclear

- Promote nuclear in general.
- Enhance nuclear power safety in India and China.

Power Sector Niches

- Advocate for and incentivize the rapid deployment of utility-scale energy storage.
- Promote long-distance transmission of renewable energy by implementing continental and intercontinental HVDC lines.
- Use railroad right-of-ways to install renewable energy transmission lines.
- Accelerate non-utility DG in the US.
- Reform the US Public Utility Regulatory Policies Act to drive renewable energy development.
- Address emissions from the water energy nexus.
- Develop and implement solutions to manage the intermittency of renewables.

Next Tier Priorities

- Address emissions from heavy duty trucks in China and India.
- Promote sustainable freight in the US.
- Push for utility decoupling and energy efficiency targets in Japan, Germany, and the UK.
- Promote investment in and market development for super-efficient appliances.
- Scale up the building retrofitting industry.

Addressing Agriculture

- Address global food waste.
- Further R&D for biochar.
- Promote cattle intensification in Brazil.
- Address methane from livestock and biodigesters.
- Improve fertilizer efficiency.
- Conduct research on the land use constraints of biomass-based carbon capture.
- Increase disease/veterinary controls on beef imports.

Forestry Priorities

- Address deforestation in Peru and Colombia.
- Focus on Malaysian forestry and palm oil.
- Address deforestation in the Congo.
- Develop Global South-to-South exchange on forestry practices.
- Push for reforestation in Eastern Europe and Russia.
- Watchdog Brazil's commitment to reforesting 11 million hectares.
- Implement Cerrado protections.

CATEGORIZATION BY INTERVENTION TYPE

Another way to categorize the white space ideas is by the type of intervention. In some ways, it is a typology based on each interviewee's sense of what current climate philanthropy is not set up to pursue. We ultimately settled on five clusters in this categorization: Behavior Change, Disruptive Solutions , Future Emissions, Movement Building, and Notably Absent.

There were two additional categories that we created to capture all of the suggestions that we heard: Indirect Action, and Incremental Change.

INTERVENTION TYPES

- Behavior Change
- Disruptive Solutions
- Future Emissions
- Movement Building
- Notably Absent

Indirect Action ideas were gaps or strategies that were similar to those in the Movement Building category, but had an even more indirect impact on emissions reductions. The Incremental Change category included ideas that were slight improvements on existing strategies or applied strategies used successfully in one region to a second tier priority region. These two categories were not included among the final categories because the Packard Foundation was interested in identifying new, innovative, and breakthrough climate strategies.

The table on pages 16–17 provide an introduction to and explanation of each category, as well as a few examples for each category. The table on pages 18–19 groups ideas as "new goals" and "new strategies." These delineations are meant to separate ideas that are wholly new areas of work, outside the existing climate philanthropy work—"new goals"—from ideas that are new approaches to achieve established goals in the climate field—"new strategies." Pages 20–24 include tables of the most promising ideas that we heard grouped by category (behavior change, notably absent, etc.) and by common topical theme.

A Framework for Climate White Spaces

BEHAVIOR CHANGE

Initiatives that aim to shift or change consumer behavior

EXAMPLE:

Discourage the growth of beef consumption in China.

COMMON THEMES:

- → Influence dietary choice and food waste.
- → Shift personal energy consumption (e.g., demand response, promoting EVs).
- → Fight general consumerism.

PERCEIVED GAP:

Philanthropy focuses mainly on the supply side of the emissions equation. We also need to dramatically shift future consumption patterns to achieve our targets.

DISRUPTIVE SOLUTIONS

Initiatives involving radical strategies or promoting disruptive technologies that can upend energy markets

EXAMPLE:

Shape the market trajectory of autonomous, electric vehicles.

COMMON THEMES:

- → Build non-utility, DG and grid/storage enabling large-scale renewable rollout.
- → Help develop the sharing economy and autonomous vehicles.
- → Support more aggressive anti-fossil-fuel strategies.

PERCEIVED GAP:

Philanthropy can fail to recognize and respond to quickly evolving, disruptive technologies, and often shies away from controversial, disruptive tactics.

FUTURE EMISSIONS

Initiatives to prevent growth of GHG emissions in areas where emissions are projected to grow rapidly

EXAMPLE:

Promote energy access and DG in India.

COMMON THEMES:

- → Promote clean energy access in developing countries.
- → Support a low-carbon development path for growing economies.
- → Focus on land use change beyond current priority countries.

PERCEIVED GAP:

Philanthropy is necessarily focused on current sources of emissions, but may not be investing sufficiently in preventing future emissions growth in key hotspots.

MOVEMENT BUILDING

Mobilization initiatives that seek to build out the climate movement, often with indirect or cross-cutting policy goals

EXAMPLE:

Develop a communications campaign on the health impacts of coal, including PM 0.1, in key countries.

COMMON THEMES:

- → Employ new tools (e.g., social media) to reach new demographics.
- → Cultivate new networks of climate leaders and international philanthropists.
- → Recruit conservatives, Catholics, or other unusual allies to break political gridlock.

PERCEIVED GAP:

Philanthropy is naturally policy-oriented and top-down. Indirect and long-term movement-building strategies are necessary for long-term, political, and social support.

NOTABLY ABSENT

Initiatives that have high GHG reduction potential (often unproven), but that philanthropy has opted not to prioritize

EXAMPLE:

Promote R&D and regulatory frameworks around geoengineering.

COMMON THEMES:

- → Support research and pilots of direct air capture, CCS, biochar, rangeland sequestration.
- → Build support for advanced nuclear.
- → Work to reduce fossil fuel subsidies and promote international border adjustments.

PERCEIVED GAP:

Philanthropy tends to avoid controversial and unproven technologies or approaches, even though such approaches may prove to be necessary.

New Goals & New Strategies for Existing Goals Suggested in Each of the Five White Space Areas

CATEGORY	NEW GOALS	NEW STRATEGIES
Behavior Change	→ Reduce global food waste in order to reduce associated emissions. → Reduce future beef consumption in developing countries, especially China. → Reduce material consumption at scale (e.g., virtualization, elimination of tax breaks for home ownership, encouraging paradigm shifts in consumption).	→ Promote utility administered energy efficiency programs in select countries (e.g., Japan, Germany, Brazil, EU). → Promote time-of-use pricing at utilities. → Engage in regulatory proceedings to steer autonomous vehicles toward EVs and shared applications. → Harness big data and social pressure to drive behavior change. → Mandate energy efficiency labeling for residential buildings.
Disruptive Solutions	→ Adopt autonomous, shared, electric vehicles. → Scale residential and utility battery storage systems to deal with renewable intermittency. → Increase price of US oil and gas with campaigns to choke supply (e.g., fugitive emissions, litigation on refineries using ozone standards, corporate attacks).	→ Utilize mobile money programs to digitize India's kerosene subsidies and redirect to solar. → Subsidize use of electric vehicles as flexible load to combat intermittency on a renewable-heavy grid. → Convince treasuries to use new agent-based models for climate impact assessments. → Target fossil fuel companies for having insufficient bonds for mine reclamation. → Buy and retire US coal assets or EU carbon permits.
Future Emissions	→ Deploy distributed renewable energy in Africa and India. → Bend energy trajectory and development path in Southeast Asia (e.g., Vietnam, Indonesia) or the Middle East. → Prevent land conversion in the Congo, non-Brazilian Amazon, Cerrado, African growth corridors, and other deforestation frontiers.	→ Launch incubators to cultivate entrepreneurs and technical training capacity in order to promote DG in India. → Develop more innovative financing options for DG in India and Africa. → Create subsidies to replace diesel groundwater pumps with solar water pumps in India. → Advocate that overseas aid (e.g., Chinese aid) for African power development is steered toward clean energy. → Limit infrastructure development in the Congo Basin.

CATEGORY	NEW GOALS	NEW STRATEGIES
Movement Building	→ Develop a well-trained, connected, and empowered next generation of international climate leaders. → Bolster current philanthropic funding by cultivating non-US donors and changing the tax implications of charitable giving. → Establish new global mitigation and adaptation goals for a post 2° world. → Spur innovation through a global network of clean tech innovation incubators in Africa and South Asia.	→ Increase resources for new media campaigns, investigative reporting, and high-profile publicity focused on engaging younger demographics. → Engage conservatives: leverage the Pope's encyclical, target moderate evangelicals, and find stronger alliances with conservatives (e.g., Green Tea Coalition). → Coordinate a global tour (e.g., Bloomberg, Branson, Clinton) to attract new philanthropists in India, China, Mexico, etc. → Utilize Islamic finance in the clean energy finance effort. → Target IT and corporate actors on climate commitments to increase industry leadership.
Notably Absent	→ Develop an international framework for regulating geoengineering and a coordinated global R&D effort. → Mainstream adoption of CCS in any new coal or gas facility. → Increase use of advanced nuclear technologies in China, India, and the United States. → Reduce agricultural emissions through shifts in cattle management, biochar application, and improved fertilizer management.	→ Pursue international adoption of harmonized border adjustments to account for carbon prices (and subsidies). → Demonize oil: develop an anti-oil movement based on variable GHG-intensities of crude oil. → Use more stringent veterinary requirements to limit trade in cattle. → Launch a fund to support cattle intensification in Latin America and India. → Launch a global initiative to increase public R&D commitments to direct air capture, enhanced weathering, and other carbon capture technologies.

Behavior Change

Initiatives that aim to alter consumer behavior

COMMON THEME	WHITE SPACE SUGGESTIONS
Dietary Choice and Food Waste	→ Reduce global food waste in order to reduce associated emissions. → Reduce future beef consumption in developing countries, especially China. → Develop smart food packaging that detects when food has gone bad. → Promote awareness about food choices globally. → Tackle obstacles to promoting reduction of meat and dairy consumption. → Shift to lower-GHG diets.
Fighting Consumerism	→ Advocate for the elimination of tax breaks for material consumption (e.g., tax breaks for home ownership). → Develop a campaign/approach to address the entire value system around consumption. → Develop an approach to address increasing consumption in China. → Shift from a consumption economy to an experience-based and sharing economy.
Shared Economy	→ Adopt autonomous, shared (e.g., via Uber), and/or electric vehicles. → Encourage the shared economy/collaborative economy and reduction of consumption. → Engage in public utility commission (PUC) proceedings around the regulation of the sharing economy (e.g., Airbnb and car-sharing).
Shifting Personal Energy Consumption	→ Develop a campaign to motivate consumers to invest in electric vehicles (EVs) and solar panels. → Promote time-of-use pricing at utilities. → Promoting utility administered energy efficiency (EERS) programs in select countries (e.g., Japan, Germany, Brazil, EU member states). → Transfer LEED-like standards for commercial buildings to residential homes (e.g., labeling homes). → Use big data and social pressure to "out your neighbor" on high-emitting behaviors/infrastructure.

Disruptive Solutions

Initiatives involving radical strategies or promoting disruptive technologies that can upend energy markets

COMMON THEME	WHITE SPACE SUGGESTIONS
Evolution of the Sharing Economy and Autonomous Vehicles	→ Adopt autonomous, shared (e.g., via Uber), and/or electric vehicles. → Engage in public utility commission (PUC) proceedings around the regulation of the sharing economy (e.g., Airbnb and car-sharing) to encourage resource efficient sharing.
Grid Storage for Large-Scale Renewables	→ Scale residential and utility battery storage systems to deal with renewable intermittency. → Advocate for and incentivize the rapid deployment of utility-scale energy storage. → Support energy storage solutions.
More Aggressive Anti-Fossil Fuel Strategies	→ Address dirty oil in new locations (e.g., Venezuela, Brazil, Middle East) using the "climate oil index." → Attack fossil fuel subsidies around the world. → Develop an anti-oil movement (similar to the anti-coal campaigns) utilizing the "climate oil index" and the different GHG-intensities of different crude oil. → Develop a transition plan for utilities by exploring the model for the utility company of the future and how to transition both utilities and workforces so that they are part of the solution. → Launch a global gas campaign that further assesses fugitive emissions from natural gas and build a campaign to prevent the development of unconventional natural gas resources. → Launch a Beyond Coal–like campaign in Europe to shut down coal plants and leverage the new criteria pollutant standards to launch a plant-by-plant campaign to convince investors not to invest in retrofits. → Launch a campaign to mobilize local opposition to new proposed lignite mines in Central and Eastern Europe.
Non-Utility DG	→ Accelerate non-utility DG in the US. → Develop innovative ways to access energy finance (e.g., pay as you go, mobile money) for DG. → Support deployment of innovative energy storage (e.g., Tesla powerwalls) technology/applications to deal with intermittent renewable power sources. → Utilizing mobile money programs (e.g., JAM — Jan Dhan, Aadhaar, Mobile), to digitize India's kerosene subsidies and provide them directly to consumers who could use the funds on renewable energy (e.g., rooftop solar) investments.
Other	→ Use big data and social pressure to "out your neighbor" on high-emitting behaviors/infrastructure. → Use agent-based modeling to change the way in which climate economics is done in all of the mainstream treasuries in the world.

Future Emissions

Initiatives to prevent growth of GHG emissions in areas where emissions are projected to grow rapidly

COMMON THEME	WHITE SPACE SUGGESTIONS
Energy Access	→ Accelerate the deployment of renewable energy in Africa. → Assist the advancement of clean rural electrification. → Develop clean energy finance in India. → Promote clean energy access in India and Africa. → Identify and cultivate entrepreneurs who can create new business models for ramping up DG in India. → Promote a grid connection fee (or something similar) in South Africa to allow for more distributed renewable energy production. → Replace diesel groundwater pumps with solar water pumps in India. → Promote rural clean energy access by providing vocational training, fostering financing innovations, conducting local outreach, and addressing community needs. → Support efforts to design renewable energy products for the base of the pyramid (e.g., make them more affordable). → Support the new Land, Environment, and Rural Development Ministry in Mozambique to figure out how to finance off-grid solar. → Utilizing mobile money programs (e.g., JAM — Jan Dhan, Aadhaar, Mobile), to digitize India's kerosene subsidies and provide them directly to consumers who could use the funds on renewable energy (e.g., rooftop solar) investments.
Low-Carbon Development Path for Growing Economies	→ Advance clean tech through clean tech innovation incubators in Kenya and elsewhere in Africa (e.g., Climate Innovation Center at Strathmore University in Nairobi). → Develop clean energy projects in the Middle East. → Develop a more diversified approach to encouraging provincial governments in China to scale DG solar. → Develop best-practices for renewable energy contracting and procurement strategies in Africa. → Establish strategic topical labs to fund explorations around local climate solutions. → Tackle food waste resulting from insufficient refrigeration during transport by developing and disseminating new practices and technologies (e.g., Coolbot). → Fund analysis of anticipated temperature changes and how that will affect future energy demand to inform current energy development decision making. → Fund analysis of potential low carbon development paths in Africa (i.e., how to achieve zero-carbon, zero-poverty development). → Mount a philanthropic intervention to support clean energy and economic development in Africa. → Shape power sector growth in Southeast Asia to include more clean technologies. → Target second tier cities in Southeast Asia for climate change initiatives.

Other

Next Frontier for Land Use Change	→ Address deforestation in Southeast Asia (e.g., Malaysia, Thailand, Vietnam). → Address deforestation in Malaysia. → Pursue opportunities to address deforestation in the next tier of countries (e.g., Colombia, Peru). → Address emissions increases coming from land use change in Brazil's Cerrado.
Ag/Forestry	→ Address over-application of nitrogen fertilizers, especially in China by creating carbon markets wherein farmers are paid to use less fertilizer. → Address methane emissions from livestock. → Develop collaborations among South America, Africa, and Southeast Asia on forestry. → Eliminate fertilizer subsidies to make compost cost competitive. → End subsidies for urea production in India. → Advance efforts to explore soil carbon potential. → Reduce emissions from livestock waste through scaling up of biodigesters. → Regulate the international lumber trade (biomass markets and trade) to address illegal and harmful logging. → Share best practices and technologies for forest management among tropical countries. → Shift land management practices to reduce emissions: no- or low-till, improve cover cropping, increase organics in the soil, reduce nitrogen fertilizer application. → Use cap and trade funds in California to fund analysis of forests' contribution to the state's CO_2 emissions and develop strategies for addressing those emissions. → Watchdog and support activities towards meeting Brazil's commitment to reforesting 11 million hectares.
Biofuels	→ Address the under-attended aspects of biofuels, particularly the opportunity to use food waste in California, which is estimated at $1 billion.
Implementation Support in the Global South	→ Create a center of excellence in key Southeast Asian countries to better coordinate philanthropic climate efforts and to assist in transitioning the management of these initiatives to local institutions. → Facilitate Global South to Global South cooperation/learning — sharing of best practices, technology, etc. → Help Indian state governments implement their state climate action plans.
Non-CO_2 Forcers	→ Address black carbon. → Address chlorofluorocarbons (CFC) emissions from informal refrigerator/appliance disposal practices. → Convene top scientists to evaluate the state of the science on addressing non-CO_2 forcers and identify leaders in the field through that convening.

Other *(continued)*

Power Sector/ Fossil Fuels in Priority Countries	→ Better integrate high volumes of renewables into the grid. → Create a stakeholder roundtable of the power sector in China to increase transparency in their decision-making process. → Launch a Beyond Coal-like campaign to support renewable energy state-by-state via influencing PUC/state legislature policies (once a political constituency exists to protect renewable energy jobs, then the politics change). → Promote revenue-neutral carbon tax and other Republican-friendly taxes in the US. → Put India on a clean development path. → Reform the US Public Utility Regulatory Policies Act (PURPA) to meet the present day electricity structure. → Scale up the building retrofitting industry. → Stop the export of pet coke from the US. → Target increased fuel efficiency (or near-zero emissions) for heavy-duty trucks in India and China.
Waste Management	→ Address GHGs (and toxins) from burning of trash in Latin America, especially burning of plastics. → Advance municipal/community composting. → Develop revenue streams for improved waste management. → Separate waste streams, specifically removing and composting organic matter. → Shift waste management policy at the local and state level to incentivize waste separation and waste reduction practices (e.g., pay-as-you-throw waste fees, easing composting facility permitting).

APPENDIX 1: INTERVIEWEE LIST

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