



ADVANCING THE PRECAUTIONARY AGENDA

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The Science and Environmental Health Network (SEHN) engages communities and governments in the effective application of science to protect and restore public and ecosystem health.

SEHN encourages the practice of science in the public interest and the accurate interpretation of scientific information; identifies information, ethical concepts, and logic that have the potential to provoke essential change; and helps communities, organizations, and governments develop and implement sound environmental policies.

SEHN was founded in 1994 by a consortium of North American environmental organizations (including the Environmental Defense Fund, The Environmental Research Foundation, and OMB Watch) concerned about the misuse of science in ways that failed to protect the environment and human health. Granted 501(c)(3) status in 1999, SEHN operates as a virtual organization, currently with six staff members working from locations across the U.S.

Since 1998, SEHN has been the leading proponent in the United States of the precautionary principle as a new basis for environmental and public health policy. SEHN has worked with issue driven organizations, national environmental health coalitions, municipal and state governments, and several NGO/government teams to implement precautionary policies at local and state levels.

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DISCLAIMER

The findings and ideas for advancing the precautionary principle indicated by the conversations are those of the author and the Science and Environmental Health Network alone.

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EXECUTIVE SUMMARY

The precautionary principle is the idea that action should be taken to prevent harm to the environment and human health, even if scientific evidence is inconclusive. The application of the precautionary principle has galvanized work on the environmental health agenda and policies in many regions. In addition, farsighted strategies are emerging in many sectors that foster care about the future of the planet and the human race, without reference to, or consciousness about, the precautionary principle. These burgeoning applications of precaution could be enhanced by synergy and mutual awareness. Therefore, to mark the 10th anniversary of the influential 1998 Wingspread Conference on the Precautionary Principle, the Science and Environmental Health Network (SEHN) set out to identify the existence of, and potential for, such strategies across a broad spectrum of industries, disciplines, and movements.

Between February and December 2008, 17 leaders in industries, disciplines, or movements related to fostering care about the future of the planet and the human race were interviewed. Questions pertained to each individual's knowledge of the precautionary principle as a cultural meme and thoughts about visionary planning and decision-making in the face of uncertainty. The 17 participants were affiliated with 14 sectors: agriculture, agribusiness, arts/culture, construction, healthcare (N=3), environmental health, environmental justice, food service, forestry, labor, law, medicine, peace/social justice, and public health (N=2). Participants were from nongovernmental organizations (N=8), not-for-profit businesses (N=3), for-profit businesses (N=2), academia (N=2), government, and a union. The 17 participants hailed from the U.S. (N=15), Nigeria, and Malaysia.

The majority of individuals interviewed were not actively engaged in an explicit application of the precautionary principle. Participants reported widely divergent timeframes for planning in their respective areas of expertise, from using measures not in years but "beyond our dimension and based on energy flows," to a multigenerational outlook, to exclusively near-term planning.

Each of the 17 conversations is summarized in depth within the report that follows. The summaries and quotes were validated by each interviewee.

The ideas that emerged from the interviews coalesced around four themes generic to the application of precautionary strategies across industries, disciplines, sectors, and borders: (1) Institutionalizing Precaution; (2) Measuring Precaution; (3) Economic Drivers of Precaution and (4) Envisioning Precaution. The findings and ideas for advancing the precautionary principle indicated by the conversations in each of these four areas are summarized below, and are those of the author and the Science and Environmental Health Network alone.

1. Institutionalizing Precaution

The conversations brought to the fore the question of how government and nongovernmental institutions can be built to either enable or disable precaution. Government institutions played a fundamental role in promoting and obstructing precautionary strategies and served as a primary source of evidence regarding health impacts relied upon in decision-making.

In the nongovernmental sector, many of the precautionary efforts described can be summed up as “embrace complexity.” The strategy involved building large collaborations whose members (1) recognize and strive to optimize the potential of their relationship to a larger, complex underlying system; and (2) are united around a common long-term precautionary goal. Examples included a large alliance of small family pig farmers who shared a vision of a healthy and humane food system; the Blue Green Alliance, a partnership launched in 2006 by the United Steelworkers and the Sierra Club uniting labor and environmental organizations in linking global warming solutions with job creation; the International Physicians for the Prevention of Nuclear War’s nonpartisan federation of national medical organizations in 62 countries; and the Global Health and Safety Initiative, a cross-sector collaboration spawning alternatives to present day healthcare system practices.

Together, the conversations related to institutionalizing precaution indicated that advocates should find common purpose with efforts to construct easy-to-navigate governmental and nongovernmental institutions that reflect and are accountable to the complex underlying systems they impact.

2. Measuring Precaution

Respondents were struggling with how to measure, evaluate, and compare health impacts of various human activities across time and place. The issue of metrics went far beyond hedging against “green-washing.” The conversations revealed how even the best of precautionary intentions can go astray or be obstructed by the limitations of existing methods. Tools for measuring precaution should: (1) account for what we already know; (2) foster health rather than measure the “least bad choice;” and (3) better our understanding of system-wide impacts. A list of characteristics of precautionary metrics is presented in the report.

While participants were all using scientific evidence in precautionary decision-making, they identified barriers to putting that reliance into practice, especially pressures to achieve profits and patents and the overall poor funding of precaution-oriented scientific research.

Together, the conversations related to measuring precaution indicated that advocates should craft and implement “precautionary metrics” sensitive to system-wide effects, and develop a better understanding of factors that influence the acquisition of knowledge.

3. Economic Drivers of Precaution

Virtually all of the conversations touched on how precautionary strategies are enhanced or impeded by economic drivers, summarized here under three themes: (1) Business models that promote precaution can thrive. (2) Current spending priorities tend to shortchange precaution. (3) The global economic system favors short-term profits over long-term planetary survival. The discount rate and other assumptions underlying economic analyses determine the value placed on the future and imply inherent tradeoffs between economic wellbeing and environmental protection. These assumptions are poorly recognized or understood by non-economists, and they are hotly debated by experts in the field.

Together, the conversations related to economic drivers of precaution indicated that advocates should work to redress the distortions in society’s allocation of resources and harness the largely untapped expertise of economists.

4. Envisioning Precaution

A key theme that emerged from the conversations was how widening disparities in wealth or the pressing demands and increasingly sped-up electronic pace of everyday life pose material, intellectual, and emotional barriers to envisioning and acting to protect the future. Opportunities identified in the conversations to overcome these human resource and attitudinal obstacles include:

- Create time for contemplation through art and culture;
- Work for social justice to help liberate people from their short-term survival imperatives and subjugation by oppressive power structures;
- Reward foresight, innovation, and collaboration in government, business, and other arenas where thinking outside the short-term box is often punished;
- Craft structures and processes that encourage human contact, consensus building, trust, respect, and friendship; and
- Inspire leadership to attend to the needs of future generations.

A final recurring theme was that precaution is impeded by the lack of a plan to transform how society is organized. Together, the conversations related to envisioning precaution indicated that advocates should move policy away from “tinkering around the edges” towards systemic changes needed to protect future generations.

In conclusion, by reflecting on these themes, and the observations and recommendations detailed in the report, advocates of the precautionary principle can advance larger global efforts to normalize intergenerational awareness and planning embodied in the Native Americans proverb: “We do not inherit the Earth from our ancestors, we borrow it from our children.”

INTRODUCTION

The idea at the core of the precautionary principle is that action should be taken to prevent harm to the environment and human health, even if scientific evidence is inconclusive. The concept of precaution was born in the environmental domain in the 1970s, and by the 1980s precaution began appearing in international environmental agreements in the context of mounting evidence of unprecedented environmental changes surrounded by vast uncertainties.

In 1998, the precautionary principle was introduced into public discourse in the United States, after participants at the Wingspread conference in Racine, Wisconsin, issued the statement, “When an activity raises threats of harm to human health or the environment, precautionary measures should be taken even if some cause and effect relationships are not fully established scientifically” (Appendix 1).¹

Ten years later, the precautionary principle and related strategies have had major influence in galvanizing work on the environmental health agenda and policies in many regions. The principle is now embedded in a wide range of international treaties, and national and local laws, regulations, and policies.ⁱ

However, outside of the arena of environmental health, the influence of the precautionary principle per se (as a term, as a concept, and as a legal and policy tool) remains limited. At the same time, farsighted strategies are emerging in many sectors that foster care about the future of the planet and the human race independent of the precautionary principle. These burgeoning applications of precaution could be enhanced by synergy and mutual awareness. Therefore, a project was undertaken to identify the existence of, and potential for, precautionary strategies that foster the long-term health and wellbeing of humans and the planet across a broad spectrum of industries, disciplines and movements.

ⁱ The precautionary principle has been enshrined in many regional and national policies on the environment and public health. As the principle grows in status, governments are increasingly compelled to adopt a clear position on precaution and to defend this position against opposing views. The Science and Environmental Health Network’s website provides current information on government positions around the world. See <http://www.sehn.org/govposit.html>

GOAL

The goal of this project was to identify the existence of, and potential for, precautionary strategies across a broad spectrum of industries, disciplines and movements.

METHODS

Selection Criteria

Interviewees were selected, not as a random sample but as a convenience sample of leaders in sectors related to fostering care about the future of the planet and the human race. To identify potential interviewees, SEHN staff created a list of industries, disciplines, and movements that foster care about the future of the planet and the human race. SEHN staff then brainstormed a list of prospective interviewees in each category that varied geographically and by sector. Potential interviewees were selected from individuals SEHN staff knew, knew of, or identified through established contacts and networks.

Data Collection

Participation was solicited in writing followed by two or more phone calls and/or emails. Interviews were conducted by a public health researcher in person when feasible or by telephone. Participants were informed at the outset that their responses would be for attribution and would be recorded in writing.

For the purpose of this project, “precautionary strategies” were defined as *any strategies that aim to foster the long-term health and wellbeing of humans and the planet, undertaken in the presence of uncertain determinants, complex scenarios, suspected risk factors, or unpredictable circumstances.*

A survey instrument was developed to guide conversations with interviewees (Appendix 2). Questions pertained to the individual’s knowledge of the precautionary principle as a cultural meme and their thoughts about visionary planning and decision-making in the face of uncertainty. Key elements of the precautionary principle, i.e., taking preventive action in the face of uncertainty, shifting the burden of proof, and conducting alternatives assessment were explored. The interview process was iterative and additional questions

(and interviewees) were developed/solicited based on the responses from participants.

Data analysis

All interview data were summarized with descriptive statistics, qualitatively analyzed, and supplemented with additional reference material obtained through a review of the relevant literature. The analysis and report were prepared by SEHN independently of interviewees. Direct quotes and each of the conversations summarized in the results section were sent to the individuals cited for validation. Responses were evaluated according to the existence of, and potential for, precautionary strategies in the respondent's area of expertise and obstacles and opportunities encountered in implementing these strategies.

RESULTS

Participants

Between February and November 2008, 25 individuals were invited to participate, 17 were interviewed and eight declined (Table 1). The interviews took from approximately 30 minutes to more than two hours to complete and were conducted in person (N=9) or by phone (N=8).

The 17 participants were affiliated with the following 14 industries, disciplines or movements: agribusiness, agriculture, arts/culture, construction, healthcare (N=3), environmental health, environmental justice, food service, forestry, labor, law, medicine, peace/social justice, and public health (N=2). Participants were from nongovernmental organizations (N=8), not-for-profit businesses (N=3), for-profit businesses (N=2), academia (N=2), government, and a union. The 17 participants hailed from the U.S. (N=15), Nigeria, and Malaysia. The 15 U.S participants were from seven states (California (N=8), Iowa (N=2), Maryland, New Mexico, New York, Texas, and Vermont) and Washington, DC. *See participant biographies at the end of the report.*

Table 1. Participants

Name	Industry/ Discipline/ Movement	Sector	Title	Organization
Dean Edwards	Health Care	Business - Not for profit	Vice-President and Chief Procurement Officer	Kaiser Permanente
Diana Frappier	Law	Non-Governmental Organization	Co-Founder	Ella Baker Center for Human Rights
Dermot J. Hayes	Agribusiness	Academia	Pioneer Chair in Agribusiness	Iowa State University
Ime John	Peace/Social Justice	Non-Governmental Organization	Co-President	International Physicians for the Prevention of Nuclear War
Tom Kelly	Environmental Health	Non-Governmental Organization	Co-Founder	KyotoUSA
William Klinefelter	Labor	Union	(Retired) Legislative and Political Director United Steelworkers	United Steelworkers (USW)
John Kouletsis	Health Care	Business - Not for profit	Director, Planning and Design Services, National Facilities	Kaiser Foundation Health Plan and Hospitals
Tom Lent	Construction	Non-Governmental Organization	Technical Policy Coordinator	Healthy Building Network
Christine Malcolm	Health Care	Business - Not for profit	Senior Vice President Hospital Strategy and National Facilities	Kaiser Foundation Health Plan and Hospitals
Ronald McCoy	Medicine	Non-Governmental Organization	Past President	International Physicians for the Prevention of Nuclear War
Spencer Phillips	Forestry	Non-Governmental Organization	Vice President, Ecology & Economics Research	The Wilderness Society
Julia Quint	Public Health	Government	(Retired) Chief	CA Dept. of Public Health Hazard Evaluation System and Information Service
Kathy Sanchez	Environmental Justice	Non-Governmental Organization	Director	TEWA Women United
Rick Schnieders	Food Service Industry	Business—For profit	Chairman and Chief Executive Officer	SYSCO Corp.
Victor W. Sidel	Public Health	Academia	Distinguished University Professor of Social Medicine	Montifiore Medical Center, Albert Einstein Medical College
Joe Uehlein	Arts/Culture	Non-Governmental Organization	Founder	<i>CultureWorks Collective</i>
Paul Willis	Agriculture	Business—For profit	Manager	Niman Ranch Pork Company

RESPONSES

Cultural Meme

The majority of individuals interviewed were not actively engaged in an explicit application of the precautionary principle. Their knowledge of the precautionary principle ran the gamut from little to no awareness (N=5/17), through knowing the precautionary principle exists but having no or only implicit application to their work (N=5/17), to being actively engaged in activities that explicitly invoke the precautionary principle (N=7/17).

William Klinefelter and Tom Kelly asserted that the precautionary principle was absent from national and state policy discussions and practical activities to address climate change. The precautionary principle was characterized as implicit in: (1) legal strategies aimed at protecting the wilderness for future generations; (2) Sysco Corp.'s efforts to "do no harm" when constructing food distribution systems; and (3) Native American beliefs regarding the laws of nature.

Instances cited where the precautionary principle was explicitly invoked were: (1) Kaiser Permanente's National Facilities construction standards; (2) the U.S. Green Building Council's guiding principles; (3) the European Union's opposition to genetically modified crops; (4) TEWA Women United's efforts to address the ongoing adverse environmental and human health impacts of the U.S. nuclear weapons program; (5) the California Department of Public Health Hazard Evaluation System and Information Service's implementation of its mandate to protect public health; and (6) a physician's efforts to frame discourse in the medical community about the implications of biotechnology.

Visionary Planning

Participants reported widely divergent timeframes for planning in their respective areas of expertise. Native American leader Kathy Sanchez of TEWA Women United expressed setting the compass needle using measures not in years but "beyond our dimension and based on energy flows." Other participants linked a multigenerational outlook to the goals of replacing industrial agriculture with a more sustainable model of food production (100 years), protecting the wilderness, abolishing nuclear weapons, and reducing carbon emissions. More near-term planning was also reported. Construction outlays were

forecast at Kaiser for the next seven to eight years; strategic planning at Sysco Corp. operates in a three- to five-year framework; and farmers raising pigs in a sustainable manner might set their sights out over the next five years.

Several participants observed that long-term visionary planning has been, or should be, rooted in identifying and addressing chronic health impacts of occupational and environmental toxins. Notably, in 1969 the United Steelworkers became the first labor union to hold a conference on air pollution issues after observing the link between air pollution and chronic health damage to union members and their families. However, it was also reported that the overwhelming concerns about job vulnerability that persist in the labor movement make it harder than ever for workers to look beyond their pressing short-term economic needs.

Finally, it was suggested that the ever-quickenning pace of planetary society could impede long-term planning. As Bill Klinefelter stated, “Planning beyond five years is essentially unrealistic when change is so rapid and pervasive—trends come and go before we can even understand them.”

PRECAUTIONARY STRATEGIES

AGRICULTURE

“All you had to do was see it to know ... After going into an industrial pig farming operation for just 10 minutes—I knew it was not the way I’d want to raise pigs..”

Paul Willis, Manager, Niman Ranch Pork Company

PAUL WILLIS described raising livestock as a mental, economic, and environmentally sustainable endeavor that starkly differs from the inhumane and environmentally destructive features of the industrial-scale confined animal feeding operations (CAFOs) that dominate the U.S. market.

In the mid-1990s, Mr. Willis made his initial foray into forging a viable alternative to CAFOs when he formed Niman Ranch Pork Company --- a company that provides a

market for pigs raised humanely by traditional family-owned and operated farms. Niman Ranch Pork Company is now a network of over 500 family hog farms, growing by 10 percent annually. Mr. Willis said, “Folks are now voting with their dollars about what type of agriculture they want to see.”

Mr. Willis reported that proponents of industrial-scale pig farms are paying attention to the market success of humanely raised hogs from family farms, as well as to reports linking CAFOs to animal cruelty and harm to the environment and public health.^{2,3} Their response, he said, has been to tout “responsible pork” with slogans such as “Every day is Earth Day for America’s pork producers,”⁴ to dismiss concerns about animal welfare as “sentimentalism” unsupported by “sound science,” and to fund university studies to mitigate the effects rather than address the underlying problems of CAFOs, as illustrated by the research efforts undertaken to “solve the odor problem” on factory farms.⁵

AGRIBUSINESS

“I cannot imagine any new technology that could pass the precautionary principle test of ‘guilty until proven innocent’.”

Dermot J. Hayes, Pioneer Chair in Agriculture, Iowa State University

DERMOT HAYES put the precautionary principle in the category of “mom and apple pie,” because the interest in protecting human health is commonly shared. He said, “The apparent attractiveness of the precautionary principle for those who do not think it through has the potential to cause enormous problems.”

Dr. Hayes said the precautionary principle amounted to a “guilty until proven innocent” stance toward technologies, and he compared this unfavorably to the current U.S. “innocent until proven guilty” approach, backed up by regulatory systems to weed out bad actors.⁶ He described “guilty until proven innocent” as a “logical fallacy” that promotes a “risk averse” policy and regulatory environment and forestalls or prevents the introduction of beneficial new technologies and drugs.

According to Dr. Hayes, the success of the opposition to genetically modified crops in the Europe Union was contributing to declines in crop yields in Europe, and escalating opposition to genetically modified crops in Africa would have negative impacts on the

continent's food supply and human health. He stated his belief that the ad hoc adoption of the precautionary principle by the U.S. Food and Drug Administration in the wake of the thalidomide tragedy had been a barrier to the development of new antibiotic drugs.

ARTS AND CULTURE

“Art is a critical complement to activism, for no matter how brilliant our attempts to inform, it is our ability to inspire that will make the difference!”

Joe Uehlein, Founder, CultureWorks Collective

JOE UEHLEIN said engaging people in art is a powerful precautionary strategy. He explained the relationship this way: “Art can arrest life for a moment and draw people into contemplation. The power of that taps into other parts of their human nature. Art can help transform fear into hope and determination. Art draws out our better nature as human beings and helps us get past short-term self-interest and fear.”

Recently Mr. Uehlein founded the CultureWorks Collective, a group of artists, musicians, organizers, activists, and leaders of the environmental, human rights, equality, peace, freedom, and labor movements (www.cultureworkscollective.com). The Collective is bound together by belief in the power of art and music to motivate and inspire, and a commitment to connecting art and music to the progressive movement. Mr. Uehlein said artists should not be on the fringe but central to movement planning and noted that other cultures better understand the power of art as a precautionary strategy.

Mr. Uehlein recalled that at one time, the sight of smoke coming out of a factory chimney in Donora, Pennsylvania meant bread on the table to the steel workers. But this image was later transformed when an inversion trapped the pollution in the community, causing the deaths of steel workers and their family members. He believed this experience led to the United Steelworkers' early and strong support for the Clean Air Act, unique among unions. He linked this type of transformation to his current efforts to redirect the labor movement's gaze beyond short-term horizons, limited by fear of job loss, to a longer-term vision about how climate change will alter the landscape for labor.

Mr. Uehlein viewed climate change as a historic opportunity to envision the creation of 30 million jobs. He said labor should get on the climate change bandwagon—recognize the changes that are coming and organize around them. While foresight is embodied in the precautionary principle, he noted, “it will be hard to get people to think in the long term until they are free of fear and want.”

CONSTRUCTION

“When selecting construction materials, well-established health impacts for which we lack reliable numbers to plug into a Life Cycle Analysis do not show up in the results.... However, these health impacts do not go away and we can ill afford to ignore them.”

Tom Lent, Technical Policy Coordinator, Healthy Building Network

TOM LENT’S work with the Healthy Building Network boils down to finding a precautionary principle–based response to the question, “Which building materials are ok and which ones are not?” Too often, he said, it is not a simple response, as the human health and environmental impacts of building materials span populations, time, and distance. One approach to materials selection that is gaining traction is “Life Cycle Analysis,” generally referred to as LCA, which attempts to quantify and compare the relative impacts of building materials across their lifetimes. However, Mr. Lent said the practice of quantification can actually cloud, not clarify, decision-making.

A method that strives to be comprehensive, quantitative, and steer clear of substituting one bad actor for another seems advantageous. However, Mr. Lent explained that the validity of LCA results depends on the availability of complete and quantified data across all measures of importance and across all applications. This kind of comprehensiveness, he said, is impossible to achieve.

He illustrated this apparent paradox—that increasing quantification may not produce more accurate (truthful) answers—by describing the findings of an LCA conducted to quantitatively assess the relative impact of polyvinyl chloride (PVC) building materials in comparison to a few available alternatives.⁷ The first draft of the LCA found no significant difference between the health impact of PVC and other materials. On investigation, Mr. Lent found that it did so because it ignored environmental and human

health impacts that could not be quantified with certainty. The examples he cited were the impacts of landfill fires and occupational and community exposures across the materials' lifespan,ⁱⁱ where the exact quantity of impact (e.g. number of cancers per pound of PVC produced) is clearly significant but highly uncertain. Adding these factors to the analysis flipped the results to make clear that PVC was consistently among the worst materials for human health impacts. The contribution of workplace exposures to relative risk calculations was so compelling that investigators concluded that occupational health impacts should not be routinely excluded from LCA in the future.⁷ But the asymmetric nature of the data used in LCA— i.e., poor quality and/or or lack of data on some factors and quantifiable data on other factors -- distorted the results of the analyses. Mr. Lent explained further that the health and environmental risks of any and all of the alternatives assessed could be well in excess of regulatory standards. The answers sought in the LCA simply speak to how the alternatives compare relative to each other.

As materials alternative assessment moves from crude measures--“recycled good, plastic bad”--toward more sophisticated models of comparison, the challenge, according to Mr. Lent, is to find methods complementary to LCA that would capture relevant but poorly quantified measures of human and environmental health in the decision-making process. When assessing alternative materials, Mr. Lent favors excluding those with recognized hazards—such as the release of known carcinogens—from the start. He concluded, “Preemptive precautionary action to limit or exclude use of certain targeted classes of chemicals is the wiser, more responsible and--considering potential liability issues--sometimes more economically conservative course than waiting for certain scientific quantification.”

ⁱⁱ (1) Landfill fires are a huge, but poorly quantified, contributor to PVC impacts, because dioxin is released when PVC is burned. On average, there are 23 landfill fires a day in the U.S. The U.S. Environmental Protection Agency's estimate of the likely amount of the emissions from landfill fires is over twice the next largest source - backyard barrel burning. Whether or not one counts the impact of landfill fires, and the dioxin-related cancers they produce, will make PVC look relatively better or worse; (2) When occupational exposures are considered in the model, PVC was consistently the worst choice among all applications in terms of human health; however, occupational data were missing for the non-PVC alternatives; and (3) People in Kentucky and Louisiana living outside plants that manufacture vinyl chloride monomer (used in the production of PVC) have elevated risks of developing cancer from the emissions from these facilities; however, the comparable data to assess the potential community health risks for the non-PVC alternatives were lacking.

HEALTHCARE

“At Kaiser Permanente, we recognize the direct link between environmental health and human health and safety. As a healthcare organization, our purpose is to keep people well and to care for them when they’re not. If our facilities are contributing to health problems, then we’re not really doing our job.”

***Christine Malcolm, Senior Vice-President, Hospital Strategy and National Facilities
John Kouletsis, Director, Planning and Design Services, National Facilities,
Kaiser Foundation Health Plan and Hospitals***

CHRISTINE MALCOLM AND JOHN KOULETIS implement the precautionary principle by developing hospital design standards that create synergies among what they call the “three safeties”: patient safety, worker/workplace safety, and environmental health and safety. In their view, a precautionary approach to design might be initiated, for example, by posing a question about how to reduce the use of patients’ pain medications through design. This contrasts with what they call “find form and jam function”—starting with design and making function fit in.

Ms. Malcolm and Mr. Kouletsis reported that Kaiser Permanente’s search for a healing architectural design strategy is being played out on a grand scale. At a cost of \$2.9 billion a year for capital projects exclusive of IT costs, Kaiser has undertaken the biggest healthcare building program in U.S. history. Moreover, in October 2007, Kaiser co-founded the *Global Health and Safety Initiative* to build a healthcare industry-wide social movement that fosters patient, worker, and environmental health synergies.⁸ Mr. Kouletsis said, “It is notable in that it is driven by healthcare providers rather than designers, architects, and engineers.”

Charting largely new territory, Kaiser and its partners have set out to identify, implement, and evaluate design strategies that promote health for both individuals and the communities that are served by the healthcare providers. Kaiser engaged the Center for Health Design to create *RIPPLE*, an updatable, open-source, searchable, web-based database to link the existing evidence for design strategies that improve the “three safeties.”⁹ In 2005, the American Institute of Architects awarded a group that included Kaiser the prestigious Latrobe Fellowship to help advance the notion of evidence-based

design. In this process, the Latrobe team looked at a variety of types of information and research methods that might best inform the design process.ⁱⁱⁱ One of the major results of the Latrobe work was the creation of a tool integrating three classes of data hitherto rarely connected in healthcare design practice—physical design features, patient experience, and patient medical outcomes. One lesson learned about evidence-based design through this effort was that “to most effectively make optimal design decisions, we need systems of information integrating various influences, rather than bits of data.”^{iv}

Ms. Malcolm and Mr. Kouletsis emphasized a related strategy: using the insights of people who do the work to design the workplace. Their design standards rely heavily on a wide range of patient satisfaction measures and on the “160,000 feedback loops” that Kaiser’s workforce represents; most of the workforce are also Kaiser members. Mr. Kouletsis explained, “Pilot projects move quickly from “insight to action.” End users are asked to evaluate full-scale models of varying degrees of fidelity that simulate the proposed design before full-scale implementation. This is taking the idea of traditional mockups to a whole new and complex level of practice.”

The advantages of the Kaiser approach are demonstrated in at least one key measure: Kaiser’s project costs for hospital planning, design, and construction are reportedly approximately nine percent lower than the average cost of all California hospitals as measured by an independent external group.

“Simply put, it is less expensive to keep people healthy, and it shouldn’t cost more to be green.”

Dean Edwards, Vice-President and Chief Procurement Officer, Kaiser Permanente

DEAN EDWARDS identified Kaiser’s purchasing practices as part of a “first do no harm,” prevention-oriented business model to keep its members healthy. He emphasized that Kaiser has the incentive to keep people well; in contrast to other healthcare providers, Kaiser, a nonprofit, receives no financial benefit when members use its services. He sees Kaiser as a catalyst for changing eating habits, stemming from

ⁱⁱⁱ American Institute of Architects (AIA) 2005 Latrobe Fellowship. Chong Partners Architecture, Kaiser Permanente and University of California, Berkeley. Developing an Evidenced-Based design Model that Measures Human Response: A Pilot Study of a Collaborative, Transdisciplinary Model in a Healthcare Setting. May 1, 2008.

^{iv} AIA College of Fellows. 2005 Latrobe Fellowship. Page 35.

the current US agriculture system, that contribute to obesity, heart disease, Type II diabetes, and other chronic diseases. He cited Kaiser's practices of purchasing locally sourced fresh food, adding "healthy picks" to its vending machines, establishing farmers markets at its facilities, and plans to provide cooking lessons for members.

Mr. Edwards does not believe that "green" products should necessarily cost more. He observed that a critical mass of purchasers can lower price. Because of its size, Kaiser can specify to vendors what is needed and leverage market shifts. He uses a financial accounting metric, "Total Cost of Ownership," that accounts for costs over a product's lifetime, including disposal. Mr. Edwards reported that when costs are evaluated over time, in most cases, environmentally preferable purchasing decisions are cost neutral or cost beneficial.

In assessing alternatives, he explained that Kaiser does not conduct independent research on claims of environmental impacts, but instead relies almost exclusively on government sources and lists of chemicals, health hazards, and energy consumption such as those generated by the U.S. Environmental Protection Agency.

Mr. Edwards mused that the U.S. is still far from the regulatory environment he encountered while working in Europe 15 years ago, and offered his opinion that the lack of federal leadership and mandates to promote environmentally preferable purchasing has left the U.S. at a competitive disadvantage. For example, when there is global demand for an "environmentally preferable" product, suppliers will favor sending scarce materials to places where a government mandate will insure they will be purchased. Mr. Edwards believes that consumer demand is the ultimate driving force behind greening the marketplace.

ENVIRONMENTAL HEALTH

“Our response to climate change is reactive and susceptible to the promise of quick and unproven technological fixes instead of making the necessary structural changes in government, the economy, and in our personal lives. It mirrors an ‘I can win the lottery’ approach to problem solving that will only waste precious time.”

Tom Kelly, Kyoto USA

TOM KELLY lamented the predominance of a non-precautionary, reactive rush toward unproven and life-threatening technological solutions to climate change. He cited as examples: substituting biofuels for gasoline; plans to capture and bury carbon dioxide deep in the ground, hoping it will stay there forever; extracting oil from the sands of Alberta; erecting shades in space to cool the Earth; and proposals to seed the oceans with iron to increase levels of phytoplankton and therefore draw more carbon dioxide from the atmosphere. Mr. Kelly contrasted these approaches with creating a society that is not dependent on automobiles, a scenario that should be, but is not, at the top of society’s to-do list for addressing climate change. In his experience, he said, we don’t want to change how we live, only what we use for fuel.

Mr. Kelly noted that while long-term targets for reduced carbon emissions have been established, they will be meaningless if people continue to think they can pass on the responsibility for past and present carbon emissions to future generations. He finds the timeframe for long-term goals unimaginable for most people, and was troubled that “we seem to lack an emotional relationship to the future.” He said, “The impacts of climate change are occurring now—our response should be immediate.”

Economic factors are also barriers to addressing climate change. While Mr. Kelly applauded the passage of AB 32, which in 2006 established California’s major initiatives for addressing climate change and reducing greenhouse gas emissions as law, he pointed out that the \$30 million borrowed from another state program to implement the law is orders of magnitude short of what will be needed. He finds these attitudinal and economic barriers to be self-reinforcing. He said, “If there is no financial commitment to implement the law consistent with the magnitude of the problem, are we relying on the

'marketplace' for solutions? If so, we are going to fall far short of what is needed?" Compounding the problem, he said, is the gap between a vision in which government mechanisms, institutions, and regulations foster positive synergies, and the reality that the federal government has ceded its responsibility to regulate.

Mr. Kelly said there are many untapped opportunities to apply the precautionary principle to the issue of climate change; for example, by vetting various cap and trade approaches and carbon taxes through a precautionary lens, and by branding as precautionary the many daily actions people can take to reduce their carbon footprint.

ENVIRONMENTAL JUSTICE

"Taking precaution could be advanced technically. Generally, to be counted something needs to be observable, repeatable, and measurable. We need new ways of measuring the imbalances, the planetary disruption of inter-relationships we are creating."

Kathy Sanchez, Director, TEWA Women United

KATHY SANCHEZ said she confronts the difference between the precautionary principle and risk assessment in her every waking moment. Ms. Sanchez described how these differing frameworks permeate the struggle between the Pueblos of the Rio Grande and the U.S. government over the environmental and human health impacts of nuclear weapons research and development conducted at the Los Alamos National Laboratory (LANL) in New Mexico.

To Ms. Sanchez, the precautionary principle is equivalent to Native American natural law, which places value on keeping lives and natural systems "in harmonious balance." To illustrate, she described her organization's culturally based response to sexual violence and trauma. Healing is addressed by a collaborative team, and all mental, physical, and spiritual aspects of harm are addressed. She said that this type of response is generally disavowed outside her community's direct sphere of influence, especially by LANL.

She described how the 2008 alternative assessment required by the National Environmental Policy Act (NEPA) to evaluate the environmental health impacts of the

planned “transformation” of the U.S. nuclear weapons complex was uncongenial to precaution. Ms. Sanchez described the process as “having completely overwhelming time demands, taking into consideration only very incomplete alternatives, and leading to results that precluded consideration of the most fundamental issues to Native Americans, such as their languages, values relative to maintaining environmental harmony, and their view that our human role is one of caretakers, not owners, of the land.” She found it ironic that while LANL is in the business of harnessing energy flows for the purpose of making nuclear weapons with the power to annihilate all life on Earth, it completely discounts life-sustaining energy flows throughout nature recognized by Native Americans.

The outcome of the NEPA process was that the U.S. Department of Energy (DOE) rejected even considering “dismantlement coupled with no capabilities to design and build new nuclear weapons” because, according to the DOE, that alternative “is not consistent with maintaining a safe, secure, and reliable nuclear weapons stockpile over the long term.”¹⁰

Ms. Sanchez elaborated that because LANL is guided by discerning “appropriate” risk levels, “if we can’t prove it, LANL’s position is it isn’t going to harm us.” She emphasized how pernicious a quantitative risk-based framework is post 9-11, when the U.S. nuclear weapons complex once again operates in complete secrecy. It now requires teams of lawyers to gather data that might otherwise have been obtained by a Freedom of Information Act request or even at LANL’s library.

Ms. Sanchez believes one reason the NEPA process is so flawed is that the U.S. government has abrogated its duty to protect its citizens and is instead captive to business interests. She advocated a cultural shift in which “precaution should just be there, just like the sun is there.” She believes public discourse should be redirected to upstream, systemic solutions and that people should be able to confront uncertainty unbounded by fears stoked by oppression, racism, and poverty.

FOOD SERVICE

“While there are issues we do not yet fully understand, for the good of our industry, we must be constantly proactive in supporting middle-sized farmers.”

Rick Schnieders, Chairman and Chief Executive Officer, Sysco Corp.

RICK SCHNIEDERS is a self-described adherent to “do no harm” strategies. He cited the work of author Michael Pollan and restaurateur Alice Waters as evidence of the enormous gap between what we find in grocery stores and the food we should eat to maintain health. He reported that Sysco sells customers what they want, but also strives to provide them with access to healthy choices and to move the market, and customer preferences, in that direction.

Four years ago, Sysco specified that over 600,000 acres of vegetable crops planted for its products implement integrated pest management (IPM) techniques that reduce the amount of pesticides used to grow food. Mr. Schnieders pointed out that Sysco launched its IPM strategy even though scientific data on pesticides were incomplete. He described the decision as “in a lot of ways, more of an emotional than scientific judgment.” He believes the success of Sysco’s IPM strategy reaches well beyond his company. Because most of Sysco’s suppliers also sell to other manufacturers, retailers, or distributors, the IPM and other standards set by Sysco can influence the agricultural system.

Mr. Schnieders gave additional examples of precautionary practices at Sysco: working with the U.S. Environmental Protection Agency for three years to develop a green certified line of cleaning products; a pandemic crisis plan, developed in conjunction with the U.S. Department of Homeland Security and the University of Minnesota; and a 6.7 percent reduction in electricity use at its 180 distribution centers in fiscal 2008.

The issue of genetically modified organisms (GMOs) in the food supply is one that Mr. Schnieders believes could benefit from shifting the burden of proof to proponents. He said that while evidence of harm to human health from GMOs is inconclusive, other attendant questions should be asked, such as the impact of GMOs on the pollution of other stock seeds. “We should know much more before we proceed with widespread

adoption of GMOs,” said Mr. Schnieders. He was dismayed that while Sysco has identified the presence of GMOs in only a low percentage of its products, the company was unable to determine the extent to which GMOs enter the meat supply indirectly through animal feed.

Mr. Schnieders cited the fact that rising incomes are associated with rising consumer demand for meat as a challenge to which the precautionary principle should, but has yet to, apply, and for which global leadership is largely lacking. He foresees the need to move beef from the center to the edge of the dinner plate. U.S. beef production and consumption patterns, he said, are unsustainable as world population grows from the current 6.7 billion people to over 9 billion by 2040.

Mr. Schnieders suggested the human proclivity to follow the easiest, but not necessarily the best, solutions may be a barrier to implementing the precautionary principle. He gave the example of the “misguided Green Revolution in India that left food distribution systems in shambles and crops rotting in the field.” He also contrasted the available “snapshot” measures of sustainability, such as the anticipated LEED silver certification for Sysco’s new Texas headquarters, with more in-depth analyses that look at an organization as a whole system. He recommended increased attention to finding improved methods such as Life Cycle Analysis or other benchmarks and metrics organizations could use to account for their systemic impacts.

FORESTRY

“Our economic system is generally aligned with short-term interests.... We tend to ignore, and therefore place little or no economic value on, impacts that will be felt by future generations.... It is not typical for people to behave in a precautionary way.”

***Spencer Phillips, Vice President, Ecology & Economics Research,
The Wilderness Society***

SPENCER PHILLIPS explored how precaution relates to the choice of a “discount rate”—a measure used by economists to compare economic value of effects that take place in different time periods. A discount rate converts future dollar amounts associated with a decision into equivalent present dollar amounts. Dr. Phillips explained that our

current societal preference for consumption is “sooner rather than later.” In economic analyses, this preference is translated into devaluing future needs: a tree felled today is likely worth more to conventional markets than a tree preserved, even for use as lumber, for tomorrow. Because the choice of a discount rate exerts tremendous sway in economic analyses of policy options, it has been the subject of raging debate among economists.

Dr. Phillips discussed the poor representation in economic analyses of other precautionary influences. One is “bequest value,” the value of passing a resource on to future generations. Another is the “option value”—the value of preserving a resource in order to retain the option to use it at some future time. Dr. Phillips reported, “These values are often left out of alternative assessments of policy options for natural resource management conducted as required by the NEPA [National Environmental Policy Act]. Whether these values are accounted for by a NEPA alternative assessment is typically a matter of the individual performing the analysis. Moreover, it is not uniformly the case that the alternative with the least environmental impact is chosen.”

Dr. Phillips said that in his field, economists are grappling with what wilderness preservation will look like in the face of climate change, and exploring the idea of hedging against the uncertainties by increasing wilderness protection. He noted that this might translate into increasing population densities, and that any potential public health impacts of heightened density must also be factored into the calculus. Dr. Phillips sees untapped economic opportunities associated with keeping wild lands intact. Preservation can ensure that a resource can be repeatedly exploited—thereby producing a stream of economic value over time—rather than simply used once before it disappears.

LABOR

“Most people lead unexamined lives ... if we have no plan for ourselves, how are we to plan for the planet?”

William J. Klinefelter
Senior Advisor to the Government Relations and Public Policy, Kelly Drye
(Retired) Legislative and Political Director and Assistant to the President,
United Steelworkers

WILLIAM KLINEFELTER said the best preventive strategies involved “turning towards, not away from problems, and being actively engaged at a table that will forge consensus solutions.” Process matters to precaution, Mr. Klinefelter said: addressing large, complex, and contentious issues requires building structures that support trust, respect, and friendships, which can be parlayed into consensus-based solutions.

Mr. Klinefelter described how, in 2002, the Hewlett Foundation and other foundation partners erected such a process, the bipartisan National Commission on Energy Policy. Two years later, the Commissioners issued a consensus document that unanimously “rejected the proposition that uncertainty [over energy choices] justifies inaction in the face of significant risks,” and outlined a wide range of actions needed to ensure affordable and reliable supplies of energy for the twenty-first century.¹¹

Given that cohesion among disparate interests is essential to success, Mr. Klinefelter was concerned that the electronic nature and accelerated pace of our interconnectedness may, paradoxically, be moving us rapidly away from interpersonal, human communication to a state of disconnectedness and isolation.

He said the Clean Air Act exemplified the merits of institutionalizing a government mechanism for taking preventive action in the face of uncertainty. He explained that through its strong and early advocacy for the Clean Air Act, organized labor played an historic role in the realization of its passage. As a result, beginning in 1970, the federal government was authorized to develop comprehensive federal and state regulations to limit toxic air emissions from both stationary (industrial) sources and mobile sources,

despite incomplete evidence related to the health impacts of the hazardous air pollutants listed under Section 112(c)(1) of the Act. As a result, he concluded, “we breathe easier, and our skies generally do not resemble those over Beijing or Mexico City.”

Mr. Klinefelter identified several obstacles to prevention-oriented public policy, including the lack of leadership at the federal level and Congress’s reactive responses to problems. He characterized the discussion about climate change among U.S. lawmakers as lagging far behind the conversation in other quarters, for example, at biweekly meetings at the AFL-CIO headquarters. Mr. Klinefelter cautioned that although climate change is already leading to large societal disruptions and an ever more complex and fragile world, “people will only tinker—there is no plan to really transform and change how society is organized.”

Mr. Klinefelter concluded, “Prevention is enthusiasm. Ultimately, we need to close the ever widening disparities of wealth and achieve a more just global society as a tonic to the despair that will defeat our best efforts.”

LAW

“Who, when asked, would really rather pay for prisons than schools? Yet that is the reality of how our society prioritizes spending.”

Diana Frappier, Co-Founder, Ella Baker Center

DIANA FRAPPIER described how the criminal justice system is mostly severed from a precautionary goal of fostering human health and security. She explained that the federal prison system overflows with people convicted of crimes related primarily to drugs and immigration, yet incarceration fails to solve either of these problems. Ms. Frappier asked, “How would you treat someone when they are in prison if you want them to make good choices when they are released?” With notable exceptions, she observed, “the dehumanizing conditions in our prisons predictably flame rather than extinguish criminal behavior.”

Ms. Frappier described a variety of precautionary strategies that run counter to the prevalent approach to criminal justice, including: transitional programs for persons released from federal prison, which provide an alternative to the traditional bus pass, a few dollars and good luck wishes typically provided; *Street Law*, a program that links law students with at-risk high school students; and *Know Your Rights* workshops, which teach high school students their legal rights.

Ms. Frappier cited *Books Not Bars*, a program that fights to redirect California's resources away from youth incarceration and towards youth opportunities as exemplifying a precautionary strategy.¹² At a cost of \$252,000 per ward per year and a recidivism rate of 70 percent, California's Division of Juvenile Justice is the nation's most expensive and least effective juvenile justice system. Currently *Books Not Bars* is working to close California's youth prisons and replace them with rehabilitation centers and community-based programs that rely on rehabilitation techniques demonstrated to be effective.

Other precautionary strategies discussed by Ms. Frappier were "restorative justice" approaches, which, for example, offer a person found guilty of defacing a building with graffiti the alternative of painting the building. Restorative justice approaches can be applied in cases ranging from vandalism to murder. They may involve establishing mediation programs led by community leaders as an alternative to violent methods of conflict resolution; diversion programs, which provide counseling and skill building as an alternative to incarceration; and ultimately, the creation of green jobs, which address the environmental crisis and poverty and provide an inspiring and tangible alternative to hopelessness and despair.

Ms. Frappier pointed to the need to change entire systems of thought, stating, "Young people who don't care about themselves tend to devalue the lives of others." According to Ms. Frappier, a key barrier to precautionary alternatives is fear of taking the risk inherent in doing things differently. She concluded, "If prevention were our priority, the positive effects would show up everywhere."

MEDICINE

“In the 21st century, genes will represent the economic equivalent of fossil fuels and the valuable metals of the industrial age.”

***Ronald McCoy, Institute for Medical Research, Kuala Lumpur
Past President, International Physicians for the Prevention of Nuclear War***

RON MCCOY called for applying the precautionary principle to new biotechnologies “as an insurance policy against our own ignorance and our readiness to take risks.” Dr. McCoy observed, “Science has leveraged power and control over fundamental biological life processes and the future lives of generations yet to come. From an historical perspective, we know that science is fallible about its conclusions and ignorant about long-term consequences.” Hence, he sees the urgent need for, “science to embrace the wisdom at the core of the precautionary principle—to restrict or even prohibit an activity that may cause long-term irreversible harm.”

Dr. McCoy enumerated formidable barriers to implementing the precautionary principle in the biotechnology arena: the enclosure, privatization, and commercialization of the planet’s genetic commons; a prevalent ahistorical belief that science will always triumph and that technology is infinitely resourceful; and the lack of political will to confront misuses of science and technology that threaten to undermine the basis of life itself. He asked, “With our knowledge of the past and uncertainties of the future, can we continue to raise our hopes and uncritically invest our trust and resources in science and technology as they stand today, unfettered by ethical principles and beholden to commercial and political interests?”

Dr. McCoy also stressed the need to transform the way we resolve human conflict, citing the increasingly disproportionate toll that warfare has taken on civilian populations over the last century. “While we can’t eradicate conflict we can try to anticipate and prevent it when we see signs of what is brewing and resolve it peacefully,” he said. “The United Nations was created for that purpose.” Such a change in global consciousness, according to Dr. McCoy, will embrace greater respect for international law and human rights and responsibility and redefine our concepts of national security. He concluded,

“The concept of nation states itself may be untenable, as we now live in an interdependent world.”

PEACE AND SOCIAL JUSTICE

“If even a relatively small nuclear war, by Cold War standards, can trigger a global catastrophe, the only viable response is the complete abolition of nuclear weapons.”

***Ime John, Co-President,
International Physicians for the Prevention of Nuclear War***

IME JOHN said International Physicians for the Prevention of Nuclear War (IPPNW) focused on “prevention as the cure” by harnessing a medical response to upstream solutions that foster the long-term health and wellbeing of humans and the planet. He described IPPNW’s work on preventing nuclear war and addressing global small arms and gun violence. In 1985, IPPNW was awarded the Nobel Peace Prize for performing “a considerable service to mankind by spreading authoritative information and by creating an awareness of the catastrophic consequences of atomic warfare.”

Dr. John explained that since the dawn of the nuclear age, “upstream” measures to prevent nuclear catastrophe have been synonymous with the abolition of nuclear weapons. This call has been echoed by voices ranging from the American Medical Association, to the 2006 Weapons of Mass Destruction Commission chaired by former Director General of the International Atomic Energy Agency Hans Blix, to global political and military leaders. Most recently, Mayors for Peace, under the leadership of Hiroshima Mayor Tadatoshi Akiba, called for the elimination of all nuclear weapons by 2020—the 75th anniversary of the US atomic bombings of Hiroshima and Nagasaki.

An upstream approach is also a hallmark of the IPPNW campaign addressing the global impacts of small arms and gun violence. While there is uncertainty about the global toll -- - the scale of human suffering caused by small arms violence is poorly counted ---- small arms and gun violence is known to produce hundreds of thousands of deaths and greater than a million injuries annually, as well as permanent physical and psychological damage, the destruction of families, lost productivity, and the diversion of resources from basic health services. *Aiming For Prevention* is grounded in a proactive public health-

based practice, in stark contrast to reactive conventional law enforcement or national security approaches. IPPNW's public health approach involves research to unravel the underlying causes of firearm violence. This research then enables the crafting of evidence-based policy recommendations for intervening at the weakest links in the chain of violence.

Dr. John found a mismatch between funding streams, which tend to flow over short time frames and measure success in the achievement of short-term objectives, and precautionary strategies, such as nuclear abolition, which may require long-term systemic change.

Dr. John reflected upon a political barrier to precaution: nation states do not want to take unilateral action on global problems. Having that day attended a meeting between an IPPNW delegation and Prime Minister Manmohan Singh of India, Dr. John reported that although a "realistic" scenario for a regional nuclear war in South Asia would kill 20 million people outright, the Prime Minister rejected seeking state or regional abolition of nuclear weapons absent a globally shared commitment.

PUBLIC HEALTH

"The impacts of chemicals exposures will be perpetuated across generations but we have yet to translate lessons of the past into policies to protect the future."

***Julia Quint, Chief, California Department of Public Health,
Occupational Health Branch, Hazard Evaluation System and Information Service (Retired)***

JULIA QUINT discerned the precautionary principle in the establishment of California's Hazard Evaluation System and Information Service (HESIS)--the institutionalization of a state government program with the authority to take preventive action in the face of uncertainty about human health effects. The story unfolded in 1977, when a small group of agricultural chemical workers in California became aware that none had fathered children recently. The ensuing investigation revealed profound, and in many cases permanent, sterility due to exposure to dibromochloropropane (DBCP), a widely used nematocide.^{13,14} Testicular atrophy due to DBCP had been documented in three rodent species 16 years before these first human reports.¹⁵ In response to this debacle,

California established the Hazard Evaluation System and Information Service (HESIS) as an early warning system, not bound by risk assessment mandates of regulatory agencies. Instead, the agency could issue human health warnings and recommend protective occupational health standards based on animal data alone.

Dr. Quint reported that the HESIS early warning system has had much success. For example, HESIS hazard alerts contributed to the fact that glycol ethers linked to adverse reproductive health outcomes are no longer used in the semiconductor industry, and that in California water-based products have virtually replaced the highly toxic cleaning solvents widely used by workers in the automotive repair industry. However, she cautioned that foresight requires hindsight and that “we are not learning the lessons of the past that are right in front of us.” She offered three examples.

First, occupational health regulations generally do not reflect well-documented chronic health impacts. Dr. Quint pointed to a 2007 study by the California Environmental Protection Agency finding that 44 of 106 workplace chemicals known to the state of California to cause cancer^v do not have a permissible exposure limit and 62 are not regulated as carcinogens.¹⁶ The report found that 5 of 19 workplace chemicals known to cause reproductive or developmental harm do not have a permissible exposure limit and 14 are not regulated as reproductive or developmental hazards. She underscored the significance of the risks that are considered acceptable for workers: six workplace chemicals had risks of greater than 1 case of cancer for every 10 exposed workers.

Second, we do not transfer the lessons learned about the adverse human health impacts of one chemical into action to prevent harm from chemicals with closely related “structure-activity” characteristics. For example, Dr. Quint said, “1-bromopropane entered the marketplace despite evidence of long-lasting ovarian failure and the absence of sperm in workers exposed to the closely related chemical, 2-bromopropane, and despite evidence that many chemicals similar to 1-bromopropane, such as DBCP, are known to cause sterility in humans.”

Third, Dr. Quint observed, “We do not incorporate what is already well known by one government agency into the regulations of others.” The 2003 HESIS warning about 1-

^v Not including drugs, banned chemicals and pesticides.

bromopropane¹⁷ did not deter the U.S. Environmental Protection Agency from endorsing it in 2007 as substitute for solvents that damage the upper ozone layer.¹⁸

Dr. Quint recounted how her introduction to the precautionary principle while leading HESIS led to her revamp the HESIS hazard alerts, expanding on how to identify and implement safer alternatives. Upon learning about the precautionary principle, she “began to use the early warnings of harm to spur the search for the good, rather than limit HESIS’ recommendations to merely a better version of the bad.”

“The precautionary principle is useful in many contexts, but war is not one of them. War is one of the worst places to argue for the precautionary principle. It is rare that there is any benefit to be gained by war or militarization. War should be rejected on other, well-established, legal and moral grounds.”

***Victor W. Sidel, Distinguished University Professor of Social Medicine
Montefiore Medical Center, Albert Einstein Medical College***

VICTOR W. SIDEL voiced concern about whether the application of the precautionary principle could inhibit a full examination of all pertinent data, such as an economic cost analysis of action/inaction. Dr. Sidel explained that while he disagrees with pitting economic growth against human health, he nevertheless believes full cost accounting of implementing precaution is needed for decision-making.

Dr. Sidel suggested, “Conditions may exist that override precaution in lieu of perceived or real short-term gains.” He said, “The benefits to patients of using drugs not yet approved by the Food and Drug Administration against terminal cancer might outweigh precaution. While it is widely agreed that we shouldn’t use fossil fuels that contribute to greenhouse emissions and thus climate change, how do we apply the precautionary principle if there is an immediate need to provide heat to populations who are cold, and coal is the most readily available fuel?”

“Virtually everything should be examined through the lens of precaution if there is any kind of risk of harm from a technique or strategy,” he concluded. “But that step alone still begs the question of what is the correct strategy. In every case, decision-making should be based on the best available evidence.”

DISCUSSION

Precautionary strategies were prevalent among the key informants interviewed although the precautionary principle did not explicitly inform the majority of strategies described. The conversations reported here represent the reflections of a group of innovators, leaders, and decision-makers grappling on a daily basis with the application of precaution in a wide range of disciplines, industries, and sectors. Common themes and patterns emerge, although inferences with statistical meaning cannot be drawn from these non-random conversations. The data presented here may well have left out key topics important to advancing the precautionary principle and issues that other individuals may have raised. The observations of the respondents are also contestable. Reference material was consulted in the preparation of this report to document some of the ideas that emerged in the discussions, but no attempt was made to vet each idea with individuals who may differ with the opinion presented. Rather, the themes discussed below represent substantive food for thought that could contribute to advancement of the precautionary principle.

The ideas emerging from the interviews coalesced around four general themes generic to the application of precautionary strategies across industries, disciplines, sectors, and borders:

- 1. Institutionalizing Precaution**
- 2. Measuring Precaution**
- 3. Economic Drivers of Precaution**
- 4. Envisioning Precaution**

The discussion and recommendations are those of the author and the Science and Environmental Health Network alone.

INSTITUTIONALIZING PRECAUTION

As for the future, your task is not to foresee it, but to enable it.

Antoine de Saint-Exupery

The conversations brought to the fore the influence of government institutions in enabling and disabling precautionary strategies. Governmental promotion of precautionary strategies was cited in examples provided on state (HESIS), federal (Clean Air Act), and international (United Nations) levels. The indispensable role of government could also be seen in the almost universal reliance on government-sanctioned evidence about health impacts in decision-making reported across sectors.

Characteristics of government institutions incompatible with precaution included: (1) the failure to regulate; (2) the lack of harmonization of government mandates and activities, which can serve to redistribute harms, rather than benefit the population as a whole; (3) a dearth of multilateral structures to think through precautionary alternatives; (4) reactive rather than proactive policies; (5) lack of commitment to precaution among leadership; (6) secrecy, as open access to information is fundamental to the assessment of risks, benefits, and alternatives; and (7) nation states, when they forestall motion on achievable steps to prevent harm in the pursuit of narrow national interests.

In the nongovernmental sector, many of the precautionary efforts described can be summed up as “embrace complexity.” The strategy involved building large collaborations whose members (1) recognize and strive to optimize the potential of their relationship to a larger, complex underlying system; and (2) are united around a common long-term precautionary goal. Examples included a large alliance of small family pig farmers who shared a vision of a healthy and humane food system;¹⁹ the Blue Green Alliance, a partnership launched in 2006 by the United Steelworkers and the Sierra Club uniting labor and environmental organizations in linking global warming solutions with job creation;²⁰ IPPNW’s nonpartisan federation of national medical organizations in 62 countries;²¹ and the Global Health and Safety Initiative, a cross-sector collaboration spawning alternatives to present day healthcare system practices.²²

Across all sectors, the conversations revealed how institutions can be built to either enable or disable precaution. Thus, key to advancing the precautionary principle is constructing easy-to-navigate governmental and nongovernmental institutions that reflect and are accountable to the complex underlying systems they impact. While our current institutions largely lack these qualities, there is reason for optimism on this front. The need to create social institutions that make carrying out the responsibility to protect future generations easy and mandatory has been well described, and several attempts have been recently made to conceptualize, invent, and create such institutions.²³ Advocates of the precautionary principle would be well served by finding common purpose with such efforts.

MEASURING PRECAUTION

*... the observed impact is a relatively small fraction of the impact yet to come but already committed to.*²⁴

G rard M gie

Respondents were struggling with how to measure, evaluate, and compare health impacts of various human activities across time and place. The issue of metrics went far beyond hedging against “green-washing.” The conversations revealed how even the best of precautionary intentions can go astray or be obstructed in achieving its aims by the limitations of existing methods.

Precautionary Metrics

Tools for measuring precaution:

- (1) Should account for what we already know.** Prevention is not the same as precaution. Whereas prevention involves addressing situations where there is a preponderance of evidence of harm, precaution lies in the realm of uncertainties about the probabilities of known and unknown impacts.²⁵ The conversations suggest that the baseline measure of a precautionary metric should be prevention. The participants provided examples of the tools they or others used to implement precautionary strategies. Characteristics of various metrics tended to squander or leverage prevention. For example:

Prevention may be squandered by:

- Hazard assessments that fail to build on existing knowledge of a chemical's structure and function;
- Searches for "safer alternatives" that fail to incorporate existing knowledge generated by governmental organizations and other scientific inquiries across disciplines;
- Life Cycle Analyses and alternative assessments that constrain the parameters of decision-making to pitting "relative risks" of well-recognized hazards against one another.

Prevention may be leveraged by:

- A hazards-based approach that proceeds from rejecting well-described harms from consideration;
- Accounting tools, such as the RIPPLE database, that strive to account for what is already known about multiple safeties in a synergistic manner;
- "Total Cost of Ownership" accounting methods that incorporate known costs across the lifetime of a product, and thus begin to measure a truer picture of costs, as well as reinforce a "cradle to cradle" responsibility for purchasing decisions.

(2) Should spur better ways to foster health rather than strive to measure the "least bad choice." Alternative assessment is a tool but not a guarantee of precaution. For example, Kathy Sanchez noted how alternative assessments required under NEPA may fail to protect health because of fundamental differences in goals. In practice, they may spur innovation through a search for better ways of ensuring health and human security, or they may reinforce the status quo by giving a pass to the "least bad choice."

(3) Need to better our understanding of system-wide impacts. Many of the conversations touched on how disparities in knowledge about the distribution of harms across time and populations can distort precautionary metrics. This can include the

tendency to make increasingly precise measurements about factors we know something of, while excluding what may be important, but still uncharacterized, drivers of harm. Distortion can also arise when local or short-term impacts mask system-wide changes that may be more difficult to detect.

Many of our current tools can be improved. For example, drug and chemical testing protocols and methods for scientific studies can be improved in their ability to predict delayed health consequences. The challenge lies less in finding new types of information than in creating better ways to integrate existing knowledge.²⁶ Innovative approaches to more effectively characterize and reduce risks emphasize the use of multiple sources of evidence.^{26,27} Moreover, Kathy Sanchez's plea for methods that account for systemic, planetary-wide "imbalances" reverberated with calls in the scientific literature for analytical approaches that capture the nature of cumulative, complex, and synergistic effects on whole ecosystems.^{28,29}

The conversations suggest that the development and implementation of "precautionary metrics" sensitive to system-wide effects will be key to advancing the precautionary principle. Characteristics of precautionary metrics culled from these interviews include the incorporation of: (1) explicit system-wide goals and measures tied to long-term planetary survival; (2) lessons already learned, i.e., measures to prevent recognized health harms and promote recognized health benefits. In this regard, it may be helpful to incorporate the 12 generic lessons learned from 14 complex case studies of late lessons of early warnings synthesized by the European Environment Agency (Appendix 3);³⁰ (3) cumulative, complex, and synergistic effects on whole ecosystems; (4) continuous feedback loops sensitive to early warnings of long-term harms and benefits; and (5) transparency, accessibility, and ease of use.

Evidence Supporting Precautionary Metrics

All respondents were using scientific evidence in precautionary decision-making. Two overarching, related barriers to putting that reliance into practice were pressures for achieving profits and patents that distort the search for scientific evidence and the poor funding for precaution-oriented scientific research.

(1) Pressures for achieving profits and patents distort the search for scientific evidence. Research funding priorities in the U.S. are shaped by other larger societal trends that are steering the direction of knowledge development. One example of such a systemic influence touched on by several respondents is the pursuit of knowledge that can be patented and the related university-industry alignment of research interests. Academic-industry relationships emerged in contemporary form with the passage of the Bayh-Dole Act of 1980 and the birth of biotechnology.³¹ These relationships are now prevalent,³² and likely to influence the choice of research topics undertaken^{33, 34, 35, 36}

Paul Willis pointed to how industry was funding university research aimed at proving the worth of CAFOs. Ron McCoy expounded on “the dire societal consequences of genetic engineering, cloning, and patenting of life, including providing multinational corporations unprecedented power to decide how future generations will live their lives.” Scholarly explorations of these issues have concluded that the appropriation of knowledge as intellectual property has led to the erosion of traditional scientific norms that spoke to the common good³⁷ fostering secrecy and financial incentives in place of the open exchange of information and a disinterested search for knowledge.^{37, 38}

(2) Precaution-oriented scientific research is poorly funded. The overall poor funding of precautionary-oriented scientific research was an obstacle that permeated the conversations. This observation is broadly applicable. Only 10 percent of the National Cancer Institute’s (NCI’s) \$5.9 billion 2008 budget request was allocated to “cancer prevention and control,” and based on a review of NCI’s stated research goals, most of NCI’s expenditures in the field of prevention appear to be in search of improved detection and other control measures.^{39, 40}

Prioritizing funding for treatment and related research while neglecting primary prevention-related research parallels the overall imbalance between healthcare and public health resource allocations. An analysis of U.S. state and local public health agency expenditures found that mean per capita spending for public health in 2004–2005 was \$149, compared to \$6,423 for overall healthcare.⁴¹ Public health, charged with creating healthful conditions for all, has competed unsuccessfully for resources supporting technologically intensive disease treatment aimed at individual

consumers.^{42,43} In 2006, America's pharmaceutical and biotechnology research companies set a new record for biopharmaceutical research, spending \$55.2 billion to develop new medicines and vaccines, or about double the entire NIH budget of \$28.4 billion budget in the same year.⁴⁴

This is the milieu in which precautionary research must find a way to flourish if the precautionary principle is to advance. In light of the centrality of scientific evidence to precautionary decision-making, a better understanding of these and other factors that influence the acquisition of knowledge will be key to advancing the precautionary principle. As recommended by the 2001 International Summit on Science and the Precautionary Principle, research needs to be directed away from questions of what futures are likely to happen towards the question of how desirable futures can be obtained.²⁶

ECONOMIC DRIVERS OF PRECAUTION

The present generations should ensure the conditions of equitable, sustainable and universal socio-economic development of future generations, both in its individual and collective dimensions, in particular through a fair and prudent use of available resources for the purpose of combating poverty.

***Declaration on the Responsibilities of the Present Generations
Towards Future Generations
General Conference of the United Nations
Educational, Scientific and Cultural Organization, 1997***

Virtually all of the conversations touched on how precautionary strategies are enhanced or impeded by economic drivers, summarized here under three themes:

- (1) Business models that promote precaution can thrive.** Kaiser's commitment to precaution is fully aligned with the interests of its members and the organization's bottom line -- as a nonprofit provider of healthcare, keeping its members well keeps Kaiser's costs down. Precautionary strategies were also reportedly woven into the for-

profit business models at Niman Ranch Pork and Sysco Foods, where two factors stood out: well-informed, motivated, and highly engaged leadership and consumer demand for products of a healthy food system. Developing a new generation of committed business leaders will be an important driver for precaution, especially as consumer demand may fluctuate with the economy.^{45,46}

(2) Current societal spending priorities tend to shortchange precaution. Financing of scientific research agendas is generally unfavorable to precaution. Beyond research, Tom Kelly noted the inadequacy of the \$30 million allocated to address climate change in California -- the world's eighth largest economy. A 2008 report by the Institute for Policy Studies determined that for every dollar allocated to stabilize the climate, the U.S. government will spend \$88 on achieving security by military force.⁴⁷ Advancing the precautionary principle requires correcting these distortions in resource allocation.

(3) The global economic system favors short-term profits over long-term planetary survival. The discount rate and other assumptions underlying economic analyses determine the value placed on the future and imply inherent tradeoffs between economic wellbeing and environmental protection. These assumptions are poorly recognized or understood by non-economists, and they are hotly debated by experts in the field.^{48,49} Economists could contribute to the advancement of precaution by making the impact of these contested assumptions transparent, and by developing and promoting precautionary economic analyses that reverse the current bias towards short-term economic gains over long-term planetary survival. However, according to economist Robert J. Shiller, "maverick" economists may feel constrained by professional and social pressure from challenging the group consensus.⁵⁰

The current global financial crisis may change that. Economist James K. Galbraith noted recently that of at least 15,000 professional economists in the U.S., only 10 or 12 foresaw the mortgage crisis. Galbraith concluded that most economists have been teaching "... a theoretical framework that has been shown to be fundamentally useless."⁵¹

ENVISIONING PRECAUTION

We must learn actually not to have enemies, but only confused adversaries who are ourselves in disguise.

Alice Walker

Letter to President-Elect Barack Obama, Nov. 5, 2008

Almost every interview touched on how widening disparities in wealth or the demands and pace of everyday life pose material, intellectual, and emotional barriers to envisioning and acting to protect the future. Opportunities identified in the conversations to overcome these human resource and attitudinal obstacles include:

- Create time for contemplation through art and culture;
- Work for social justice to help liberate people from their short-term survival imperatives and subjugation by oppressive power structures;
- Reward foresight, innovation, and collaboration in government, business, and other arenas where thinking outside the short-term box is often punished;
- Craft structures and processes that encourage human contact, consensus building, trust, respect, and friendship; and
- Inspire leadership to attend to the needs of future generations.

A final recurring theme was that precaution is impeded by the lack of a plan to transform how society is organized. Advancing the precautionary principle requires moving from “tinkering around the edges” toward systemic changes needed to protect future generations.

SUMMARY

Seventeen conversations among innovators, leaders and decision-makers grappling on a daily basis with the application of precaution in a wide range of disciplines, industries and sectors were conducted. Common themes and patterns from these highly informed respondents coalesced around four general themes generic to the application of precautionary across industries, disciplines, sectors, and borders:

- 1. Institutionalizing Precaution**
- 2. Measuring Precaution**
- 3. Economic Drivers of Precaution**
- 4. Envisioning Precaution**

With the goal of contributing to moving larger efforts to advance the precautionary principle forward, a number of recommendations for advancing the precautionary principle were distilled from the conversations. All of the themes drawn, and suggestions for advancing the precautionary principle presented, were those of the author and the Science and Environmental Health Network alone.

By reflecting on these themes, and the observations and recommendations detailed in the report, advocates of the precautionary principle can advance larger global efforts to normalize intergenerational awareness and planning embodied in the Native Americans proverb: “We do not inherit the Earth from our ancestors, we borrow it from our children.”

APPENDIX 1. The Wingspread Statement on the Precautionary Principle

January 1998

The release and use of toxic substances, the exploitation of resources, and physical alterations of the environment have had substantial unintended consequences affecting human health and the environment. Some of these concerns are high rates of learning deficiencies, asthma, cancer, birth defects and species extinctions; along with global climate change, stratospheric ozone depletion and worldwide contamination with toxic substances and nuclear materials.

We believe existing environmental regulations and other decisions, particularly those based on risk assessment, have failed to protect adequately human health and the environment - the larger system of which humans are but a part.

We believe there is compelling evidence that damage to humans and the worldwide environment is of such magnitude and seriousness that new principles for conducting human activities are necessary.

While we realize that human activities may involve hazards, people must proceed more carefully than has been the case in recent history. Corporations, government entities, organizations, communities, scientists and other individuals must adopt a precautionary approach to all human endeavors.

Therefore, it is necessary to implement the Precautionary Principle: When an activity raises threats of harm to human health or the environment, precautionary measures should be taken even if some cause and effect relationships are not fully established scientifically.

In this context the proponent of an activity, rather than the public, should bear the burden of proof.

The process of applying the Precautionary Principle must be open, informed and democratic and must include potentially affected parties. It must also involve an examination of the full range of alternatives, including no action.

Participants

Dr. Nicholas Ashford	M.I.T.
Katherine Barrett	Univ. of British Columbia
Anita Bernstein	Chicago-Kent College of Law
Dr. Robert Costanza	Univ. of Maryland
Pat Costner	Greenpeace
Dr. Carl Cranor	Univ. of California, Riverside
Dr. Peter deFur	Virginia Commonwealth Univ.
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Andrew King	United Steelworkers of America, Canadian Office
Dr. Frederick Kirschenmann	Farmer
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Sue Maret	Union Inst.

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Carolyn Raffensperger	Science and Environmental Health Network
Dr. Philip Regal	Univ. of Minnesota
Hon. Pamela Resor	Massachusetts House of Representatives
Florence Robinson	Louisiana Environmental Network
Dr. Ted Schettler	Physicians for Social Responsibility
Ted Smith	Silicon Valley Toxics Coalition
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Joel Tickner	Univ. of Mass., Lowell
Dr. Konrad von Moltke	Dartmouth College
Dr. Bo Wahlstrom	KEMI (National Chemical Inspectorate), Sweden
Jackie Warledo	Indigenous Environmental Network

APPENDIX 2. INTERVIEW QUESTIONS

Introduction:

Thank you so much for agreeing to participate in this project about the precautionary principle. To begin, I want to review the parameters of the interview as outlined in the letter you received from SEHN:

- The interview will take from 30 minutes to 1 hour to complete.
- Yours and all of the interview responses will be compiled into one report that will be authored by SEHN and prepared independently of participants.
- Your name and the names of all of the participants will be cited in the report.
- Prior to the release of the final report, I will send you any direct quotes from you that are used in the report for validation.
- We anticipate the report will be finalized by Fall 2008.
- A copy of the final report will be mailed to you and disseminated widely.

Before we begin, do you have any questions about any aspect of the project?

The idea at the core of the Precautionary Principle is that action should be taken to prevent harm to the environment and human health, even if scientific evidence is inconclusive.

Born in the environmental domain in the 1970s, by the 1980s the concept of precaution began appearing in international environmental agreements in the context of mounting evidence of unprecedented environmental changes surrounded by vast uncertainties. The principle is now embedded in a wide range of international treaties, and national and local laws, regulations, and policies. The Precautionary Principle was introduced to public discourse in the United States in 1998, after a conference at Wingspread in Racine, Wisconsin, which issued the statement, "When an activity raises threats of harm to human health or the environment, precautionary measures should be taken even if some cause and effect relationships are not fully established scientifically."

The purpose of this interview is to explore if and how "precautionary strategies" have, or have not, emerged in [fill in area of expertise]. By "precautionary strategies" we mean *any strategies that aim to foster the long-term health and wellbeing of humans and the planet, undertaken in the presence of uncertain determinants, complex scenarios, suspected risk factors, or unpredictable circumstances.*

Questions:

I. Visionary Planning

1. In [fill in area of expertise], how far out into the future do you plan? How and for what timeframe do you set the compass needle?

II. Decision-Making in the Face of Uncertainty

2. In [fill in area of expertise], have, could, or should "precautionary-like strategies" been proposed or implemented?

3. **If proposed**, what have been the barriers to implementation of this/these strategies? How do you think about the economy in terms of the potential for, and barriers to innovation?

If implemented, what has been the outcome thus far of this/these strategies? Where have these strategies been successful, failed or encountered difficulties?

4. "Precautionary-like strategies share distinctive elements. To what extent has/have this/these strategies discussed above incorporated the following elements?
 - a. **Taking Preventive Action in the Face of Uncertainty**
Does/to what extent does the strategy move **from** requiring incontrovertible evidence of harm for each hazard before taking preventive action **to** taking preventive action in the face of uncertainty?
 - b. **Shifting the Burden of Proof**
Does/to what extent does the strategy move **from** the need to prove that agents, technologies or policies are harmful before they are removed or controlled **to** the duty of the proponents of an activity to demonstrate that they can be used/undertaken safely.
 - c. **Conducting Alternatives Assessment**
Does/to what extent does the strategy move **from** not considering potential health and environmental or health impacts when designing new materials, technologies, or policies, or taking action based on "acceptable levels of risk" **to** exploring a wide range of alternatives to possibly harmful actions, including no action?

III. The Precautionary Principle as a Cultural Meme

5. Have, how, and/or to what extent have you heard about the precautionary principle?
6. Do you have any recommendations about how various disciplines, industries, movements and/or sectors that are utilizing precautionary strategies might join forces?

IV. Conclusion

7. Are there any other issues about precautionary strategies that are important that I have not asked you about?
8. Thank you so much for your insights and time. If you have any questions please do not hesitate to contact me.

APPENDIX 3. Twelve Late Lessons of Early Warnings

1. Acknowledge and respond to ignorance, as well as uncertainty and risk, in technology appraisal and public policy- making.
2. Provide adequate long-term environmental and health monitoring and research into early warnings.
3. Identify and work to reduce ‘blind spots’ and gaps in scientific knowledge.
4. Identify and reduce interdisciplinary obstacles to learning.
5. Ensure that real world conditions are adequately accounted for in regulatory appraisal.
6. Systematically scrutinize the claimed justifications and benefits alongside the potential risks.
7. Evaluate a range of alternative options for meeting needs alongside the option under appraisal, and promote more robust, diverse and adaptable technologies so as to minimize the costs of surprises and maximize the benefits of innovation.
8. Ensure use of ‘lay’ and local knowledge, as well as relevant specialist expertise in the appraisal.
9. Take full account of the assumptions and values of different social groups.
10. Maintain the regulatory independence of interested parties while retaining an inclusive approach to information and opinion gathering.
11. Identify and reduce institutional obstacles to learning and action.
12. Avoid ‘paralysis by analysis’ by acting to reduce potential harm when there are reasonable grounds for concern.

Source: European Environment Agency. 2001. Late lessons from early warnings: The precautionary principle 1896—2000. Environmental Issue Report No. 22. Luxembourg: Office for Official Publications of the European Communities.
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PARTICIPANT BIOGRAPHIES

DEAN EDWARDS, Vice-President and Chief Procurement Officer, Kaiser Permanente (KP), leads the Procurement and Supply (PS) organization at KP with the goal of establishing a robust sourcing and supply capability, to ensure the people of KP have the products and services they need to provide the best quality care at the lowest possible cost to their members and patients. With nearly 25 years of purchasing and supply chain experience, Edwards has held various leadership positions across countries and industries—including banking (Credit Suisse First Boston), hospitality (Hilton), food processing (H.J. Heinz), and automotive (Rover Car Group) in Britain, Mexico, Brazil, and the United States—before joining Kaiser Permanente in 2004. As Vice President of Procurement for the Americas at Cadbury Schweppes from 2002 to 2004, he centralized procurement operations across North America. With the integration of Cadbury Schweppes and Adam's Confectionery in 2003, Edwards contributed to significant synergistic savings. Prior to his role at Cadbury Schweppes, Edwards headed the US Marketing and Sales Purchasing team at SmithKline Beecham/Glaxo SmithKline for 10 years. During his time there, Edwards also led the purchasing function for SmithKline's subsidiary—Diversified Pharmaceutical Services—helping them become one of the first Pharmaceutical Benefit Management companies to adopt strategic purchasing. Edwards graduated with honors from the University of Leicester in England with a Bachelor of Arts degree in politics. He is also a graduate of the Center for Creative Leadership's Leadership Development Program (LDP)® located in Greensboro, North Carolina. Edwards is an active member of The Conference Board's Strategic Sourcing Leadership Council and the Institute for Supply Management (ISM) Northern California chapter. He also serves on the board for Broadlane and the Tri-Valley YMCA. At Kaiser Permanente, Edwards serves as Company Incident Commander, as his team helps lead national efforts to prepare for and provide an effective, timely response in the event of a natural or man-made disaster. He has been quoted in the Wall Street Journal and a number of industry publications, such as Purchasing Magazine (December 2007), Modern Healthcare (February 2008), and Computer World (January 2008). A native Englishman, Edwards has resided in the United States for 13 years and recently gained American citizenship. He currently lives in Pleasanton, California with his wife and three children.



DIANA FRAPPIER is a founding member of the Ella Baker Center for Human Rights and has remained behind the scenes support that makes the Center's work possible. Diana has proudly supported the organization's growth from a small-scale operation of one full-time staff into a grassroots powerhouse. Diana received her B.A. in Social Welfare and her J.D. at Hastings College of Law. When she is not focused on the Ella Baker Center, she is operating a private community criminal defense practice and serving on the boards of Bay Area non-profits Machen Center and TURF (Together United Recommitted Forever.) This San Francisco native is also a real estate broker, supporting activists and other members of her community to empower themselves through homeownership.



<http://www.ellabakercenter.org/page.php?pageid=2>

DERMOT HAYES is a native of the Republic of Ireland. He obtained a Bachelor of Agriculture Science degree from University College in Dublin in 1981. He entered the Ph.D. program in the Department of Agricultural Economics at Berkeley in the fall of 1981, where he majored in International Trade. Dr. Hayes joined the Department of Economics at Iowa State University in March 1986. His research interests include food safety, livestock modeling, demand analysis, commodity markets, and agricultural and trade policy. Dr. Hayes is currently the Pioneer Hi-Bred International Chair in Agribusiness, a Professor in the Department of Economics, and a Professor in the Department of Finance at Iowa State University. He is also Assistant Director of the Meat Export Research Center (MERC) at Iowa State University.

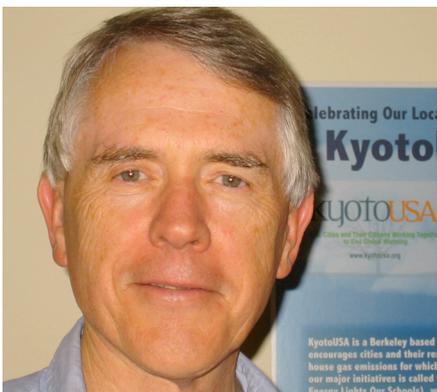


http://www.agforum.org/2000/dermot_hayes.html

IME AKPAN JOHN is a Nigerian physician and consultant in public health with special interest in violence and injury prevention. He is currently a PhD Candidate at the Division of Social Medicine, Department of Public Health Sciences of the Karolinska Institute, Stockholm, Sweden. Previously, he earned a Masters degree in Public Health from the same institution. Dr. John is the leader of the Nigerian affiliate of International Physicians for the Prevention of Nuclear War (IPPNW). He was the Vice President of IPPNW for the African Region, 2002-2006. He was elected Co-President of IPPNW in 2006. In collaboration with colleagues, Dr. John co-initiated and successfully executed a Multinational Injury Surveillance research project in five African countries. He has authored scientific articles and has made several presentations at international conferences and workshops. <http://www.ippnw.org/>



TOM KELLY is a co-founder of KyotoUSA with his wife, Jane, and a number of local residents interested in taking action on global warming. KyotoUSA is a volunteer organization that encourages cities and their residents to work together to reduce the greenhouse gas emissions for which they are responsible. Tom is a former public interest lawyer and has worked for various nonprofits in the Bay Area and as a contract employee at the California Department of Public Health. At KyotoUSA's urging, the City of Berkeley became the nation's first city to "ratify" the Kyoto Protocol in January 2005—calling on cities across the country to join it in addressing global warming. That citizen-led effort resulted in a national campaign by Mayor Greg Nickels of Seattle and the US Conference of Mayors to encourage cities to step into the void created by the federal government's refusal to acknowledge or act on climate change. As cities across the country develop their own strategies for conserving and reducing their use and reliance on fossil fuels, KyotoUSA has launched its HELIOS Project, another citizen-led effort to reduce energy consumption and put photovoltaic systems on our public schools. In August 2008, Berkeley's Washington Elementary became the first HELIOS school. The 103 kilowatt photovoltaic system produces most of the electricity the school will need without increasing the school district's operating budget. As a member of the City of Berkeley's Community Health Commission, Tom worked closely with other community activists to draft and pass Berkeley first Precautionary Principle Ordinance. <http://www.kyotousa.org/>



BILL KLINEFELTER is a Senior Advisor to the Government Relations and Public Policy and the International Trade and Customs practice groups at Kelley Drye. Drawing on more than twenty years of experience helping organizations achieve major policy initiatives, Mr. Klinefelter helps clients develop strong advocacy strategies and forge strong working relationships to create change. He creates and implements political advocacy campaigns using a multifaceted approach. He helps clients achieve their goals by developing persuasive mes-



sages, utilizing grassroots networks, creating coalitions, and building strategic alliances. Mr. Klinefelter builds working partnerships and alliances between unions and companies that address international trade, environmental, pension, and economic concerns, and advises clients on compliance with environmental regulations including Occupational Health and Safety, Clean Air Act, and environmental remediation. Mr. Klinefelter advocates on behalf of his clients before the U.S. Congress and before federal agencies including the Commerce Department, the Office of the U.S. Trade Representative, Environmental Protection Agency, and the Inter-

national Trade Commission. He has published *Addressing Climate Change in the Next Administration: Special Report—The Impact of Climate Change on the 2008 Presidential Election*, Aspatore Books (September 2008). Prior to joining Kelley Drye, Mr. Klinefelter worked for 20 years at the United Steelworkers (USW), most recently as the Legislative and Political Director and Assistant to the President. There, he regularly worked with many members of Congress to promote the legislative agenda of the USW. He also worked to ensure the continued support for the Stand Up for Steel campaign, a coalition of major U.S. steel companies and unions whose mission is to ensure fairness in international trade laws and promote the wellbeing of steelworkers. Mr. Klinefelter served as the coalition's co-chair and led its legislative team. He has also served as part of the legislative team for the AFL-CIO, International Brotherhood of Teamsters, and the National Wildlife Federation.

JOHN KOULETSIS, National Director of Strategy, Planning, & Design with Kaiser Permanente's National Facilities Services, has built the basis for the Standards Program as it exists today and established Kaiser Permanente as one of the foremost proponents of evidence-based design and safety by design. Mr. Kouletsis is also the Executive Director for the Templated Hos-



pital Project, KP's hospital of the future, and KP's High Performance Buildings Initiative. He is one of the sponsors of the Sidney R. Garfield Centers for Health Care Innovation which is KP's research and development center for healthcare operations, safety, technology review/approval/integration and innovations initiatives center for healthcare operations, IT, planning and design and other key stakeholders in the facilities design process. Prior to joining the National Facilities Services Core Group, Mr. Kouletsis worked as a Project Manager at KP's Vallejo Medical Center and was responsible for the planning, design, and construction of major inpatient and outpatient facilities. Before joining KP, Mr. Kouletsis worked for 15 years as an architect in architectural and engineering firms specializing in health care design. He has lectured widely on design excellence, high performance design, and sustainable design and operations. He graduated from the University of Southern California and did postgraduate research at the Department of Engineering at Kyoto University. He is a member of the American Institute of Architects and is a member of the AIA Healthcare Guidelines Revision Committee.

TOM LENT,



Policy Director, is responsible for defining the Healthy Building Network's guiding philosophy and policies with regard to building materials. Tom has spent nearly 30 years working on the environmental impact of buildings, materials, and energy in both the private sector and with public interest groups. A highly regarded expert in the field of green healthcare facilities design and operations, Tom was a founding coordinator of the Green Guide for Health Care, sits on the steering committee of the LEED Application Guide for Health Care of the US Green Building Council, and is an advisor to Kaiser Permanente. Tom is currently overseeing the development of the Pharos rating criteria and data entry, working closely with the Center for Clean Products and Clean Technologies at the University of Tennessee. <http://www.healthybuilding.net/>

CHRISTINE MALCOLM, Senior Vice-President of Hospital Strategy and National Facilities, is responsible for managing facility strategy, including design, construction, operations, and real estate, for Kaiser Permanente, America's leading integrated health plan. Before joining Kaiser Permanente, Ms. Malcolm served as Senior Vice-President of Strategy, Marketing, and Program Development at Chicago's Rush University Medical Center. Ms. Malcolm has received many prestigious awards throughout her career, including the AMA's Steurt Henderson Britt Award, the AHA Touchstone Award for Excellence in Healthcare Planning and Marketing, and the IABC Spectra Award. She has lectured extensively across the nation on healthcare management and strategy issues. An active supporter of community organizations, Ms. Malcolm currently serves on the Board of Directors of Girls, Inc. She holds an M.B.A. (Health Care Administration Specialization) and a B.A. in Public Affairs from the University of Chicago.



RONALD MCCOY has lived all his life in Malaysia where he was born and educated. After graduating in medicine from the University of Malaya, he worked at the Kuala Lumpur General Hospital and later underwent specialist training in obstetrics and gynaecology at the Churchill Hospital and Radcliffe Infirmary in Oxford, England. He obtained Membership of the Royal College of Obstetricians and Gynaecologists, London, and later was made a Fellow. He worked as a consultant obstetrician and gynaecologist at Assunta Hospital and Pantai Medical Centre, Kuala Lumpur, Malaysia, until he retired in 1996. Dr McCoy, who is a life member and past president of the Malaysian Medical Association, chaired the MMA working group on health reforms and universal healthcare and submitted a report, Reforming Health Care in Malaysia, to the Malaysian government in 1999. Dr McCoy is founder president of Malaysian Physicians for Peace and Social Responsibility and past president of International Physicians for the Prevention of Nuclear War, recipient of the Nobel Peace Prize in 1985. He has worked for the abolition of nuclear weapons for twenty-two years and was a member of the Canberra Commission on the Elimination of Nuclear Weapons, appointed by the Australian government in 1996. He has published papers and lectured on nuclear abolition at international conferences. He believes that the babies whom he has delivered deserve to live in a world free of nuclear weapons.



SPENCER PHILLIPS, Ph.D., is Vice President, Ecology & Economics Research, The Wilderness Society. Spencer is a natural resource economist with more than 15 years' experience helping people, communities, and institutions realize the benefits of wildland conservation. He has recently been named Vice President of The Wilderness Society's research department



whose team of economists, ecologists, attorneys, and landscape scientists inform the debate of wilderness protection, wildland stewardship, and federal natural resource policy. He has served as executive director of the North Woods Stewardship Center, president of the Forest Stewardship Council–U.S., board member for Northeast Wilderness Trust and the Global Forest Policy Project, and as an advisor to the Certified Forest Products Council, the Model Forest Policy Program, and the National Community Forestry Center, Northern Forest Region. In 2006, he received the Edward A. Ames Award for Scholarship and

Conservation Advocacy from The Wilderness Society. Spencer previously worked on a variety of environmental issues at the White House Council on Environmental Quality and has consulted for clients including Resources for the Future, Natural Resources Council of Maine, the U.S. Fish and Wildlife Service, and Virginia's Air Pollution Control Department. Born and raised in Pennsylvania, Spencer earned a B.A. in economics from the University of Virginia and an M.S. and Ph.D. in agricultural and applied economics from Virginia Polytechnic Institute. Backpacking on a snowy Mt. Rogers in 1983 reconnected Spencer to wildlands and sparked his passion for exploring the intersections of wilderness with human spiritual and economic development. Spencer lives in Vermont and serves his community as Town Moderator and a volunteer firefighter.

<http://wilderness.org/>

JULIA QUINT is a public health scientist and retired Chief of the Hazard Evaluation System & Information Service (HESIS), an occupational health program in the California Department of Public Health (CDPH). Julia has a doctorate in Biochemistry from the University of Southern California and was a basic science researcher at Lawrence Berkeley Laboratory and the University of California San Francisco before joining CDPH as a public health scientist in 1981. Under Julia's leadership HESIS worked closely with environmental agencies and other organizations to develop integrated strategies to protect workers, communities, and the environment from the hazards of toxic chemicals. In recognition of this collaborative work, HESIS received Pollution Prevention awards from Cal/EPA in 2002 and 2003, and Julia received a lifetime achievement award from the Western Regional Pollution Prevention Network in 2006. In 2008, she received the Helen Rodriguez Trias "Lighting the Way" award from the California Public Health Association, and the Health and Safety Activist award from the Occupational Health and Safety Section of the American Public Health Association. Julia currently serves on the Scientific Guidance Panel of the California Environmental Contaminant Biomonitoring Program, the Tracking Implementation Advisory Group of the California Environmental Health Tracking Program, the Cal/OSHA PEL Update Health Experts Advisory Committee, and the National Academy of Sciences Committee on Tetrachloroethylene. She has authored numerous public health reports and scientific articles.



KATHLEEN "WAN WOE POVI" SANCHEZ, M.A. is a native spirit-rooted, Tewa-speaking environmental activist, a community educator to stop violence against native women, a traditional black ware potter and a proud grandmother from San Ildefonso Pueblo, New Mexico. Wan Woe Povi means "medicine that comes from the Pine trees." This relationship of sisterhood with the trees of her birthplace describes Kathy's role in nurturing and protecting

the natural elements. Life to Kathy must affirm happy, healthy, and spiritually connected future leadership. Kathy is the director for Tewa Women United (TWU), a 501(c)3 organization for Northern Pueblo Tewa women and all relations who also advocate for positive social changes. Because of the contradictions encountered in living in two totally different ways of thinking, she has created the Two-world Harmony—Butterfly model as a management system. TWU sponsors an Annual Gathering for Mother Earth in September that addresses nuclear safety and wholistic wellness for our Earth Mother and all her relations. www.tewawomenunited.org



RICHARD J. SCHNIEDERS is Chairman and Chief Executive Officer of Sysco Corporation, the global leader in selling, marketing and distributing food products to customers who prepare food away from home. Operating from distribution facilities throughout Canada and the United States, SYSCO provides foodservice products and related supplies to approximately 420,000 customers including restaurants, healthcare and educational institutions, lodging establishments, and other foodservice operations. The company generated sales of \$37.5 billion for its fiscal year that ended July 2008. In addition to his responsibilities at SYSCO, Mr. Schnieders currently holds community board positions at the National Restaurant Association Educational Foundation, the University of Minnesota's Food Industry Center where he has served in the past as Chairman, the Greater Houston Partnership, The Menil Collection, Save the Children and Share Our Strength. He is also currently serving on the Finance Committee for Stone Barns and holds the position of Fellow of the Institute with The Culinary Institute of America. In past years, Mr. Schnieders served on the board of the public company Aviall, Inc. He is a 1970 graduate of the University of Iowa with a Bachelor of Arts degree in mathematics. Mr. Schnieders and his wife, Beth, reside in Houston and are the parents of two grown daughters, Caroline and Margaret. <http://www.sysco.com/>



VICTOR W. SIDEL, MD is Distinguished University Professor of Social Medicine at Montefiore Medical Center and the Albert Einstein College of Medicine and Adjunct Professor of Public Health at Weill Medical College of Cornell University. He has served as president of the American Public Health Association in 1985 and of the Public Health Association of New York City in 1980 and in 2000. He was the honorary Cleveringa Professor of Medicine and Human Rights at Leiden University in the Netherlands in 1999. The updated paperback edition of his 2006 book, *Social Injustice and Public Health*, co-edited with Dr. Barry Levy, will be published by Oxford University Press in collaboration with APHA in January 2009. Dr. Sidel was one of the founders of Physicians for Social Responsibility in 1961, was its president in 1987, and is currently a member of its Board of Directors. In 1980 he was one of the founders of the International Physicians for the Prevention of Nuclear War, the recipient of the 1985 Nobel Prize for Peace, was its co-president from 1993 to 1998, and is currently its head representative to the United Nations New York City site. He is co-editor with Dr. Levy of *War and Public Health* (2008) and *Terrorism and Public Health: A Balanced Approach to Strengthening Systems and Protecting People* (2007), both published by Oxford University Press in collaboration with APHA. He is co-author with Prof. Wendy Cukier of *The Global Gun Epidemic: From Saturday Night Specials to AK-47s*, published by Prager Security International in 2006.



JOE UEHLEIN is a labor organizer, musician, and environmental advocate. Prior to his retirement in June of 2005, he served as Director of the AFL-CIO's Center for Strategic Campaigns, and as Secretary Treasurer of the AFL-CIO's Industrial Union Department. Joe was a chief architect of the famous Ravenswood Campaign, designed to track down and pressure



Marc Rich, the largest metals trader in the world and fugitive from US justice, to end a vicious management lockout of the workers at an aluminum mill owned by Mr. Rich in Ravenswood, West Virginia. Joe was also a chief organizer of the labor component of the massive anti-corporate globalization demonstrations against the WTO in Seattle, WA on November 30, 1999. Joe is the founder of CultureWorks, a new organization that advocates for the use of art as a central element in the progressive movement, and trains leaders and organizers on how to utilize art in their campaigns. (www.cultureworkscollective.com.)

Joe is also a musician and bandleader (The U-Liners: www.uliners.com), and is a 40-year member of the American Federation of Musicians (AFM). Joe has also devoted tremendous energy to work in the environmental movement. In the mid-1980s he helped found the OSHA-Environmental Network, a coalition of labor and environmental organizations. Currently Joe serves on the Ceres board of directors—a coalition of large investors, environmental, labor, and citizen organizations and others that seeks to require corporations to file extensive “full spectrum–triple bottom line” reports each year on their social, economic, and environmental practices. Joe is also a member of the National Advisory Board of the Union of Concerned Scientists.

PAUL WILLIS is a hog farmer and Manager of Niman Ranch Pork Company. He is the owner and operator of the Willis Free Range Pig Farm in Thornton, Iowa. In 1994, Paul was introduced to Bill Niman, and the two forged a ground-breaking partnership to sell natural pork from family farms using traditional, humane animal husbandry. Paul has been the subject of numerous feature-length articles, including ones in the New York Times, the Boston Globe, The Iowan, Successful Farming, Vogue, Country Living, Bon Appetit, and Food & Wine. He



is also the subject of a chapter called “The Good Farmer” in Peter Kaminsky’s recent book *Pig Perfect*, in which Kaminsky describes him as “among the most influential of a very few who are employing modern business practices in the service of traditional agriculture.” Paul is currently a member of the committee convened by the National Academy of Sciences to undertake the project, 21st Century Systems Agriculture: An Update of the 1989 NRC Report *Alternative Agriculture*, which is studying the

science and policies that influence the adoption of farming practices and management systems designed to reduce the costs and environmental effects of agricultural production. Paul was also an invited participant in the Expert Meeting on Capacity Building to Implement Good Animal Welfare Practices convened in October 2008 in Rome by the Food and Agriculture Organization of the United Nations to review the current knowledge on animal welfare standards, practices, and policies and to seek advice on the requirements for capacity-building especially in developing countries. In 2003, together with Bill Niman, he was honored with the Good Neighbor Harvest Award by the Glynwood Center, an organization that works nationally and internationally to support sustainable agriculture. Niman Ranch pork is marketed in the finest retail outlets and restaurants throughout the country. http://www.nimanranch.com/farmers/paul_willis.aspx