Harnessing Collective Intelligence to Address Climate Change: The Climate CoLab

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ABSTRACT

Climate change is a problem of daunting scope and complexity. But the past decade-and-a-half has seen the emergence of new forms of Internet-enabled collaboration, in which large numbers of people, making contributions from all around the world, can work together to tackle big problems. Notable examples include open source software and Wikipedia.

Inspired by these systems, the Climate CoLab applies an open source, crowdsourcing-based approach to develop proposals for what to do about climate change.

1. HOW THE CLIMATE COLAB WORKS

The Climate CoLab is a web platform where an online community—with support from experts in climate science and policy—develops, analyzes, and selects detailed proposals for what humanity can do to address global climate change. Anyone who is interested can join the community. Activity on the site is structured through online contests.

In these contests, members of the community are invited to submit proposals that address key aspects of climate change. The 2010 contest, for example, focused on international climate diplomacy; last year's addressed the transition to a green economy at the global and national levels.

Proposals may be developed by individual community members or teams. Each proposal describes a set of actions to address climate change; an outline of how these actions could be accomplished; and an explanation of why the approach set out represents a desirable path forward.

Proposal authors also have access to computerized simulation models that project the anticipated impact of the actions on:

- earth systems (concentration of greenhouse gases in the atmosphere; average global temperature; sea level rise; and effects in such realms as food and water supply, storms and coastal flooding, and impact on disease vectors, vulnerable ecosystems, and endangered species);

- the economy (cost of proposed actions to address climate change; costs of damages to the economy caused by climate change).

Other members of the community are invited to support and comment upon proposals. After the deadline for submittal, a panel of exert judges select the most promising entries as finalists. Some judges are members of the Climate CoLab's Expert Council, a group of distinguished climate scientists, economists, and policy experts; others are recruited separately, often based on recommendations from the Expert Council.

After the selection of finalists, proposal authors can refine their proposals. Winners are then chosen through a combination of wisdom of the crowd and expert judgment. The community is invited to vote for the finalist proposals they like best, and the entries that obtain the most votes receive Popular Choice Awards. Judges' Choice Awards are also given, based on a separate selection undertaken by the Judges.

At the end of the contest, the winning proposals are presented to groups in a position to implement good ideas: policy makers, business executives and investors, and officials at non-government organizations.

2. WORK TO DATE

The Climate CoLab web site was launched publicly in 2009. Since then, more than 40,000 people from 183 countries have visited, and more than 4,000 of those have registered.

The Climate CoLab's 2010 contest asked for proposals on the question, what international climate agreements should the world community make? The contest attracted 29 entries from North America, Europe, and Asia. Three winners were selected; the main ideas behind them were:

- North/South approach for negotiating agreements on emission reductions;

- less stringent initial mitigation targets;

- emphasis on technologies and policies that remove greenhouse gases from the atmosphere to augment the current emphasis on emission-reduction technologies and policies.

In December 2010, the winning teams presented their proposals to the UN Secretary General's Climate Change Support Team and to the staff of the Select Committee on Energy Independence and Global Warming of the U.S. House of Representatives.

The 2011 contest focused on the green economy, one of the key themes of the Rio+20 conference held in May 2012. It invited proposals that answered the question: How should the 21st century economy evolve bearing in mind the risks of climate change?

More than 60 entries were received from Africa, Asia, Australia, Europe, and North America. Six winners were chosen in global and national categories, with members of the winning teams hailing from the United States, Australia, India, and Nigeria.

The winning global proposal in 2011 combined the best ideas from the 2010 contest (as described above). The global runner-up called for reduced meat consumption to lower emissions of short-lived greenhouse gases (especially methane and carbon black) immediately, with a longer term vision that the land now used for grazing could being turned back into forests that could serve as a carbon sink.

In the national category, the proposal with the most votes called for rapid deployment of next generation nuclear technology by the U.S. The runner up described a plan for reducing India's future emissions that featured extensive use of information technology to monitor compliance. There were also two Judge's Choice awards in the national category. One called for university students to work with subsistence farmers in sub-Saharan Africa to adapt agricultural practices to changing climatic conditions. The other called for construction of personal rapid transit systems, powered by magnetic levitation, in United States metro areas.

Winners of the 2011 contest presented their ideas in January 2012 during a series of briefings with policy makers, including staff members of the United Nations Framework Convention on Climate Change (UNFCCC) Secretariat; UN Undersecretaries General Brice Lalonde and Elizabeth Thompson, who were the executive coordinators for the Rio+20 conference ; and staff members of the U.S. House of Representatives Natural Resources Committee, along with the ranking Democratic Representative on the Committee, Edward Markey.

3. BREAKING UP THE PROBLEM

In its 2012-13 contests, the Climate CoLab will break down the large, complex problem of climate change into a series of more manageable sub-problems. These sub-problems will be defined by three key dimensions:

- What actions will be taken to address climate change?

- Where will these actions be taken?

- Who will take the actions?

The What dimension describes the kinds of interventions that can occur, for example, reducing emissions (mitigation), figuring out ways to live with climate change (adaptation) or intentionally modifying the climate at large scale (geoengineering).

The Where dimension takes into account that proposed actions can be focused at different geographic levels and locations: global, national, state/provincial, city/metro region, neighborhood, even household.

The Who dimension describes the primary social group or person expected to undertake the proposed actions; it encompasses government; business; civil society organizations such as universities, non-profits, community groups, and churches; and individual citizens.

The Climate CoLab team developed a detailed taxonomy of the What, Where, Who dimensions, based on work by the Intergovernmental Panel on Climate Change (IPCC) and consultations with members of the Climate CoLab Expert Council.

Contests were chosen for 2012-13 with several goals in mind. First, the mix of contests seeks to provide full coverage of all potential kinds of action along the What dimension. Sample contests designed to achieve the goal of full coverage include most of the ones that address aspects of mitigation, several contests on adaptation, and one on geoengineering.

In addition, contests have been launched to address particularly interesting or important aspects of the climate change challenge. An example of a contest chosen to meet this objective is one on changing cultural attitudes toward climate change.

Finally, some contest topics were chosen based on collaboration between the CoLab and an outside organization already working on climate change. Such collaborations can ensure that a contest addresses an issue already identified as important by working professionals in the field; in addition, they can ensure a pre-existing audience for contest results. Examples of contests selected on this basis include sustainable cement (in collaboration with Carbon War Room), and urban adaptation (in collaboration with ICLEI, the International Council for Local Environmental Initiatives).

An innovation for this year is that each contest will be overseen by a senior expert in the field, known as a Climate CoLab Advisor. The Advisor shapes the contest topic, recruits judges, and helps to bring the best ideas from the contest to the attention of potential implementers. Advisors are assisted by Climate CoLab Fellows, who oversee day-to-day contest activity; Fellows are post-docs, graduate students, or working professionals.

The current round of contests, addressing approximately twenty focused topics, will last through the first half of 2013. After these contests are completed and their results presented to prospective implementers, the Climate CoLab plans to launch a subsequent round of activity. In the latter round, the community will be invited to assemble combinations of focused solutions into broad, integrated proposals at the national and global level.

The CoLab team anticipates that simulation models will be a key tool for enabling development of these integrated proposals. The team is working with collaborators to build the modeling infrastructure to support integrated proposals: MIT's System Dynamic Group; Climate Interactive, which builds fast running simulations of energy and climate systems; and several of the groups that bring together the community of researchers working on integrated assessment models (which combine energy/economic models with short-form climate models).

The CoLab team is also working on innovative new approaches for evaluating proposals. In particular, we are seeking to leverage expert talent, which is in short supply, by using a collective intelligence approach, in which less demanding aspects of the evaluation task are undertaken by semi-experts or even potentially crowds of non-experts or computational algorithms.

4. LONG TERM ASPIRATIONS

At the least, the Climate CoLab can help to educate citizens around the world about global climate change. But if the project achieves its highest aspirations, it will also engage scientists, policy makers, business executives, investors, and concerned citizens in helping to generate, and gain support for, proposals to address climate change that are better than any that would have been developed otherwise.

We believe that the approach embodied in the Climate CoLab also has potential for solving other large social problems and

complex challenge in other domains, such as drug discovery or corporate strategic planning.

5. ABOUT THE AUTHOR

Robert Laubacher is a Research Scientist and Associate Director at the MIT Center for Collective Intelligence. His presentation at the 2013 ICT4S conference is based on research done in collaboration with Thomas W. Malone, John Sterman, Hal Abelson, Joshua Introne, and Erik Duhaime of MIT; Gary Olson of University of California Irvine; and Jeff Nickerson and Winter Mason of Stephens Institute of Technology.