

THE CLIMATE

**'Not only is it real, it's here,
and its effects are giving rise
to a frighteningly new global
phenomenon:**

1932

**the man-made
natural disaster.'**

**BARACK OBAMA
ON GLOBAL WARMING**

1988

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FROM TOP: GEORGE BRANT COLE MANTON; MARK ARCHIBUT; JAMES HANSEN; WASHINGTON POST; NATIONAL ARCHIVES; UNIVERSITY OF MONTANA



POLITICIANS ARE FIDDLING WHILE THE PLANET BURNS. WHAT'S A VOTER TO DO?

BY JAMES HANSEN

PLANET EARTH IS IN IMMINENT PERIL. We now have clear evidence of the crisis, provided by increasingly detailed information about how Earth responded to perturbing forces during its history and by observations of changes that are beginning to occur around the globe. The startling conclusion is that continued exploitation of all fossil fuels on Earth threatens not only the other millions of species on the planet but also the survival of humanity itself—and the timetable is shorter than we thought.

I believe the biggest obstacle to solving global warming is the role of money in politics, the undue sway of special interests. "But the influence of special interests is impossible to stop," you say. It had better not be. But the public, and

young people in particular, will need to get involved in a major way.

"What?" you say. You already did get involved by working your tail off to help elect President Barack Obama. Sure, I (a registered independent who has voted for both Republicans and Democrats over the years) voted for change too, and I had moist eyes during his Election Day speech in Chicago. That was and always will be a great day for America. But let me tell you: President Obama does not get it. He and his key advisers are subject to heavy pressures, and so far the approach has been "Let's compromise." So you still have a hell of a lot of work ahead of you. You do not have any choice. Your attitude must be "Yes, we can."

I am sorry to say that most of what politicians are doing on the climate

front is greenwashing—their proposals sound good, but they are deceiving you and themselves at the same time. Politicians think that if matters look difficult, compromise is a good approach. Unfortunately, nature and the laws of physics cannot compromise—they are what they are.

In 2001, when I spoke to Vice President Dick Cheney's cabinet-level Climate Task Force, I was more sanguine about the climate situation. It seemed that the climate impacts might be tolerable if the atmospheric carbon dioxide amount was kept at a level not exceeding 450 parts per million (ppm; thus 450 ppm is 0.045 percent of the molecules in the air). So far, humans have caused carbon dioxide to increase from 280 ppm in 1750 to 387 ppm in 2009.

During the past few years, however, it has become clear that 387 ppm is

CUMULATIVE CO₂
EMISSIONS (1900–2005)
FROM FOSSIL FUELS
IN MILLIONS OF METRIC TONS

CANADA

24,300

CHINA

92,950

GERMANY

73,208

PHOTO: TONY GENTILE—REUTERS
GRAPHIC SOURCE: CLIMATE ANALYSIS INDICATORS TOOL, WORLD RESOURCES INSTITUTE

FROM LEFT SILVIO BERLUSCONI, NICOLAS SARKOZY, DMITRY MEDVEDEV, BARACK OBAMA, BAN KI-MOON, AND MUAMMAR KADDAFI AT THE G8 SUMMIT IN JULY.

already in the dangerous range. It's crucial that we immediately recognize the need to reduce atmospheric carbon dioxide to at most 350 ppm in order to avoid disasters for coming generations. Such a reduction is still practical, but just barely. It requires a prompt phaseout of coal emissions, plus improved forestry and agricultural practices. We need to acknowledge now that a change of direction is urgent. This is our last chance.

How, though, can today be a critical moment when we do not yet observe great changes in climate? So far, the effects of climate change have been limited because of climate-system inertia, but inertia is not a true friend. As amplifying feedbacks begin to drive the climate toward tipping points, that inertia makes it harder to reverse direction.

Heat is pouring into the ocean, and ice shelves are starting to melt. We must remember that the human-made climate forcing—changing the planet's energy balance in a way that alters temperature—is not coming on just a bit faster than the natural forcings of the past; on the contrary, it is a rapid, powerful blow, an order of magnitude greater than any natural forcings that we are aware of.

Qualitatively different storms will occur when ice-sheet disintegration is large enough to damp high-latitude ocean warming, or even to cause regional ocean cooling, while low latitudes continue to warm. Global chaos will ensue when increasingly violent storminess is combined with sea-level rise of a meter and more. Although ice-sheet inertia may prevent a large sea-level rise before the second half of the century, continued growth of greenhouse gases in the near term will make that result practically inevitable, out of our children's and grandchildren's control.

Several uncertainties will affect the speed at which more obvious climate changes emerge. One is uncertainty about whether and how solar irradiance will change during the next few years and the next few decades. As of October 2009, the sun remains in the deepest solar minimum in the period of accurate satellite data, which began in the 1970s. It is conceivable that the sun's energy output will remain low for decades. But, contrary to the fervently voiced opinions of solar-climate aficionados, such continued low irradiance would not cause global cooling and would not stop the continued progression of global warming. Indeed, if the sun pulls out of its current minimum soon, resuming a typical solar cycle, there may be

I HAD MOIST EYES DURING OBAMA'S ELECTION DAY SPEECH IN CHICAGO. BUT LET ME TELL YOU: HE DOES NOT GET IT.

an acceleration of global warming in the next six to eight years. But whatever happens with solar irradiance, the world is going to be warmer during the next decade than it was in the present decade, just as the present decade is warmer than the 1990s.

You need to be well informed to understand these matters, because you cannot count on governments to deal

properly and promptly with the climate issue. The problem with governments is not scientific ability—the Obama administration, for example, appointed some of the best scientists in the country to top positions in science and energy. Instead, the government's problem is politics—politics as usual.

U.S. government scientists, at least those at the highest levels, cannot contradict a position taken by the president. And President Obama's assertion that he would "listen to" scientists did not mean that he would not listen, perhaps with even sharper ears, to political advisers.

When you learn of a lightly publicized agreement with Canada for a pipeline to carry oil squeezed from tar sands to the United States, when the president advocates an ineffectual cap-and-trade approach for controlling carbon emissions, when our government funnels billions of dollars to support "clean coal" while treating next-generation nuclear power almost as a pariah, you can recognize right away that our government is not taking a strategic approach to solve the climate problem.

Our planet, with its remarkable array of life, is in imminent danger of crashing. Yet our politicians are not dashing forward. They hesitate; they hang back.

Therefore it is up to you. As in other struggles for justice against powerful forces, it may be necessary to take to the streets to draw attention to injustice. Civil resistance may be our best hope. It is crucial for all of us, especially young people, to get involved. This will be the most urgent fight of our lives.

HANSEN is a member of the National Academy of Sciences, an adjunct professor at Columbia University and Columbia's Earth Institute, and director of the NASA Goddard Institute for Space Studies. Excerpted from his new book, *Storms of My Grandchildren*.

INDIA

25,895

SOUTH AFRICA

12,414

UNITED KINGDOM

55,034

UNITED STATES

318,432

GREEN ALERT

AS CLIMATE CHANGE ACCELERATES, SO TOO WILL HUNGER, POVERTY, AND PERHAPS EVEN SOCIAL UNREST.

BY THE PRINCE OF WALES

AS THE WORLD EDGED INTO FINANCIAL crisis, there were repeated warnings that we were headed for disaster. In the end, disaster struck. In many ways, the challenge of climate change has a similar feel, and the alarm bells are ringing just as loudly. But while it was possible to bail out the banks and to stimulate economic recovery with trillions of dollars of public finance, it will not be possible to bail out the climate—unless we act now.

Yet even when the basic science of climate change has been accepted by almost all scientists, many others still seem to think that it is unfounded, and that the world has more important questions to address. Reducing poverty, increasing food production, combating terrorism, and sustaining economic recovery are seen as more deserving of our attention. But this is a false choice, for climate change is not an alternative priority to all of these; it is in fact a “risk multiplier,” a factor that will undermine our ability to achieve any of these things.

For example, ending poverty so that every person has the opportunity to lead a good life is already a hugely challenging ambition, and rapid climate change will make it more so. Several studies have set out how climatic change will threaten economic development, especially in the most vulnerable and poorest countries. This will, in turn, damage programs to reduce poverty.

Food security is already at risk be-

cause of soil erosion and the volatility of oil and gas prices that sustain industrial farming, while demand is rising because of population growth and changing diets. Climate change will exacerbate this squeeze. According to a United Nations Environment Program projection, agricultural productivity could drop by up to 50 percent in many developing countries by 2080—not least because of changed patterns of rainfall.

These environmental stresses are likely to heighten social tensions. If in the future it becomes clear that the world’s big polluters knew but did little or nothing about these problems, a whole new generation of resentment might be born.

With this in mind, it seems to me that we need to adopt a new approach. Surely the starting point must be to see the world as it really is, and perhaps to accept that the economy is a wholly owned subsidiary of Nature and not the other way around. Nature is, after all, the capital that underpins capitalism. The world’s tropical rainforests provide a powerful case in point.

These incredible ecosystems harbor more than half the earth’s terrestrial biodiversity, on which, whether we like it or not, human survival depends. They generate rainfall; they are home to many of the world’s indigenous peoples; and they help meet the needs of hundreds of millions of other people. They also hold vast quantities of carbon. But they are being cleared and burned at a rate of about 6 million hectares per year. In addition to hastening a mass extinction of species—

many of which could hold the answer to the treatment of human diseases as well as the key to new technologies based on mimicking Nature’s genius—this is causing massive greenhouse-gas emissions, accounting for about a fifth of the total.

This is precisely why my Rainforests Project has expended so much effort during these last two years to help facilitate a consensus on increasing international cooperation to cut deforestation. Back in April, I was able to host a meeting of world leaders at St. James’s Palace in London, in the margins of the G20 summit, where it was agreed to establish a new informal

GRAPHIC SOURCE: FOOD AND AGRICULTURE ORGANIZATION



THE PRINCE SURVEYS ILLEGAL LOGGING IN INDONESIA'S HARAPAN RAINFOREST.

PERCENTAGE DECREASE IN FORESTLAND (1990-2007)

BOLIVIA
7.3

BRAZIL
9.3

CAMBODIA
22.7

COLOMBIA
1.3

INDONESIA
27.3

PHOTO: JOHN STILLWELL—PA ARCHIVE-PRESS ASSOCIATION IMAGES

working group to look at how rates of deforestation could be slowed as rapidly as possible. The group came back with recommendations just a few weeks ago, and it is enormously heartening to see the degree of partnership that has developed between countries, environmental groups, and companies that are determined to work together toward implementing the proposals for dealing with the underlying economic root causes of deforestation.

Through providing countries with financial rewards for their positive performance in cutting deforestation (or for not starting it in the first place), we would make it possible for rainforest nations to implement strategies for sustainable development more quickly and without having to rely so heavily on the kind of economic activities that cause deforestation. By using—in addition to public-sector finance—innovative, long-term investment instruments, perhaps facilitated by the multilateral development banks, we could restore vast areas of already degraded land to increase food

output. At the same time, money would be available for new health and education programs, as well as genuinely integrated rural-development models. In return, the world would sustain the vital ecosystem services upon which we all rely for our economic, physical, and spiritual survival.

The idea that the world should pay in some way for the essential utility services provided by the rainforests (after all, we already pay for our water, gas, and electricity) is not a new one. But there does, at last, appear to be agreement that this is one way we can quickly begin to reduce emissions and, thus, buy urgently needed time in the battle against catastrophic climate change. Through a constructive process, countries have been able to

FORGING
A RECONNECTION
WITH NATURE
IS THE REAL
CHALLENGE TO WHICH
WE MUST RISE.

find a mutually agreeable approach that I hope, in the months ahead, will lead to the kind of international cooperation that could make a decisive difference.

While initiatives like this will need to be a part of the solution, they are not, I believe, the whole answer. In some ways the climate challenge is not first and foremost due to an absence of sound policy ideas or technology, but more a crisis of perception. As we have become progressively more separate from Nature, and more reliant on technological inventiveness to solve our problems, we have become less able to see our predicament for what it really is—namely as being utterly out of balance, having lost any sense of harmony with the earth's natural rhythms, cycles, and finite systems. The fact that we generally regard economics as being separate from Nature is just one, albeit quite fundamental, sign of this imbalance.

Forging a reconnection with Nature and reintegrating our societies and economies with her capacities is, as far as I can see, the real challenge to which we must rise. The Copenhagen summit will, I hope, contribute to a shift at this deeper level, as well as set out the plan for transition to a low-carbon economy based on official targets, policies, and technologies. As things stand, the world is not short of all these—what it does lack, however, is a mindset fit for the situation we face.

While time may not be on our side, our ability to cooperate and innovate to find solutions appears to be with us still. We have in the past faced huge challenges and prevailed. This time the challenge seems greater than ever before, but I hope with all my heart that in Copenhagen we will be able to exploit these very human attributes to the full. It is the very least we can do for future generations.

THE PRINCE OF WALES *created his Rainforests Project in 2007 to find sustainable solutions to combating tropical deforestation, a contributor to global climate change.*



MEXICO

7.7

PAPUA NEW GUINEA

7.5

PERU

2.3

VENEZUELA

9.4

ZIMBABWE

23.9

THE NEXT INDUSTRIAL REVOLUTION

BUSINESSES WILL SOON
LIVE OR DIE ACCORDING TO
THEIR CLIMATE PRACTICES.
THE BEST MAY
EVEN THRIVE.



THE CALIFORNIA ACADEMY OF SCIENCES, IN SAN FRANCISCO, EMPLOYS A "LIVING ROOF" TO LOWER ENERGY COSTS.

Can business save the planet? Champions of an environmental New Deal have often cast the corporation as the enemy in the struggle against global warming. But the more than 800 corporate leaders who've signed the Copenhagen Communiqué on Climate Change argue the opposite line: the business community wants—and needs—an ambitious global agreement that will spur the creation of a low-carbon economy. Five of those leaders spoke with NEWSWEEK's William Underhill: Ian Cheshire, CEO of Kingfisher, an international home-improvement retail chain; Noel Morrin, VP for sustainability and green construction at Skanska, an international construction company based in Sweden; James Smith, chairman of Shell U.K.; Reinoldo Poernbacher, CEO of Klabin S.A., Brazil's biggest paper producer, exporter, and recycler; and Jeffrey Swartz, CEO of Timberland. Excerpts:

Are you disappointed that it looks as if Copenhagen may not yield as much as previously hoped in terms of solid agreements?

CHESHIRE: One of the things about Copenhagen is that it's a highly symbolic moment. But there is a slight danger that everyone thinks everything has to be nailed down by the time the conference breaks up; that if it's not all in place, somehow it's a failure. I take a slightly more pragmatic view: if people make serious commitments, then there is going to be a lot of work after the event to turn them into nitty-gritty reality.

MORRIN: This is a milestone on a much longer journey. It would be an enormous surprise if we did get a solid agreement at such a symbolic event. A lot of the hard work gets done before and after. The important thing is that we have a lot

of very powerful business leaders who are prepared to come, and hopefully they will give enough political signals to the people who actually have to get into the details of how solid agreements are drafted so the next conference delivers the final product.

SMITH: Copenhagen may not be the last word, but it can be a major step in the right direction. I would say that the news out of Beijing and Washington has been very encouraging. In the run-up to Copenhagen there has been more of a feeling that we are all in this together—and therefore we all have to do something about it.

POERNBACHER: I'm not disappointed, because we have made many, many steps forward already by just having business committed to this Copenhagen event. In the case of Brazil, business has

ENERGY CONSUMPTION
PER CAPITA, IN MILLIONS
OF BTUs (2007)

AUSTRALIA

295.1

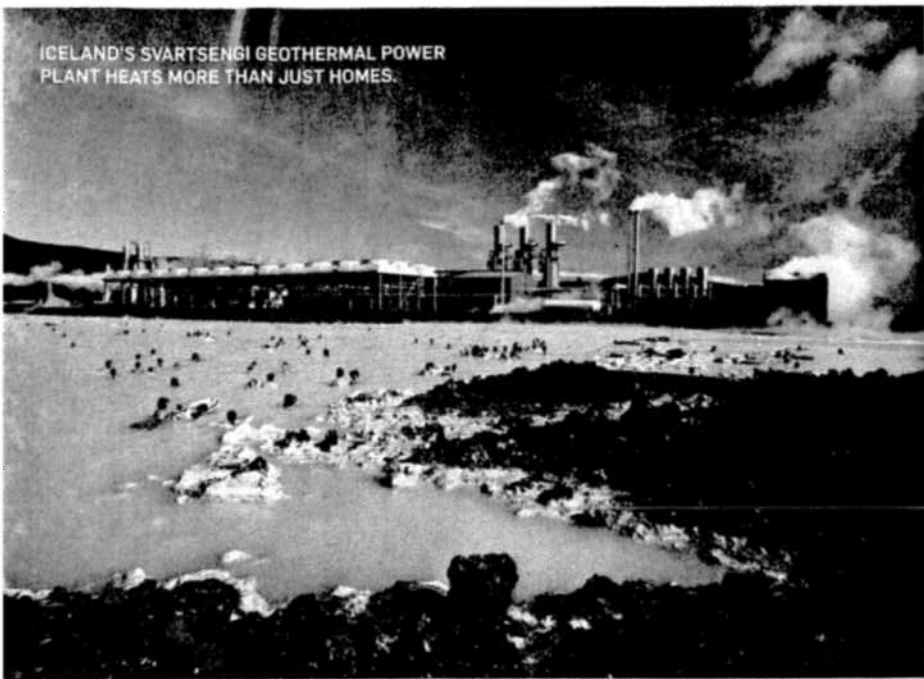
BRAZIL

52.2

CHINA

58.9

ICELAND'S SVARTSENGI GEOTHERMAL POWER PLANT HEATS MORE THAN JUST HOMES.



offered our government suggestions on how to proceed, and we have seen tremendous movement from our government, which is now willing to take steps that would have been unthinkable only a few years ago.

SWARTZ: We may be a very small company, but we are a consumer-facing company, and our sense is that consumers in America are not as encouraged as the others here have suggested. A lot of what characterizes American discourse [on this subject] is not civil and is not progressive. There is a sense that this is another leadership failure in the U.S.

It's often said that what business really wants is policy certainty. Is it really uncertainty that is holding business back?

CHESHIRE: I would say there were a couple of major policy areas where it is very hard to actually think about investment, where you don't quite understand how the metrics will play out—say, about the price of carbon. But in the U.K., for example, we are looking at how to retrofit the housing stock: how do you take what are often quite old buildings and make them much more energy-efficient? If there were

a price for carbon, I could probably [retrofit the heating and lighting of] our 330 stores in the U.K. I can't realistically put my shareholders' money into that just on a guess of what the price of carbon is going to be.

SMITH: I avoid the word "certainty," because what is certain? I do talk about confidence, because we do have to have the confidence to invest. And you build confidence where you can see there is going to be concerted action. I think there is some good news here: there is a set of technologies that can actually solve our problem. What we have got to be now is economically viable so that industry can get them out of the laboratory and operating on an industrial scale, and that means putting a price on carbon and getting the carbon market working.

MORRIN: We don't see the lack of a price for carbon as an excuse for not driving up energy efficiency. We have just moved our people into the 32nd floor of the Empire State Building in New York.

We made an investment out of our own pocket with a very attractive payback that cut the energy bill by 30 percent. The owner is now convinced that he's going to do it for the whole building. If you can do it for the Empire State Building, it's a fair assumption that you can do it for many others. What we would like is more regulatory certainty. That would mean that we saw an acceleration in market demand as improvements became compulsory rather than voluntary.

Isn't there an inherent contradiction between the interests of business and the environment?

CHESHIRE: I don't agree with that at all. I actually think it's going the other way. Customers and employees are actually driving us to be more demonstrably sustainable than we have ever been in the past. Our customers and our teams are much more aware of what we do in the business in terms of how we conduct ourselves and how sustainable our entire business model is. And the price for not being sustainable is frankly going to get higher and higher.

'WE SEE THIS AS THE BIGGEST OPPORTUNITY IN THE WORLD —FOR SCIENTISTS, FOR CREATING NEW JOBS, FOR EVERYTHING.'

POERNBACHER: It would be a contradiction if there aren't common rules for everybody. If we all play by the same rules, I don't see any contradiction. On the contrary, the way we see all this is as the biggest opportunity in the world, whether for scientists or for creating new jobs—for everything. The key point is that everyone should play by the same rules, and then we will have a big opportunity for business worldwide.

PHILIPPE BOURSELLER—THE IMAGE BANK—GETTY IMAGES

ETHIOPIA

1.3

INDIA

17.0

INDONESIA

20.8

JAPAN

176.4

RUSSIA

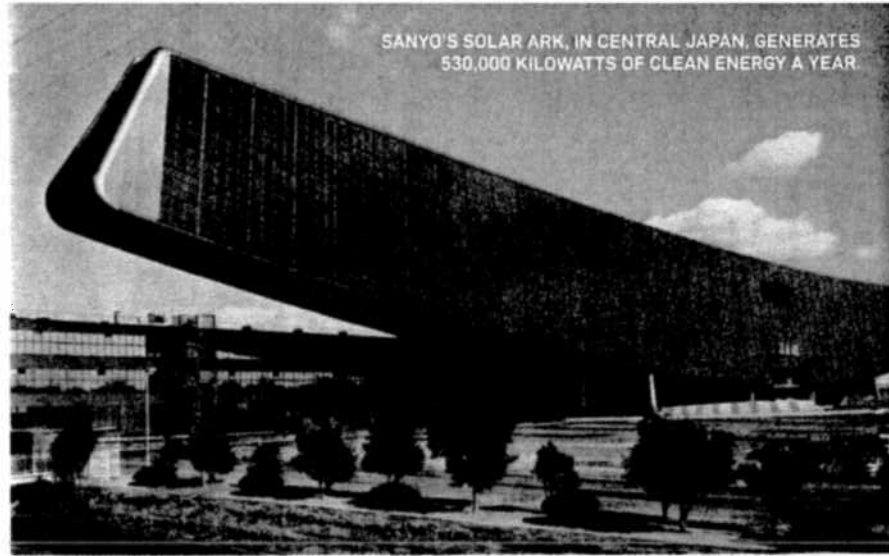
214.7

The changes you envision in the communiqué would be difficult and expensive in the best of times. Aren't they going to be particularly unwelcome at a time of economic crisis?

SWARTZ: To be honest, I think just the opposite. It is going to be good, smart business to be looking at your energy cost. We are a small retailer in the United States. We changed the lights to LEDs and reduced our energy consumption by 80 percent and paid [the costs of] the project back in less than 18 months. This is exactly the point to be looking at every economic opportunity that innovation brings forth. Here's a chance for every rational CFO to look down his or her list and find 10 or 12 different ways to reduce costs and improve the environment. It's not eco-luxury; it is eco-frugality.

SMITH: Climate change will be tackled sooner or later, but later would be very bad. And in a rush we might get hurried legislation that had not been properly thought through. Starting sooner gives us a bit more time to sort out the technologies, more time to get coherence internationally and sort out the policies.

MORRIN: I have been in this sort of role for 20 years, and my experience is that when everyone is fat and happy—as they were until about 18 months ago—a lot of this gets forgotten because every-



or our technical capability, it's about what is our sustainability agenda. These decisions are often taken in the boardroom, not anywhere else, and our CEO is quite often called in not to explain the price but our commitment to environmental responsibility, energy, and wider sustainability.

Do you see wide divergence across the world in attitudes among companies or consumers?

POERNBACHER: What we see from surveys in Brazil is that people want products that are environmentally friendly, but when it comes to paying more for them, it's difficult. But most of our customers are not the end users. And companies [that we supply] are becoming more aware. If we set a price for carbon emissions, it will set a trend for the way to go.

Are you afraid that your motives in signing the communiqué will be interpreted as greenwashing?

MORRIN: If you look at the different stakeholders in society, then those with the greatest ability to help are in the business sector, because we have the management skills and the ability to mobilize the resources. Governments can create the right environment for us to operate, make it more difficult or not,

quicker or slower—but quite often the sort of solutions that are required will have to be delivered by the private sector. NGOs can act as our conscience or as a spur, but they don't have access to the human resources and the financial capital that many large businesses have.

POERNBACHER: In Brazil, in fact, it's business that is pushing the government to take a more positive position and commit to a limit on emissions. The rainforests of the Amazon won't survive if greenhouse-gas concentration continues as it is now. If we destroy our forests, it will be bad for global warming, but if nothing is done, our forests will be killed by the effects of global warming.

If there is one thing you would like to come out of Copenhagen, what would it be?

SWARTZ: A commitment to the notion that social change at this level will require the voice of the private sector at the table.

SMITH: A political agreement to a significant reduction in emissions starting soon.

MORRIN: Business must be seen as part of the solution, and we want to see some very powerful political commitments that are followed up quickly: something that the world will believe in.

'IN AN ECONOMIC DOWNTURN, THE BUSINESS CASE FOR ECO-EFFICIENCY GETS MUCH STRONGER.'

one is too busy making money. While we are in an economic downturn, the business case for environmental responsibility for eco-efficiency or anything else you want to call it actually gets much stronger. With the biggest projects that we win—and for us that's \$1 billion-plus—it's not about the price

IN PARTNERSHIP WITH:



COURTESY OF SANYO ELECTRIC CO., LTD.

SWEDEN
249.3

UNITED KINGDOM
155.7

UNITED STATES
337.1

RESEARCH
BY IAN YARETT
SOURCE: ENERGY
INFORMATION
ADMINISTRATION