Public and Private Groups Give Vigorous Boost to States and Localities in Enterprising Green Energy Programs

Climate change is a global issue, but while policies to combat it are debated at the national and international level, states and localities take the vast majority of distinct steps to protect the environment in the US. These are the jurisdictions which deal with energy use and savings, land use, transportation alternatives, flooding and erosion of beaches and barrier islands, and the many other consequences of climate change.

As the states and exploding cities of the world grow and develop, writes Jack Werner, "they contribute to the depletion of natural resources and increased pollution in the air, water, and land. [Like] an enormous debt...suddenly falling due, the United States — and the rest of the world — [are] discovering that our unfettered consumption of the earth's natural resources and nonrenewable energy to support economic growth...is visibly damaging our environment."

To maintain the critical balance between a healthy economy and a healthy environment, economic growth and environmental quality must be treated as complementary, not competing objectives, Werner continues. Through public policy, management and investment, this balanced perspective is essential to "sustain" our communities. Both state and local governments hold a unique position as leaders, with the facilities to act as "sustainable laboratories," the authority to initiate change, and the flexibility to tailor programs to local and regional circumstances.

A strong link of energy programs to climate change at the state and local level is not yet entirely in place, experts note, and a dynamic system needs to be established to...

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Upcoming Climate Institute Special Events

1998
Oct. 26-28 Washington, DC Earth Technologies Forum
International Climate Change Partnership
Nov. 7-8 Buenos Aires, Argentina Green Energy Symposium
(concurrent with COP4, Nov. 2-13)
Nov. 30-Dec. 4 Miami, FL Climate Change: Intra-America Region
Florida International University,
(with Org. of American States)
Nov. 30-Dec. 1 Training Session
Dec. 2-4 Conference

1999
Feb. 1-4 M. S. Swaminathan
Rschr Fdr, Chennai, India Climate Change and the New Millennium

For more info see Climate Institute web site: www.climate.org
Australia, Countering Outcast Image, Takes Steps to Meet Kyoto Target

By the Hon. Tom Roper, Former Planning and Environment Minister of Victoria

Australia, one of the highest per capita carbon dioxide emitters, has commenced a comprehensive program to move towards its Kyoto target.

Although in the lead-up to Kyoto many countries and green groups regarded Australia as a pariah in its efforts to resist international agreement the Prime Minister, John Howard, released a significant statement of Commonwealth government intentions and actions in November, prior to the Conference.

Unchanged policy would have resulted in emissions growth of 30 percent between 1990 and 2010. The measures announced will reduce this growth to 18 percent, leaving a cut of about the same amount to achieve the Kyoto target.

Key elements of the package include:
• Assistance for renewable energy innovation, commercialization and showcasing
• Mandatory targets for renewable energy
• Energy market reform and generation efficiency
• Industry programs including a 10-fold increase in companies joining Greenhouse Challenge
• Cities for Climate Protection (300 by 2005)
• Revegetation, plantations and land use change

Environment Minister, Senator Robert Hill, has identified that local government involvement will be crucial to achieving the Kyoto target:

“If we can get every household to take up the challenge we will be well on track to meet our commitment. Every home can potentially save at least three or more tons of greenhouse gas and hundreds of dollars each year by sensibly reducing energy consumption.

“Local government is the link not only to these homes but to emission reduction efforts at a community level.

“Local councils can influence such areas as building codes, transportation, waste management, and land use. In addition they can take steps to significantly reduce their own emissions.”

Following the internationally proven Cities for Climate Change program and underwritten by a $13 million government contribution, an initial 29 Councils in four of the six states have signed up. By 2005 the aim is an ambitious, but achievable, 300 municipalities.

One Victorian Council, Moreland — part of my electorate — has committed $5.5 million of its own funds to establish an “Energy Trust” to encourage individual, community, business and entrepreneurial renewable energy and efficiency activity in its municipality.

This will be a major part of the Moreland Renewable Energy Conservation and Management Strategy which includes:
• An energy management system for Council’s own buildings and operations
• A community education program
• The use of purchasing power in a competitive energy market to secure conservation outcomes
• Funds to enable families, especially of low income, and businesses to use renewables and invest in efficiency measures

Another key initiative is to dramatically expand The Greenhouse Challenge Program, a cooperative effort by industry and government to reduce emissions using voluntary agreements. Among its features are:
• Top level chief executive officer commitment
• An emissions inventory, a specific and comprehensive greenhouse action plan with a reduction forecast
• A public statement on undertakings
• Regular monitoring and reporting and an agreement to independent verification

It is planned to expand from 100 plus to 500 large and medium companies by 2000, and more than 1000 in 2005 to cover the great majority of national industrial emissions. A “Greenhouse Allies” program will include small business.

One Greenhouse Challenge participant, Westpac — a major bank — has, over three years, invested $4 million to save $11 million and reduce annual emissions by 23,000 tons. Energy saving is gradually being integrated into all areas of the bank’s operations in its 40 major buildings and 2000 branches.
Possibly Australia’s best example is the Australian Parliament building itself. Although the billion dollar plus building — 4,500 rooms and 250,000 square meters — opened 10 years ago as an energy guzzler it has demonstrated what can be done to cut emissions.

Energy consumption has been reduced by 53 percent: gas 66 percent from 180,000 TJ to 62,000; electricity 38 percent from 43 GWhr to 20.5; and the vehicle fleet by 39 percent, together with selective changes to green fuels.

Carbon dioxide emissions have been cut from 53,924 tons in 1988-9 to 32,953 in 1996-7.

Forty-nine projects have included efficient lighting, air conditioning, improved and reduced boilers, changes to car park fans, efficient equipment selection and education programs for MP’s, staff and visitors.

Taxpayers should be happy too. Savings have exceeded the $6 million spent so far — the audited figure is now $2.3 million a year with gas bills reduced from $1.6 million to $600,000 and electricity from $3.8 million to $2.6 million. Projects have had a payback ranging from 10 months to four years. Comfort and air quality have actually improved.

The Joint House Commission is not content to rest on its laurels, planning further cuts in Parliamentary “hot air” of 1.5 percent in each of the next six years.

Another notable example is the Olympic Solar Village which will be one of the world’s largest solar photovoltaic residential developments, generating over one million kilowatt hours annually. Greenhouse gas emissions from a typical home will be reduced by 75 percent — 4,000 tons from the Village as a whole.

Australia faces a huge challenge. Its economy is built on some of the cheapest fossil fuel energy, to which can be added massive coal exports and some rural interests which clear land with almost religious gusto.

Despite this, the last year has seen more action than the previous 10.

While no complete program yet exists to achieve the Kyoto target the movement is in a positive direction.

Champions of the World: Stratospheric Ozone Protection Awards
Book Review by John C. Topping, Jr., President, Climate Institute

The winning of the battle to protect stratospheric ozone has been vividly described in a collection of stories published by the USEPA. The book, Champions of the World, contains applications that go far beyond the ozone layer and illustrates valuable lessons for protecting the world’s climate.

The three authors collected the accounts from 320 individuals and organizations in 25 countries which through leadership and technical innovation earned the EPA’s Stratospheric Protection Agency Awards. Lead author, Dr. Stephen Andersen, is now director of Strategic Climate Projects, Atmospheric Pollution Prevention Division, EPA. Clayton Frech was with the Stratospheric Protection Division, and E. Thomas Morehouse with the Institute for Defense Analysis.

“We believe the very same leadership and technological innovation will help us to meet current worldwide challenges to combat global climate,” Sherri W. Goodman, Deputy Undersecretary of Defense for Environmental Security, has commented on the volume.

Before 1987, industry claimed the science of ozone depletion was too uncertain, substitutes would not be available, new technology would cost too much, replacements would be more dangerous. But corporate leaders and employees, plus Asahi Glass of Japan; Department of Environment, Malaysia; Minebea Group in Thailand; proved how wrong these predictions were.

In accounts that contribute to environmental policy and the theory of business behavior, the book shows how:
- Government and industry formed teams and worked together productively. (E.g., MIT has encouraged cooperation with other governments in promoting technology cooperation.)
- Industry associations advocated more stringent regulations. (E.g., the Association of Fluorocarbon Consumers and Manufacturers of Australia worked closely with the Australian government to formulate effective ozone protection regulations.)
- Companies agreed to compete on price and quality but to cooperate on environmental protection. (E.g., IBM hosted more than 75 other companies, including direct competitors, for discussions and authorized marketing of key cleaning technology.)
- Military organizations took responsibility for environmental security and used technical and market clout to halt the use of chemicals that destroy the ozone layer. (E.g. NAVSEA, the US Naval Sea Systems Command, was responsible for the Navy’s first ozone-friendly ships of the 21st century.)
- Multinational companies donated technology to public use. (E.g., Digital Equipment Corporation successfully used aqueous cleaning techniques and then actively distributed the “how to” information.)
- Auto mechanics worked with Friends of the Earth to persuade vehicle manufacturers to allow CFC recycling under warranty repair.
- F-16 fighters, smart bombs and weapon shelters were developed that did not depend on ozone-

(Continued on page 4)
Yale Study Finds Growing Corporate Interest in International Environmental Labeling Accord

Corporations care a great deal about environmental labeling of their products, a recent study by the Yale Environmental Protection Clinic has discovered. And they recognize the need to "harmonize" international standards, to bring into agreement the labeling measures that concerned countries abide by, the study prepared for the Climate Institute found.

US firms involved in international commerce showed special interest in bringing into concordance the criteria and testing methods used for environmental labeling. They approved the work of the International Standards Organization (ISO), specifically the ISO 14020 series, the eco-labeling standards which consist of the general principles for environmental labels and declarations.

In some cases, however, environmental labeling, a valuable tool enabling individual and corporate consumers to accelerate use of green products, can through deliberate design or inadvertence erect trade barriers. This was illustrated in the Tuna-Dolphin case in which US tuna producers used a "dolphin-free" tuna label that Mexico contested. Later, a dispute settlement panel found the label did not violate GATT rules.

The Yale study reviews types of environmental claims, certification categories and constraints (legal, trade-related, technical and operational, economic, political and those grounded in confidentiality concerns) and describes case studies of successful and unsuccessful labeling efforts.

The Yale team detected an interesting trend — although consumer interest in environmentally friendly products may have leveled off, the corporate culture has become increasingly greener. CEOs, senior managers and purchasing officers have made environmental concerns a major factor in corporate purchasing decisions.

The study was prepared by three graduate students, Kris Morico and George Silva at the Yale School of Forestry and Environmental Studies, and Lisa Schenck, a West Point faculty member on sabbatical in a masters program at Yale Law School. The team worked under the guidance of Prof. Daniel Esty, Director of the Yale Environmental Protection Clinic and with input from John Topping and Michele Pena of the Climate Institute and Dr. Stephen Andersen of the USEPA which has supported Climate Institute analyses into environmental labeling trends.

The study is available on the Climate Institute web site.

Michele Pena and John Topping of Climate Institute; George Silva, Lisa Schenck, and Kris Morico of Yale Clinic

**Book Review**
*(Continued from page 3)*

depleting substances.
The celebration of the first decade of the Montreal Protocol on Substances that Deplete the Stratospheric Ozone Layer showed a much improved ozone layer, which is now expected to recover.

Award winners from the US and from as far away as Australia, Brazil, Japan and Malaysia demonstrated: 1) public-private partnerships to address national and international problems, and 2) companies that encourage innovative, productive workers who strive to protect the environment, all out-compete their rivals.

**State and Local**
*(Continued from page one)*
carry out an effective national climate change plan. Critical for success is participation by all stakeholders, who include Federal, state and local governments, environmental NGOs, academia, and representatives of real estate, waste disposal, media, urban and regional planning, energy, construction, finance, insurance, communications, health and transportation.

Many are working to put such a system in place — Federal agencies, state groups such as ECOS and NASEO, nongovernmental organizations such as the Climate Institute, PTI and ICLEI.

ECOS

At the request of EPA, the Environmental Council of States (ECOS) — an association of state and territorial environmental commissioners — recently formed a committee to advise the Federal government on issues related to global climate change. The committee, chaired by Bob Shinn, Commissioner of the New Jersey Department of Environmental Protection, and David Gardiner, EPA Assistant Administrator for Policy, Planning and Evaluation, will help the states define voluntary reduction programs among the US electricity generators, manufacturers and the
transportation sector. The first order of business for the committee is to prepare a set of educational and outreach materials for state commissioners about the facts on the issue, policy implications relevant to their regions and state, and success of business and industry voluntary efforts to reduce greenhouse gas emissions. IREC

The states are leading the way in providing incentives for alternative energy, according to a recent report by the Interstate Renewable Energy Council (IREC). Incentives range from loan programs to grants and tax credits — corporate, personal income, property and sales. Montana provides a tax credit for those investing $5000 or more in wind technology. Alabama allows a tax deduction for residents who convert from gas or electricity to wood as their primary energy source. Indiana exempts all solar energy equipment from property taxes.

Composed of representatives of state and municipal energy agencies and other organizations, and through its Photovoltaics for Utilities Program, IREC is helping states to implement net metering, allowing homeowners and others with small renewable energy systems to send excess power into the electric grid for credit at the same rate the utility charges retail customers. Twenty states now offer net metering. Colorado's aggressive strategy to increase use of renewable energy includes education, green power procurement, financing for renewable energy technologies and economic development of a renewable energy industry.

"States are taking over the helm of designing and driving innovative strategies to solve environmental problems," says Commissioner Shinn. "And given the magnitude and complexities of the issues surrounding global warming, innovative and nontraditional approaches will be crucial to long-term national and global success."

The statement is particularly apt in the fast-paced effort to deal with utility restructuring — the marketing of green power. Ten states have enacted restructuring legislation (CA, ME, MT, NV, NH, OK, PA, RI, MA, IL), seven have provisions promoting the use of clean energy (CA, ME, ME, NV, RI, MA, IL). Arizona has issued a regulatory order for a solar portfolio standard rather than restructuring legislation.

"Harnessing renewable technologies represents perhaps the greatest economic opportunity in the history of the world," says Harvey Ruvin, Clerk of the Courts, Dade County, Florida.

To instill consumer confidence in green power products, the Center of Resource Solutions, a nonprofit organization in San Francisco, runs a voluntary certification and verification program. It has announced that 10 electricity products in California have met the organization's "Green-e" environment standards which require that a product must obtain at least 50 percent of its total electricity supply from renewable sources.

An account of a recent training course in Philadelphia (See article on page 7) illustrates the vigor and drive of IREC.

Action Plans
The US Climate Change National Action Plan (CCAP) provides a framework under which each state prepares its own plan. More than 30 states have become partners in the EPA's state outreach program. Most have completed greenhouse gas inventories; nearly 20 are working on or have completed plans identifying options for reducing emissions and selecting policy options according to emission reduction potential, cost effectiveness, political feasibility and public acceptance.

The plans are being closely linked to those of state energy office programs, through the National Association of State Energy Officials (NASEO), to share ideas and carry out an international exchange program on solutions to reducing emissions.

State, Community Energy Programs
Nearly 50 municipalities have joined a Cities for Climate Protection Program, committing themselves to reducing greenhouse gas emissions, concentrating especially on buildings, transportation and waste management. This effort is being coordinated by the International Council for Local Environmental Initiatives (ICLEI) which offers support to cities and counties such as Overland Park, Kansas; Minneapolis, MN; Portland, OR; Chicago and Atlanta to develop and carry out their Action Plans. ICLEI is an international municipality membership-based environmental organization which works closely with Public Technology Inc.'s Urban Consortium network.

Various Federal programs such as EPA's Energy Star and "Smart Growth" Programs, and DOE's Rebuild America Program, are starting to be coordinated. EPA's Office of Solid Waste assists in curtailment of waste to accomplish greenhouse gas reduction goals. DOE's Million Solar Roofs offers new opportunities for decreasing energy use. The program has a goal of installing one million solar energy systems on buildings across the United States by the year 2010. Million Solar Roofs is designed to create high-tech jobs, slow greenhouse gas emissions and keep US companies competitive.

The Climate Institute's Municipal Energy Program, dating back for several years, includes the Energy (Continued on page 6)
State and Local
(Continued from page 5)

$mart Atlanta project funded by the Turner Foundation, with technical support from Southface Energy Institute. The audit of several municipal facilities revealed energy use in the city could be reduced by at least 30 percent, using building upgrades — lighting, heating, ventilation, air conditioning, fans, insulation — that pay for themselves, and the city has created and staffed an Office of Environment and Energy Management to take advantage of many dollar savings and energy efficiency opportunities. Fulton County, GA and Louisville KY have made building upgrades, and at least 10 other cities and counties are implementing building energy efficiency measures by carrying out Energy Star guidelines.

The Institute has also published a compendium, Steps to Successful Municipal Energy Management, which includes 10 case studies on innovative ways cities across the US have used energy efficiency upgrades in city-owned buildings for economic and environmental benefits. The study was prepared in collaboration with ICLEI and Public Technology, Inc. and is available on the Institute website.

Energy Star Program

At the Federal level, EPA and DOE have forged partnerships with manufacturers, utilities, businesses and institutions to reduce the side effects of producing and consuming energy. They have promoted energy-efficient equipment by awarding Energy Star labels to products meeting stringent efficiency criteria, thus saving energy, money and protecting the environment.

A household can cut by nearly half the release of nitrous oxides, the primary contributors to smog and acid rain, the Energy Star program points out. An approved air source heat pump can cut a household’s energy bill enough to provide a free month of cooling each year.

A typical US household, which spends about $1300 on its home energy bill, could reduce that bill by about 30 percent — nearly $400 a year — through buying Energy Star appliances, home office equipment, and heating and cooling equipment. Consumers would save on the initial purchase price and in operating costs over the product’s lifetime — costs that may be even higher than the initial price. A household buying the labeled equipment instead of standard new could prevent the release of 70,000 pounds of CO₂ over the product’s lifetime.

The potential for saving energy and reducing air pollution is substantial: in a 15-year period choosing Energy Star products could save consumers and business $100 billion, according to EPA. It could achieve a reduction of greenhouse gas emissions equivalent to taking 17 million cars off the road each year.

DOE’s Rebuild America Project

This is a voluntary USDOE program that helps community partnerships make profitable investments in existing and new buildings through energy-efficient and renewable technologies.

- Rebuild Nebraska has 65 local partners with a total of 224 buildings.
- The city of San Diego has completed energy retrofits in 2.3 million square feet of building space in the last 3 years. The city has saved over 2.8 million kWh of electricity from the retrofits.
- Public housing authorities in North Carolina, already the lead partners in three Rebuild America affiliations, are now developing three regional partnerships that potentially could include more than 100 public housing agencies.
- Berkeley, CA municipal government has saved about $120,000 a year in energy bills and has reduced CO₂ emissions by about 670 t a year.

EPA State and Local Projects

Under an EPA grant, the Institute has set up four regional conferences whose theme is vulnerability and adaptation to change in these regions or sectors. Three of these meetings have been held and will be reported in a forthcoming newsletter: 1) at Yale University covering the business sector, 2) at Ramapo College, west of New York City, covering the tri-state region, and 3) in St. Louis, MO, covering the midwest. The fourth will be held in Florida in the fall.

The Institute is also working with various states to compile energy profiles detailing the amount and distribution of energy use (electric, gas, solar, etc.) by sector (government, business, industrial, residential). It is making an assessment of energy efficiency opportunities and the use of renewable technologies in the short term and energy planning in the long-term. Potential savings in dollars and greenhouse emissions are being calculated.

The states profiled include Arizona, California, Florida, Massachusetts, Michigan, New Mexico, New York, Texas, Vermont and Wisconsin — with detailed analyses for 1-3 major metropolitan areas in each state.

The Climate Institute has recruited five communities to become Rebuild America partners. The City of Philadelphia has developed a model action plan and has started a major outreach pro-
Within 15 Degrees of South
IREC Philadelphia Workshop

By Jack Werner, senior associate, Climate Institute, and Michelle Knopik, Esq., City of Phila., Mun. Energy Off.

That’s where you would be if you were a passive solar design building. You would also have windows that permitted solar gain, flooring materials that contributed to thermal mass storage, and passive solar cooling measures such as window overhangs and natural cross ventilation which would reduce the need for air conditioning. Add course discussions on solar electricity, solar hot water, and biomass community energy systems and you have the agenda for the Interstate Renewable Energy Council’s (IREC) Neighborhood Power Training Course. Then add IREC’s collection of renewable energy procurement guides, case studies, videos, slides, guides and directories, and you have the makings of IREC’s Workshop in A Box designed to give community and government energy representatives all the tools, information and presentation materials necessary for creating individualized educational seminars.

“The idea behind the Box is to accelerate state and local government purchase of renewable energy products,” noted IREC’s executive director, Jane Weissman.

From December 4 - 6, 1997, in Philadelphia, approximately 65 local, state, federal and community energy representatives attended IREC’s Workshop in A Box Training Course: Neighborhood Power — Building Communities with Solar Energy. The audience was treated to the first showing of the Neighborhood Power video, illustrating that even in freezing cold Boston and overcast New Jersey, solar power is succeeding in cutting energy costs.

Participants learned that under electric restructuring policies and regulations we may soon compare:

- The Energy Office of the Virgin Islands is helping in the renovation of the governor’s house with solar applications and new energy efficient technologies.
- Mt. Rainier, MD is working on a new police facility which will have state-of-the-art energy technology and plans to replace its old street lights (which have an annual electricity bill of $65,000) with new, energy-saving ones.
- Sarasota County government, FL has recently joined the Rebuild America program and is developing its action plan. Albuquerque, NM; Clark County, NV; and Dade County, FL are in various stages of joining the RBA plan. The RBA program is spreading to other communities through the Climate Institute’s efforts.

Solar electricity (a.k.a. photovoltaics (PV) — the next Silicon Valley.

Take a silicon semi conductor, add sunlight, and you get a flow of electrons. Encapsulate and seal 12 or more cells and you have a laminated module that can be used as building material for roof tiles, building facades and skylights. PVs can be part of the existing utility grid (“grid-tied” PV systems) or self contained units that serve an electric load (“grid-independent”). With PVs being used in wireless personal communications systems, disaster sensing and warning systems, and in strategies for reducing peak power expenses, speakers predicted that the next (Continued on page 8)
Philadelphia Workshop (Continued from page 7)

Silicon Valley will be about PVs.

Pump it up — to the roof, solar water heaters. Replace an electric water heater with a solar water heater and you'll probably recover your investment in three years. The structure is a weatherproof box that contains dark solar absorber panels. The sun's heat is delivered either directly to the water supply in the absorber or indirectly to the water by means of a heat transfer fluid such as a refrigerant or anti-freeze solution. The easiest and most efficient form of solar water heating is the swimming pool heating system, which can raise the temperature of several thousand gallons of water a few degrees (to about 80 degrees) at an efficiency of 70-80 percent.

Climate responsive buildings. No one energy-efficient measure will give the occupant optimal savings and comfort. A whole-building approach integrates passive solar strategies for cooling, load avoidance and thermal mass storage (ranging from glazing technology to daylighting and proper landscaping) with PVs, solar hot water heating, energy efficiency (i.e., properly-sized heating and HVAC systems), non-polluting and recycled building materials, community perspective, and building purpose.

Community Energy Systems (a.k.a. district heating and cooling systems). A central energy plant and a two-sided pipe distribution system carries steam, hot water and/or chilled water to individual buildings where the energy is transferred for use in space heating, hot water systems, etc. IREC presenter Debra Sachs described a woodchip CES in Vermont that incorporates sophisticated emissions controls, multi-fuel capability and low temperature hot water heat transfer. Burlington's 50 MW wood-chip fired system currently serves colleges, a hospital, schools and the downtown commercial district with the added benefit of reduced GHG (CO2), NOx and SO2 emissions (currently at 30,000, 18 and 33.5 tons/yr., respectively). Wind turbines are an alternative: in Spirit Lake, Iowa wind power (250 kW machine) serves a secondary school and the junior high school. What they don't consume of the 380 kWh generated returns to the grid for credit.

IREC is holding a solar implementation workshop in August.
IREC web: www.eren.doe.gov/irec

Climate Institute News

Board Elects Devra Davis

At an April 3 meeting at Yale University the Climate Institute elected Dr. Devra Lee Davis to its Board of Directors.

Widely regarded as one of the world's leading environmental epidemiologists, Dr. Davis serves as Director of Health, Environment and Development of the World Resources Institute.

Dr. Davis received her B.S. and M.A. degrees from the University of Pittsburgh, a Ph. D. in science studies at the University of Chicago and an M.D.H. in epidemiology at the Johns Hopkins University. She has written more than 140 articles in publications ranging from Scientific American to the Journal of the American Medical Association.

Besides her distinguished record in the sciences, her work in the early 1980s at the Environmental Law Institute was instrumental in the US phaseout of lead from gasoline. Her work on passive smoking for the National Academy of Sciences helped lay the groundwork for smoke-free air flights throughout the United States.

Founder of the International Breast Cancer Research Group, she produced a film on the subject.

Dr. Davis made the presentation on health implications of climate change at the Climate Institute's first North American Conference on Preparing for Climate Change. She also coordinated a collaborative study involving the World Health Organization and WRI concerning the lives that might be saved by reducing air particulate emissions with a decline in fossil burning. Published in September 1997 in Lancet, the study evoked considerable interest at the Kyoto Conference last December.

Parry Writes Book On Assessment of Climate Impact and Adaptation

Climate Institute Board member Martin Parry has written an illuminating account in non-technical language for those interested in the far-reaching effects of changes in climate. The book, Climate Impact and Adaptation Assessment: A Guide to the IPCC Approach; just over 150 pages, was published by Earthscan in January. Parry is professor of environmental management and director of the Jackson Environmental Institute at University College, London.

He and his co-author, Timothy Carter, a senior researcher with the Finnish Meteorological Institute, were lead authors of the IPCC Technical Guidelines for Assessing Climate Change Impacts and Adaptations (1994). Their aim in their new book is to provide a readable guide to the previous necessarily very condensed document, to provide background on how the assessment has developed and examples of its use.

For information on ordering: earthsales@earthinfo.co.uk.
El Niño

(Continued from page one)

of the National Center for Atmospheric Research in Colorado said recently there is an excellent analogy between El Niño and the kind of effects people will experience under climate change, although with climate change the effects may be more pervasive: drying will be more common, droughts more severe and longer lasting, vulnerability to fire more pronounced.

The more difficult question: are climate changes already under way which are increasing the intensity and frequency of El Niño events, is one we are not yet ready to answer.

In any case, Tom Karl of the US government’s National Climatic Data Center, has said, “The long term trend of increasing temperatures and precipitation in the US continues. These record-breaking statistics are generally consistent with both a strong El Niño and climate model projections of a continuing trend toward a warmer, wetter world as greenhouse gases continue to increase.”

Here are some of the extreme weather events of the last year that have been partially linked to El Niño:

Floods and Mudslides in Peru

Starting in February, mudslides and flash floods have been even more destructive for Peru than during the vicious El Niño in 1983 when hundreds of Peruvians died. One weatherman called it the biggest natural disaster to hit Peru in 50 years. By mid-May El Niño rains had finally abated.

Fires in Mexico

Nearly 10,000 blazes in Mexico, many of them fires started in January by farmers clearing land for planting, claimed scores of lives and left 50 million choking in smoke. For several weeks, starting in early April, a cloud of haze and cinders covered thousands of square miles over southern Mexico and northern Central America.

Mexico City declared an environmental alert on May 15, urging residents to stay indoors.

A government spokesman said the winter’s fires burned only a tiny fraction of Mexico’s timberland, and long-term damage would be minimal. But environmentalists disputed that.

Restrictions in Panama Canal

The year 1997 was the driest year of the century for the Panama Canal watershed with rainfall 35 percent below normal because of El Niño-related drought. The Panama Canal Commission limited the weight of ships traveling through the canal, calculating that 17 percent of the vessels using the waterway might need to reduce their cargo or the amount of fuel they carry, possibly until next October.

The head of the National Institute of Renewable Energy Resources, Merei Endara, estimated that clear burning plus the drought plus commercial logging have led to the destruction of 76,000 hectares of jungle throughout Panama since December.

Amazon Wildfires

The fires this year in Brazil, spreading quickly amid the harsh drought, were the worst on record; the government estimates of the acreage affected varied from 2,300 to 11,500 square miles, roughly the size of Belgium. Most of the area is savanna and converted farmland, which burn each dry season, but this year’s fires also damaged rainforest usually too humid to burn. By early April rain had put out virtually all the fires in the northern Amazon region where they had been burning since January.

Friends of the Earth officials, however, expressed concern about the rest of the Amazon where “once the dry season starts at the end of May, we will face enormous risks.”

Record Drought in Hawaii

El Niño has pushed storms that normally pass over Hawaii farther north, diverting their heavy rainfall directly to California. On the island of Hawaii where Hilo has long boasted of being the wettest city in America with rainfall averaging 10 1/2 feet at the eastern end of the big island, barely half an inch had fallen by mid-February. Even the deserts of southern Arizona received more rain this year than Hilo. The worst of the current drought is probably over, but it may take longer than just a few months to replenish ground moisture and reservoirs.

Drought, Fires in Indonesia

The worst drought in 50 years, deepened prospects of a severe food shortage in this nation of 200 million, the world’s fourth most populous country. The monsoon was delayed by three months following the development of El Niño. Forest fires starting last September spewed smoke over Southeast Asia, causing the region’s worst-ever air pollution. A “chooking, health-threatening haze” covered neighboring Singapore, Malaysia and Brunei, and extended north into Thailand and the Philippines. More than 30,000 people in the Indonesian islands of Sumatra and Borneo suffered respiratory problems.

Hunger, Disease in Philippines

At the end of last year, the Philippines reeled from the onslaught of El Niño. Rivers had dried up, dams had sunk to critical levels, water was being rationed in major towns and cities all over the country. Food security was threatened, and diseases were on the rise. More than 3 and 1/2 million people in 17 cities and provinces struggled for survival. In late April, the Philippine Red Cross reported a massive effort to combat widespread drought with more than 700,000 families severely affected and depending on relief assistance to survive.

Increase in Emissions

Massive pollution has been released from the Amazon, Indonesian and Philippine fires, according to a spokesman for Friends of the
El Niño
(Continued from page one)

Earth in April. Since the start of the year, the fires released 125 million tons of CO₂, FOE officials said. The huge levels of greenhouse gases added to the atmosphere amount to almost a quarter of total annual emissions of Great Britain.

Ozone Rises High in S. Pacific
Two research planes flying at an altitude of about 8,000 feet north of Fiji flew through a plume of smog containing ozone levels of 131 parts per billion, which is above the smog alert level of Los Angeles or Mexico City. The flight was part of a study being conducted by Nobel Prize winner F. Sherwood Rowland and his colleague Donald Blake. The scientists attributed the pollution to forest and brush fires in Africa, Indonesia, South America and Indonesia, carried thousands of miles by winds. Air above the Galapagos Islands near Ecuador was also affected.

Prof. Rowland has said the ozone measured in the study is high enough in the atmosphere that it is unlikely people of the South Sea Islands are troubled by it, but it is a dramatic sign of escalating ozone levels worldwide and an indicator that on a regular basis we are approaching ozone levels considered harmful on an occasional basis.

Australian Bushfires
Several huge bushfires erupted in southeastern Australia in early December; 168 fires burned about one million acres in New South Wales state, only four days into the southern hemisphere summer. Meteorologists said the El Niño weather pattern would increase the risk of bushfires over the next few months and would likely delay the start of the monsoon over tropical northern Australia.

El Niño-related drought and high ocean temperatures off the coast resulted in coral bleaching around the Great Barrier Reef, raising concern among experts about the future of these fragile ecosystems, the “rainforests of the sea,” said a NOAA report in late February.

Coral reefs normally recover from bleaching unless high ocean temperatures last too long or become even warmer. The sea surface temperatures have been higher than in the 1982-3 and 1987 El Niños, according to NOAA oceanographer Al Strong.

Power Outage in New Zealand
Searing summer heat and humidity, added to drought, strained to the breaking point the hydroelectric plant of Auckland, New Zealand’s largest city with a population just under one million.

On January 22 the first of four cables supplying power to the central business district failed. February 20 the last cable gave out and plunged most of the area into darkness.

Selected episodes of widespread coral bleaching

Diesel-powered generators on almost every other street corner operated night and day to supply power to Auckland’s energy-starved buildings. New power lines were being installed but the city was expected to be without power till late March, a five or six week stretch, very unusual for a city that large and a tremendous blow to business.

California Rains and Mudslides
A punishing series of storms swept in from the Pacific in early February, causing more than $500 million in damage and prompting Gov. Pete Wilson to declare a state of emergency in two-thirds of California’s 58 counties. Rainfall records back to 1884 were broken. The torrential rains plus rare tornadoes, treacherous mudslides and flash flooding that damaged homes and washed away cars, caused the deaths of at least nine people.

Disaster in Central, East Africa
From October to February, El Niño wreaked havoc on East and Central Africa. In some places rainfall averaged eight inches a day, 500 percent above normal. More than 4,000 have died from flooding and rain-related diseases such as malaria and cholera.

Major roads have been washed out. Rain kept farmers in nearly all of the region from planting tons of thousands of acres of crops. One bright spot in the grim picture was the greening of land where herders could graze their animals. Low crop yields in other places plus increased transportation costs have led to sharp price hikes. Business and tourism are down. Kenya, Ethiopia, Tanzania and Somalia suffered especially harsh effects.

Unusually Severe Tornadoes
The tornadoes in late February in Florida were the deadliest since the National Weather Service started keeping records half a century ago, spreading random destruction across a broad area and killing 88. In early April, tornadoes struck Alabama.
Mississippi and Georgia with great ferocity, killing 41. And in the middle of the month, tornadoes hit a broad swath of farmland and small towns in Kentucky, Arkansas, and Tennessee, including downtown Nashville.

The number of tornadoes was in line with other years, but they have been stronger and hit in more populated areas. Since 1985, an average of 46 people a year have died in tornado-related effects, but by late April this year the toll had already reached 102. Alexander MacDonald, director of NOAA's Forecast Systems Laboratory in Boulder, CO, has said that so many strong storms this year have been due to two factors: large amounts of moisture and the re-routing of the storm track, both effects of El Niño. A stronger-than-usual southern branch of the jet stream, whose rapidly-moving winds separate cooler air masses in the north from the warmer ones in the south, stirs up a low pressure system, spawning thunderstorms. The thunderstorms may become more severe, and the greater the temperature disparity and the more moisture, the more severe the thunderstorms which can then spin out into tornadoes.

**Québec Ice Siege**

A combination of sopping wet air from the south and freezing temperatures in Quebec, Maine and up-state New York, turned what would have been a comparatively harmless January blizzard into an event characterized by a climatologist of Environment Canada as conceivably, judged by its weight, "the heaviest ice storm in the history of the planet."

The previous record for ice storm thickness — in 50 years of Environment Canada's history — was two inches; this one was three times that amount. At its peak 1.4 million of Hydro-Québec's 3.4 million customers were without power. The immense water resources of the province have made Hydro-Québec a dependable source of energy: cheap, independent of the political vagaries of oil, the environmental costs of coal, the financial burden of nuclear energy. Because it was relied on by customers for not only light but heat, hot water and cooking, the power outage in January had a deeper impact than it might have elsewhere.

**Return to Normal**

According to the latest Climate Prediction Center forecasts, there will be a return to near normal conditions in the tropical Pacific during the next 3 - 6 months. D. James Baker, Undersecretary of Commerce for oceans and atmosphere, said in a summary report in April that, "this record-breaking El Niño is consistent with a worldwide trend over the last 40 years towards a warmer and wetter world. We can't draw a causal link between El Niño and global warming, but our modeling tells us that global warming may first manifest itself in changes in weather patterns....[T]his winter's El Niño is a taste of what we might expect if the earth warms as we now project."

**Total Damage Costs**

Val Bunting of the Federal Emergency Management Agency reported in early April that despite the floods, blizzards, ice storm and tornadoes, El Niño did not deliver a winter any more costly than the previous two. FEMA committed more than $289 million for 1997-98 winter disasters compared with $295 million in 1996-97 and $280 million in 1995-96. But, no central authority tallies lost lives and property. California officials' preliminary estimate pegged the state's damage at $500 million — paling against '95 and '97 storm damage at $1.8 billion each.
Energy Star Program Is Enlisting Consumers in Drive Toward Wider Use of Energy Efficiency

While corporations began to join the effort to label energy efficient technology as early as 1992, the Energy Star campaign has now turned its attention to consumers. Last August the US Environmental Protection Agency began a public information drive to persuade consumers that efficient energy use and a healthy environment go hand in hand.

There has been a “latent awareness” among consumers, said Betsy Agle, EPA’s Energy Star Communications Director, in an interview with Climate Alert. (Computer users first saw their green energy labeled models go into a low-power sleep mode in 1991.) It is still early in the campaign for firm numbers, Agle said, and the agency is just beginning to get quantitative answers to how well consumers recognize the benefit to them of reducing energy use.

Five thousand public service announcements have now been issued on how consumers can save: on washing machines, refrigerators, dishwashers and air conditioners, on heat pumps, boilers and thermostats, even on new homes and mortgages, and on insulation and lighting fixtures. Not only will these items use less electricity and natural gas, but they will also send less smog-producing pollutants into the atmosphere.

In April McDonald’s put the Energy Star message on some of its bags and caps, Kinko had a big poster on Earth Day touting Energy Star savings. More than 100 articles have appeared in local newspapers and magazines, and in late May EPA started a national press effort with an article in Parade.

Energy Star has also been working with corporations to take the message to consumers. When retailers and utilities cooperated closely on a public awareness campaign, the sales of energy efficiency equipment rose 30 percent, an indication of what can be achieved, Agle concluded.

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Climate Institute
120 Maryland Avenue, NE
Washington, DC 20002

Address correction requested

Double Issue: States and Cities Use Green Energy to Combat Climate Change and a Report on El Niño

The Climate Institute is a private nonprofit organization formed to advance public understanding of climate change including the greenhouse effect and of strategies to avert stratospheric ozone depletion.