

Proposal Summary and White Paper

Global Solutions & Outreach Programs (GSOP)

Enabling Humanity to Survive and Thrive

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Problem. The Earth is one integrated system that can only respond to the sum-total of physical actions by all countries and peoples. Our convenience, prosperity, and survival are irrelevant. By burning fossil fuels and releasing CO₂, we the people have destabilized the entire Earth's energy balance. More energy coming in than going out is causing global warming, which, in turn, drives climate change, rising sea levels, extreme weather, and ocean acidification. We must stabilize the Earth's energy balance to stop further warming, and then adjust it to return to prior conditions. In short, we must solve global warming on Earth's terms, not just on our terms. If we do not solve it on Earth's terms, we do not solve it. This simple reality is being overlooked with dire consequences.

Modern Civilization was built and continues to depend on fossil fuel energy (heating, cooling, food production, transportation, manufacturing, construction). While solving global warming on Earth's terms, we must also solve it on human terms of economic feasibility, social and political acceptability, natural and human resources, plus we must cope with ongoing climate change impacts. If we do not solve it on human terms, we do not solve it.

Imperative. We have no other rational choice than to *successfully* solve global warming, on both Earth's terms and on human terms in order to assure the future well-being of our children and grandchildren, and the survival of Modern Civilization.

Critical Oversight. Herein lies our critical oversight: No coordinated, international *engineering* effort is underway or even planned to develop a successful *global* solution to global warming. This work is not included in the UN and US scientific reports or political plans.

We now have ad-hoc efforts influenced by public and private initiatives, political priorities, vested interests, and market influence, which will likely not add up to successful global solutions on Earth's terms. Complex technical problems are never solved in this way. Engineers always develop integrated engineering designs of bridges, airplanes, ships or rocket systems before building the systems to assure that they will work. For example, the Navy spent 9 billion USD designing and component testing its new Zumwalt destroyers before construction. Ignoring this upfront engineering effort to solve global warming risks spending trillions of US dollars and precious decades on non-solutions, and threatens the future wellbeing of all people, and a livable planet.

Proposed Solution. Fortunately, this oversight, and its untenable risks can be avoided at reasonable costs. An international army of engineers, economists, social experts and other specialists from all countries must be mobilized to develop country, regional and global action plans, which together will solve global warming on both Earth's terms and human terms. While scientists investigate the science behind global warming, engineers are needed to solve the problem in practical terms.

Wicked-Problem Approach. To do so, we must accept that global warming is an extremely complex problem, a "wicked-problem," with a mix of technical, economic and social/political factors snarled together like a Gordian knot of immense complexity. Normal engineering step-by-step methods do not work to solve such problems. Nor do ad-hoc efforts that guess at right answers. These problems require a different approach. While working as a chemical engineer for the US Army at Aberdeen Proving Ground, Dick Hutchinson and colleagues discovered a novel way to

solve “wicked problems.” This proven “Wicked-Problem Approach” is well suited for solving the complex problem of global warming.

GSOP Plan. We will incorporate this approach in the three-year international Global Solutions and Outreach Programs (GSOP) aimed at solving the global warming problem at the scale of Earth. The GSOP is comprised of two mutually supporting programs. The international Global Solutions Program focuses on developing solutions for each country, for regions, and for the entire Earth. The Outreach Program will provide engineering support and advice to each country’s States/Provinces, communities, and industries taking action on global warming. Together, the two programs will bring local groups into the problem-solving efforts along with country and international teams. All participants will collaborate as equals and share results through the Internet. Together, they will develop honest, practical solutions that are successful on Earth’s physical terms, and economically and socially/politically successful on human terms. The GSOP teams, directly funded in each country and independent of government control, will minimize political pressures, corporate interests and other biases.

GSOP Goals. The overall goals of the GSOP are: (1) Halt the net release of CO₂. (2) Adapt to unavoidable climate-change impacts. (3) Stabilize the Earth’s energy balance to halt global warming. (4) Adjust the Earth’s energy balance to return to prior conditions. and (5) Address Ocean acidification and other problems.

Global Solutions Program. This program is comprised of three international People’s Projects that together will develop successful country, regional, and global solutions to global warming. We call these “People’s Projects” because the problem and solutions will affect everyone and because problem complexity demands best efforts by all people. These projects are described in Dick’s book, *People’s Assessment of Global Warming Plus Adaptations for Advancement and Survival*, available in hard copy from Amazon and as a free PDF file on our website at <https://www.climate-collaboration.com/our-proposal>

People’s Project 1 focuses on halting net CO₂ release and adapting to ongoing climate impacts. Teams formed within each country are needed to thoroughly evaluate all available options to meet these goals. The evaluations will address technical, economic and social/political factors.

People’s Project 2 will evaluate ways to stabilize and adjust the Earth’s energy balance and to address ocean acidification and other problems. International teams are needed to evaluate each available option. Results will go to each country for consideration in their country action plans.

People’s Project 3 will address climate monitoring, modeling and future projections of the Earth’s energy and CO₂ balances. International teams will evaluate technologies currently in R&D to meet Project 1 and 2 goals. Results will go to each country’s GSOP teams for consideration in their country action plans.

All available options in Projects 1 and 2 and R&D options in Project 3 will be thoroughly evaluated against the same criteria. Technical evaluations will address technical feasibility, effectiveness in meeting GSOP goals, environmental impacts, scale of implementation, capital and yearly costs, net energy requirements and availability, and human and natural resource requirements and availability. Economic evaluations will address economic feasibility at country levels. Social/political evaluations will consider local community, State/Province and industry acceptability of the options within each country.

The evaluated options from all three projects will then be periodically integrated by each country’s GSOP participants into their country action plan. In this way, each action plan will reflect the conditions and priorities within that country. The country plans will then be summed and re-evaluated regionally and globally by international teams to see if they add up to overall global solutions that successfully meet the five GSOP goals, are economically feasible, and socially/politically acceptable. This process will be iterated over 3 years to develop country, regional and global action plans that, when implemented, will successfully solve global warming on both Earth’s terms and on human terms.

Outreach Program. Each country's Outreach Program will provide engineering support and advice to States/Provinces, local communities and industries that are taking action on global warming. The Global Solutions Program and Outreach Program will have ongoing exchange of results and good ideas. Local people can assist on social/political evaluations of different options and feed their results into their country's Global Solutions Program. States/Provinces, local communities and industries may also offer to assist with pilot testing solution options. Thus, the GSOP will have two-way links from States/Provinces and local communities and industry up through country and international levels – a broad and powerful focusing of many minds.

Cost & Staffing Estimates. We estimate the GSOP work in the US will cost the US 377 million US dollars (USD) over the three-year program plus a start-up year. The US effort will require 382 full-time professionals and 2,990 part-time participants comprised of entry, mid and senior level professionals. Participants will include engineers, economists, social/political experts, other specialists, and subject-matter experts. Both US and global budgets are based on an annual salary of 129 thousand USD, as we intend to pay these participants at the same level, which is based on an average chemical engineering salary. Administration support personnel will also be paid at competitive US rates.

The professionals who lead and execute the GSOP will need boldness, energy and self-interest drive, and not be wedded to business-as-usual. Many must also be around to implement the solutions – a key consideration.

By necessity, the GSOP must be an international, global effort with people in all countries participating. It cannot be successful on a piecemeal basis; the Earth is one integrated system. Quickly mobilizing the GSOP in all countries at a *Global Scale* will cost approximately 3.2 billion USD over the three-year program plus a global start-up year. We are seeking US and international donations and commitments to secure these needed funds. We will not start the GSOP until the full sum is identified.

The US Global Support Center will fund and assist engineers and other professionals to form GSOP start-up teams within each country. With centralized funding, GSOP will then be initiated together in all countries around the world, placing everyone on the same learning curve and allowing international collaboration to start immediately.

GSOP Results & Advantages. The GSOP will eliminate a critical oversight and untenable risks by performing the upfront engineering work required to develop successful integrated global solutions to the global-warming problem. Direct results will include: a. Country, Regional and Global Action Plans that can guide future work in all countries to *successfully* solve global warming – solve it on both Earth's physical terms and on human economic and social/political terms; b. Engineering support to each country's States/Provinces, local communities and industries to enhance their vital ongoing work; c. Extensive country and international collaboration, which will build global consensus and cooperation needed to implement the Action Plans.

Many associated advantages will flow from the GSOP including a roadmap for sound corporate planning; public support and confidence; a system context to prioritize new technologies; an international pool of knowledgeable engineers to implement the solutions; and enormous technical, economic and social/political advancements throughout the world.

Strategy. So, this is our strategy: We want to mobilize and empower entry, mid and senior level professionals to lead and execute the GSOP in their own self-interest. Working together around the world, participants will provide real hope to successfully overcome global warming and enable humanity to survive and thrive.

Please visit our website for more information on the GSOP at: www.climate-collaboration.com
Please fill out a questionnaire if you are interested in future GSOP employment, and please encourage others to do the same.