

State of the World 2009: CONFRONTING CLIMATE CHANGE

UK PRESS RELEASE

Contact: andrew.miller@earthscan.co.uk / T: +44 (0) 207 841 1930 / F: +44 (0) 207 242 1474
Earthscan, Dunstan House, 14a St Cross Street, London EC1N 8XA / UK Publisher's webpage:
www.earthscan.co.uk / <http://www.earthscan.co.uk/?tabid=27739> / <http://www.worldwatch.org/>

Heat and Hope: Time Running Out for Steep Emissions Cuts

Washington, D.C.—The world will have to reduce emissions more drastically than has been widely predicted, essentially ending the emission of carbon dioxide by 2050 to avoid catastrophic disruption to the world's climate, according to *State of the World 2009: Confronting Climate Change*, released today by the Worldwatch Institute. Yet opportunities abound in renewable energy and efficiency improvements, agriculture and forestry, and the resilience of societies for slowing and managing climate change, according to the book's 47 authors.

"We're privileged to live at a moment in history when we can still avert a climate catastrophe that would leave the planet hostile to human development and well-being," said Worldwatch Vice President for Programs Robert Engelman, project co-director for *State of the World 2009*. "But there's not much time left. Sealing the deal to save the global climate will require mass public support and worldwide political will to shift to renewable energy, new ways of living, and a human scale that matches the atmosphere's limits."

Confronting Climate Change, the 26th edition of the *State of the World* series, addresses the need to reduce greenhouse gas emissions as well as prepare to adapt to climate change. The Earth's average temperature has already risen by more than 0.8 degrees Celsius (1.4 degrees Fahrenheit) since the beginning of the Industrial Revolution in the mid-18th century, with much of that increase attributed to human activities. Nearly 1 degree Celsius of additional warming may already be in store, based on past emissions of heat-trapping greenhouse gases that have not yet made their influence felt on surface temperatures.

A chapter by climate scientist W. L. Hare concludes that in order to avoid a catastrophic climate tipping point, global greenhouse gas emissions will need to peak before 2020 and drop 85 percent below 1990 levels by 2050, with further reductions beyond that date. Emissions of carbon dioxide would actually need to 'go negative'—with more being absorbed than emitted—during the second half of this century. Hare's research finds that even a warming of 2 degrees

Celsius poses unacceptable risks to key natural and human systems, including significant loss of species, major reductions in food-production capacity in developing countries, severe water stress for hundreds of millions of people, and significant sea-level rise and coastal flooding.

A successful climate strategy will motivate rapid reductions in emissions as well as major investments in adaptation, with both efforts necessarily financed mostly by the world's wealthier countries and people, the book argues. Such a strategy ultimately will also need to address the warming climate's connection to food production, population growth, and the global economy. Economists have estimated the cost of avoiding dangerous climate change at around \$1–2.5 trillion a year for decades to come; yet the costs of not doing so are expected to be far higher.

In order to assess the threat the climate crisis presents—and explore innovative and practical solutions—Worldwatch enlisted more authors for this book than for any previous edition of the series, many hailing from the developing countries most vulnerable to climate change. The resulting framework offers a roadmap for a world that not only survives climate change, but emerges more stable, more just, and more prosperous.

At the center of this framework, the book's opening chapter notes ten key challenges* that must be adopted as part of any successful path to mitigation and climate change adaptation and resilience. (Resilience refers to societies' capacity to adapt to dramatic change without suffering significant reductions in governance, security, prosperity, or quality of life.)

Simultaneously addressing these interlinked and challenging issues could lay the groundwork for a world that will not merely bounce back from both the economic and climate crises, but surge forward. A new U.S. administration and impending climate negotiations in Copenhagen in December 2009 could finally break the gridlock that has long plagued climate policy.

“We can't afford to let the Copenhagen climate conference fail,” said Worldwatch President Christopher Flavin. “The outcome of this meeting will be written in the history books—and in the lasting composition of the world's atmosphere.”

—END—

* See next page for a list of Ten Key Challenges outlined in the introductory chapter of State of the World.

To receive a UK review copy of [State of the World 2009](#) please contact: Andrew Miller
Email: andrew.miller@earthscan.co.uk / Tel: +44 (0) 207 841 1930 / Web: www.earthscan.co.uk

STATE OF THE WORLD 2009: Ten key challenges to avoiding catastrophic climate change

- 1. Thinking Long-term.** At the core of the climate problem is the likelihood that future generations will pay with a deteriorating global environment for the refusal of current generations to live in balance with the atmosphere. Visionary leaders will need to marshal the public to take responsibility for the impacts of today's behavior on the future and to act accordingly.
- 2. Innovation.** The emissions shift will require technologies that break the carbon link to energy consumption with as little sacrifice of price and convenience as possible. A range of renewable technologies can produce electricity and meet heating and cooling needs. Such technologies include buildings that produce more energy than they consume and "smart grids" that use information technology to match renewably produced electricity precisely to demand.
- 3. Population.** Rarely addressed in the context of climate change, future population trends could make the difference between success and failure in the long-term balance of human activities, atmosphere, and climate. The world's population is likely to stop growing and then gradually decline for a period when women gain the full capacity to decide for themselves whether and when to have children.
- 4. Changing Lifestyles.** The assumption that the "good life" requires ever more individual consumption, more meat-eating, ever larger homes and vehicles, and disposable everything will need to fade. A spirit of shared and equitable material sacrifice can replace it—with no loss of what really matters, such as active good health, strong communities, and time with family.
- 5. Healing Land.** Managed for the task, the Earth's soil and vegetation can remove billions of tons of carbon from the atmosphere. Agricultural landscapes can accomplish this while improving food and fiber production and minimizing the need for artificial fertilizer and fossil-fuel-driven tilling and raising farmer incomes.
- 6. Strong Institutions.** As with the deteriorating global economy, the global nature of climate change demands international cooperation and sound governance. The strength and effectiveness of the United Nations, multilateral banks, and major national governments are essential to addressing global climate change. These institutions—and those emerging from the hoped-for Copenhagen climate agreement in 2009—require strong public support for their critical work.
- 7. The Equity Imperative.** No climate agreement will succeed without support from those countries that have so far contributed little to human-induced climate change, have low per-capita emissions, and stand to face the biggest challenges in adapting to the coming changes. A pact that is fair to developing and industrialized countries alike is thus essential.
- 8. Economic Stability.** With the world now fixated on the sputtering global economy, addressing climate change will demand attention to costs and the promise of improving rather than undermining long-term economic prospects. A climate agreement will have to operate effectively during anemic as well as booming economic periods, facing squarely the challenges of poverty and unemployment while continually reducing emissions of carbon dioxide and other greenhouse gases.
- 9. Political Stability.** A world beset by conflict and terrorism is far less likely to prevent dangerous climate disruption than one at peace. Security and climate must be addressed simultaneously. On the positive side, negotiating an effective and fair climate agreement offers countries a needed opportunity to practice peace and re-frame international relations along cooperative rather than competitive lines.
- 10. Mobilizing for Change.** The way to deal with climate change we ourselves are causing is to see the opportunity for a new global economy and new ways of living in the effort to bring net greenhouse gas emissions to an end. There's no guarantee such a transition will be easy—or even possible. But a global movement to make the effort is needed now, and could yield new jobs, new opportunities for peace, and global cooperation beyond what humanity has ever achieved.

STATE OF THE WORLD 2009: Facts at a Glance

Emissions and Warming

- According to the latest IPCC report, **warming by 2100 is projected to be in the range of 1.1–6.4 degrees Celsius** above the average in the 1980–99 period. Unabated, current increasing trends in emissions can be expected to raise Earth’s temperature by 4–6 degrees Celsius above today’s levels, if not more, by the end of this century. (pp. 13–14)
- A recent assessment indicates that **a significant number of “tipping points”**—thresholds beyond which it would become difficult-to-impossible to reverse changes in the climate system—could be approached if the planet warms more than 3 degree Celsius over the preindustrial level. However, a number of tipping points—including loss of the Greenland ice sheet—could be approached at warming levels over 1.5–2 degrees Celsius. (p. 17)
- The findings of the latest IPCC assessment and more-recent studies strongly reinforce the conclusion that **“safe” levels of warming lie at 2 degrees Celsius or below**. (p. 19)
- Once greenhouse gas concentrations are stabilized, **global mean temperature will continue to rise due to momentum in the climate system** for several decades, but it will very likely also begin to stabilize after several decades. (p. 23)
- **Half of the carbon dioxide (CO₂) emitted today is expected to remain in the atmosphere a century from now**, and much will remain even 10,000 years in the future. (pp. 23–24)
- Recent research has demonstrated that **it is technically and economically feasible to reduce greenhouse gas emissions fast enough** so that their atmospheric concentrations can be limited to around 400 parts per million of CO₂-equivalent, or to lower in the longer term. (p. 25)

Land Use

- **Land-use changes and fossil fuel burning are the two major sources of the increased CO₂** in the atmosphere that is changing the global climate. Overall, land use and land-use changes account for some 31 percent of human-induced greenhouse gas emissions. (p. 31)
- **The process of tilling soil releases CO₂ into the atmosphere**. Worldwide, approximately 95 million hectares of cropland are under no-till management—a figure that is growing rapidly, particularly as rising fossil fuel prices increase the cost of tillage. (p. 36)
- **Perennial crops store more carbon in the soil than annually planted ones**. Harvested native hay meadows retained 179 tons of carbon and 12.5 tons of nitrogen in a hectare of soil, while annual wheat fields retained only 127 tons of carbon and 9.6 tons of nitrogen. (p. 37)
- **Livestock now account for 50 percent of emissions from agriculture and land-use change**. (p. 39)

Ice Melt and Water Availability

- **For sea ice, the IPCC projected a decrease in both the Arctic and Antarctic** under every unmitigated emissions scenario, with Arctic summer sea ice disappearing almost entirely toward the end of this century. Observed rapid loss of Arctic summer ice (about 9.1 percent annually for the 1979–2006 period) exceeds projections in nearly all the latest IPCC models. (pp. 16–17)
- By the 2050s, it is projected there will be **less annual river runoff and water availability in dry regions in the mid-latitudes and tropics** but more in high-latitude regions and in some tropical wet areas. (p. 16)
- **Serious water-supply impacts have been seen in Australia** from the 2001–07 droughts—the most extreme and hottest drought period recorded for this continent. (p. 17)
- **The Gangotri glacier in the Himalayas, which provides up to 70 percent of the water in the Ganges River, is retreating 35 meters yearly**. Once the glacier disappears, the Ganges will become a seasonal river, depriving 400 million people of water. (p. 32)

Energy

- **Buildings use about 40 percent of global energy** and account for a comparable share of heat-trapping emissions. (p. 131)
- Today's **electricity generation accounts for 41 percent of global primary energy use** (from coal mining to appliances or other "end uses") and 44 percent of CO₂ emissions. (p. 135)
- **Renewables—including large hydro—provide nearly one-fifth of world electricity.** (p. 135)
- **Heating and cooling account for 40–50 percent of global energy demand.** Renewables are among the lowest cost options for reducing CO₂ emissions and fossil fuel dependency, yet they currently meet only 2–3 percent of world demand. (pp. 139, 141)
- Approximately **two-thirds of the energy fed into the world's power plants is wasted**—released into the environment as heat. (p. 142)

STATE OF THE WORLD 2009: Select Innovations

Land Use

- In Parana, Brazil, farmers have developed **organic management systems combined with no-till**. No-till plots yielded a third more wheat and soybean than conventional plowed plots and reduced soil erosion by up to 90 percent. (p. 36)
- In 2005, a Pennsylvania dairy farm invested \$1.14 million in a project to process the manure from 800 cows, using a digester and a combined heat and power unit. Now **the farm makes a profit using biogas** to generate 120 kilowatt-hours of electricity to sell back to the local utility. (p. 41)
- Both India and China have **large national programs to revegetate millions of hectares of forest and grasslands**—seen as investments to reduce poverty and protect watersheds. (p. 44)
- In Morocco, 34 pastoral cooperatives with more than 8,000 members **rehabilitated and manage some 450,000 hectares of grazing reserves**. (p. 44)
- In Rajasthan, India, **community-led watershed restoration programs** have reinstated more than 5,000 traditional *johads* (rainwater storage tanks) in over 1,000 villages. (p. 44)
- Some countries are **redirecting subsidy payments to agri-environmental payments** for ecosystem services, some of which explicitly include carbon storage and emissions reduction. (p. 46)

Energy

- **Güssing, Austria, has become energy self-sufficient**, increasing living standards and reducing carbon emissions more than 90 percent since 1992 by shifting to local, renewable energy. (p. 130)
- **Integrated building design with multiple efficiency measures** can reduce energy use to at least half of a conventional building, achieving gains of over 80 percent in some cases. (p. 132)
- The Combined Power Plant, a project that links 36 wind, solar, biomass, and hydropower installations throughout Germany, has demonstrated that a **combination of renewable energy sources and more-effective control can balance out short-term fluctuations** and provide reliable electricity with 100-percent renewable sources. (p. 139)
- Between 1980 and 2005, **taxes on energy and CO₂ in Sweden** drove a major shift from fossil fuels to biomass for district heating, reducing associated emissions to less than a third. (pp. 139–40)
- Already, **more than 40 nations, states, and provinces have enacted feed-in laws**, which generally guarantee anyone who produces electricity with renewable sources priority access to the electricity grid and long-term premium payments for their electricity. (p. 186)
- According to the German government, the country's **feed-in law avoided some 79 million tons of CO₂ emissions in 2007**, while emissions trading that year reduced national emissions by some 9 million tons. The feed-in law is considered Germany's primary climate-protection policy. (p. 149)

- Algeria plans to build a 3,000-kilometer cable to Germany, allowing it to **export 6,000 megawatts of solar thermal power by 2020** and providing perfect complement to Germany's significant wind energy capacity. (p. 111)

Building Resilience

- The city of **Manizales, Colombia, has taken steps to build resilience**, particularly by not letting its rapidly growing low-income population settle on dangerous sites. (p. 161)
- **Farmers in Njoro Division, Kenya, are adapting to climate change** in several ways, including switching from wheat and potatoes to quick-maturing crops such as beans and maize, and planting whenever it rains because there is no longer a clear growing season. (p. 151)
- **Villages in Nepal are building resistance and resilience to climate change** by improving access to resources and assets via small livestock distribution, vegetable farm demonstrations, kitchen and organic farming, as well as sloping agricultural land technologies. (p. 154)
- **In northeast Tanzania, local farmers use very specific indicators to predict the beginning of the rains**, including increases in temperature, lightning, various plant changes, and changing behavioral patterns of birds, insects, and mammals. (p. 158)
- **Mali's government has been providing climate-related information directly to farmers** to help them measure climate variables. (p. 159)

Notes to Editors:

To interview Christopher Flavin or Robert Engelman, or other *State of the World 2009* authors, please contact:

Andrew Miller / andrew.miller@earthscan.co.uk / +44 (0) 207 841 1930

For review copies in the U.S., Canada, and India:

To obtain a review copy of *State of the World 2009*, contact Julia Tier at jtier@worldwatch.org.

Purchasing Information: *State of the World 2009* sells for \$19.95 plus shipping and handling. It can be purchased via the Worldwatch website at <http://www.worldwatch.org/pubs/>, by e-mailing wwpub@worldwatch.org, by calling toll-free +1-877-539-9946 (in U.S.) or +1-301-747-2340 (from overseas), or by faxing 1-301-567-9553 with ISBN number 9780393334180.

For review copies outside the U.S., Canada, and India:

State of the World 2009 is also published in English by Earthscan, for sale outside the U.S., Canada, and India. To obtain a preview copy, contact Andrew Miller at andrew.miller@earthscan.co.uk; Tel: +44 (0)20 7841 1950 (direct); +44 (0)20 7841 1930 (general).

Purchasing Information: *State of the World 2009* sells for £14.99 plus shipping and handling. It can be purchased through the Earthscan website at www.earthscan.co.uk, by e-mailing earthinfo@earthscan.co.uk, or by calling +44(0)1256 302 699 with ISBN number 9781844076949.

Worldwatch E-mail List: If you would like to receive Worldwatch press advisories regularly, please send your request to Julia Tier at jtier@worldwatch.org or call (+1) 202-452-1992 x594.

About the Worldwatch Institute: Worldwatch is an independent research organization based in Washington, D.C. that works on energy, resource, and environmental issues. The Institute's *State of the World* report is published annually in more than 20 languages. For more information, visit www.worldwatch.org.