

FOIA MARKER

This is not a textual record. This is used as an administrative marker by the William J. Clinton Presidential Library Staff.

Collection/Record Group: Clinton Presidential Records
Subgroup/Office of Origin: WH Task Force on Climate Change
Series/Staff Member: Roger Ballentine; Paul Bledsoe; Julie Anderson
Subseries:

OA/ID Number: 41301
FolderID:

Folder Title:
PCAST [President's Committee of Advisors on Science and Technology] Report, August '99

Stack:	Row:	Section:	Shelf:	Position:
S	100	3	10	2

fax to: Elliott /
Ange

~~MEMO~~
COVER LETTER
PRESS RELEASE
SEND REPORT + CLIPS

to:

- BILL STEVENS
- BOB HERBERT
- BOB SEMPLE
- PETER MILIOS
- MARILYN HAMILTON
- DAVID IGNATIUS

2/21

—

Clinton Presidential Records Digital Records Marker

This is not a presidential record. This is used as an administrative marker by the William J. Clinton Presidential Library Staff.

This marker identifies the place of a publication.

Publications have not been scanned in their entirety for the purpose of digitization. To see the full publication please search online or visit the Clinton Presidential Library's Research Room.

Powerful Partnerships:

A Synthesis of a Report by the President's Committee of Advisors on Science and Technology

“Advanced energy technologies can help meet the challenges of economic development, national security, and environmental quality.” President Bill Clinton, July 23, 1998

It is in our fundamental National interest to greatly strengthen international cooperation in energy innovation. The President's Committee of Advisors on Science and Technology (PCAST) concluded that continuing our current energy trajectory would be “problem plagued and potentially disastrous.” Unless innovation to increase energy end-use efficiency and to improve energy supply technologies is both rapid and global, world energy demand is likely to soar in the next century to four times today's level, entailing higher consumer costs for energy, greater oil-import dependence, worse local and regional air pollution, more pronounced climate disruption from greenhouse gases, and bigger nuclear energy risks than today. And if the United States abdicates leadership in international cooperation on energy technology while others forge ahead, it will cost U.S. firms dearly in their share of the multi-hundred-billion-dollar-per-year global market in energy-supply technologies, most of which is and will remain overseas. As the world heads into the next millennium, however, there is a window of opportunity — open now but closing fast — to move the world off this troublesome path. The choices the United States makes today will influence the evolution of the global energy system for many decades to come (Box 1). The United States has strong stakes in the future economic, national security, and environmental course of world energy development. (See references 1,2.)

Initiatives are recommended in four areas:

- **Strengthening capacities for energy technology innovation** through education and training; creation and support of regional centers for energy research and deployment; promotion of energy sector reform that attracts private capital while protecting the public interest; and creation of mechanisms for demonstration, cost-reduction and financing of advanced energy technologies;
- **Promoting technologies to limit energy demand** by increasing efficiency of energy use, particularly in buildings and appliances, small vehicles and buses, energy-intensive industries, and cogeneration of electricity;
- **Promoting technologies for a cleaner energy supply**, with emphasis on biomass, wind, solar, and other renewable energy sources, using fossil fuels far more efficiently, developing technologies to capture and store carbon, and nuclear fission and fusion; and
- **Improving management of the Federal portfolio**, including with external oversight.

These programs go beyond spurring research and development; they are designed to catalyze and facilitate efforts of the private sector, and will launch advanced energy technologies into substantial international markets, free of the need for ongoing government subsidies.



Panel Urges Boost In Funds to Push Energy Use Abroad

By JOHN J. FIALKA

Staff Reporter of THE WALL STREET JOURNAL

WASHINGTON—A presidential panel urged the government to triple its funding for programs helping energy companies develop and promote new energy technologies abroad.

The head of the President's Committee of Advisors on Science and Technology, John P. Holdren, said the move would recast the programs to ensure U.S. industry benefits from what is expected to be an exploding market for technology in developing countries.

"We ought to be interested in U.S. firms having a substantial part of that action," said Dr. Holdren, a Harvard University environmental scientist.

According to the committee's report, the U.S. spends about \$230 million a year on programs aimed at influencing energy use abroad. The largest share focuses on safety improvements for Soviet-designed nuclear reactors and on an international experiment in fusion energy.

The programs' focus and funding, Dr. Holdren said, "are not at all adequate." The report calls for boosting the budgets for federal agencies involved in the projects to a total of \$750 million a year within the next five years.

The new money would target relatively clean energy technologies, low-energy building designs, more energy-efficient cars and buses and smaller power plants that sell heat as well as electricity.

World energy demand is expected to double by 2025, with about half of the growth in developing countries, the panel said. That would create a "multi-hundred-billion dollar per year" market for U.S. companies that are prepared for it. The government's role in helping to prepare them, the panel said, would include a continuing drive to build safer nuclear-power plants.

"In other parts of the world, natural gas is not so abundant and cheap [as in the U.S.] and somebody is going to build nuclear-power plants there. We need to stay in that market, not just for economic reasons, but for reasons of promoting safety and preventing nuclear proliferation as well," Dr. Holdren said.

Currently, about 78% of the world's energy supply comes from coal, oil and gas, the report said. Continued reliance on fossil-fuel technologies, unless they are improved, would "commit the world to increased smog, acid rain" and risk accelerated global warming, the panel said.

James Ball of the Union of Concerned Scientists called the report "a good beginning," but said it didn't go far enough in promoting solar energy and other devices that don't derive power from a central distribution system. "There is going to be a huge market in developing countries where many homes are simply not connected to any power grid."

Panel member Larry T. Papay, a senior vice president of Bechtel Group Inc.'s Bechtel Technology & Consulting unit, said the committee tried to find a balance between programs for off-grid systems and traditional power systems. "In urban centers there will be the need for grid-connected power . . . so there will definitely be business opportunities," he said.

Panel Urges Boost In Funds to Push Energy Use Abroad

By JOHN J. FIALKA

Staff Reporter of THE WALL STREET JOURNAL

WASHINGTON—A presidential panel urged the government to triple its funding for programs helping energy companies develop and promote new energy technologies abroad.

The head of the President's Committee of Advisors on Science and Technology, John P. Holdren, said the move would recast the programs to ensure U.S. industry benefits from what is expected to be an exploding market for technology in developing countries.

"We ought to be interested in U.S. firms having a substantial part of that action," said Dr. Holdren, a Harvard University environmental scientist.

According to the committee's report, the U.S. spends about \$230 million a year on programs aimed at influencing energy use abroad. The largest share focuses on safety improvements for Soviet-designed nuclear reactors and on an international experiment in fusion energy.

The programs' focus and funding, Dr. Holdren said, "are not at all adequate." The report calls for boosting the budgets for federal agencies involved in the projects to a total of \$750 million a year within the next five years.

The new money would target relatively clean energy technologies, low-energy building designs, more energy-efficient cars and buses and smaller power plants that sell heat as well as electricity.

World energy demand is expected to double by 2025, with about half of the growth in developing countries, the panel said. That would create a "multi-hundred-billion dollar per year" market for U.S. companies that are prepared for it. The government's role in helping to prepare them, the panel said, would include a continuing drive to build safer nuclear-power plants.

"In other parts of the world, natural gas is not so abundant and cheap [as in the U.S.] and somebody is going to build nuclear-power plants there. We need to stay in that market, not just for economic reasons, but for reasons of promoting safety and preventing nuclear proliferation as well," Dr. Holdren said.

Currently, about 78% of the world's energy supply comes from coal, oil and gas, the report said. Continued reliance on fossil-fuel technologies, unless they are improved, would "commit the world to increased smog, acid rain" and risk accelerated global warming, the panel said.

James Ball of the Union of Concerned Scientists called the report "a good beginning," but said it didn't go far enough in promoting solar energy and other devices that don't derive power from a central distribution system. "There is going to be a huge market in developing countries where many homes are simply not connected to any power grid."

Panel member Larry T. Papay, a senior vice president of Bechtel Group Inc.'s Bechtel Technology & Consulting unit, said the committee tried to find a balance between programs for off-grid systems and traditional power systems. "In urban centers there will be the need for grid-connected power . . . so there will definitely be business opportunities," he said.

Panel Urges Boost In Funds to Push Energy Use Abroad

By JOHN J. FIALKA

Staff Reporter of THE WALL STREET JOURNAL
WASHINGTON—A presidential panel urged the government to triple its funding for programs helping energy companies develop and promote new energy technologies abroad.

The head of the President's Committee of Advisors on Science and Technology, John P. Holdren, said the move would recast the programs to ensure U.S. industry benefits from what is expected to be an exploding market for technology in developing countries.

"We ought to be interested in U.S. firms having a substantial part of that action," said Dr. Holdren, a Harvard University environmental scientist.

According to the committee's report, the U.S. spends about \$230 million a year on programs aimed at influencing energy use abroad. The largest share focuses on safety improvements for Soviet-designed nuclear reactors and on an international experiment in fusion energy.

The programs' focus and funding, Dr. Holdren said, "are not at all adequate." The report calls for boosting the budgets for federal agencies involved in the projects to a total of \$750 million a year within the next five years.

The new money would target relatively clean energy technologies, low-energy building designs, more energy-efficient cars and buses and smaller power plants that sell heat as well as electricity.

World energy demand is expected to double by 2025, with about half of the growth in developing countries, the panel said. That would create a "multi-hundred-billion dollar per year" market for U.S. companies that are prepared for it. The government's role in helping to prepare them, the panel said, would include a continuing drive to build safer nuclear-power plants.

"In other parts of the world, natural gas is not so abundant and cheap [as in the U.S.] and somebody is going to build nuclear-power plants there. We need to stay in that market, not just for economic reasons, but for reasons of promoting safety and preventing nuclear proliferation as well," Dr. Holdren said.

Currently, about 78% of the world's energy supply comes from coal, oil and gas, the report said. Continued reliance on fossil-fuel technologies, unless they are improved, would "commit the world to increased smog, acid rain" and risk accelerated global warming, the panel said.

James Ball of the Union of Concerned Scientists called the report "a good beginning," but said it didn't go far enough in promoting solar energy and other devices that don't derive power from a central distribution system. "There is going to be a huge market in developing countries where many homes are simply not connected to any power grid."

Panel member Larry T. Papay, a senior vice president of **Bechtel Group Inc.**'s Bechtel Technology & Consulting unit, said the committee tried to find a balance between programs for off-grid systems and traditional power systems. "In urban centers there will be the need for grid-connected power . . . so there will definitely be business opportunities," he said.

Panel Urges Boost In Funds to Push Energy Use Abroad

By JOHN J. FIALKA

Staff Reporter of THE WALL STREET JOURNAL

WASHINGTON—A presidential panel urged the government to triple its funding for programs helping energy companies develop and promote new energy technologies abroad.

The head of the President's Committee of Advisors on Science and Technology, John P. Holdren, said the move would recast the programs to ensure U.S. industry benefits from what is expected to be an exploding market for technology in developing countries.

"We ought to be interested in U.S. firms having a substantial part of that action," said Dr. Holdren, a Harvard University environmental scientist.

According to the committee's report, the U.S. spends about \$230 million a year on programs aimed at influencing energy use abroad. The largest share focuses on safety improvements for Soviet-designed nuclear reactors and on an international experiment in fusion energy.

The programs' focus and funding, Dr. Holdren said, "are not at all adequate." The report calls for boosting the budgets for federal agencies involved in the projects to a total of \$750 million a year within the next five years.

The new money would target relatively clean energy technologies, low-energy building designs, more energy-efficient cars and buses and smaller power plants that sell heat as well as electricity.

World energy demand is expected to double by 2025, with about half of the growth in developing countries, the panel said. That would create a "multi-hundred-billion dollar per year" market for U.S. companies that are prepared for it. The government's role in helping to prepare them, the panel said, would include a continuing drive to build safer nuclear-power plants.

"In other parts of the world, natural gas is not so abundant and cheap [as in the U.S.] and somebody is going to build nuclear-power plants there. We need to stay in that market, not just for economic reasons, but for reasons of promoting safety and preventing nuclear proliferation as well," Dr. Holdren said.

Currently, about 78% of the world's energy supply comes from coal, oil and gas, the report said. Continued reliance on fossil-fuel technologies, unless they are improved, would "commit the world to increased smog, acid rain" and risk accelerated global warming, the panel said.

James Ball of the Union of Concerned Scientists called the report "a good beginning," but said it didn't go far enough in promoting solar energy and other devices that don't derive power from a central distribution system. "There is going to be a huge market in developing countries where many homes are simply not connected to any power grid."

Panel member Larry T. Papay, a senior vice president of **Bechtel Group Inc.**'s Bechtel Technology & Consulting unit, said the committee tried to find a balance between programs for off-grid systems and traditional power systems. "In urban centers there will be the need for grid-connected power . . . so there will definitely be business opportunities," he said.

A Clinton administration panel says the government should triple funding for programs that help US companies develop and promote new energy technologies abroad.

The report by the President's Committee of Advisors on Science and Technology recommends boosting funding for the projects to \$750 million a year within the next five years. The money would be used to promote relatively clean energy technologies, low-energy building designs, energy-efficient automobiles and smaller power plants that sell heat as well as electricity.

Panel head John P. Holdren of Harvard U. said the extra money would help ensure that US companies benefit from what is expected to be an "exploding" market in developing nations. The panel also says that continued reliance on fossil-fuel technologies would "commit the world to increased smog, acid rain" and global warming.

James Ball of the Union of Concerned Scientists called the report "a good beginning" but said it does not sufficiently promote solar energy and other systems that don't rely on a central distribution system (John J. Fialka, Wall Street Journal, Aug. 20). -- MB

===== WASTES AND HAZARDOUS SUBSTANCES =====

*3 YUCCA MOUNTAIN: EPA Releases Draft Radiation Standards

The US EPA yesterday issued draft environmental radiation standards that the proposed Yucca Mountain nuclear waste repository site would have to meet to be licensed for operation.

The standards seek to protect public health and the environment from wastes that would be stored and disposed in the underground repository. According to the draft, the DOE must demonstrate "that there is a reasonable expectation that for 10,000 years following disposal the reasonably maximally exposed individual receives no more than an annual dose equivalent of 150 microsieverts (15 mrem)." The EPA will accept public comments for 90 days.

The draft follows an environmental impact statement (EIS) released earlier this month by the Energy Dept., which showed that "very little" radiation would leak from the proposed Yucca Mountain site. The report concluded that the Nevada site would be much cheaper and as safe as storing the waste at 72 commercial reactor and five DOE sites across the US, as is done now (Greenwire, Aug. 9) (EPA release, Aug. 19).

Meanwhile, the Yucca Mountain project would face "major layoffs and delays" if Congress cuts the DOE's budget too much. Pres. Clinton proposed allocating \$409 million to continue scientific studies of the mountain, but the House has reduced that number to \$280 million and the Senate has offered \$355 million (Mary Manning, Las Vegas Sun, Aug. 18).

PAPERS COMMENT ON STUDIES

A Seattle Post-Intelligencer editorial said that Congress "ought to insist" on an independent economic analysis of the site. The paper: "The DOE hasn't given enough realistic thought to what will happen to Nevada's climate over 10,000 -- or even 1,000 -- years" (Aug. 11).

And the Las Vegas Sun writes that politics "has trumped

A Clinton administration panel says the government should triple funding for programs that help US companies develop and promote new energy technologies abroad.

The report by the President's Committee of Advisors on Science and Technology recommends boosting funding for the projects to \$750 million a year within the next five years. The money would be used to promote relatively clean energy technologies, low-energy building designs, energy-efficient automobiles and smaller power plants that sell heat as well as electricity.

Panel head John P. Holdren of Harvard U. said the extra money would help ensure that US companies benefit from what is expected to be an "exploding" market in developing nations. The panel also says that continued reliance on fossil-fuel technologies would "commit the world to increased smog, acid rain" and global warming.

James Ball of the Union of Concerned Scientists called the report "a good beginning" but said it does not sufficiently promote solar energy and other systems that don't rely on a central distribution system (John J. Fialka, Wall Street Journal, Aug. 20). -- MB

===== WASTES AND HAZARDOUS SUBSTANCES =====

*3 YUCCA MOUNTAIN: EPA Releases Draft Radiation Standards

The US EPA yesterday issued draft environmental radiation standards that the proposed Yucca Mountain nuclear waste repository site would have to meet to be licensed for operation.

The standards seek to protect public health and the environment from wastes that would be stored and disposed in the underground repository. According to the draft, the DOE must demonstrate "that there is a reasonable expectation that for 10,000 years following disposal the reasonably maximally exposed individual receives no more than an annual dose equivalent of 150 microsieverts (15 mrem)." The EPA will accept public comments for 90 days.

The draft follows an environmental impact statement (EIS) released earlier this month by the Energy Dept., which showed that "very little" radiation would leak from the proposed Yucca Mountain site. The report concluded that the Nevada site would be much cheaper and as safe as storing the waste at 72 commercial reactor and five DOE sites across the US, as is done now (Greenwire, Aug. 9) (EPA release, Aug. 19).

Meanwhile, the Yucca Mountain project would face "major layoffs and delays" if Congress cuts the DOE's budget too much. Pres. Clinton proposed allocating \$409 million to continue scientific studies of the mountain, but the House has reduced that number to \$280 million and the Senate has offered \$355 million (Mary Manning, Las Vegas Sun, Aug. 18).

PAPERS COMMENT ON STUDIES

A Seattle Post-Intelligencer editorial said that Congress "ought to insist" on an independent economic analysis of the site. The paper: "The DOE hasn't given enough realistic thought to what will happen to Nevada's climate over 10,000 -- or even 1,000 -- years" (Aug. 11).

And the Las Vegas Sun writes that politics "has trumped

A Clinton administration panel says the government should triple funding for programs that help US companies develop and promote new energy technologies abroad.

The report by the President's Committee of Advisors on Science and Technology recommends boosting funding for the projects to \$750 million a year within the next five years. The money would be used to promote relatively clean energy technologies, low-energy building designs, energy-efficient automobiles and smaller power plants that sell heat as well as electricity.

Panel head John P. Holdren of Harvard U. said the extra money would help ensure that US companies benefit from what is expected to be an "exploding" market in developing nations. The panel also says that continued reliance on fossil-fuel technologies would "commit the world to increased smog, acid rain" and global warming.

James Ball of the Union of Concerned Scientists called the report "a good beginning" but said it does not sufficiently promote solar energy and other systems that don't rely on a central distribution system (John J. Fialka, Wall Street Journal, Aug. 20). -- MB

===== WASTES AND HAZARDOUS SUBSTANCES =====

*3 YUCCA MOUNTAIN: EPA Releases Draft Radiation Standards

The US EPA yesterday issued draft environmental radiation standards that the proposed Yucca Mountain nuclear waste repository site would have to meet to be licensed for operation.

The standards seek to protect public health and the environment from wastes that would be stored and disposed in the underground repository. According to the draft, the DOE must demonstrate "that there is a reasonable expectation that for 10,000 years following disposal the reasonably maximally exposed individual receives no more than an annual dose equivalent of 150 microsieverts (15 mrem)." The EPA will accept public comments for 90 days.

The draft follows an environmental impact statement (EIS) released earlier this month by the Energy Dept., which showed that "very little" radiation would leak from the proposed Yucca Mountain site. The report concluded that the Nevada site would be much cheaper and as safe as storing the waste at 72 commercial reactor and five DOE sites across the US, as is done now (Greenwire, Aug. 9) (EPA release, Aug. 19).

Meanwhile, the Yucca Mountain project would face "major layoffs and delays" if Congress cuts the DOE's budget too much. Pres. Clinton proposed allocating \$409 million to continue scientific studies of the mountain, but the House has reduced that number to \$280 million and the Senate has offered \$355 million (Mary Manning, Las Vegas Sun, Aug. 18).

PAPERS COMMENT ON STUDIES

A Seattle Post-Intelligencer editorial said that Congress "ought to insist" on an independent economic analysis of the site. The paper: "The DOE hasn't given enough realistic thought to what will happen to Nevada's climate over 10,000 -- or even 1,000 -- years" (Aug. 11).

And the Las Vegas Sun writes that politics "has trumped

THE WHITE HOUSE**Office of Science and Technology Policy****For Immediate Release**

August 19, 1999

MEDIA ADVISORY Contacts:

Dr. Joan Porter (PCAST) (202/456-6101)

Dr. John Holdren (617/495-1464)

**President's Committee on Science and Technology Finds
Soaring Worldwide Energy Demand "Potentially Disastrous"
Unless U.S. Makes Clean Technology and Efficiency Investments**

Investments Would Yield Huge Foreign Markets, Avoid Environmental Risk

Washington, D.C. -- A report released today by the President's Committee of Advisors on Science and Technology (PCAST) concludes that projected growth in energy usage worldwide could be "potentially disastrous" for the environment and calls for greater public and private investment by the United States in clean energy technology, in cooperation with international partners.

At the same time, the report, notes that U.S. firms would greatly benefit from such investments, helping them capture much of the \$10 trillion which will be spent worldwide for energy supply technologies over the next 20 years.

Dr. John Holdren of Harvard University and Chair of the PCAST Energy Panel said, "The world faces more severe air pollution, greater oil insecurity, heightened threat of global climatic changes, and increased nuclear proliferation risks unless we increase investments in international cooperation on clean energy technology and efficiency now."

The Panel found that world energy demand is likely to soar in the next century to four times today's level. Reductions in projected energy demand would not happen, the panel said, unless innovation to increase energy end-use efficiency and to improve energy supply technologies is both rapid and global.

Dr. Neal F. Lane, Assistant to the President for Science and Technology and Co Chair of PCAST, said, "Tremendous export markets will develop for advanced fossil fuel, renewable, and other clean energy technologies in the very near future. U.S. firms can position themselves to capture a much larger portion of those markets if government and industry make the right decisions now."

Overall, the report finds that the choices the U.S. makes today on research development and deployment opportunities will influence the evolution of the global energy system for many decades, and have a tremendous impact on efforts to fight global warming, air pollution, oil insecurity and other problems energy use will cause.

The report was prepared in response to a request from President Clinton to identify ways to improve the U.S. program of international cooperation on energy R&D to best support our nation's priorities and address the key global energy and environmental challenges of the next century.

The PCAST panel which produced the report identified four sets of initiatives to help address these problems, requiring an additional government investment of about \$250 million per year in FY2001, increasing to \$500 million more per year in FY2005. The recommended initiatives include:

- ~Strengthening energy-related education and training; supporting regional centers for energy research and employment; promoting energy sector reform that attracts private capital while protecting the public interest; and creating mechanisms to assist competitive demonstration, cost-reduction, and financing of advanced energy technologies;
- ~Developing and promoting technologies to halve the energy use of new building, build the factories of the 21st century, improve the efficiency of small vehicles and buses, and increase cogeneration of electricity and heat;
- ~Developing and promoting cleaner energy supply technologies, particularly biomass, wind, solar, and other renewable energy sources, more efficient fossil fuel systems, technologies to capture and store carbon, and nuclear fission and fusion; and
- ~Improving management of the Federal portfolio, including greater use of external peer review.

The PCAST panel responsible for the report is made of a diverse group of experts from industry, academic, and non-governmental organizations with a variety of backgrounds and perspectives. In addition to energy expert John Holdren, the report panel included PCAST members John Young (former CEO of Hewlett-Packard Co. and PCAST Co-Chair), John M. Deutch (Massachusetts Institute of Technology), Lilian Shiao-Yen Wu (IBM); industry representatives Richard Balzhiser (President Emeritus of the Electric Power Research Institute), Larry Papay (Vice President of Bechtel), Maxine Savitz (Allied Signal Ceramic Components), Bruce Stram (VP of Enron Energy Services); and others from diverse backgrounds, John P. Boright (National Research Council), William Chandler (Battelle Pacific Northwest National Laboratory), Howard Geller (American Council for an Energy Efficient Economy), John H. Gibbons (Assistant to the President for Science and Technology, ret.), Nathan Rosenberg (Stanford University), and Robert Williams (Princeton University). Despite this diversity, these members and PCAST were unanimous in the recommendations.

A summary of the report: *Powerful Partnerships: A Synthesis of a Report by PCAST* can be accessed at:<http://www.whitehouse.gov/WH/EOP/OSTP/html/new.html>

The full PCAST report can be found at: *Powerful Partnerships: The Federal Role in International Cooperation on Energy Innovation* can be accessed at:
http://www.whitehouse.gov/WH/EOP/OSTP/html/OSTP_Home.html

FACSIMILE TRANSMITTAL SHEET



OSTP - Environment Division

Office of Science and Technology Policy
Executive Office of the President
Old Executive Office Building, Room 443
Washington, DC 20502
202-456-6202 (main)

TO: PAUL BLEDSOE URGENT

FAX: 208 3381 VOICE: _____

FROM: ROSINA M. BIERBAUM - Associate Director
(v): 202-456-6202 (f): 202-456-6025 (e-mail): rbierbaum@ostp.eop.gov

DATE: _____ # of Pages (including this cover page): 3

Should you have difficulties receiving this fax in its entirety, please call (202) 456-6202.

COMMENTS:

Here 'tis
I fixed web site address &
removed a double sentence --
will e-mail back to you &
to Elliot. ROSINA

THE WHITE HOUSE**Office of Science and Technology Policy****For Immediate Release**

August 19, 1999

MEDIA ADVISORY Contacts:

Dr. Joan Porter (PCAST) (202/456-6101)

Dr. John Holdren (617/495-1464)

**President's Committee on Science and Technology Finds
Soaring Worldwide Energy Demand "Potentially Disastrous"
Unless U.S. Makes Clean Technology and Efficiency Investments**

Investments Would Yield Huge Foreign Markets, Avoid Environmental Risk

Washington, D.C. — A report released today by the President's Committee of Advisors on Science and Technology (PCAST) concludes that projected growth in energy usage worldwide could be "potentially disastrous" for the environment and calls for greater public and private investment by the United States in clean energy technology, in cooperation with international partners.

At the same time, the report, notes that U.S. firms would greatly benefit from such investments, helping them capture much of the \$10 trillion which will be spent worldwide for energy supply technologies over the next 20 years.

Dr. John Holdren of Harvard University and Chair of the PCAST Energy Panel said, "The world faces more severe air pollution, greater oil insecurity, heightened threat of global climatic changes, and increased nuclear proliferation risks unless we increase investments in international cooperation on clean energy technology and efficiency now."

The Panel found that world energy demand is likely to soar in the next century to four times today's level. Reductions in projected energy demand would not happen, the panel said, unless innovation to increase energy end-use efficiency and to improve energy supply technologies is both rapid and global.

Dr. Neal F. Lane, Assistant to the President for Science and Technology and Co Chair of PCAST, said, "Tremendous export markets will develop for advanced fossil fuel, renewable, and other clean energy technologies in the very near future. U.S. firms can position themselves to capture a much larger portion of those markets if government and industry make the right decisions now."

Overall, the report finds that the choices the U.S. makes today on research development and deployment opportunities will influence the evolution of the global energy system for many decades, and have a tremendous impact on efforts to fight global warming, air pollution, oil insecurity and other problems energy use will cause.

The report was prepared in response to a request from President Clinton to identify ways to improve the U.S. program of international cooperation on energy R&D to best support our nation's priorities and address the key global energy and environmental challenges of the next century.

The PCAST panel which produced the report identified four sets of initiatives to help address these problems, requiring an additional government investment of about \$250 million per year in FY2001, increasing to \$500 million more per year in FY2005. The recommended initiatives include:

~Strengthening energy-related education and training; supporting regional centers for energy research and employment; promoting energy sector reform that attracts private capital while protecting the public interest; and creating mechanisms to assist competitive demonstration, cost-reduction, and financing of advanced energy technologies;

~Developing and promoting technologies to halve the energy use of new building, build the factories of the 21st century, improve the efficiency of small vehicles and buses, and increase cogeneration of electricity and heat;

~Developing and promoting cleaner energy supply technologies, particularly biomass, wind, solar, and other renewable energy sources, more efficient fossil fuel systems, technologies to capture and store carbon, and nuclear fission and fusion; and

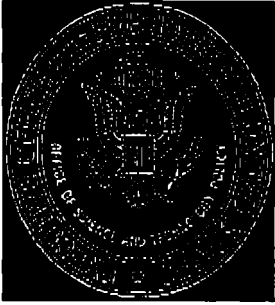
~Improving management of the Federal portfolio, including greater use of external peer review.

The PCAST panel responsible for the report is made of a diverse group of experts from industry, academic, and non-governmental organizations with a variety of backgrounds and perspectives. In addition to energy expert John Holdren, the report panel included PCAST members John Young (former CEO of Hewlett-Packard Co. and PCAST Co-Chair), John M. Deutch (Massachusetts Institute of Technology), Lilian Shiao-Yen Wu (IBM); industry representatives Richard Balzhiser (President Emeritus of the Electric Power Research Institute), Larry Papay (Vice President of Bechtel), Maxine Savitz (Allied Signal Ceramic Components), Bruce Stram (VP of Enron Energy Services); and others from diverse backgrounds, John P. Boright (National Research Council), William Chandler (Battelle Pacific Northwest National Laboratory), Howard Geller (American Council for an Energy Efficient Economy), John H. Gibbons (Assistant to the President for Science and Technology, ret.), Nathan Rosenberg (Stanford University), and Robert Williams (Princeton University). Despite this diversity, these members and PCAST were unanimous in the recommendations.

A summary of the report: *Powerful Partnerships: A Synthesis of a Report by PCAST* can be accessed at:<http://www.whitehouse.gov/WH/EOP/OSTP/html/new.html>

The full PCAST report can be found at: *Powerful Partnerships: The Federal Role in International Cooperation on Energy Innovation* can be accessed at:
http://www.whitehouse.gov/WH/EOP/OSTP/html/OSTP_Home.html

FACSIMILE TRANSMITTAL SHEET



OSTP - Environment Division

Office of Science and Technology Policy
Executive Office of the President
Old Executive Office Building, Room 443
Washington, DC 20502
202-456-6202 (main)

(Same as previous fax, but want clear it went)

TO: PAUL BLEDSOE

URGENT

FAX: 208 3381

VOICE:

FROM: ROSINA M. BIERBAUM - Associate Director

(v): 202-456-6202

(f): 202-456-6025

(e-mail): rbierbaum@ostp.eop.gov

DATE: _____ # of Pages (including this cover page): 3

Should you have difficulties receiving this fax in its entirety, please call (202) 456-6202.

COMMENTS:

Here 'tis

I fixed web site address &

removed a double sentence

will e-mail back to you &

to Elliot. ROSINA



**United States
Department of the Interior**

FAX

DATE:

TO:

Bill STEVENS.

OFFICE:

FAX NUMBER:

212-556-7306

NUMBER OF PAGES TO FOLLOW:

8

FROM:

Paul Bledsoe

OFFICE OF THE SECRETARY

Office of Communications and Media Affairs

U.S. Department of the Interior

1849 C Street NW, Washington DC 20242

Phone: (202) 208-6416

Fax: (202) 208-5133

E-MAIL: paul_bledsoe@ios.doi.gov

8/19/99

To: Patrick Connors
or

EDDIE EVANS

7 pages

Congress and Global Warming: Short-Changing Our Future

While the evidence of global warming continues to mount, some in Congress are trying to strangle common-sense programs that save energy, save consumers and businesses money, and reduce global warming pollution. Appropriations bills working their way through Congress deny funding increases proposed by President Clinton to accelerate research and development of clean energy technologies for the 21st century. What's more, many of the bills include legislative "riders" that would throw roadblocks in the way of any Administration efforts to address climate change.

Special-Interest Assaults on Common-Sense Programs. Restrictive language attached to a number of fiscal year 2000 spending bills would put climate policy in a straitjacket. The Administration recently fought off or weakened some of the most far-fetched of these special-interest "riders." One sought to suppress scientific research on climate, and another tried to bar implementation of the President's new executive order to reduce federal energy use and save taxpayers \$750 million a year.

Still alive, however, is the Knollenberg rider. Building on a similar provision in last year's VA-HUD Appropriations bill, the language purports merely to prohibit implementation of the Kyoto Protocol in advance of Senate ratification. In practice, though, it would give naysayers in Congress a toe-hold to object to virtually all aspects of Administration climate policies, even when they clearly save money for consumers and businesses. Potential impacts include:

- **Rolling back voluntary programs to reduce energy waste and greenhouse gas emissions.** Report language from the House VA-HUD Appropriations Subcommittee seeks to vastly expand the prohibition on Kyoto-related activities to cover "non-regulatory actions, such as programs and initiatives." This undoes an agreement reached last year to ensure continuation of successful voluntary programs such as Green Lights and Energy Star, which have a proven track record of saving money for both consumers and businesses. In addition, it would block legitimate climate research and policy analysis.
- **Dictating Scientific Process.** The Report language also would require that a small minority of critics be given equal standing with mainstream scientists in educational seminars or activities -- even on questions about which there is broad scientific consensus. This is the kind of "balance" that tobacco companies used to fight for on the dangers of smoking.
- **Unconstitutional interference?** This year the rider has been attached to a wide range of spending bills, including those funding the State Department, the Agency for International Development, the Department of Energy, the Department of the Interior, the Environmental Protection Agency, NASA, the National Oceanic and Atmospheric Administration, and the National Science Foundation. Applying these restrictions to international negotiations and activities raises serious Constitutional concerns and could prevent the Administration from advancing bipartisan objectives of engaging developing countries and reducing the cost of addressing climate change.

Smart Investments At Risk. The Administration secured a record \$1 billion in fiscal year 1999

for the Climate Change Technology Initiative (CCTI), a package of investments to research, develop and deploy energy efficiency technology and renewable energy. For fiscal year 2000, the Administration is proposing \$1.37 billion for investments in forward-thinking clean energy technologies -- a 34 percent increase over. So far, Congress has appropriated almost none of this increase. Examples where CCTI and other climate-related investments are being under-funded include:

- ***Weatherization Assistance and State Grants.*** *FY 2000 request: \$191 million; Congress under-funding by \$25 million.* The same week dozens of older Americans are dying from the heat, Congress is short-changing this program to deliver conservation services, such as insulation, to millions of low-income families. The program improves health and safety, reduces carbon emissions, and reduces energy costs for those least able to afford them.
- ***Renewable Energy.*** *FY 2000 request: \$399 million; Congress under-funding by about \$90 million.* Federal R&D investments can help make clean energy technologies such as wind, solar, bioenergy, and geothermal energy affordable for American consumers. Current spending bills, however, would *cut these efforts below FY 1999 levels* by some \$27 million-\$35 million.
- ***Partnership for a New Generation of Vehicles.*** *FY 2000 request: \$264 million; Congress currently under-funding by \$58 million.* PNGV is a partnership between the federal government and automakers to develop cars with three times the fuel economy of today's models with no sacrifice in comfort or performance. At current House and Senate levels, the program would not meet its technical objectives and would have to terminate a number of promising efforts, such as developing highly efficient high-power energy storage devices and the development of advanced fuel cells.
- ***Clean Air Partnership Fund.*** *FY 2000 request: \$200 million; Congress under-funding by \$159 million.* This initiative would provide grants to state and local governments for projects that reduce both greenhouse gases and pollutants like soot, smog and air toxics.



Powerful Partnerships: A Synthesis of a Report by the President's Committee of Advisors on Science and Technology

"Advanced energy technologies can help meet the challenges of economic development, national security, and environmental quality." President Bill Clinton, July 23, 1998

It is in our fundamental National interest to greatly strengthen international cooperation in energy innovation. The President's Committee of Advisors on Science and Technology (PCAST) concluded that continuing our current energy trajectory would be "problem plagued and potentially disastrous." Unless innovation to increase energy end-use efficiency and to improve energy supply technologies is both rapid and global, world energy demand is likely to soar in the next century to four times today's level, entailing higher consumer costs for energy, greater oil-import dependence, worse local and regional air pollution, more pronounced climate disruption from greenhouse gases, and bigger nuclear energy risks than today. And if the United States abdicates leadership in international cooperation on energy technology while others forge ahead, it will cost U.S. firms dearly in their share of the multi-hundred-billion-dollar-per-year global market in energy-supply technologies, most of which is and will remain overseas. As the world heads into the next millennium, however, there is a window of opportunity — open now but closing fast — to move the world off this troublesome path. The choices the United States makes today will influence the evolution of the global energy system for many decades to come (Box 1). The United States has strong stakes in the future economic, national security, and environmental course of world energy development. (See references 1.2.)

Initiatives are recommended in four areas:

- **Strengthening capacities for energy technology innovation** through education and training; creation and support of regional centers for energy research and deployment; promotion of energy sector reform that attracts private capital while protecting the public interest; and creation of mechanisms for demonstration, cost-reduction and financing of advanced energy technologies;
- **Promoting technologies to limit energy demand** by increasing efficiency of energy use, particularly in buildings and appliances, small vehicles and buses, energy-intensive industries, and cogeneration of electricity;
- **Promoting technologies for a cleaner energy supply**, with emphasis on biomass, wind, solar, and other renewable energy sources, using fossil fuels far more efficiently, developing technologies to capture and store carbon, and nuclear fission and fusion; and
- **Improving management** of the Federal portfolio, including with external oversight.

These programs go beyond spurring research and development; they are designed to catalyze and facilitate efforts of the private sector, and will launch advanced energy technologies into substantial international markets, free of the need for ongoing government subsidies.



August 1999

Neal F. Lane

Assistant to the President
for Science and Technology
PCAST CoChair

John A. Young

Hewlett-Packard Co.
PCAST CoChair

Norman R. Augustine

Lockheed Martin Corporation

Francisco J. Ayala

University of California, Irvine

John M. Deutch

Massachusetts Institute of Technology

Murray Gell-Mann

California Institute of Technology

David A. Hamburg

Carnegie Corporation of New York

John P. Holdren

Harvard University

Diana MacArthur

Dynamac Corporation

Shirley M. Malcom

American Association for the
Advancement of Science

Mario J. Molina

Massachusetts Institute of Technology

Peter H. Raven

Washington University, Saint Louis

Sally K. Ride

University of California, San Diego

Judith Rodin

University of Pennsylvania

Charles A. Sanders

Glaxo-Wellcome, Inc.

David E. Shaw

D.E. Shaw & Co. and
Juno Online Services

Charles M. Vest

Massachusetts Institute of Technology

Virginia V. Weldon

Washington University, St. Louis

Lilian Shiao-Yen Wu

IBM

Executive Secretary

Joan P. Porter

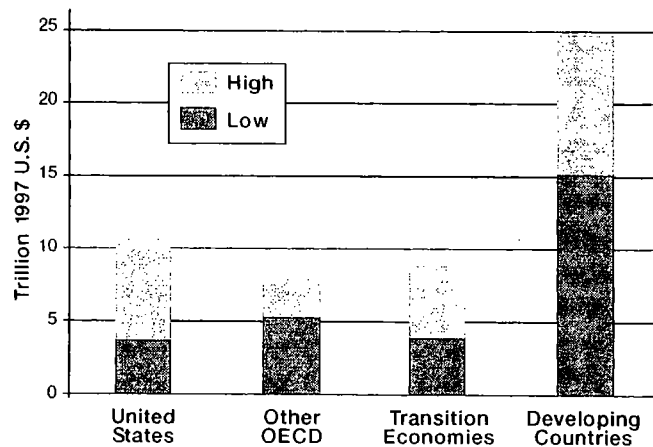
Energy use will grow dramatically worldwide—particularly in developing nations.

Most of the twenty-fold world energy growth since 1850 has occurred in the industrial countries, and fossil fuels account for 78 percent of the world's energy supply (Figure 2). In the next two decades, however, over half of global energy growth will be in the developing and transition economies as those nations improve their standard of living. This growth will reduce the disparities in present per capita energy use (Figure 3) and improve well-being for the poorer inhabitants of the planet, but this rapid growth in total world energy use could further exacerbate the energy-linked problems and challenges already of great concern today.

Technological innovation and the policies adopted to promote efficient and clean energy technologies will determine the quantity of energy used in the future and the impact of that energy use. An energy future that continues recent trends, including heavy reliance on conventional fossil fuel technologies, would commit the world to increased smog, acid rain, and other conventional air pollution problems, as well as the risk of climate change from increasing atmospheric carbon dioxide, approaching levels not seen on the planet for millions of years. Vigorous deployment of energy efficiency technologies, on the other hand, would mean the difference between doubling and quadrupling world energy supply by 2100 — a quantity of energy equal to the current oil output of nearly 50 Saudi Arabias — reducing the economic and national security consequences of such massive growth. Use of clean fossil, nuclear and renewable energy technologies means avoiding many of the environmental impacts looming in the coming century (Figure 2).

A significant portion of the demand for new energy technologies will be outside of the United States under any future scenario. Between now and 2050, investments in new energy technologies in developing nations will likely approach \$15 to \$25 trillion dollars, accounting for more than half of the global investments in energy supply (Figure 1). Ninety percent of the markets for coal, nuclear, and renewable energy technologies are expected to be outside of the United States in the coming decades. Strategic investments today — by the U.S. government and the private sector — will assist strong participation in those markets tomorrow.

Figure 1: Projected Total Investment in Energy-Supply



Future investments in energy supply technologies will be much larger outside the United States. Developing countries will account for the largest share — roughly \$15-25 trillion from 1990-2050. Energy efficiency investments will be of similar magnitude as countries develop their buildings, industry, and transport infrastructures. Adapted from (3).



Box 2: The Window of Opportunity

- *Energy-sector restructuring and regulatory reform* in many countries will be largely completed over the next decade and will “lock in” the mechanisms determining success or failure in the dual aims of attracting private capital and addressing public benefits.
- *Rapid urbanization* will “lock in” land-use patterns and infrastructure — including the configuration of urban transportation networks, patterns of urban sprawl, and building design — for a century or more.
- *Investments in energy research, development, demonstration, and deployment made today* will influence the characteristics of the world energy system for many decades. Many energy technologies deployed between now and 2020 will still be in operation in 2050. Investments made today in research and development will determine the new technologies available for deployment between 2020 and 2050. Thus, today’s choices will strongly influence energy costs, greenhouse gas emissions, oil dependence, proliferation resistance, and public-health impacts for the balance of the next century.

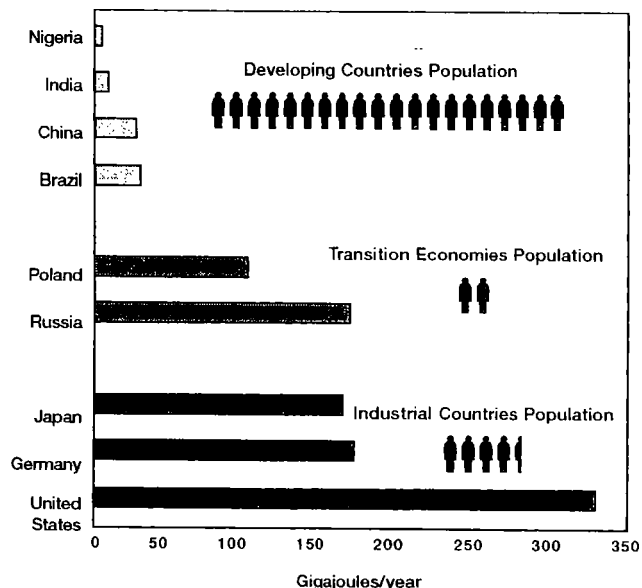
Government has a critical and legitimate role to play. The private sector plays the major role in energy innovation and related international cooperation. Private-sector investments alone, however, will not adequately capture the full range of public benefits — like reduced pollution, increased energy security, long-term technology innovation, and developmental equity issues. Government activities focused on filling the gaps in private-sector investment can achieve significant benefits for the United States.


Current government programs cannot meet the challenges of future global energy growth. In 1997, government expenditures on international cooperation on energy innovation amounted to about \$250 million per year, but these funds were primarily in nuclear fission and fusion. The government has few programs to bridge the gap between R&D and commercial deployment. The lack of government programs for the middle part of the technology innovation “pipeline” — demonstration and early deployment — impedes the commercialization of innovative energy technologies (Figure 4). To address the full spectrum of energy technology needs, PCAST recommends doubling the present funding for federal programs in international energy cooperation in FY 2001, focusing on programs that build stronger foundations for energy technology innovation, promote innovation in energy end-use, and promote clean and efficient energy supply. (See Table 1.)

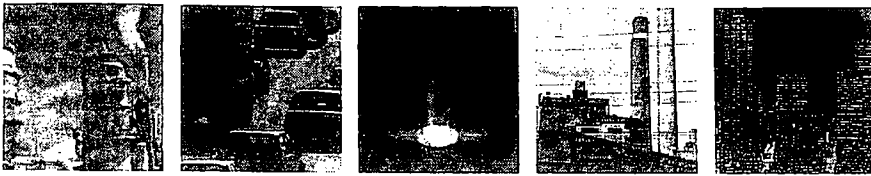
Strengthening North-South cooperation on clean and advanced energy technologies is a promising approach to helping secure developing country participation in an international framework for addressing global climate change. The United Nations Framework Convention on Climate Change — signed by President Bush and ratified by the U.S. Senate — calls explicitly for such cooperation. This cooperation would help provide the alliances, information, and foundations needed to achieve specific developing nation commitments to greenhouse gas emissions-reductions targets and timetables.

Greater cooperation with other industrial countries can help build the scientific and technological basis for more rapid innovation in the energy sector. Industrial country cooperation can also play a key role in developing the competitive mechanisms needed to bridge the gap in the innovation pipeline (Figure 4) for technologies with significant public benefits.

Figure 3: Per Capita Energy Use and Population



Current per capita energy use shown for selected countries and total population in developing countries, reforming economies, and OECD countries. (Excludes traditional biomass.) One  200 million people. 1 Gigajoule = 0.95 million Btus = 7 gallons of gasoline. Data drawn from (4).

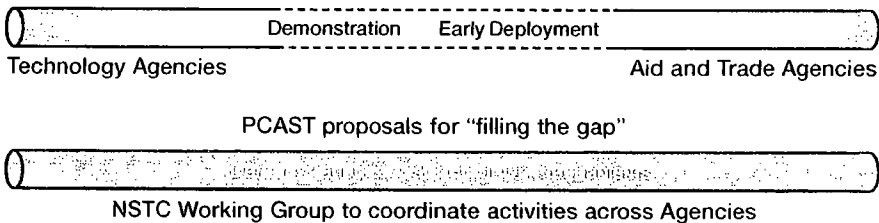


A unified vision and coordinated management structure will enhance U.S. international cooperative efforts on energy. PCAST calls for a new Interagency Working Group on Strategic Energy Cooperation under the National Science and Technology Council, to provide overall coordination and assess agency programs. The Working Group should have an Advisory Board drawn from the private, academic, and NGO sectors. PCAST recommends that the Working Group conduct portfolio assessments to help oversee development of a coordinated Strategic Energy Cooperation Fund, designed to promote and support programs in international energy cooperation.

The Panel concluded:

"The needs and opportunities for enhanced international cooperation on energy-technology innovation supportive of U.S. interests and values are thus both large and urgent. The costs and risks are modest in relation to the potential gains. Now is the time for the United States to take the sensible and affordable steps outlined here to address the international dimensions of the energy challenges to U.S. interests and values that the 21st century will present."

Figure 4: The "technology innovation" pipeline today, with primary Agency supports



The innovation pipeline for energy technology has a significant gap between government programs for R&D and government programs to support successful commercialization. This gap constrains the deployment of innovative technologies. To bridge that gap, PCAST recommends mechanisms for demonstrating technologies, competitively buying-down their price, and for coordinating the work of the technology development, aid, and trade agencies. Agencies involved include the Departments of Commerce, Energy, and State, the United States Agency for International Development, the Environmental Protection Agency, Export-Import Bank, Overseas Private Investment Corporation, and the Trade and Development Agency, among others.

This study responds to President Clinton's request to identify "ways to improve the U.S. program of international cooperation on energy R&D to best support our nation's priorities and address the key global energy and environmental challenges of the next century." A PCAST Panel investigated these issues intensively for 9 months and wrote a comprehensive report. This Panel included fourteen experts drawn from a diverse mix of industry, academic, non-governmental and other organizations, and with a wide variety of backgrounds and perspectives. Despite this diversity, these members were unanimous in making the recommendations in this report, noting that there is a narrow window of opportunity for the United States to respond to the urgent needs they identified (Box 2). The full PCAST has also endorsed this report. The PCAST serves as the highest level private sector science and technology advisory group for the President and the National Science and Technology Council.

John P. Holdren
Harvard University
PCAST Member
(Panel Chair)

Richard Balzhiser
Electric Power Research Institute

John P. Boright
National Research Council

William Chandler
Battelle Pacific Northwest National
Laboratory

John M. Deutch
Massachusetts Institute of
Technology
PCAST Member

Howard Geller
American Council for an Energy
Efficient Economy

John H. Gibbons
Assistant to the President for
Science and Technology, ret.

Larry T. Papay
Bechtel Group, Inc.

Nathan Rosenberg
Stanford University

Maxine Savitz
Allied Signal Ceramic Components

Bruce N. Stram
Enron Energy Services

Robert Williams
Princeton University

Lilian Shiao-Yen Wu
IBM
PCAST Member

John A. Young
Hewlett-Packard Co.
PCAST Co-Chair

Study Executive Director
Samuel F. Baldwin
National Science and Technology
Council

Assistant to the Chair
Paul de Sa
Harvard University

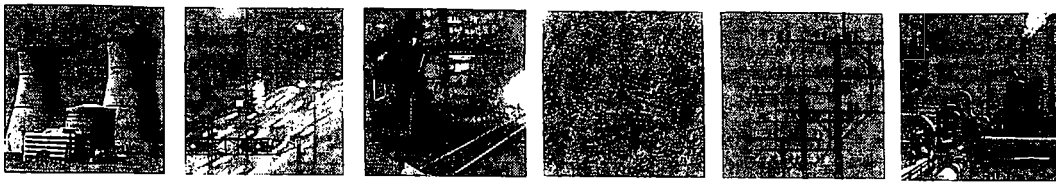
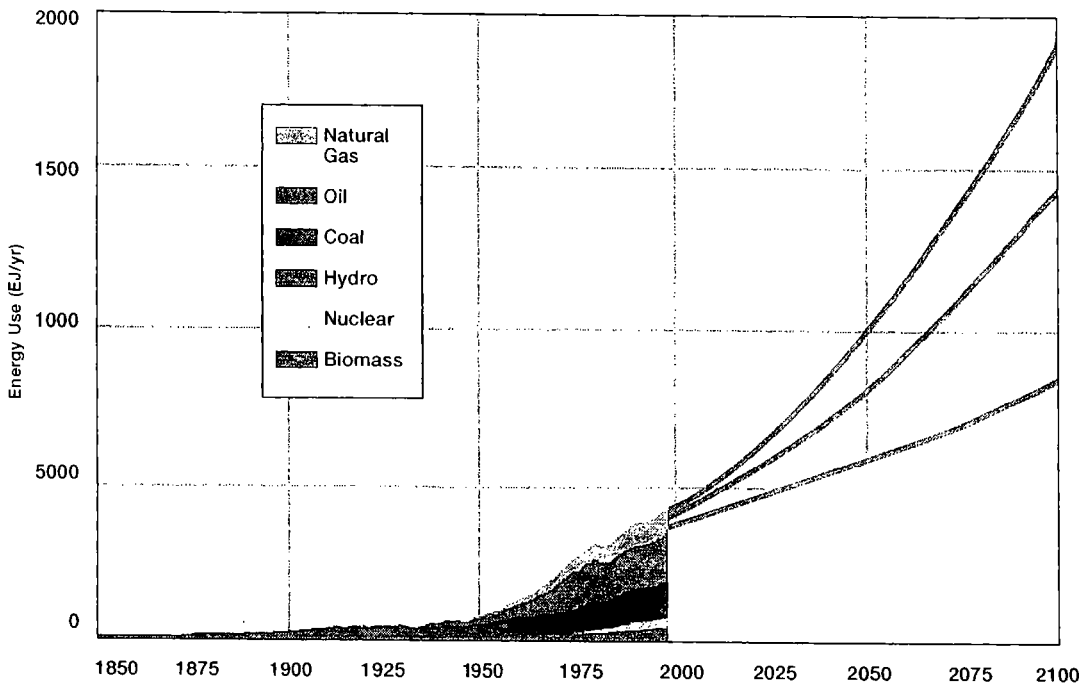


Figure 2: Historical and Projected Energy Use



World energy use is growing rapidly and is dominated by fossil fuels. The future path depends on economic growth, technological change, and investments in energy efficiency. 1 Exajoule = 0.95 Quad = 160 million barrels of oil. Adapted from (3).

Box 1: Global Energy Challenges and the U.S. National Interest

- **Economic:** International cooperation provides economic opportunities for U.S. companies to access global energy supply technology markets, worth hundreds of billions of dollars each year. Action now can give U.S. companies access to the best innovative ideas in the world and open doors to these markets, the bulk of which will be outside of the United States in the coming century (Figure 1). Such innovation will also lower the cost of energy for U.S. consumers.
- **National Security:** New technology to power vehicles with greater efficiency or with alternative fuels reduces domestic and international dependence on oil supplies from politically volatile regions. Advanced reactor designs can potentially reduce nuclear proliferation risks. Clean energy supplies for economic development enhance the political and economic stability needed for sound markets and international trade.
- **Environmental:** Clean, low-carbon sources of energy—renewable, advanced fossil, and nuclear— together with energy-efficient cars, buildings, and industries, can reduce air pollution and greenhouse gas emissions and nuclear reactor waste and safety concerns domestically and internationally. It can also help create a framework for wider cooperation on the energy climate challenge in which developing, transition, and industrialized countries alike will participate.

References:

1. President's Committee of Advisors on Science and Technology, Panel on Energy Research and Development, *Federal Energy Research and Development for the Challenges of the Twenty-First Century*, (Washington, DC: Office of Science and Technology Policy, November 1997), http://www.whitehouse.gov/WH/EOP/OSTP/html/OSTP_Home.html
2. President's Committee of Advisors on Science and Technology, Panel on International Cooperation in Energy Research, Development, Demonstration, and Deployment, *Powerful Partnerships. The Federal Role in International Cooperation on Energy Innovation*, (Washington, DC: Office of Science and Technology Policy, June 1999), http://www.whitehouse.gov/WH/EOP/OSTP/html/OSTP_Home.html
3. N. Nakićenović, A. Grübler, and A. MacDonald, eds., *Global Energy Perspectives* (Cambridge, UK: Cambridge University Press, 1998)
4. World Bank, *World Development Report 1998-99. Knowledge for Development*, (New York, NY: Oxford University Press, 1999)

The cover photo shows electric lights on earth at night, adapted from satellite imagery. Courtesy of NASA

Initiatives and Budgets (Budgets in Millions of \$ Supplemental Spending)

FOUNDATIONS OF ENERGY INNOVATION		FY2001	FY2005
Capacity Building	Increase the capacity for energy innovation by investing in education and training programs and supporting regional centers for energy research, development, demonstration, and deployment.	\$20M	\$40M
Energy Sector Reform	Provide assistance for energy-sector reform that attracts private investment and includes mechanisms to protect the public's interest in energy innovation that reduces environmental impacts, addresses the energy needs of society's poorest members, and provides other societal benefits not captured in markets. Provide assistance in establishing regulatory frameworks for natural gas grids.	20	40
Demonstration and Cost Reduction	Establish an international Demonstration Support Facility to promote pre-commercial, private-sector-sponsored demonstrations of clean and efficient energy technologies. Allow energy-production tax credits for U.S. firms participating in demonstration projects abroad. Promote market-based mechanisms to reduce the difference in cost between advanced and conventional energy technologies by means of the learning that accompanies increased production.	40	80
Financing	Encourage the World Bank and other multilateral development banks to increase financing for clean and efficient energy technologies; provide trust funds to the banks for analytical and assessment activities in support of such lending. Facilitate market-based finance of these technologies by creating a fund administered by the Overseas Private Investment Corporation to mitigate financing risks in private and joint public-private projects of this type abroad.	40	80
A PORTFOLIO OF ENERGY EFFICIENCY RESEARCH, DEVELOPMENT, DEMONSTRATION AND DEPLOYMENT			
Buildings	Reduce energy use of new buildings in developing and transition economies by 50% by 2020 by assisting them to develop efficiency standards, ratings, and labeling for building equipment as well as design tools, energy codes, and standards for building shells. Encourage multilateral development banks and the Global Environment Facility to support such measures.	20	40
Transport	Expand research, development, demonstration, and cost-reduction efforts to achieve inexpensive, efficient, and clean small vehicles and buses. Assist in analysis and implementation of vehicle emissions testing and standards. Engage the multilateral development banks and the Global Environment Facility in support of these measures.	20	40
Industry	Invent the factories of the 21 st century through U.S. public/private/foreign partnerships to develop and implement energy-efficient technology roadmaps for energy-intensive industries.	10	20
Combined Heat and Power (CHP)	Maximize CHP's (cogeneration's) share of the market for new power generation in developing countries through collaborative assessments of potential CHP sites, addressing regulatory/market barriers, attracting funding for demonstrations, helping secure financing, and through information and training programs.	10	20
A PORTFOLIO OF ENERGY SUPPLY RESEARCH, DEVELOPMENT, DEMONSTRATION AND DEPLOYMENT			
Renewables	Achieve widespread use of renewables, comparable to fossil fuel use today, by 2025-2050. Conduct research, development, demonstration, and cost-reduction efforts on industrial-scale use of biomass to generate power and coproducts and on integrated renewable energy and hybrid systems for use in rural areas. Accelerate deployment of grid-connected intermittent renewable/hybrid systems.	40	80
Fossil Fuel	Develop economic fossil fuel decarbonization and carbon-storage technologies with near-zero carbon and pollutant emissions, including low-cost hydrogen production and byproduct carbon recovery. Evaluate carbon-reservoir potential.	20	40
Nuclear Energy	Preserve nuclear energy as a 21 st century option by expanding the Nuclear Energy Research Initiative with increased international cooperation addressing cost, safety, waste, and proliferation issues for nuclear fission. Increase international cooperation on spent-fuel management and high-level wastes. Pursue new international agreement on fusion R&D.	10	20
A SET OF MANAGEMENT RECOMMENDATIONS			
Agency Management	Establish an interagency working group under the National Science and Technology Council, with an external Advisory Board, to provide strategic vision, interagency coordination, portfolio analysis, and strengthened evaluation. Agencies would use competitive solicitations to identify best approaches. Strengthen agency international capabilities.		
TOTAL	Strategic Energy Cooperation Fund	\$250M	\$500M

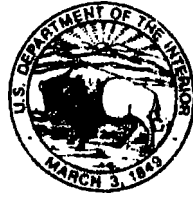
For Additional Copies and Further Information, Contact:

PCAST Executive Secretariat

Telephone: 202-456-6100 / Facsimile: 202-456-6026

Also Available on the PCAST Home Page via Link from the OSTP Home Page at:

http://www.whitehouse.gov/WH/EOP/OSTP/html/OSTP_Home.html



**United States
Department of the Interior**

FAX

DATE:

8/19/99

TO:

MARTHA HAMILTON

OFFICE:

FAX NUMBER:

496 3816

NUMBER OF PAGES TO FOLLOW:

2.

FROM:

Paul Bledsoe

OFFICE OF THE SECRETARY

Office of Communications and Media Affairs

U.S. Department of the Interior

1849 C Street NW, Washington DC 20242

Phone: (202) 208-6416

Fax: (202) 208-5133

E-MAIL: paul_bledsoe@ios.doi.gov



**United States
Department of the Interior**

FAX

DATE:

8/19/99.

TO:

JOE HERBERT

OFFICE:

- AP -

FAX NUMBER:

776-9570

NUMBER OF PAGES TO FOLLOW:

8.

FROM:

Paul Bledsoe

OFFICE OF THE SECRETARY

Office of Communications and Media Affairs

U.S. Department of the Interior

1849 C Street NW, Washington DC 20242

Phone: (202) 208-6416

Fax: (202) 208-5133

E-MAIL: paul_bledsoe@ios.doi.gov

*** TX REPORT ***

TRANSMISSION OK

TX/RX NO 3248
CONNECTION TEL 98629266
CONNECTION ID
ST. TIME 08/19 11:27
USAGE T 01'08
PGS. 3
RESULT OK



United States Department of the Interior

FAX

DATE:

TO:

John Fiacka

OFFICE:

WS Journal

FAX NUMBER:

862-9266.

NUMBER OF PAGES TO FOLLOW:

2.

FROM:

*** TX REPORT ***

TRANSMISSION OK

TX/RX NO	3251	
CONNECTION TEL		94963816
CONNECTION ID		
ST. TIME	08/19 13:58	
USAGE T	01'04	
PGS.	2	
RESULT	OK	



United States Department of the Interior

FAX

DATE: 8/19/99

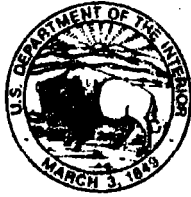
TO: MARTHA HAMILTON

OFFICE:

FAX NUMBER: 496-3816

NUMBER OF PAGES TO FOLLOW: 2.

FROM:



**United States
Department of the Interior**

FAX

DATE:

TO:

JOHN FIALKA

OFFICE:

FAX NUMBER:

862-9266

NUMBER OF PAGES TO FOLLOW:

6

REPORT SUMMARY

FROM:

Paul Bledsoe

OFFICE OF THE SECRETARY

Office of Communications and Media Affairs

U.S. Department of the Interior

1849 C Street NW, Washington DC 20242

Phone: (202) 208-6416

Fax: (202) 208-5133

E-MAIL: paul_bledsoe@ios.doi.gov

FOR IMMEDIATE RELEASE

August 19, 1999

Contact: Dr. Joan Porter (OSTP/PCAST)

(202/456-6101)

Dr. John Holdren

(617/495-1464)

**President's Committee on Science and Technology Finds
Soaring Worldwide Energy Demand "Potentially Disastrous"
Unless U.S. Makes Clean Technology and Efficiency Investments**

Investments Would Yield Huge Foreign Markets, Avoid Environmental Risk

Washington, D.C. -- A report released today by the President's Committee of Advisors on Science and Technology (PCAST) concludes that projected growth in energy usage worldwide could be "potentially disastrous" for the environment and calls for greater public and private investment by the U.S. in clean energy technology in cooperation with international partners.

At the same time, the report, notes that U.S. firms would greatly benefit from such investments, helping them capture much of the \$10 trillion which will be spent worldwide for energy supply technologies over the next 20 years.

Dr. John Holdren of Harvard University and Chair of the PCAST Energy Panel said, "The world faces more severe air pollution, greater oil insecurity, heightened threat of global climate changes and increased nuclear energy risks unless we increase investments in clean energy technology and efficiency now."

The Panel found that world energy demand is likely to soar in the next century to four times today's level. Reductions in projected energy demand would not happen, the panel said, unless innovation to increase energy end-use efficiency and to improve energy supply technologies is both rapid and global.

Dr. Neal F. Lane, Assistant to the President for Science and Technology and Co Chair of PCAST, said, "Tremendous export markets will develop for advanced fossil fuel, renewable, and other clean energy technologies in the very near future. U.S. firms can position themselves to capture a much larger portion of those markets if government and industry make the right decisions now. "

Overall, the report finds that the choices the U.S. makes today on research development and deployment opportunities will influence the evolution of the global energy system for many decades, and have a tremendous impact on efforts to fight global warming, air pollution, oil insecurity and other problems energy use will cause.

The report was prepared in response to a request from President Clinton to identify ways to improve the U.S. program of international cooperation on energy R&D to best support our nation's priorities and address the key global energy and environmental challenges of the next century.

The PCAST panel which produced the report identified four sets of initiatives to help address these problems, requiring an additional government investment of about \$250 million per year in FY2001, increasing to \$500 million more per year in FY2005. The recommended initiatives include:

~Strengthening energy-related education and training; supporting regional centers for energy research and employment; promoting energy sector reform that attracts private capital while protecting the public interest; and creating mechanisms to assist competitive demonstration, cost-reduction, and financing of advanced energy technologies;

~Developing and promoting technologies to halve the energy use of new building, build the factories of the 21st century, improve the efficiency of small vehicles and buses, and increase cogeneration of electricity and heat;

~Developing and promoting cleaner energy supply technologies, particularly biomass, wind, solar, and other renewable energy sources, more efficient fossil fuel systems, technologies to capture and store carbon, and nuclear fission and fusion; and

~Improving management of the Federal portfolio, including greater use of external peer review.

The PCAST panel responsible for the report is made of a diverse group of experts from industry, academic, and non-governmental organizations with a variety of backgrounds and perspectives. In addition to energy expert John Holdren, the report panel included PCAST members John Young (former CEO of Hewlett-Packard Co. and PCAST Co-Chair), John M. Deutch (Massachusetts Institute of Technology), Lillian Shiao-Yen Wu (IBM); industry representatives Richard Balzhiser (President Emeritus of the Electric Power Research Institute), Larry Papay (Vice President of Bechtel), Maxine Savitz (Allied Signal Ceramic Components), Bruce Stram (VP of Enron Energy Services); and others from diverse backgrounds, John P. Boright (National Research Council), William Chandler (Battelle Pacific Northwest National Laboratory), Howard Geller (American Council for an Energy Efficient Economy), John H. Gibbons (Assistant to the President for Science and Technology, ret.), Nathan Rosenberg (Stanford University), and Robert Williams (Princeton University). Despite this diversity, these members and PCAST were unanimous in the recommendations. The full PCAST endorsed the report as well.

A summary of the PCAST report: *Powerful Partnerships: A Synthesis of a Report by PCAST* can be accessed on line at:

~~A summary of the PCAST report can be accessed on-line at:~~

~~www.whitehouse.gov/WH/EOP/OSTP/html/new.html~~

The full PCAST report can be found at:

http://www.whitehouse.gov/WH/EOP/OSTP/html/OSTP_Home.html

From: <rbierbau@ostp.eop.gov>
To: ibr8dm00.ibr8smtp("pbledsoe@usbr.gov")
Date: 8/13/99 4:02PM
Subject: panel address list--USE JUDICIOUSLY!

(See attached file: P2panelList1.doc)

Internal Use Only

The President's Committee of Advisors on Science and Technology
Panel on
International Cooperative Energy Research and Development

John P. Holdren
Panel Chairman
Teresa and John Heinz Professor
of Environmental Policy
Director, Program in Science,
Technology and Public Policy
Center for Science and International Affairs
John F. Kennedy School of Government
IN SUMMER, TRY HOME PHONE TOO
Office Tel: 617-495-1464
home Tel: 508-548-5266

Email: holdren@socrates.berkeley.edu
Assistant: Laura Wilson: 627-495-1498

~~Richard Balzhiser~~
President Emeritus
Electric Power Research Institute
3412 Hillview Avenue
Palo Alto, CA 94304-1395
Tel: 650-855-2141 (direct)
Tel: 650-855-2000 (main)
Fax: 650-855-2090
Email: rbalzhis@epri.com

560 Sand Hill Circle
Menlo Park, CA 94205
HOME Tel: 415-854-0238

- Jim Ball
w/ Univ of Concord Scientists
332-0900

~~Annie Peterson
EDF
387-3300 X123~~

~~Jennifer Morgan
WWF
778-9514 . . .~~

John P. Boright
Executive Director
Office of International Affairs
National Academy of Sciences
National Research Council
2101 Constitution Ave., N.W.
Washington, DC 20418
Tel: 202-334-2800
Fax: 202-334-2139/3094
Email: jboright@nas.edu

Home: 5215 Baltimore Ave.
Bethesda, MD 20816
Tel: 301-652-0603

Bill Chandler
Battelle Pacific Northwest Laboratory
901 D Street SW
Washington, DC 20024
Tel: 202-646-5242
Fax: 202-646-5233
Email: william.chandler@pnl.gov

Home: 811 Robin Hood Road
Sherwood Forest, MD 21405
Tel: 410-849-3731

Professor John M. Deutch
Institute Professor
Department of Chemistry
Room 6-208
Massachusetts Institute of Technology
77 Massachusetts Avenue, Room 6-208
Cambridge, Massachusetts 02139
Tel: 617-253-1479/1972
Fax: 617-258-5700
Email: jmd@mit.edu
Assistant: Elizabeth Green, 617-253-1972

Howard Geller
Director, American Council for an Energy Efficient Economy
1001 Connecticut Ave., N.W. Suite 801
Washington, DC 20036

Tel: 202-429-8873
Fax: 202-429-2248
Email: hgeller@aceee.org

Home: 5414 30th Street, N.W.
Washington, DC 20009
Tel: 202-362-4141

John H. Gibbons
PO Box 379
The Plains, VA 20198
Tel: 540-253-5409
Fax: 540-253-5076
Email: jackgibbons@erols.com
Home: 540-253-9843

Larry T. Papay
Senior Vice President & Manager
Bechtel Corporation
PO Box 193965
45 Fremont Street
San Francisco, CA 94105-1895
Tel: 415-768-0275
Fax: 415-768-0503
Email: ltpapay@bechtel.com
Assistant: Puri Soriben: 415-768-2372
Fax: 415-768-0503
Email: psoriben@bechtel.com

Home: 415-563-7651
Fax: 415-673-9553

Maxine Savitz
General Manager
Allied Signal Ceramic Components
2525 W. 190th Street
Mail Code 1/5-1,26,000
Torrance, CA 90504
Tel: 310-512-5678
Fax: 310-512-5901
Email: maxine.savitz@alliedsignal.com
Assistant: Valerie Ferrell: 310-512-5665

Home: 10350 Wilshire Blvd., Apt. 604
Los Angeles, CA 90024
Tel: 310-271-0874

Bruce N. Stram
Vice President, Business Development
Enron Energy Services
P.O. Box 1188
Houston, TX 77251-1188
Tel: 713-853-6212
Fax: 713-646-8750
Email: bstram@enron.ees.com
Assistant: Kaye Davenport
Kdavenpo@enron.ees.com

Fedex: 1400 Smith, EB 984
Houston, TX 77002

Home: 2206 Swift
Houston, TX 77030
Tel: 713-666-3994

Robert Williams
Senior Research Scientist
Center for Energy and Environmental Studies
Olden Street von Neumann Building
Room H115
Princeton University
Princeton, NJ 08544-5263
Tel: 609-258-5448
Main: 609-258-5445
Fax: 609-258-3661
Email: rwilliam@arundel.princeton.edu

Home: 164 Grover Avenue
Princeton, NJ 08544
Tel: 609-921-6585

Lilian Shiao-yen Wu
Research Scientist
IBM
T.J. Watson Research Center

PO Box 218
Yorktown Heights, NY 10598
Tel: 914-945-2930
Fax: 914-945-3434
Email: wul@watson.ibm.com
Assistant: Lucia: 914-945-1187

Home: 260 Douglas Road
Chappagua, NY 10514
Tel: 914-238-8522

John Young
PCAST Co-Chair
President and CEO, Retired
Hewlett-Packard Co.
3200 Hillview Avenue
Palo Alto, CA 94304-1298
Tel: 650-857-2057
Fax: 650-857-2677
Email: john_young@hp.com
Assistant: Karma Ridgeway: 415-857-2057
Karma_Ridgeway@HP.PaloAlto-om4.om.hp.com

Sam Baldwin
Executive Study Director
Room 443 Old Executive Office Building
Washington, DC 20502
Tel: 202-456-6073
Main: 202-456-6202
Fax: 202-456-6025
Email: sbaldwin@ostp.eop.gov

National Renewable Energy Laboratory
409 12th Street SW, Suite 710
Washington, DC 20024-2125
Tel: 202-651-7542
Main: 202-651-7500
Fax: 202-651-7502/7501
Email: Sam_Baldwin@nrel.gov

Home: 503 Boston Avenue
Takoma Park, MD 20912
Tel: 301-585-3525

CC: ibr8dm00.ibr8smtp("Jefferson_B._Seabright@whcctf.eop.gov")

CONGRESS AND GLOBAL WARMING: SHORT-CHANGING OUR FUTURE

While the evidence of global warming continues to mount, some in Congress are trying to strangle common-sense programs that save energy, save consumers and businesses money, and reduce global warming pollution. Appropriations bills working their way through Congress deny funding increases proposed by President Clinton to accelerate research and development of clean energy technologies for the 21st century. What's more, many of the bills include legislative "riders" that would throw roadblocks in the way of any Administration efforts to address climate change.

Special-Interest Assaults on Common-Sense Programs. Restrictive language attached to a number of fiscal year 2000 spending bills would put climate policy in a straitjacket. The Administration recently fought off or weakened some of the most far-fetched of these special-interest "riders." One sought to suppress scientific research on climate, and another tried to bar implementation of the President's new executive order to reduce federal energy use and save taxpayers \$750 million a year.

Still alive, however, is the Knollenberg rider. Building on a similar provision in last year's VA-HUD Appropriations bill, the language purports merely to prohibit implementation of the Kyoto Protocol in advance of Senate ratification. In practice, though, it would give naysayers in Congress a toe-hold to object to virtually all aspects of Administration climate policies, even when they clearly save money for consumers and businesses. Potential impacts include:

- ***Rolling back voluntary programs to reduce energy waste and greenhouse gas emissions.*** Report language from the House VA-HUD Appropriations Subcommittee seeks to vastly expand the prohibition on Kyoto-related activities to cover "non-regulatory actions, such as programs and initiatives." This undoes an agreement reached last year to ensure continuation of successful voluntary programs such as Green Lights and Energy Star, which have a proven track record of saving money for both consumers and businesses. In addition, it would block legitimate climate research and policy analysis.
- ***Dictating Scientific Process.*** The Report language also would require that a small minority of critics be given equal standing with mainstream scientists in educational seminars or activities -- even on questions about which there is broad scientific consensus. This is the kind of "balance" that tobacco companies used to fight for on the dangers of smoking.
- ***Unconstitutional interference?*** This year the rider has been attached to a wide range of spending bills, including those funding the State Department, the Agency for International Development, the Department of Energy, the Department of the Interior, the Environmental Protection Agency, NASA, the National Oceanic and Atmospheric Administration, and the National Science Foundation. Applying these restrictions to international negotiations and activities raises serious Constitutional concerns and could prevent the Administration from advancing bipartisan objectives of engaging developing countries and reducing the cost of addressing climate change.

Smart Investments At Risk. The Administration secured a record \$1 billion in fiscal year 1999 for the Climate Change Technology Initiative (CCTI), a package of investments to research, develop and deploy energy efficiency technology and renewable energy. For fiscal year 2000, the Administration is proposing \$1.37 billion for investments in forward-thinking clean energy technologies -- a 34 percent increase over. So far, Congress has appropriated almost none of this increase. Examples where CCTI and other climate-related investments are being under-funded include:

- ***Weatherization Assistance and State Grants.*** *FY 2000 request: \$191 million; Congress under-funding by \$25 million.* The same week dozens of older Americans are dying from the heat, Congress is short-changing this program to deliver conservation services, such as insulation, to millions of low-income families. The program improves health and safety, reduces carbon emissions, and reduces energy costs for those least able to afford them.
- ***Renewable Energy.*** *FY 2000 request: \$399 million; Congress under-funding by about \$90 million.* Federal R&D investments can help make clean energy technologies such as wind, solar, bioenergy, and geothermal energy affordable for American consumers. Current spending bills, however, would *cut these efforts below FY 1999 levels* by some \$27 million-\$35 million.
- ***Partnership for a New Generation of Vehicles.*** *FY 2000 request: \$264 million; Congress currently under-funding by \$58 million.* PNGV is a partnership between the federal government and automakers to develop cars with three times the fuel economy of today's models with no sacrifice in comfort or performance. At current House and Senate levels, the program would not meet its technical objectives and would have to terminate a number of promising efforts, such as developing highly efficient high-power energy storage devices and the development of advanced fuel cells.
- ***Clean Air Partnership Fund.*** *FY 2000 request: \$200 million; Congress under-funding by \$159 million.* This initiative would provide grants to state and local governments for projects that reduce both greenhouse gases and pollutants like soot, smog and air toxics.

draft 8/16/99

CALENDAR OF POTENTIAL OUTREACH OPPORTUNITIES

<u>Event</u>	<u>Date</u>	<u>Location</u>	<u>Comment</u>
4 th Biomass Conference of The Americas	8/29-9/2	Oakland, CA	technical
IAEE, USAEE Annual Conf	8/29-9/1	Orlando	
NASEO Annual Meeting	9/19-22	Indianapolis	BP,DR on agenda
Nat'l Assn of Mutual Insurance Co's Convention	9/19-22		
ICMA Annual Conference	9/26-29		
1999 Natural Gas Conference	9/28-29	Montreal	
STAPPA "Communicating Air Quality"	9/99 ??		
ECOS Annual Meeting	10/3-6	Jackson Hole	BP on agenda?
ICLEI CCP Campaign	10/7-10	Los Angeles	
COP 5	10/25-11/2	Bonn	
PowerMart	10/26-28	Houston	
Businesses for Social Responsibility Nat'l Conf	11/3-5	San Francisco	
NARUC Annual Convention	11/7-10	San Antonio	
American Public Health Assn	11/7-11	Chicago	
North American Gas Strategies Conference	11/8-9	Calgary	

August 10, 1999

Editor

The New York Times
229 West 43rd Street
New York, N.Y. 1003

To the Editor:

Bob Herbert deserves real credit for his recent columns dealing with the dangers of global warming, and especially for his call for greater political leadership. ((In point of fact)), Since 1993, President Clinton and Vice President Gore have proposed and implemented a series of programs -- scientific research, clean energy technology, partnerships with industry -- to help reduce the likelihood of catastrophic global climate changes.

Unfortunately, the US Congress has not the shown the type of leadership Herbert -- and the American people -- are rightly calling for. Congress has consistently underfunded Administration effort to fight global warming.

Perhaps even more disturbing, Republicans in Congress have attached riders to numerous pending appropriations bills which ~~seek to block efforts at finding solutions that would be good for the environment as well as create new jobs. These riders actually~~ aim to forestall almost any progress in fighting the very real threats to our public health, safety and economic well-being which global warming presents.

As we close out the 1990's -- a decade that saw 7 of the ten ^{worst} ~~???~~ our hope is that Congress will heed the call for leadership and work with the Administration to fight this real and extremely serious problem.

Sincerely,

Initiatives and Budgets (Budgets in Millions of \$ Supplemental Spending)

FOUNDATION FOR ENERGY INNOVATION			
Capacity Building	Increase the capacity for energy innovation by investing in education and training programs and supporting regional centers for energy research, development, demonstration, and deployment.	\$20M	\$40M
Energy Sector Reform	Provide assistance for energy sector reform that attracts private investment and includes mechanisms to protect the public's interest in energy innovation that reduces environmental impacts, addresses the energy needs of society's poorest members, and provides other societal benefits not captured in markets. Provide assistance in establishing regulatory frameworks for natural gas grids.	20	40
Demonstration and Cost Reduction	Establish an International Demonstration Support Facility to promote pre-commercial, private-sector-sponsored demonstrations of clean and efficient energy technologies. Allow energy-production tax credits for U.S. firms participating in demonstration projects abroad. Promote market-based mechanisms to reduce the difference in cost between advanced and conventional energy technologies by means of the learning that accompanies increased production.	40	80
Financing	Encourage the World Bank and other multilateral development banks to increase financing for clean and efficient energy technologies; provide trust funds to the banks for analytical and assessment activities in support of such lending. Facilitate market-based finance of these technologies by creating a fund administered by the Overseas Private Investment Corporation to mitigate financing risks in private and joint public-private projects of this type abroad.	40	80

Buildings	Reduce energy use of new buildings in developing and transition economies by 50% by 2020 by assisting them to develop efficiency standards, ratings, and labeling for building equipment as well as design tools, energy codes, and standards for building shells. Encourage multilateral development banks and the Global Environment Facility to support such measures.	20	40
Transport	Expand research, development, demonstration, and cost-reduction efforts to achieve inexpensive, efficient, and clean small vehicles and buses. Assist in analysis and implementation of vehicle emissions testing and standards. Engage the multilateral development banks and the Global Environment Facility in support of these measures.	20	40
Industry	Invent the factories of the 21 st century through U.S. public/private/foreign partnerships to develop and implement energy-efficient technology roadmaps for energy-intensive industries.	10	20
Combined Heat and Power (CHP)	Maximize CHP's (cogeneration's) share of the market for new power generation in developing countries through collaborative assessments of potential CHP sites, addressing regulatory/market barriers, attracting financing for demonstrations, helping secure financing, and through information and training programs.	10	20

RESEARCH RESEARCH ON LONG-TERM ENERGY AND EFFICIENCY			
Renewables	Achieve widespread use of renewables, comparable to fossil fuel use today, by 2025-2050. Conduct research, development, demonstration, and cost-reduction efforts on industrial-scale use of biomass to generate power and coproducts and on integrated renewable energy and hybrid systems for use in rural areas. Accelerate deployment of grid-connected intermittent renewable/hybrid systems.	40	80
Fossil Fuel	Develop economic fossil fuel decarbonization and carbon-storage technologies with near-zero carbon and pollutant emissions, including low-cost hydrogen production and byproduct carbon recovery. Evaluate carbon-reservoir potential.	20	40
Nuclear Energy	Promote nuclear energy as a 21 st century option by expanding the Nuclear Energy Research Initiative with increased international cooperation addressing cost, safety, waste, and proliferation issues for nuclear fission. Increase international cooperation on spent-fuel management and high-level wastes. Pursue new international agreement on fusion R&D.	10	20

IMPLEMENTATION RECOMMENDATIONS			
Agency Management	Establish an interagency working group under the National Science and Technology Council, with an external Advisory Board, to provide strategic vision, interagency coordination, portfolio analysis, and strengthened evaluation. Agencies would use competitive solicitations to identify best approaches. Strengthen agency international capabilities.		

TOTAL	Strategic Energy Cooperation Fund	\$260M	\$600M
--------------	--	---------------	---------------

For Additional Copies and Further Information, Contact:

PCAST Executive Director

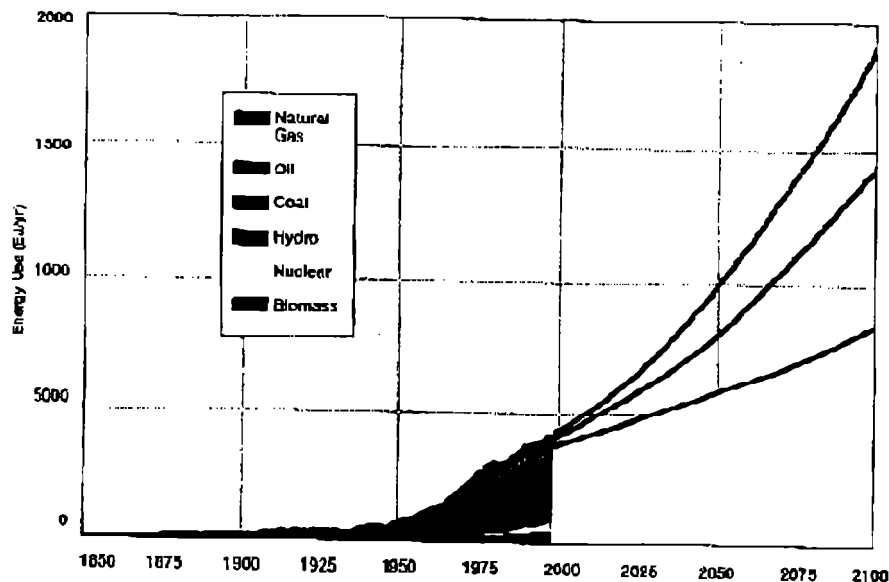
Telephone: 202-455-4000 Fax: 202-455-6026

Also Available on the PCAST Home Page via Link from the CSTF Home Page at:

<http://www.technology.gov/WEB/PCAST/plan/OSTP/Home.html>



Figure 2: Historical and Projected Energy Use



World energy use is growing rapidly and is dominated by fossil fuels. The future path depends on economic growth, technological change, and investments in energy efficiency. (Extrapolate 0.95 Quad (60 million barrels of oil). Adapted from (3).

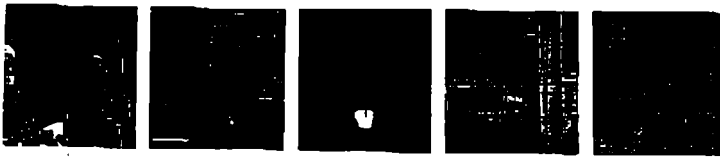
Box 1: Global Energy Challenges and the U.S. National Interest

- **Economic:** International cooperation provides a variety of opportunities for U.S. companies to access global energy supply technology markets, worth hundreds of billions of dollars each year. Under developed U.S. companies benefit to the best innovative uses in the world and open access to these markets. The bulk of them will be outside of the United States in the 21st century (figure 3). Their innovation will also lower the cost of energy for U.S. consumers.
- **National Security:** New technology to power vehicles with greater efficiency or with alternative fuels reduces domestic and international dependence on oil supplies from politically volatile regions. Advanced reactor designs can potentially reduce nuclear proliferation risks. Clean energy supplies for economic development enhance the political and economic stability needed for sound markets and international trade.
- **Environmental:** Clean, low-carbon sources of energy—renewable, advanced fossil, and nuclear—along with energy-efficient cars, buildings, and industries, can reduce air pollution and greenhouse gas emissions and to clean water, waste, and safety concerns domestically and internationally. It can also help create a trans-work the wider cooperation on the energy climate challenge in which developing, transition, and industrialized countries alike will participate.

References:

1. President's Committee of Advisors on Science and Technology, Panel on Energy Research and Development, *Federal Energy Research and Development for the Challenges of the Twenty-First Century* (Washington, DC: Office of Science and Technology Policy, November 1997), http://www.ostp.eis.gov/WH/EOP/OSTP/Panel/OSTP_Home.html
2. President's Committee of Advisors on Science and Technology, Panel on International Cooperation in Energy Research, Development, Demonstration, and Deployment, *Powerful Partnerships: The Federal Role in International Cooperation on Energy Innovation* (Washington, DC: Office of Science and Technology Policy, June 1999), http://www.whitehouse.gov/WH/EOP/OSTP/Panel/OSTP_Home.html
3. N. Nakicenovic, A. Grunler, and A. Macdonald, eds., *Global Energy Perspectives* (Cambridge, UK: Cambridge University Press, 1998).
4. World Bank, *World Development Report 1999: Knowledge for Development* (New York, NY: Oxford University Press, 1999).

The cover photo shows electric lights on earth at night, adapted from satellite imagery. Courtesy of NASA.

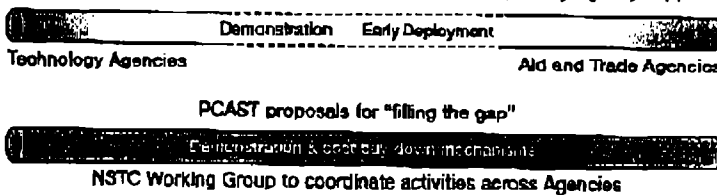


A unified vision and coordinated management structure will enhance U.S. international cooperative efforts on energy. PCAST calls for a new Interagency Working Group on Strategic Energy Cooperation under the National Science and Technology Council, to provide overall coordination and assess agency programs. The Working Group should have an Advisory Board drawn from the private, academic, and NGO sectors. PCAST recommends that the Working Group conduct portfolio assessments to help oversee development of a coordinated Strategic Energy Cooperation Fund, designed to promote and support programs in international energy cooperation.

The Panel concluded:

"The needs and opportunities for enhanced international cooperation on energy-technology innovation supportive of U.S. interests and values are thus both large and urgent. The costs and risks are modest in relation to the potential gains. Now is the time for the United States to take the sensible and affordable steps outlined here to address the international dimensions of the energy challenge to U.S. interests and values that the 21st century will present."

Figure 4: The "technology innovation" pipeline today, with primary Agency supports



The innovation pipeline for energy technology has a significant gap between government programs for R&D and government programs to support successful commercialization. This gap constrains the deployment of innovative technologies. To bridge that gap, PCAST recommends mechanisms for demonstrating technologies, competitively buying-down their price, and for coordinating the work of the technology development, aid, and trade agencies. Agencies involved include the Department of Commerce, Energy and State, the United States Agency for International Development, the Environmental Protection Agency, Export-Import Bank, Overseas Private Investment Corporation, and the Trade and Development Agency, among others.

This study responds to President Clinton's request to identify "ways to improve the U.S. program of international cooperation on energy R&D to best support our nation's priorities and address the key global energy and environmental challenges of the next century." A PCAST Panel investigated these issues intensively for 8 months and wrote a comprehensive report. The Panel included fourteen experts drawn from a diverse mix of industry, academic, non-governmental and other organizations, and with a wide variety of backgrounds and perspectives. Despite this diversity, those members were unanimous in making the recommendations in this report, noting that there is a narrow window of opportunity for the United States to respond to the urgent needs they identified (Box 2). The full PCAST has also endorsed this report. The PCAST serves as the highest level private sector science and technology advisory group for the President and the National Science and Technology Council.

John P. Holdren
Harvard University
PCAST Member
Panel Chair

Richard Balzhiser
Electric Power Research Institute

John H. Bortig
National Research Council

William Chandler
Futaba Energy Northwest National Laboratory

John M. Deutch
Massachusetts Institute of Technology
PCAST Member

Howard Gellin
American Council for an Energy Efficient Economy

John H. Goldstein
Assistant to the President for Science and Technology

Larry T. Papay
Bechtel Group, Inc.

Nathan Rosenberg
Stanford University

Maxine Savitz
Allegheny State University

Bruce H. Strum
Energy Research Center

Robert Williams
PricewaterhouseCoopers

Lillian Shwe-Yen Wu
IPED
PCAST Member

John A. Young
Hewlett-Packard Co.
PCAST Co-Chair

Study Executive Director
Samuel E. Baldwin
National Science and Technology Council

Assistant to the Chair
Paul de Sa
Harvard University

Box 3: The Winners at Opportunity

- Energy conservation, energy efficiency, and renewable energy investments will be largely completed over the next decade, but "low-hanging fruit" (the mechanisms of identifying success or failure in the dual goals of attracting private capital and adding long public benefits).
- Rapid technological change in fuel and power patterns and infrastructure — including the substitution of oil and coal for natural gas, patterns of oil and coal and building design — are a reality in many.
- Investments in energy efficiency, development, and conservation, and energy conservation programs will influence the characteristics of the world energy system for many decades. Many energy technologies deployed between now and 2020 will still be in operation in 2050. Investments made today in cooperation with other countries will determine the new technologies available for deployment between 2020 and 2050. Thus, today's choices will strongly influence energy costs, greenhouse gas emissions, oil dependence, profitability, resistance, and public health impacts for the balance of the next century.

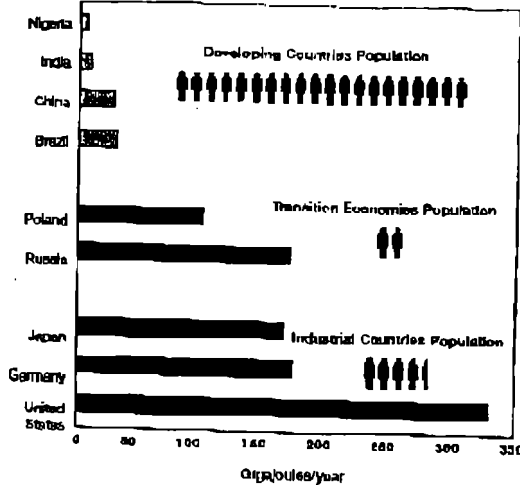
Government has a critical and legitimate role to play. The private sector plays the major role in energy innovation and related international cooperation. Private-sector investments alone, however, will not adequately capture the full range of public benefits — like reduced pollution, increased energy security, long-term technology innovation, and developmental equity issues. Government activities focused on filling the gaps in private-sector investment can achieve significant benefits for the United States.

Current government programs cannot meet the challenges of future global energy growth. In 1997, government expenditures on international cooperation on energy innovation amounted to about \$250 million per year, but these funds were primarily in nuclear fission and fusion. The government has few programs to bridge the gap between R&D and commercial deployment. The lack of government programs for the middle part of the technology innovation "pipeline" — demonstration and early deployment — impedes the commercialization of innovative energy technologies (Figure 4). To address the full spectrum of energy technology needs, FCAST recommends doubling the present funding for federal programs in international energy cooperation in FY 2001, focusing on programs that build stronger foundations for energy technology innovation, promote innovation in energy end-use, and promote clean and efficient energy supply. (See Table 1)

Strengthening North-South cooperation on clean and advanced energy technologies is a promising approach to helping secure developing country participation in an international framework for addressing global climate change. The United Nations Framework Convention on Climate Change — signed by President Bush and ratified by the U.S. Senate — calls explicitly for such cooperation. This cooperation would help provide the alliances, information, and foundations needed to achieve specific developing nation commitments to greenhouse gas emissions-reductions targets and timetables.

Greater cooperation with other industrial countries can help build the scientific and technological basis for more rapid innovation in the energy sector. Industrial country cooperation can also play a key role in developing the competitive mechanisms needed to bridge the gap in the innovation pipeline (Figure 4) for technologies with significant public benefits.

Figure 3: Per Capita Energy Use and Population



Current per capita energy use shown for selected countries and total population in developing countries, reforming economies, and OECD countries. (Excludes traditional biomass.) One barrel = 200 million people, 1 Gigawatt = 0.95 million plus = 7 gallons of gasoline. Data drawn from (4).

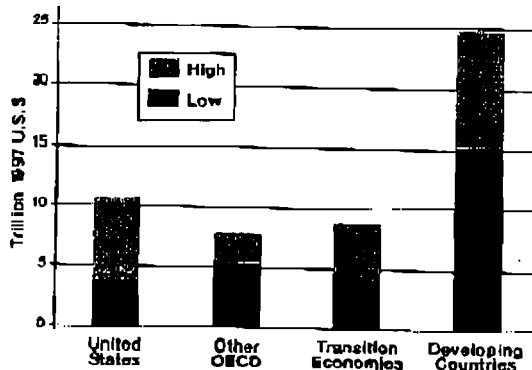
- Neal F. Lane
Assistant to the Director
for Science and Technology
D-95T Co-Chair
- John A. Young
Hercules-Packard Co.
D-95T Co-Chair
- Norman H. Augustine
Ed. Wilson & Partners
D-95T Co-Chair
- Francisco J. Ayala
University of California, Irvine
- John M. DeLuca
Massachusetts Institute of Technology
- Murray Gill-Mann
Columbia Institute of Technology
- David A. Hamburg
Carnegie Corporation of New York
- John P. Helton
Harvard University
- Luigi MacArthur
Exxon Corporation
- Stanley M. Malachuk
American Association for the
Advancement of Science
- Mario J. Molina
Massachusetts Institute of Technology
- Peter H. Raven
Washington University, Saint Louis
- Dolly K. Rice
University of California, San Diego
- Judith Rubin
University of Pennsylvania
- Charles A. Sanders
Glaxo-Wellcome, Inc.
- David E. Shaw
E.C. Shaw & Co. and
Time Online Services
- Charles M. Vest
Massachusetts Institute of Technology
- Virginia W. Wahlen
Washington University, St. Louis
- Lilian Shiao-Yen Wu
IPM
- Executive Secretary
Joan P. Porter

Energy use will grow dramatically worldwide—particularly in developing nations. Most of the twenty-fold world energy growth since 1850 has occurred in the industrial countries, and fossil fuels account for 78 percent of the world's energy supply (Figure 2). In the next two decades, however, over half of global energy growth will be in the developing and transition economies as those nations improve their standard of living. This growth will reduce the disparities in present per capita energy use (Figure 3) and improve well-being for the poorer inhabitants of the planet, but this rapid growth in total world energy use could further exacerbate the energy-linked problems and challenges already of great concern today.

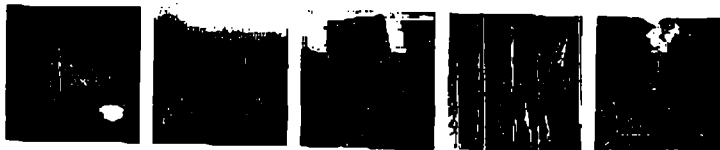
Technological innovation and the policies adopted to promote efficient and clean energy technologies will determine the quantity of energy used in the future and the impact of that energy use. An energy future that continues recent trends, including heavy reliance on conventional fossil fuel technologies, would commit the world to increased smog, acid rain, and other conventional air pollution problems, as well as the risk of climate change from increasing atmospheric carbon dioxide, approaching levels not seen on the planet for millions of years. Vigorous deployment of energy efficiency technologies, on the other hand, would mean the difference between doubling and quadrupling world energy supply by 2100 — a quantity of energy equal to the current oil output of nearly 50 Saudi Arabias — reducing the economic and national security consequences of such massive growth. Use of clean fossil, nuclear and renewable energy technologies means avoiding many of the environmental impacts looming in the coming century (Figure 2).

A significant portion of the demand for new energy technologies will be outside of the United States under any future scenario. Between now and 2050, investments in new energy technologies in developing nations will likely approach \$15 to \$25 trillion dollars, accounting for more than half of the global investments in energy supply (Figure 1). Ninety percent of the markets for coal, nuclear, and renewable energy technologies are expected to be outside of the United States in the coming decades. Strategic investments today — by the U.S. government and the private sector — will assist strong participation in those markets tomorrow.

Figure 1: Projected Total Investment In Energy-Supply



Future investments in energy supply technologies will be much larger outside the United States. Developing countries will account for the largest share — roughly \$15-25 trillion from 1990-2050. Energy efficiency investments will be of similar magnitude as countries develop their buildings, industry, and transport infrastructures. Adapted from (3).



Powerful Partnerships: A Synthesis of a Report by the President's Committee of Advisors on Science and Technology

"Advanced energy technologies can help meet the challenges of economic development, national security, and environmental quality." President Bill Clinton, July 23, 1999

It is in our fundamental National Interest to greatly strengthen international cooperation in energy innovation. The President's Committee of Advisors on Science and Technology (PCAST) concluded that continuing our current energy trajectory would be "problem-plagued and potentially disastrous." Unless innovation to increase energy end-use efficiency and to improve energy supply technologies is both rapid and global, world energy demand is likely to soar in the next century to four times today's level, entailing higher consumer costs for energy, greater oil-import dependence, worse local and regional air pollution, more pronounced climate disruption from greenhouse gases, and bigger nuclear energy risks than today. And if the United States abdicates leadership in international cooperation on energy technology while others forge ahead, it will cost U.S. firms dearly in their share of the multi-hundred-billion-dollar-per-year global market in energy-supply technologies, most of which is and will remain overseas. As the world heads into the next millennium, however, there is a window of opportunity — open now but closing fast — to move the world off this troublesome path. The choices the United States makes today will influence the evolution of the global energy system for many decades to come (Box 1). The United States has strong stakes in the future economic, national security, and environmental course of world energy development. (See references 1, 2.)

Initiatives are recommended in four areas:

- **Strengthening capacities for energy technology innovation** through education and training; creation and support of regional centers for energy research and deployment; promotion of energy sector reform that attracts private capital while protecting the public interest; and creation of mechanisms for demonstration, cost-reduction and financing of advanced energy technologies.
- **Promoting technologies to limit energy demand** by increasing efficiency of energy use, particularly in buildings and appliances, small vehicles and buses, energy-intensive industries, and cogeneration of electricity.
- **Promoting technologies for a cleaner energy supply**, with emphasis on biomass, wind, solar, and other renewable energy sources, using fossil fuels far more efficiently, developing technologies to capture and store carbon, and nuclear fission and fusion, and
- **Improving management of the Federal portfolio**, including with external oversight.

These programs go beyond spurring research and development, they are designed to catalyze and facilitate efforts of the private sector, and will launch advanced energy technologies into substantial international markets, free of the need for ongoing government subsidies.



August 1999

DRAFT

DRAFT

DRAFT

cooperation can play an important role in achieving these goals. Further, increasing North-South cooperation on clean and advanced energy technologies is a promising approach to helping secure developing country participation in an international framework for addressing global climate change.

The report was prepared in response to a request from President Clinton to identify "ways to improve the U.S. program of international cooperation on energy R&D to best support our nation's priorities and address the key global energy and environmental challenges of the next century." The Panel found that unless innovation to increase energy end-use efficiency and to improve energy supply technologies is both rapid and global, world energy demand is likely to soar in the next century to four times today's level. This will result in higher consumer costs for energy, greater oil-import dependence, worse local and regional air pollution, more pronounced climate disruption from greenhouse gases, and bigger nuclear energy risks than today. And if the United States abdicates leadership in international cooperation on energy technology while others forge ahead, it will cost U.S. firms dearly in their share of the multi-hundred-billion-dollar-per-year global market in energy-supply technologies, most of which will be overseas.

The report can be found at: http://www.whitehouse.gov/WH/EOP/OSTP/html/OSTP_Home.html



+

+

+

+

**PHOTOCOPY
PRESERVATION**

Clinton Presidential Records Digital Records Marker

This is not a presidential record. This is used as an administrative marker by the William J. Clinton Presidential Library Staff.

This marker identifies the place of a publication.

Publications have not been scanned in their entirety for the purpose of digitization. To see the full publication please search online or visit the Clinton Presidential Library's Research Room.

policy

+

Developing **countries**

& Global **climate change**

Electric Power Options for Growth

+

Mark Bernstein

Scott Hassell

Jeff Hagen, et al

RAND

+



PEW CENTER
ON
Global CLIMATE
CHANGE



For Immediate Release:
Wednesday June 16, 1999

Contact: Kelly Sullivan/Heather Fass
202-289-5900

New Study Shows Options In Developing Countries To Lower Emissions and Maintain or Improve Economic Growth

Study Identifies Four Policy Alternatives for New Power Generation

Washington, D.C. – A report released today by the Pew Center on Global Climate Change concludes that developing countries can reduce emissions from power generation while maintaining or improving economic growth.

Current projections show a near tripling of carbon dioxide emissions from electric power in developing countries over the next 20 years, which represents 10 percent of all projected emissions. The role of developing countries in any eventual international protocol on climate change is one of the major outstanding issues in determining long-term equitable commitments and global participation in a climate change regime.

“The findings in this study – Developing Countries and Global Climate Change – represent a major step forward in the climate change debate,” said Eileen Claussen, executive director, Pew Center on Global Climate Change. “This study shows that developing countries do not have to choose between protecting the environment and ensuring their economic future – they can do both.”

The study was conducted for the Pew Center by RAND, a non-profit corporation that seeks to improve public policy and decision-making through research and analysis. Originally founded by the US Air Force to focus on national security issues, RAND has addressed many of the nations' most pressing policy problems for more than 50 years. Today, RAND's research includes topics as diverse as national security, energy and the environment, health care and education, and numerous other topics.

The report assesses the \$68 billion likely to be invested annually in new generation capacity. While "business as usual" trends nearly triple carbon dioxide emissions within 20 years, the report details four alternative paths that decrease carbon dioxide and other emissions relative to current expectations, without impeding economic growth.

- First, including the costs of electricity delivery – not just generation – makes planning and investment decisions more efficient and makes distributed renewable energy more viable, decreasing carbon dioxide emissions by up to 2.5 percent;
- Second, increasing privatization of the electricity sector could reduce carbon dioxide by up to one percent and boost economic benefits by up to five percent;
- Third, increasing the use of natural gas and renewables could reduce carbon dioxide emissions by almost 25 percent with the same economic benefits; and

2111 Wilson Blvd.
Suite 350
Arlington, VA 22201
ph (703) 516-4146
fax (703) 841-1422
www.pewclimate.org

The Pew Center On
Global Climate Change
brings a new cooperative
approach and critical
scientific, economic and
technological expertise
to the global debate on
climate change.

- Fourth, increasing the efficiency of electricity supply and demand could reduce carbon dioxide emissions by up to ten percent.

The findings were based on an aggregated analysis and may not hold for individual countries.

“The study findings offer a blueprint for progress,” said Claussen. “But progress in the developing world will not build itself. The industrialized world has an important role to play in supporting reforms that will allow these benefits to accrue.”

Claussen also noted that participation in the Clean Development Mechanism or other international mechanisms could increase the available up-front financing to accomplish these reforms.

This overview report will be followed by five detailed case studies examining electric power generation in Argentina, Brazil, China, India and the Republic of Korea.

The findings in the study will be highlighted in a print advertisement supported by the Pew Center, which is scheduled to appear in *The New York Times*, *The Washington Post*, *National Journal*, *Roll Call* and *The Economist*.

The Pew Center was established in May 1998 by the Pew Charitable Trusts, one of the nation's largest philanthropies and an influential voice in efforts to improve the quality of America's environment. The Pew Center is conducting studies, launching public education efforts, promoting climate change solutions globally and working with businesses to develop marketplace solutions to reduce greenhouse gases. The Pew Center is led by Eileen Claussen the former U.S. Assistant Secretary of State for Oceans and International Environmental and Scientific Affairs.

The Pew Center includes the Business Environmental Leadership Council, which is composed of 21 major, largely Fortune 500 corporations all working with the Pew Center to address issues related to climate change. The companies do not contribute financially to the Pew Center – it is solely supported by contributions from charitable foundations.

#



ABOUT THE AUTHORS

“Developing Countries and Global Climate Change”

Dr. Mark Allen Bernstein

Dr. Bernstein is currently a Senior Policy Analyst at the RAND Corporation working to develop RAND's expertise and analytical capabilities on energy and environmental issues. Work currently underway includes analyses on the role of technology innovation in reducing greenhouse gas emissions, scenarios for electric power in developing countries, role of energy efficiency in economic productivity and a review of California's Public Interest Energy Research Program. Until June of 1998, Mark spent two years as the Senior Energy Policy Analyst for the White House Office of Science and Technology Policy in the Executive Office of the President, where he was responsible for energy issues as it relates to technology and the economy including reviewing Department of Energy's R&D budgets, working on legislation on electricity restructuring, climate change technology strategies and renewable energy technologies.

He has published articles on implications of emission trading, comparison of costs of coal and nuclear and alternative energy systems, as well as assessing the impacts of energy options in economic development. Mark has been an active member and on the board of the International Association of Energy Economics and the US Association of Energy Economics. Mark has worked in Southeast Asia, in particular advising on energy issues in China, Thailand, Philippines and Indonesia. Mark has also worked with government and energy organizations in Africa and Latin America.

Mark holds a Ph.D. in Energy Management and Environmental Policy from the University of Pennsylvania and a Masters and Bachelors in Mathematics.

Scott Hassell

Scott Hassell holds MS degrees in Civil & Environmental Engineering and Technology & Policy from the Massachusetts Institute of Technology. At RAND, his research is primarily in the areas of energy, environment, economic development, and technology policy. His graduate research focused on mobility, environment, and the automotive industry in Thailand. Prior to joining RAND, Scott worked on a broad range of issues spanning high-level radioactive waste management at the National Research Council to Everglades restoration with the South Florida Water Management District. He holds a BS in Engineering from Swarthmore College.

Jeff Hagen

Jeff Hagen obtained a Bachelor of Science degree in Engineering and Applied Science from the California Institute of Technology in 1991 and a Masters in Aeronautical Engineering from the University of Washington in 1993. While at Caltech he worked at the Jet Propulsion Laboratory and NASA Dryden Flight Research Center and at the University of Washington his research focused on turbulent fluid flows. Upon graduation he joined the RAND Corporation in the Defense and Technology Planning Department. His research areas there include strategic policy and decision making and technological systems analysis. Much of his work involves modeling and simulation of military forces as well as economic and environmental systems. Recent publications include *Trends in Recognition Technology*, *Alternatives for Achieving Aircraft Survivability*, and *Dual-Use Rotorcraft Technology: Market Factors and Technology Development*.

2111 Wilson Blvd.
Suite 350
Arlington, VA 22201
ph (703) 516-4146
fax (703) 841-1422
www.pewclimate.org

The Pew Center On
Global Climate Change
brings a new cooperative
approach and critical
scientific, economic and
technological expertise
to the global debate on
climate change.



Business Environmental Leadership Council

ABB Inc.

Air Products and Chemicals, Inc.

American Electric Power

Baxter International Inc.

Boeing Company

BP Amoco

CH2M HILL

DuPont

Enron Corp.

Entergy

Holnam Inc.

Intercontinental Energy Corporation

Lockheed Martin

Maytag Corporation

PG&E Corporation

Shell International

Sunoco, Inc.

Toyota

United Technologies

Weyerhaeuser

Whirlpool

2111 Wilson Blvd.
Suite 350
Arlington, VA 22201
ph (703) 516-4146
fax (703) 841-1422
www.pewclimate.org

The Pew Center On
Global Climate Change
brings a new cooperative
approach and critical
scientific, economic and
technological expertise
to the global debate on
climate change.

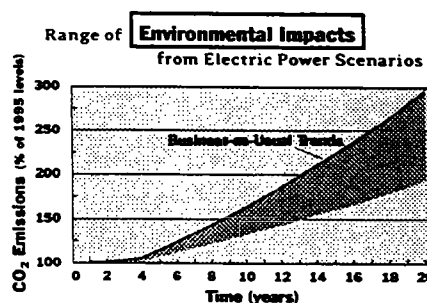
Developing Countries and Global Climate Change

Developing countries are expected to expand their economies, boost electricity investments, and increase greenhouse gas emissions substantially over the next two decades. But a report funded by the Pew Center on Global Climate Change demonstrates that the growth in carbon dioxide emissions can be lowered while still enabling economic development.

The report, "Developing Countries and Global Climate Change: Electric Power Options for Growth," assesses the \$68 billion likely to be invested annually in new generation capacity. This "business as usual" path nearly triples CO₂ emissions, but the report presents four paths that decrease CO₂ and other emissions relative to current expectations:

- including the costs of electricity delivery — not just generation — makes planning and investment decisions more efficient and makes distributed renewable energy more viable, decreasing CO₂ emissions by up to 2.5 percent;
- increasing privatization of the electricity sector could reduce CO₂ emissions by up to 1 percent and boost economic benefits by up to 5 percent;

- using low-polluting technologies — increasing the use of natural gas and renewables — could reduce CO₂ emissions by almost 25 percent while still allowing economic growth; and
- increasing the efficiency of electricity supply and demand could reduce CO₂ emissions by up to 10 percent.



These findings were based on an aggregated analysis of developing countries and may not hold for individual countries. For similar benefits to accrue, specific reforms that account for national conditions would have to be implemented in the developing world. Countries could also obtain funds from various international institutions to increase the available up-front financing to accomplish these reforms.



PEW CENTER
Global CLIMATE CHANGE

For a copy of the Pew Center on Global Climate Change's report, *Developing Countries and Global Climate Change*, call (703) 516-4146 or visit our web site at www.pewclimate.org

WORKING TOGETHER... BECAUSE

CLIMATE CHANGE IS **serious business**

PEW CENTER

 Global CLIMATE CHANGE

2111 Wilson Blvd.
Suite 350
Arlington, VA 22201
ph (703) 516-4146
www.pewclimate.org

The Pew Center On Global
Climate Change brings a
new cooperative approach
and critical scientific,
economic and technological
expertise to the global
debate on climate change.



PHOTOCOPY
PRESERVATION