



WIREC 2008 Ministerial Bulletin

A summary report of the Washington International Renewable Energy Conference 2008
Published by the International Institute for Sustainable Development (IISD)

ONLINE AT [HTTP://WWW.IISD.CA/YMB/WIREC2008/](http://www.iisd.ca/ymb/wirec2008/)
VOLUME 95, No. 8, TUESDAY, 11 MARCH 2008



SUMMARY OF WIREC 2008 MINISTERIAL: 4-6 MARCH 2008

The Washington International Renewable Energy Conference (WIREC 2008) convened from 4-6 March 2008, at the Washington, DC Convention Center in the US. WIREC 2008 consisted of a Ministerial Meeting, a business conference, a trade show exhibition and side events. More than 3000 participants from 118 countries registered for the Ministerial Meeting, including approximately 100 ministerial representatives. Over 4000 individuals registered to participate in the business conference, trade show and side events. This *Bulletin* reports on the Ministerial Meeting events.

George W. Bush, President of the United States of America, addressed the WIREC 2008 Ministerial Meeting on Wednesday morning, 5 March. Participants also attended over 25 plenary and workshop sessions to discuss four themes: market adoption and finance; agriculture, forestry and rural development; state and local authorities; and research and development (R&D).

At the close of WIREC 2008, over 100 pledges had been submitted for the Washington International Action Program, a compilation of domestic and international pledges to accelerate the global uptake of renewable energy. The Renewable Energy Network for the 21st Century (REN21) will support WIREC 2008 by following up on the implementation of the pledges, which will be accepted until 4 April 2008. India offered to host the next International Renewable Energy Conference in early 2010.

A BRIEF HISTORY OF MULTILATERAL PROCESSES ON RENEWABLE ENERGY

During the fuel crisis of the 1970s, many countries began exploring alternative sources of energy. The international community's first major attempt to develop a strategy for the use of alternative fuels was the 1981 UN General Assembly Resolution A/RES/36/193 on the outcomes of the UN Conference on New and Renewable Sources of Energy, which included a "Nairobi Programme of Action for the Development and Utilization of New and Renewable Sources of Energy." However, it was only following the 1992 UN Conference on Environment and Development (UNCED), in Rio de Janeiro, Brazil, that renewable energy issues featured more prominently on the international environment and development agenda.

UN CONFERENCES AND SUMMITS: At UNCED, delegates adopted Agenda 21, an action plan for implementing sustainable development. Agenda 21 addresses sustainable



US President George W. Bush addressed delegates

energy, among others, in Chapter 9, on protecting the atmosphere, which notes that the need to control atmospheric emissions of greenhouse gases and other substances will increasingly need to rely on environmentally sound energy systems, particularly new and renewable sources of energy. The chapter also addresses, *inter alia*, the need for R&D, the transfer and use of technologies, and measures to overcome barriers to the use of renewables.

In the years following UNCED, several UN conferences and summits addressed renewable energy and sustainable development issues in their outcome documents. These included the Global Conference on Sustainable Development in Small Island Developing States (1994), International Conference on

IN THIS ISSUE

A Brief History of Multilateral Processes on Renewable Energy	1
WIREC 2008 Ministerial Report	3
Tuesday, 4 March	3
Wednesday, 5 March	6
Thursday, 6 March	11
Upcoming Meetings	14

The *WIREC 2008 Ministerial Bulletin* is a publication of the International Institute for Sustainable Development (IISD) <info@iisd.ca>, publishers of the *Earth Negotiations Bulletin* © <enb@iisd.org>. This issue was written and edited by Douglas Bushey, Twig Johnson, Ph.D., Miquel Muñoz, Ph.D., and Lynn Wagner, Ph.D. The Digital Editor is Dan Birchall. The Editor is Mark Schulman <mark@iisd.org>. The Director of IISD Reporting Services is Langston James "Kimo" Goree VI <kimo@iisd.org>. Funding for coverage of this meeting has been provided by the U.S. Department of State. IISD can be contacted at 161 Portage Avenue East, 6th Floor, Winnipeg, Manitoba R3B 0Y4, Canada; tel: +1-204-958-7700; fax: +1-204-958-7710. The opinions expressed in the *Bulletin* are those of the authors and do not necessarily reflect the views of IISD. Excerpts from the *Bulletin* may be used in other publications with appropriate academic citation. Electronic versions of the *Bulletin* are sent to e-mail distribution lists (in HTML and PDF formats) and can be found on the Linkages WWW-server at <http://www.iisd.ca/>. For information on the *Bulletin*, including requests to provide reporting services, contact the Director of IISD Reporting Services at <kimo@iisd.org>, +1-646-536-7556 or 300 East 56th St., 11A, New York, NY 10022, USA.

Population and Development (1995), World Summit on Social Development (1995), Fourth World Conference on Women (1995), UN Conference on Human Settlements (1996) and World Food Summit (1996). The World Solar Summit in 1996 and the 19th Special Session of the UN General Assembly (UNGASS-19) in 1997 also addressed energy issues, with UNGASS-19 deciding that the issue should be further examined during the ninth session of the Commission on Sustainable Development (CSD-9) in 2002.

CSD: In April 2001, CSD-9 adopted Decision 9/1 (E/CN.17/2001/19) on “Energy for sustainable development.” The Decision included recommendations to encourage the role of the private sector, strengthen R&D and institutional capacities, develop and use indigenous sources of renewable energy, and strengthen financial support to developing countries. It also addressed issues of energy accessibility and rural energy, noting that access to affordable energy services is a prerequisite for implementation of the goal accepted by the international community to halve the proportion of people living on less than US\$1 per day by 2015. IISD RS coverage of CSD-9 can be found at: <http://www.iisd.ca/csd/csd9/index.html>

CSD-15, at its May 2007 meeting, also addressed energy issues, although delegates did not reach consensus on any decisions. IISD RS coverage of CSD-15 can be found at: <http://www.iisd.ca/csd/csd15>

WSSD: The World Summit on Sustainable Development (WSSD) convened in August-September 2002, in Johannesburg, South Africa. WSSD participants adopted the Johannesburg Plan of Implementation (JPOI), which addresses renewable energy in several of its chapters. Regarding sustainable consumption and production patterns (Chapter III), governments agreed to increase the global share of renewable energy sources substantially, with the aim of raising the contribution renewable energy makes to total energy supply “with a sense of urgency.” The JPOI also addressed renewable energy issues in text on poverty eradication (Chapter II), small island developing States (Chapter VII) and Africa (Chapter VIII).

RENEWABLES 2004: At the WSSD, German Chancellor Gerhard Schröder invited the international community to Germany for an International Conference on Renewable Energy - *renewables 2004*. The conference took place in June 2004, in Bonn, Germany. Approximately 3600 participants from 154 countries attended the Conference, including several Heads of State and 121 Ministers. Participants addressed issues including: best-practice examples and success stories; policies for renewable energy market development; financing options; strengthening capacities, research and policy development, and institutions; energy services and the Millennium Development Goals (MDGs); and the contribution of renewable energy in meeting the climate challenge. In the closing session, delegates adopted three outcomes: policy recommendations, an international action programme and a political declaration. The declaration called for the establishment of a global policy network, which led to the creation REN21. IISD RS coverage of *renewables 2004* can be found at <http://www.iisd.ca/sd/ren2004>

BIREC 2005: The Chinese Government hosted the Beijing International Renewable Energy Conference in November 2005 (BIREC 2005). The 1200 representatives from over 80 countries in attendance addressed practical measures, success stories and

effective legislative and policy measures to create institutional and technical infrastructures and make market forces work effectively. They also discussed the establishment of a review process to assess the progress made towards the implementation of the JPOI and the International Action Programme of *renewables 2004*. Officials adopted a Beijing Declaration, which recognizes the need for significant financial resources, both public and private, for investment in renewable energy and energy efficiency, and emphasizes the need for enhanced international cooperation for capacity building in developing countries, among other issues.

G8 AND RENEWABLE ENERGY: In July 2000, the Group of Eight (G8) leading industrialized countries established a Renewable Energy Task Force to identify actions to promote a change in the supply, distribution and use of renewable energy in developing countries. In 2001, the Task Force concluded that renewable energy resources can sharply reduce local, regional and global environmental impacts, as well as energy security risks, and suggested that concerted action by the G8, other countries, the private sector and international financial institutions to implement the Task Force’s recommendations over the next decade could result in various positive outcomes. At the Gleneagles Summit in July 2005, the G8 issued a joint statement in which the leaders announced a global dialogue on climate change, clean energy and sustainable development, the results of which will be reported to the G8 in 2008.

MAJOR ECONOMIES PROCESS: On 31 May 2007, US President Bush announced a US initiative on energy security and climate change. The first Major Economies Meeting on Energy Security and Climate Change convened in Washington DC, US, in September 2007, and was attended by officials from 16 invited major industrialized and developing countries, the EU and the UN. Participants discussed technological options and responses to climate change, sectoral opportunities and long-term “aspirational” goals for reducing emissions. The second Major Economies Meeting convened in Honolulu, Hawaii, in January 2008, and focused on how to develop a detailed contribution to take forward the roadmap and Action Plan agreed in December 2007 during the UN Climate Change Conference in Bali, Indonesia. The third Major Economies Meeting is expected to convene in France, in April 2008.

IPCC: At the 25th meeting of the Intergovernmental Panel on Climate Change (IPCC-25) in April 2006, the Panel agreed to hold a scoping meeting on a Special Report on Renewable Energies. This meeting convened in January 2008, in Lübeck, Germany, where issues such as the mitigation potential of renewable energies, policies and different renewable technologies were considered. The meeting resulted in a document suggesting a structure for the special report for consideration by IPCC-28, in Budapest, Hungary, in April 2008.

REGIONAL CONSULTATIONS PRIOR TO WIREC: The Renewable Energy and Energy Efficiency Partnership (REEEP) conducted regional consultation meetings for WIREC 2008 in Pretoria, South Africa; Sydney, Australia; New Delhi, India; Singapore; and across Latin America. The outcomes from these meetings were compiled into a report that was presented by the South African Minister for Minerals and Energy, Buyelwa Sonjica, on the final day of WIREC 2008.

WIREC 2008 MINISTERIAL REPORT

US Under Secretary of State for Democracy and Global Affairs Paula Dobriansky opened WIREC 2008 on 4 March 2008. She



Paula Dobriansky, Under Secretary of State for Democracy and Global Affairs, US Department of State

emphasized the importance of stimulating renewable energy development to address poverty alleviation, energy security, local air quality and climate change, and highlighted that the meeting would produce a Washington International Action Program, which would compile voluntary domestic and international pledges to advance the uptake of renewable energy.

WIREC 2008 participants then heard from conference organizers and sponsors, along with reports from the two meetings that preceded WIREC 2008: *renewables*

2004 and BIREC 2005. Following these opening statements, they convened in ministerial and stakeholder sessions and a joint session to discuss environmental and economic benefits of renewable energy. On Wednesday, 5 March, US President George W. Bush addressed the conference, and participants attended workshops that were organized around WIREC's themes. The conference concluded on Thursday afternoon, 6 March, following reports on Wednesday's workshops, regional consultations and pledges that were made during the conference. This report summarizes the proceedings of WIREC 2008 and is organized chronologically.

TUESDAY, 4 MARCH

OPENING STATEMENTS: Michael Eckhart, President, American Council On Renewable Energy (ACORE), noted his organization's role in partnering with the US Government to organize WIREC 2008. He highlighted that: renewable energy is a policy-driven market; technology is available, affordable and spreading; and major R&D is needed to increase the scale and reduce the costs of third and fourth generation technologies.

Thomas Dorr, Under Secretary for Rural Development, US Department of Agriculture (USDA), said the US has gone from producing 2 million to 450 million gallons of biodiesel in the last seven years, and many new technologies, in such areas as genomics, offer great promise.

John Negroponte, Deputy Secretary of State, US Department of State, said renewable energies can reduce dependency on fossil fuels and lower greenhouse gas emissions, and highlighted climate change discussions among the major economies and a clean energy fund.

Ed Schafer, Secretary, USDA, underscored agriculture as the main contributor to renewable energy. He said that renewables have boosted the farm economy, and noted the potential benefits



Participants listened to a presentation by REN21 Chairman Mohamed El-Ashry, in plenary

of opening agriculture markets for developing countries. Schafer noted challenges such as the need for viability without subsidies, environmentally safe production, social acceptance and balancing energy and food production needs.

Parliamentary State Secretary Michael Müller, German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, emphasized that protection of natural capital can stabilize the global economy, create jobs and improve quality of life, and proposed an "ecological Bretton Woods" emerging from the G8, to address the ecological challenges of the upcoming century.

Zhang Xiaoqiang, Vice Chairman, National Development and Reform Commission of China, reviewed the experience of BIREC 2005, and highlighted the need for: greater international support for renewable energy in developing countries; new mechanisms for technology research, development and dissemination; capacity building; and a global approach to establishing product standards, currently dominated by a few large countries.

MINISTERIAL LEVEL PLENARY SESSION: DEFINING

THE ISSUES: Six speakers made presentations on current trends and issues relating to the transition to renewable energy. Hermann Scheer, General Chairman of the World Council for Renewable Energy and Member of Parliament, Germany, stated that renewable energy is an opportunity, not a last resort. He suggested that frontrunners are necessary for a scale up of renewable energy, and encouraged the US to play a leadership role. Emphasizing the importance of exchanging experiences, he described the German proposal for an international renewable energy agency, and invited willing countries to join.

Samuel Bodman, Secretary, US Department of Energy (DOE), emphasized the role of renewables and energy efficiency for a cleaner, more affordable and secure energy system that relies less on fossil fuels. He highlighted US work with the major economies on a future climate change framework, underscoring technological solutions. He said the American public is calling for action, and stressed domestic concern about energy prices and volatility, as well as the needs of developing countries. Bodman highlighted investment in R&D and cellulosic ethanol demonstration projects, and emphasized recent growth in photovoltaic and wind energy deployment.

Tony Hayward, CEO, BP, noted that the US, as the largest energy consumer, is key to any effort to address energy security and climate change, which, he noted, has become an issue in the upcoming US election. He said cap and trade approaches are the way forward, and, while a global trading system should be the ultimate goal, post-Kyoto frameworks should not preclude



Michael Eckhart, President, ACORE

regional efforts. He further stated that subsidies would be needed for critical new technology development until their effectiveness has been demonstrated and they become affordable.

Mohamed El-Ashry, Chairman, REN21, announced the release of the REN21 2007 Global Status Report. He stated that renewable energy has become mainstream, citing statistics on sectoral job growth, financial investment and national targets and policies. Highlighting the problems of energy security, energy poverty and climate change, he called for the continuation and acceleration of the recent rapid scale up of renewable energy technologies.

Nobuo Tanaka, Executive Director, International Energy Agency, said energy security and climate change must be addressed together and pose an unprecedented challenge requiring immediate action, participation from major economies and, possibly, lifestyle changes. He outlined carbon-neutral technological options that could help reach the greenhouse gas (GHG) reductions required by 2050 to stabilize the climate. He said renewables need to generate more than 50% of electricity in 2050, highlighted education and training, and the need to find geological formations for carbon and nuclear waste storage. Tanaka noted a decrease in public energy R&D in industrialized countries and said time was a scarce resource.



Nobuo Tanaka, Executive Director, International Energy Agency

and said that current forecasts will prove equally wrong due to the inability to account for future innovation and technology. He added that the timetable for technology adoption is being reduced. Khosla then reviewed a number of innovative technologies being developed, and called for a stable regulatory framework underpinning a global trading system supplemented by transitional subsidies for promising technologies.

MINISTERIAL SESSION: THE ECONOMIC AND ENVIRONMENTAL BENEFITS OF RENEWABLE ENERGY:

This closed interactive ministerial session was facilitated by Claudia McMurray, US Assistant Secretary of State, Oceans, Environment and Science. Steve Johnson, Administrator, Environmental Protection Agency (EPA), and Andris Piebalgs, Energy Commissioner, European Union (EU), delivered opening statements, following which other ministers and government representatives addressed the session.

Participants heard about US and EU renewable energy activities, including cooperative efforts between the US and the European Commission. Work on the UN Framework Convention on Climate Change (UNFCCC) commitment to achieve a post-2012 agreement and activities under the Asia-Pacific Partnership, the Methane to Market Partnership and the Energy Star Program

were also highlighted. A few speakers discussed the EU's 20-20-20 by 2020 commitment, which includes the goal of achieving a target of 20% of energy from renewables by 2020, up from 8.5% now.

Many speakers highlighted the importance of cooperative efforts with other countries, including an example of cooperation between the US, EU and Brazil on biofuels, and several emphasized the need for the US and EU to work together on renewable energy.

One speaker highlighted power sector activities such as clean coal, large-scale carbon storage and wind power, and transportation sector activities, such as increasing gas mileage requirements. Speakers underscored relevant national policies, such as efforts to strengthen institutions, increase energy efficiency, and promote public transportation and the use of rail rather than roads for transporting goods.

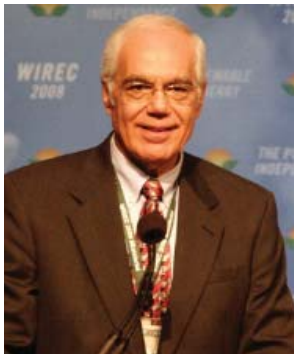
Speakers emphasized that the future of renewables depends on political will, and that agreement on a comprehensive framework is essential to create a stable investment environment. One speaker stressed the "tried and tested" geothermal and hydroelectric power renewable energy sources. Several participants highlighted the importance of adequate R&D funding.

Speakers noted the needs of developing countries, including small island developing States, where energy consumption will need to increase substantially to achieve economic development. The high initial costs of renewable energy were noted by speakers who highlighted the possibilities for assistance to these countries. One speaker said sources of low-cost financing from international institutions should be identified.

Links between energy, climate and security issues were emphasized by speakers, who said energy policies should be closely related to climate policy. One speaker outlined several advantages of renewable energy: it is based on domestic resources so it can be used in any country; it is not exhaustible; it diversifies energy sources; it does not have carbon emissions; and it is a decentralized power source.

STAKEHOLDER SESSION: THE ECONOMIC AND ENVIRONMENTAL BENEFITS OF RENEWABLE ENERGY:

David Hales, President, College of the Atlantic, chaired the afternoon stakeholder session, which focused on barriers and solutions to renewable energy scale up. Dieter Salomon, Lord Mayor, Freiburg, Germany, and ICLEI (Local Governments for Sustainability) Executive Committee Member, described the barriers to effective involvement of local governments, highlighting a lack of expertise and difficulties affecting centralized energy generation. Corrado Clini, Chair, Global Bioenergy Partnership, identified trade barriers and agricultural subsidies as significant barriers to global scale up. Dan Reicher, Co-Chair, ACORE and Director of Climate Change and Energy Initiatives, Google Inc., described Google's goal of installing one gigawatt of renewable energy capacity that is cheaper than coal. Lew Milford, President, Clean Energy Group, said additional barriers include lack of consensus on strategies, gaps in infrastructure, and a lack of financing mechanisms. Moekth Soejachmoen, Indonesia, spoke of the significant costs associated with a scale up, and stated that fixating on large-scale technologies instead of many small-scale technologies can hinder promising small-scale, distributed technologies. Arthouros



Mohamed El-Ashry, Chairman, REN21



Panelists in the stakeholder session: The Economic and Environmental and Environmental Benefits of Renewable Energy

Zervos, President, European Wind Energy Association and President, European Renewable Energy Council, said subsidies of conventional technologies pose a significant barrier to renewable energy scale up. Tetsunari Iida, Executive Director, Institute for Sustainable Energy Policies, described four myths about renewable energy that hinder scale up: high price, intermittency, low energy density and land intensivity. He stated that vested interests close to central governments make policy change difficult.

Among the issues raised during the discussion were: a lack of domestic policy frameworks in many countries, locked-in ways of thinking about renewable energy and a failure to look across borders to identify policies that have been successful elsewhere. A number of participants stressed the importance of “community power” and expressed concern about a “monopoly” on renewable power generation by power companies and large corporations. Another stakeholder shared concerns about the policy environment, noting the complexity of issues like transmission and planning. One stakeholder stated that waiting until prices come down is a barrier in and of itself because prices do not come down until large-scale production is attempted.

Panelists commented on ways to address the barriers identified. Among others, they highlighted: policy innovations; better factual communication on renewables; reaching a common understanding on what renewables can and will deliver; and the benefit that political support at the scale that oil pipelines, oil fields and power lines had and have for leveling the competitive playing field. They also suggested learning from other non-energy distributive innovation areas, such as cell phones, and noted that the challenge is both informational and technological. Noting that Amory Lovins predicted 20 years ago many of the issues discussed today, Dieter Salomon said good ideas need time.

JOINT MINISTERIAL-STAKEHOLDER “STRAIGHT TALK” SESSION: The Joint Ministerial-Stakeholder Session was moderated by Hank Habicht, Vice Chairman, Global Environment and Technology Foundation, and Managing Partner, SAIL Venture Partners. Habicht opened the session by identifying five key issues for scaling up renewable energy technologies: a need for information and awareness; meeting the needs of financiers; providing incentives for R&D and technology transfer; involving developing countries; and finding better ways to deploy existing technologies.

Andris Piebalgs summarized the ministerial session, noting that a number of fundamental questions were raised regarding land use, sustainability and how costs could be brought down. He said

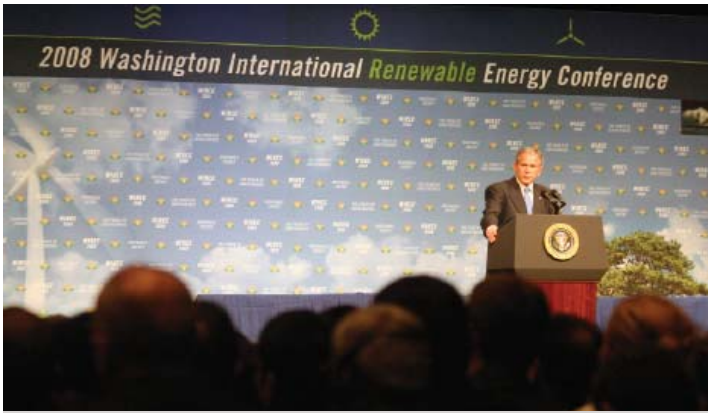
additional issues discussed included R&D needs, the potential of hydro and geothermal power, and the importance of doing things right from the beginning. David Hales summarized the points of consensus from the stakeholder session, highlighting the need for consistent and predictable policy, public awareness and rapid action.

Connie Hedegaard, Minister for Climate and Energy, Denmark, stressed the importance of long-term and short-term binding targets. She described Denmark’s success in developing its renewable energy market and suggested that other countries study the strategies they have used. Kim Campbell, former Prime Minister of Canada and Member, Board of Directors, Madrid Club, underscored the importance of energy efficiency and stressed the need for an economic plan of action with specific targets and goals. She highlighted the need to consider the real costs of energy, to identify the national strengths of each country on renewables, and for clear and consistent policies.

A number of government representatives then offered statements. Brazil said 45% of its energy comes from renewable sources, in spite of its size, diversity, and high rates of growth in population and energy demand. He said many of its near-term targets will be met from accelerating efforts to achieve energy efficiency, and Brazil is determined to avoid trade-offs between food and energy production. Poland reported that his country is working to accelerate the process of increasing renewable energy sources without negative impacts on the environment by, for example, investing in biomass generation only at a local scale that does not involve high transportation costs, and focusing on small-scale hydropower that avoids extensive damage to ecosystems. Spain reported it has doubled its production of renewable energy. He noted that last year was the first to show a decrease in energy intensity. New Zealand highlighted his country’s pledges to become carbon neutral and to increase its percentage of renewable energy.

During the discussion, one speaker said there is a need for case studies of countries and leaders who are at the forefront on these policies. Another asked panelists for ideas about how best to engage the financial community. Hedegaard said national market incentives should be in place and targets can help push markets in the right direction. She also stressed that enhancing energy efficiency does not involve costs and holds great potential. Additional issues discussed included: international benchmarking for feed-in tariffs; windfall profits; confidence-building; clear policies; how to implement feed-in tariffs in developing countries; and the importance of commitment. Morocco proposed developing a strategy based on existing grid connections to Europe to promote renewables in Morocco.

MINISTERIAL LUNCHEON: During a luncheon of ministers and other dignitaries, participants were addressed by Dirk Kempthorne, Secretary, US Department of the Interior, who highlighted the Department of Interior’s experiences with renewable energy, including converting its own facilities to using renewable energy. He highlighted the need to take a holistic approach to renewable energy, and said the US Administration is undertaking a water census, and has developed an initiative to understand the dynamics of wild bird populations, to address issues related to the development of biofuel and wind energy, respectively.



US President George W. Bush



Tim Pawlenty, Governor of Minnesota and Chairman of the National Governor's Association

WEDNESDAY, 5 MARCH

SPECIAL ADDRESS: George W. Bush, President of the United States of America, said he suspected that the WIREC 2008 agenda would seem outdated within a decade due to technological change, and stated that participants should take pride in being part of the change. Bush highlighted security, economic and environmental reasons to reduce fossil fuel dependency, and described US goals and policies in the transportation and electricity generation sectors, including a goal to reduce gasoline consumption by 20% over 10 years. He added that the US is working with others in the Global Nuclear Energy Partnership to help developing countries adopt proliferation safe nuclear power and to resolve the waste issue. He also said he sees a day when each house can be an electric generator of its own and feed power back to the grid.

Bush said the US is serious about confronting climate change and that there should be an effective, results-oriented international agreement that includes commitments by every major economy, and no free riders. He noted that the Major Economies Process that the US is hosting is a parallel process to the UN process and seeks to enable the UN process to become more effective. He emphasized that an effective agreement will recognize that economies need to grow in order to afford R&D and investment to address the issue. He added that a clean technology fund is needed to help poor countries afford clean energy technologies, and has called on Congress to commit US\$2 billion for this purpose. Bush also said tariffs and barriers on exports of clean energy technologies should be eliminated to enable them to move duty free around the world.

MARKET ADOPTION AND FINANCE SESSIONS:

The plenary session for this theme was moderated by Gregory Manuel, Special Advisor to the Secretary of State and International Energy Coordinator, US Department of State. Alexander "Andy" Karsner, Assistant Secretary of Energy Efficiency and Renewable Energy, US DOE, noted that renewables address mitigation, finance and technology transfer, three of the pillars from the Bali roadmap. Maud Olofsson, Deputy Prime Minister and Minister for Enterprise and Energy, Sweden, told of Sweden's transition to a "green" economy. She said it is possible to combine welfare development with climate care and stressed that biofuels must not conflict with food or have large environmental impacts. Tim Pawlenty, Governor of Minnesota and Chairman of the National Governor's Association, noted US states' concerns for energy prices, national security and

greenhouse gases, and interest in "green collar" jobs. Reuben Jeffery III, Under Secretary for Economic, Energy and Agricultural Affairs, US Department of State, highlighted the need for the EU, US and Brazil to agree to common standards on biofuels, and called attention to a clean technology fund committed to by the US, UK and Japan. Michael Liebreich, CEO, New Energy Finance, forecasted the clean energy sector to stabilize at

about US\$650 billion per year around 2030.

Grid Connected Generation: Market Adoption and Deployment of New Technology: Hans Jørgen Koch, Deputy State Secretary, Danish Energy Agency, highlighted Denmark's 20% annual share of wind power, stated that this share increases to 35% in some months and 100% in some hours, and noted there had been no problems with the grid. Christine Wörlen, German Energy Agency, comparing reviews of the German feed-in tariff with lapses in the US Production Tax Credit (PTC), noted the role of policy continuity and adjustment in sustaining exponential growth of wind power. She said feed-in tariffs, while the most effective instrument, are not sufficient, and must be accompanied by other measures such as provisions on grid access and balance of power, transmission planning and zoning laws. Terry Hudgens, President and CEO, PPM Energy, said 119,000 US jobs will be lost by 2009 if the PTC is not extended. Ian Simm, Chief Executive Officer, Impax Group PLC, cautioned against "spaghetti" policy, or too many policies at the same time, and noted the impacts of the credit and equity market crisis on the renewable sector, while highlighting the sector's long-term investment potential. Lucien Bronicki, Chairman and Chief Technology Officer, Ormat Technologies Inc., said geothermal provides base-load weather-independent power. The ensuing discussion focused, among others, on grid expansion, R&D and the not-in-my-backyard (NIMBY) effect.

Distributed and Off-Grid Generation: Market Adoption and Deployment of New Technology: This session was facilitated by Jeff Leonard, President and CEO, Global Environment Fund. Daniel Yergin, Chairman, Cambridge Energy Research Associates, said he expects the US to have a carbon cap and trade regime in place by 2009/2010, and that venture capitalists will fund the scale up of renewable energy. He emphasized the importance of opening up global trade in renewable energy technologies, products and services. Linda Conlin, Vice Chair and First Vice President, US Export Import Bank, described various Bank programs available to US companies to promote renewable investment. Wu Guihui, Deputy Director General, Energy Bureau, National Development and Reform Commission, China, said his government's goal is to use renewable energy, especially methane, biomass and hydro, to power rural villages, and to upgrade the central grid systems to be able to connect to villages using renewable energy sources for electrical power generation. Gary Rieschel, Founder

and Managing Director, Quiming Venture Partners, suggested developing countries could skip development of expensive grid systems by use of reliable lower-cost renewable electricity on a massive scale. He said US\$20-40 billion a year is needed in R&D investment across the board.

Renewable Fuels: Market Adoption and Deployment of New Technology: This session was facilitated by Paolo Frankl, Head of Renewable Energy Unit, International Energy Agency. Guatam Bhandari, Executive Director, Morgan Stanley, noted the difficulties in ethanol production and distribution due to sustained rises in corn prices, emphasizing the benefits of this in spurring investment into the most promising cellulosic biomass technologies. Kadri Nassiep, CEO, South African National Energy Research Institute, underscored the need for scale up, deployment, and a decentralized approach to biofuels, noting that local authorities play a key role in making land available. Fernando Reinach, General Partner, Votorantim Ventures, spoke on the recent advances in cellulosic ethanol in Brazil and existing potential. He stressed that sugar cane genetics today are like those of corn in 1850. John Plaza, President and Founder, Imperium Renewables, emphasized that biodiesel has a “leg up on” ethanol in terms of integration into traditional infrastructure. Steve Gatto, Chairman, Chief Executive Officer, Bioenergy International, said we are at the tipping point of the next industrial revolution, and the main constraint remains the so-called “valley of death,” the maturation point after research proves confidence in technology but before financing takes hold.

Grid-Connected Generation in Mature Markets: Binyamin Ben-Eliezer, Minister of National Infrastructure, Israel, highlighted the role of renewable energies in energy security, underscored Israel’s leadership in solar energy, and said Israel is committed to becoming a renewables high-tech center. Christopher Eckerberg, Vice President and Head of Public Affairs, Vattenfall, underscored problems with transmission grids and consumer attitude. Pat Wood III, Principal, Wood3 Resources and Past Chairman of Advisory Board, Airtricity North America, identified success factors for wind power deployment in Texas, including the ability to build new transmission and allocate transmission costs, and Texas’ electricity market integration and robustness. He said one of the reasons why there was no US federal renewable portfolio standard is because the US Southeast does not have much solar or wind potential and it is seen as unfair to burden its citizens with a renewables obligation. Robert Hertzberg, Principal, Renewable Capital, Chairman, G24 Innovations Ltd., and former Speaker of the California House of Representatives, said that to get good policy enacted and implemented it is important to understand the “laws of physics” between the worlds of finance and politics. He said the US

roughly spends US\$1 billion a day in oil imports. The following discussion focused, among others, on US federal plans for renewable electricity support, connection of small producers to the grid and financing of grid expansion.

Distributed and Off-Grid Generation in Mature Markets: This session was moderated by Wolfgang Palz, Chair of the World Council for Renewable Energy. He underscored the importance of political support for renewable energy deployment in developed countries, and noted the strong growth of renewable energy in Europe. Thomas Dinwoodie, CEO, SunPower Corporation Systems, highlighted the 50% growth per year in the US solar market as well as the potential of wind, central photovoltaic and energy efficiency. He said utilities will need more flexible forms of base load by 2015 and energy storage by 2030-2050. Mit Mehta, Principal, CCMP Capital Advisors, LLC, highlighted that sustained and visible policy and economic incentives are key for renewable energy growth and necessary to maintain current growth rates. Daniel Foley, Vice President, Power Marketing, Acciona Energy North America, noted that key potential areas of growth are geothermal, offshore wind, energy storage and energy efficiency. In the ensuing discussion participants discussed the effects of existing federal and state regulations and policies. There was general agreement that extending incentives for renewable energy is desirable, whether the goal is to decrease greenhouse gas emissions or to decrease dependence on fossil fuels.

Renewable Fuels in Mature Markets: Harry Duynhoven, Associate Minister of Energy and Minister of Transport Safety, New Zealand, moderated the session. He noted New Zealand’s strategy to become carbon neutral in the transport sector by 2040 and to use 90% renewable electricity by 2025. Paul Vikner, President and CEO, Mack Trucks, said every alternative fuel is not appropriate for every application, and highlighted distribution infrastructure, and R&D partnerships between industry and government. Mark Fulton, Managing Director, Global Head of Strategic Planning and Climate Change Strategist, Deutsche Bank, said biofuels are coming under pressure in investment markets. He identified uncertainties including carbon debt, whether incentives will disappear and trade barriers. Donald Paul, Vice President – Special Projects, Chevron Corporation, noted the importance of existing infrastructure, such as pipelines, in determining whether new development will take place, and said technology, energy efficiency and conventional, unconventional and renewable fuels are all necessary. Mary Beth Stanek, Director of Environment, Energy, and Safety Policy, General Motors Corporation, stressed the importance for consistent governmental policy, said mandates only work if there are policies in place to support them, and expressed concern that money is only going to R&D. In the ensuing discussion, speakers highlighted the importance of certification and global standards, including standardized biofuel products.

Grid-Connected Generation in Emerging Markets: V. Subramanian, Secretary to the Government of India, Ministry of New and Renewable Energy, outlined the regulatory framework for renewables in India, and said there are too many regulatory commissions in India. V.K. Garg, Power Finance Corp, underscored grid connection problems in India, saying support needs to move away from installed capacity to electricity generated and connected to the grid. He highlighted the need for



Panelists in the session on market adoption and finance of grid-connected generation in emerging markets

economic and technical viability in order to secure private sector financing. Dana Younger, International Finance Corporation (IFC), noted that while renewables are maturing, they are still not low-cost technologies for developing countries. He underscored remarkable wind power growth in China and India, and described growth of different renewable technologies in developing countries. Jeffrey Sachs, Columbia University, identified three megatrends in the energy sector: lack of pricing of carbon into energy choices; access to electricity in rural developing areas; and energy resource constraints by mid-century. He underscored that the climate agenda and the poverty agenda are intersecting as never before. In the ensuing discussion, participants discussed, among others: feed-in laws and the feed-in cooperation between Spain, Germany and Slovenia; risk to hydropower in Africa from changes in water resources due to climate change; microgrids; and biomass.

Distributed and Off-Grid Generation in Emerging Markets:

This session was moderated by Mark Radka, Energy Programme Coordinator, UN Environment Programme (UNEP). Amina Benkhadra, Minister of Energy, Mines, Water and Environment, Morocco, described how rural electrification increased in coverage from 20% to 90% in one decade. Leandro Alves, Head of Energy Division, Inter-American Development Bank, said that energy accounts for 15% of their loan portfolio and that 25% of that is in renewable energy. Chris Flavin, President, Worldwatch Institute, said a new paradigm is needed for rural electrification as part of a robust rural development context, rather than as a project to be funded by foreign donors. He called for regional research and development centers focusing on policy frameworks and economic development approaches as well as technology. Anthony Orlando, President and CEO of Covanta Energy, said that size matters for plants generating power from waste and therefore tend to be located in densely populated areas. Angelo Reyes, Secretary, Department of Energy, the Philippines, noted some of the challenges associated with a nation made up of 7100 islands and expressed interest in ocean thermal energy.

Renewable Fuels in Emerging Markets: Hernan Martinez Torres, Minister of Energy and Mines, Colombia, moderated this session. Yusof Basiron, CEO, Malaysian Palm Oil Council, discussed the Malaysian palm oil industry and highlighted its benefits as a highly productive fuel that can reduce greenhouse gases compared to fossil fuels. José Sergio Gabrielli de Azevedo, President and CEO, Petrobras, noted the importance of regulatory actions to increase biofuel consumption in the light vehicle market, including through requiring a mandatory blend and requiring mileage improvements. Anil Cabraal, Lead Energy Specialist, World Bank, said the World Bank is just



Under Secretary Thomas Dorr of the US Department of Agriculture, addressed the role of agriculture, forestry and rural development in renewable energy

beginning to think about biofuels, and has identified many trade-offs in regard to this sector but has not developed a position on the issue. He said certification and standards should be addressed on a multilateral basis. Glenn Prickett, Senior Vice President, Conservation International, highlighted environmental considerations, including impacts on rural communities and ecosystem services, and emphasized the importance of establishing a global price for carbon.

AGRICULTURE, FORESTRY AND RURAL DEVELOPMENT SESSIONS:

The plenary on this theme was moderated by Thomas Dorr, Under Secretary for Rural Development, USDA. Chuck Conner, Deputy Secretary of Agriculture, USDA, highlighted the successes of USDA programs at the interface between agriculture and renewable energy. Marcos Jank, President and CEO, Brazilian Sugar Cane Industry Association, highlighted the comparative advantages of ethanol from sugar cane, noted the many trade and non-trade barriers to ethanol while fossil fuels move freely, and said we should move to unobstructed trade. Andrzej Dycha, Under Secretary of State, Ministry of Agriculture and Rural Development, Poland, said it was unacceptable to import biomass that was not produced in conformity with sustainability criteria. Arthur Cua Yap, Secretary, Department of Agriculture, the Philippines, noted that his country's high oil price vulnerability index led to the launch of a national biofuels initiative that includes increasing the ethanol/gasoline mix, increasing the production of a variety of food stocks, and addressing infrastructure requirements in transportation and irrigation.

Sustainability, Technology and Development: Claudia McMurray, Assistant Secretary of State for Oceans, Environment and Science, US Department of State, moderated this session. Juan Pablo Bonilla, Coordinator, Sustainable Energy and Climate Change Initiative, Inter-American Development Bank, emphasized that technology has been a fundamental instrument for innovation for projects in Latin American and Caribbean countries, particularly in relation to renewable energy, energy efficiency and biofuels. Prodipto Ghosh, Senior Advisor to Prime Minister of India and Distinguished Fellow, The Energy and Resources Institute, discussed sustainable biomass and solar energy opportunities



McMurray
Claudia McMurray, Assistant Secretary of State for Oceans, Environment and Science, US Department of State



Panelists in the session on Distributed and Off-Grid Generation in Emerging Markets, moderated by Mark Radka, Energy Programme Coordinator, UNEP

in India, and highlighted the sustainable long-term potential for solar power. William Dar, Director General of the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), highlighted ICRISAT's development of a "smart crop," sweet sorghum, and said greater investments in international agricultural research must be made to fully harness science and technology for biofuel development. Manoel Vicente Bertone, Under Secretary for Production and Agro Energy, Ministry of Agriculture, Brazil, highlighted that 45% of Brazilian energy is renewable, 12% of investments in the sugar cane industry are international and investments are encouraged in Brazil's open market.

Rural and Economic Development: James Kunder, Acting Deputy Administrator, US Agency for International Development, moderated this session in which panelists discussed the central role of energy access for economic and social development. Albert Butare, Minister of State for Energy and Communications, Ministry of Infrastructure, Rwanda, said they wanted to expand the grid and diversify energy sources in rural areas, which hold 90% of the population and where coverage is less than 5%. Doug Faulkner, Deputy Under Secretary for Rural Development, USDA, said clean energy, renewables and efficiency could be one of the greatest opportunities for rural and agricultural development in the US. Sarah Adams, CEO, Global Village Energy Partnership International, described their bottom-up approach based on local resources and capacities, local partnerships and small grants projects. Jamal Saghier, Director for Energy, Transport and Water, World Bank, described the power crisis in Africa, emphasized that off-grid generation does not compete with on-grid, and said 40% of the US\$1.4 billion invested in energy last year was for low-carbon systems. Yasuo Watanabe, Deputy Director General, Minister's Secretariat, Ministry of Agriculture, Forestry and Fisheries, Japan, described the Biofuel Nippon Strategy, R&D related to the Strategy and the increase in the number of "Biomass Towns" from the current 100 to 300 by 2010.

Development of Biobased Products Industry (Non-Fuels): Roger Conway, Director, Office of Energy Policy and New Uses, USDA, moderated this session. John Renieri, Vice President and General Manager, Bio-Based Materials – Energy & Specialties, DuPont, gave a brief account of developing and bringing bioproducts to market, following which USDA Sustainable Operations Council Chair, Boyd Rutherford, described the energy, economic and environmental effects of the government procurement preference program for biobased products. Ibrahim Togola, Director, Mali Folkecenter/CURES Network, Citizens United for Renewable Energy and Sustainability, Mali, spoke about the importance of biofuels in poorer countries, and stressed the importance of avoiding conflicts between traditional uses of biomass and new technologies. Subjects of ensuing discussion included: cellulosic ethanol R&D, generating "demand pull" for bioproducts, and uses of biofuel and bioproduct production byproducts.

The Role of Forestry in Renewable Energy: Mark Rey, Under Secretary for natural Resources and Environment, USDA, moderated this panel, in which discussion centered on sustainable production, R&D and continued production of conventional products. Donna Harman, President and CEO, American Forest & Paper Association, cautioned that the bioenergy market should not

displace the traditional forest products industry. Sundar Bajgain, Head Biogas Programs, Bangladesh, discussed the indirect benefits of tropical forest conservation and the importance of biogas plants for rural economic development. Tom Richardson, CEO Scion Group, discussed the importance of forestry in New Zealand's energy strategy and stressed the importance of technological advancements in production and conversion. Mauri Pekkarinen, Minister of Trade and Industry, Finland, discussed the importance of forest biomass-based energy in Finland, highlighting that 70% of renewable energy in Finland is wood based, and emphasized the importance of sustainable management and research support for optimal use of all residues in bioenergy production. Robert M. Persaud, M.P., Minister, Ministry of Agriculture, Guyana, discussed the transition from charcoal and fuelwood to new technologies and policies that reduce greenhouse gases.

STATE AND LOCAL AUTHORITIES SESSIONS

Renewable Energy Policy and Financing Initiatives:

Lessons Learned and Emerging Strategies: Panelists discussed state and local initiatives to advance renewable energy markets and projects. Patrick D'Addario, President, Fiorello H. LaGuardia Foundation, US, stated that technologies cannot be transferred to developing countries in a vacuum, adding that they need to be integrated into the local scheme. Javier Garcia Monge, Energy and CDM Investment, Investment and Development Division, Corfo, Chile, said local banks do not know the renewable energy market, assume a high risk rate and ask for high warranties for Clean Development Mechanism (CDM) projects. Piyush Ranjan Rout, Executive Director, City Managers' Association, India, discussed the importance of incentivizing citizens and building networks for sharing best practices. Dieter Salomon, Lord Mayor, Freiburg, Germany, stated that private investors are eager to invest but that we now need to enact good legislation that provides policy security for the next 20 years of investment. Mark Sinclair, Director, Clean Energy States Alliance, US, said states and local governments are driving clean energy progress and are at the forefront of policy development. George Fitch, Mayor, Warrenton, Virginia, US, stressed the importance of overcoming the reluctance of local governments to try new things, describing the promise of waste-to-energy systems.

Economic Development and Renewable Energy: State and Local Authorities: Katie McGinty, Secretary, Pennsylvania Department of Environmental Protection, moderated this session. Paul Tonko, President, NYSERDA, State of New York, Innovative Business Development, emphasized "the clean energy innovation economy" to further commercialize "green" energy, accelerate research and development, attract new clean energy



Panelists in the Renewable Energy Policy and Financing Initiatives: Lessons Learned and Emerging Strategies

businesses and investment, stimulate market penetration, create “green” energy jobs and training, and increase New York’s renewable energy consumption. Marta Bonifert, Executive Director, Regional Environmental Center (REC) for Central and Eastern Europe, Hungary, described REC’s efforts to grow renewable energy markets through removing barriers to trade in environmental goods and services and support education, communication, policy development and legislation. Tom Delay, Chief Executive, UK Carbon Trust, noted the use of public land can act as an incentive for commercial development of renewable energy. Stephen Kabuye, Mayor, Entebbe, Uganda, described the negative environmental impacts of Uganda’s wood and biomass consumption, but said that high costs impede greater deployment of renewables. Kaspars Gerhards, Minister of Economics, Latvia, summarized efforts to introduce renewable energy in the country’s electricity supply, noting that 34% of Latvia’s electricity comes from renewables.



Stephen Kabuye, Mayor, Entebbe, Uganda

Renewable Energy Collaboration Opportunities: Creating National and Sub-National Partnerships: Paul Suding, Head of Secretariat, REN21, facilitated this session, which included the panelists Marianne Osterkorn, International Director, Renewable Energy and Energy Efficiency Partnership; Kijune Kim, Chair, Asia-Pacific Partnership for Clean Development and Climate, Renewable Energy Distributed Generation Task Force, South Korea; Robert Meyers, Acting Assistant Administrator, Office of Air and Radiation, US EPA; Marty Sedler, Global Utilities Director, Intel Corporation; and Gunnhild Utkvitne, Director, Baltic Sea Solutions. The discussion focused on the need for federal, state and local levels to work together and with other stakeholders, such as the private sector, to adopt new and renewable energy. Panelists provided examples of actions at the national level to encourage adoption of renewable energy at the sub-national level, discussed bottom-up approaches whereby local communities press for renewable energy as a business investment, and compared the appropriateness of voluntary and mandatory approaches.

RESEARCH AND DEVELOPMENT: Peter Robertson, Vice Chairman, Chevron Corporation, moderated the plenary on this theme, in which speakers discussed various aspects of renewable energy R&D, with a consensus that significantly more money for R&D is needed. John Holdren, Harvard University, gave a survey of the renewable energy R&D landscape, stressing that research, development, demonstration and deployment are iterative, not linear processes. Ossur Skarphedinsson, Minister of Industry, Iceland, described Iceland’s successes developing their geothermal and hydroelectric potential, and encouraged other countries to do the same. Li Junfeng, Secretary General, Chinese Renewable Energy Industries Association, stressed the importance of R&D cooperation, technology transfer and research partnerships. Arthouros Zervos, President, European Wind

Energy Association, and President, European Renewable Energy Council, explained that R&D needs for different technologies depend on the technologies’ current level of development. Walter Kohn, chemistry Nobel Laureate, University of California, Santa Barbara, expressed concern about nuclear power expansion and overpopulation. Noting that scaling up renewable energy is a challenge, he stated that production costs continue to drop as more capacity is produced.

Bioenergy Feedstocks: Gale Buchanan, Under Secretary for Research, Education and Economics, USDA, moderated this session, in which speakers from government, industry and academia discussed prospects and concerns about a scale up of bioenergy feedstock production. Miles Drake, Senior Vice President, R&D, Weyerhaeuser Company, discussed scaling up biofuels production from forest resources, stressing the need to: protect economic value of forest resources; create incentives for third party sustainability certification; reduce financial risk; and integrate the forestry sector into carbon markets. Kepler Euclides Filho, Executive Director, EMBRAPA, Brazil, described Brazilian sugar cane production, emphasizing social aspects of crop production and the ability to plant cane on degraded lands. Both academic panelists raised cautions about large-scale biofuels production. Timothy Searchinger, Woodrow Wilson School, Princeton University, stated that, due to land use changes, using cropland to produce ethanol can be nearly twice as greenhouse gas intensive as gasoline. Wayne Smith, University of Florida, said that although there was no silver bullet, he was optimistic about bioengineered poplar as a feedstock.

Bioenergy Conversion Processes: Moderator Ray Orbach, Under Secretary for Science, US DOE, moderated this session. He said breaking plant fibers into sugar (recalcitrance) is the biggest barrier to making biofuels cost effective, and he noted that the DOE has recently established three new Bioenergy Research Centers. Bruce Dale, Michigan State University, underscored: the importance of making biofuels economically viable and competitive with fossil fuels; environmental impacts from biofuels; and the role of the biofuel industry in economic growth. James Dumesic, University of Wisconsin, described technical research on biofuels. Jane-Eric Sundgren, Volvo Group, said the biofuels portfolio must be evaluated for its utility under different prevailing conditions. He said the key issue is how to increase conversion and utilization efficiency. In the discussion that followed, various trade-offs between feedstock, conversion technologies and efficiency were highlighted.



Bruce Dale, Michigan State University

Wind and Solar: This session was moderated by Joachim Luther, Chairman, International Science Panel on Renewable Energies (ISPRES), during which participants discussed the history and future of wind and solar R&D. Luther announced that ISPRES will release a global review of renewable energy research and development in May 2008, and underscored cost reductions,



Panelists in the session on research and development of wind and solar, moderated by Joachim Luther, Chairman of ISPPE

grid integration/storage and sustainable production schemes. Dan Arvizu, Director, National Renewable Energy Laboratory, noted that wind capacity has grown 40% in 2007 in the US and will continue to grow if there are stable policies. Nathan Lewis, California Institute of Technology, said photovoltaics are the only renewable energy source with immediate potential to address a major part of our energy needs, pointing out that the industry is currently limited by the capacity to produce solar cells. Arnold Goldman, Founder and Chairman, BrightSource Energy, emphasized the need for stable long-term government policies, rules for access to transmission lines and early transition incentives. The ensuing discussion focused, among others, on the returns of investment on research.

Ocean, Tidal, Geothermal, Hydro and Hydrogen: Jason Bak, Chief Executive Officer, Finavera Renewables Inc., moderated this session. He underscored the need for new R&D paradigms, including open-domain technology development. He stressed technology development, commercialization and deployment at national and sub-national levels. Liv Monica Stubholt, Deputy Minister of Petroleum and Energy, Norway, highlighted the need to consider many different renewable energy resources including existing and novel renewable energy sources. She described Norway's public-private partnership on energy recovery from osmosis and Norway's 99% renewable hydropower electricity share. José Achache, Director, Group on Earth Observations (GEO), stressed geothermal power's availability and non-intermittency and emphasized the need for research in corrosion and new materials. He said land will be required to meet the housing, food, water and other requirements in a world of 10 billion people, underscoring trade, not only in carbon, but also in land use. Thorsteinn Sigfusson, University of Iceland, overviewed marine renewables, including wave power, ocean thermal energy and tidal, geothermal power and hydrogen as an energy carrier. He also noted Iceland's lack of fossil fuel resources. Kristjan Guy Burgess, Executive Director, Global Center, Iceland, underscored geothermal energy in Iceland. Noting policy options depend on technology, he said hydroelectric and geothermal need more deployment in developing countries, not R&D.

MINISTERIAL LUNCHEON: During the luncheon for ministers and dignitaries, Robert Mosbacher, Jr., President and CEO, US Overseas Private Investment Corporation (OPIC), described OPIC's commitment to cap and reduce by 20% the GHG emissions of its portfolio and announced a global call for proposals for solar, wind, geothermal and biomass energy investments.

THURSDAY, 6 MARCH

On the final day of WIREC 2008, participants heard presentations of findings from Wednesday's focal theme discussions and from the regional consultations that the Renewable Energy and Energy Efficiency Partnership (REEEP) conducted prior to WIREC 2008. They also heard about the pledges that governments offered as part of the Washington International Action Program.

AGRICULTURE, FORESTRY AND RURAL

DEVELOPMENT: Thomas Dorr, Under Secretary for Rural Development, USDA,

drew together ideas from the sessions on agriculture, forestry and rural development, and state and local authorities. Stating that the environmental, economic and security stakes of the issue are clear, and underscoring that the technical potential for renewable energy is here now, he outlined a number of common themes.

On rural development, he stressed the costs of inaction, the importance of respecting the needs of developing countries and the need to ensure economic growth. On food issues, he stated that the food versus fuel debate is manageable, and highlighted the importance of increased yields and conversion efficiencies. On forestry, he discussed the role of carbon sequestration, the potential for increasing production in the future, and the necessary structural change to empower state and local entities. He concluded by describing barriers to renewable energy scale up, stressing the importance of well-defined property rights, "regularizing" access to public lands and taking advantage of existing intellectual capital.

MARKET ADOPTION AND FINANCE: Gregory Manuel, Special Advisor to the Secretary of State and International Energy



Gregory Manuel, Special Advisor to the Secretary of State and International Energy Coordinator, US Department of State



Thomas Dorr, Chairman, Secretary's Energy Council, Under Secretary for Rural Development, USDA

Coordinator, US Department of State, summarized the results of discussions on market adoption and finance. He said common themes included: grid connectivity issues such as load balancing; approaches to cross-fertilizing R&D between governments; how to learn from the "policy laboratory" taking place around the world; new development models emerging as experience accumulates; opportunities for innovative

partnerships between government and industry in technological areas such as geothermal, hydro, solar, and bioenergy; unmet opportunities due to the scale of capital requirements and time required; and identifying scale opportunities to try out various

approached in places such as Brazil. In addition, he said it was noted that venture capital firms are generally very close to their investments, and that the cost of grains is being driven up principally by Chinese demand for meat.

RESEARCH AND DEVELOPMENT: Millie Dresselhaus, Massachusetts Institute of Technology, reviewed the plenary and four sessions dealing with research and development. She said general observations emerging from discussions include: a strong sense of optimism regarding the future of renewable energy; an appreciation of the scale of the energy challenge; agreement that science policy needs to be predictable and regulatory regimes need to provide incentives for industry partnerships; that 3% of annual investment in renewable energy is needed for R&D, perhaps 1% from government and 2% from industry; and that capacity must be increased, in terms of human resources, R&D infrastructure and the strategic planning of research priorities.

She described technology-specific R&D research priorities that emerged from the week's discussion. On ocean and tidal power she said priorities included saltwater corrosion and fouling, and technologies for concentrating distributed ocean energy. She laid out the need to improve drilling technologies for geothermal, storage for hydrogen, and scalable pumping and turbine technologies for hydropower. On wind and solar, she outlined the need to continue the rapid growth of wind and solar, to improve grid interoperability, to improve storage technologies and to generate large markets to drive economies of scale.

On bioenergy feedstocks, she stressed the need to focus on the diversity, sustainability and economic viability of feedstocks, and noted that other priorities that emerged from the sessions included: the need for new partnerships; the importance of taking a global, integrated approach to biomass energy; the need to enhance the productivity and diversity of feedstocks; and the need for better understanding of feedstock options.

On bioenergy conversion technologies, Dresselhaus stated that the largest barrier to making biofuels cost-effective is developing the technology to break plant fibers into sugars. Pointing out that all biofuels are not equal, she noted that different geographic locations may specialize in different biofuels, and stressed the importance of ensuring that local communities capture some of the economic benefits from biofuel processing. She concluded by laying out other research priorities that were identified, including: the development of biomass supply and logistics, nanotechnology-based conversion of sugars to biofuels other than ethanol; and efficient batteries and other storage technologies.

REGIONAL FINDINGS: Buyelwa Sonjica, Minister of Minerals and Energy, South Africa, presented the findings of several consultations that REEEP organized in preparation for WIREC 2008. She highlighted the importance of conferences such as WIREC 2008 and the development of partnerships, and urged countries and the partnerships developed at WSSD, and other forums such as REEEP and REN21, to work with Africans to ensure their



Buyelwa Sonjica, Minister of Minerals and Energy, South Africa

greater participation in the age of renewable energy. She said that the potential of hydropower in Africa needs to be unlocked. Sonjica emphasized the importance of strong global leadership and highlighted challenges in Africa, such as: lack of long-term renewable energy goals in many national plans; lack of suitable financing and business models to enable long-term renewable energy financing; lack of knowledge about renewables by investors, who generally do not consider renewables in their plans; and lack of a level playing field with traditional energy sources. She said governments at all levels should formulate appropriate long-term policies with appropriate incentives, and collaborate with each other. She underscored the need for expertise, training and education for developers, and emphasized that renewables in Africa are still seen as a risk market. She underscored the potential of renewables to address climate change, energy security, poverty alleviation, and mitigate the social and economic effects of increasing fuel prices

PLEDGES AND COMMITMENTS: Under Secretary of State for Democracy and Global Affairs Paula Dobriansky opened the session on pledges and commitments, stating that over 100 pledges had been received by more than 40 nations. US Assistant Secretary for Energy Efficiency and Renewable Energy, DOE, Alexander "Andy" Karsner described the pledge process and gave an overview of the pledges made by the US. Karsner invited further pledges of specific quantifiable commitments, statements of policy or programs for commercialization and deployment, noting that pledges would continue to be collected until 4 April 2008. Noting that the US has met the technological and commercial pledges it made in Bonn in 2004, he proceeded to lay out the more than 25 pledges the US made at WIREC 2008.

On energy efficiency, he described a pledge of 30% efficiency improvement at federal facilities by 2015. Additionally, he described pledges to continue R&D, draft new codes and standards, encourage voluntary, market-based deployment, and improve education and outreach. On transportation, he detailed the US pledge to produce 36 billion gallons of ethanol by 2022, and to increase annual alternative fuel consumption in federal fleets by 10% by 2015. On large-scale renewables, he described a pledge for US federal facilities to increase renewable electricity use to 7.5% by 2013. For commercialization and deployment, Karsner stressed the need to remove trade barriers on clean technologies, and described pledges to provide US\$10 billion in loan guarantees to fund projects that reduce greenhouse gas emissions, and US\$2 billion to a Clean Technology Fund to support technology transfer and diffuse technologies.

Several government representatives then presented their pledges. New Zealand pledged 90% renewable electricity by 2025. He said New Zealand plans to meet the goal with a carbon trading scheme and a 10-year restriction on new base-load fossil fuel generation plants, and welcomed President Bush's pledge to exercise leadership on renewables.

Denmark pledged to increase its renewable energy share to at least 30% by 2025. He underscored that would be achieved despite no hydropower potential in Denmark. He said Denmark would increase its energy efficiency by 1.4% per year and double its R&D investment in renewables by 2010. He noted the establishment of intermediate targets, and Denmark's leadership amongst European countries in renewables deployment. He said

wind power will cover 25-30% of total electricity consumption, a larger share than nuclear power in the US or UK. Underlining Denmark's energy efficiency, he said his country will continue to have high and sustained economic growth, closely linked with renewable energy.

Canada, as part of its "Use Less, Live Better" approach, described several new initiatives including, C\$1.5 billion for renewables, C\$1.5 billion on biofuels and C\$300 million on efficiency. Cape Verde pledged to achieve 50% renewable energy by 2020 and 100% renewable electricity on one of its nine habitable islands.

Australia pledged a 20% share of renewables by 2020, as part of their strategy to reduce greenhouse gas emissions 60% by 2050. He said a comprehensive plan requires more than just an emission trading scheme and must include transitional measures. He identified renewables as an economic growth opportunity, and Australia's focus on energy efficiency, including phasing out the incandescent light bulb.

Brazil pledged to maintain its share of renewable energy, which is now 45%, and promote diversification among renewable energy sources. He noted that available fuels in Brazil are E25 and E100, that 90% of new cars sold in Brazil are flexfuel and that imported cars run on E25 with minor modifications. He pledged to keep the share of renewable electricity generation above 80%, despite the need to expand electricity generation by 47% by 2015. He reported that Brazil had become self-sufficient in oil in 2007, and, notwithstanding recent oil discoveries, plans to maintain its share of renewables in the energy system. He pledged to promote renewables worldwide and to cooperate with Least Developing Countries in the development of their national biofuel programs. He highlighted the White Paper on Standards and Goals for Biofuels.

Norway pledged an increase in development aid to 1% of its gross national income, with a priority for environment and energy spending. Germany shared its goal of having 18% of its consumption come from renewable energy by 2020, while phasing out nuclear power. Jordan announced that it responded to Bush's call on Wednesday to have free renewable energy trade by removing taxes on all renewable energy and energy conservation equipment. Afghanistan pledged to electrify 60% of its rural population by 2018 and to improve air quality by 10-12% by 2012.

CLOSING REMARKS: Paula Dobriansky said the pledges offered for the Washington International Action Program underscore that we all have a role to play in meeting the challenges of energy security and climate change.

Michael Eckhart, President, American Council On Renewable Energy (ACORE), said that over 8100 delegates had registered for WIREC 2008, which had involved 80 side events, a business conference, and a trade show in which over 240 organizations had exhibited their products or activities. He highlighted that President Bush's speech on energy and climate had included new words we had not heard before, and noted Bush's pledge to call on other heads of government to participate in the Clean Technology Fund.

V. Subramanian, Secretary to the Government of India, Ministry of New and Renewable Energy, offered to host the next International Renewable Energy Conference in India,



V. Subramanian, India

with the dates and venue to be decided, but most likely to take place in early 2010. He expressed his hope that participants will come not just with pledges, but with progress to report on the fulfillment of pledges.

Dobriansky closed the meeting at 12:40 pm.

MINISTERIAL

LUNCHEON: The luncheon for ministers and other dignitaries that followed the close of WIREC

2008 was addressed by two speakers. Maud Olofsson, Deputy Prime Minister and Minister for Enterprise and Energy, Sweden, said she would take seven conclusions away from WIREC 2008: the call for immediate action at all levels of society; leadership and courage are necessary; it is necessary to send signals to the market that it is time to switch to renewables; there are golden opportunities for taking action; investment in R&D is needed; we need to learn from each other; and we need to look at the challenges from a broad international perspective and leave no countries behind. She noted that Sweden will Chair the EU during the second half of 2009, and expressed her hope that an agreement on climate change would be reached at the 2009 UN Conference on Climate Change in Copenhagen, Denmark.

Graeme Wheeler, Managing Director, Operations, The World Bank Group, suggested that addressing climate change is a difficult challenge for three main reasons: the intersectoral connections are complex; it involves serious equity and moral issues; and it involves difficult issues of sequencing and competitiveness. He discussed the role of The World Bank Group on renewable energy and said it endeavors to mitigate harmful environmental impacts. Wheeler said the Bank is preparing a strategic framework for climate change, and thanked the US for the US\$2 billion it has pledged for the Clean Technology Fund to be set up at the Bank. He also noted that the Bank is stepping up its applied research on climate change, including through low-carbon growth strategies in six countries, and emphasized that climate change represents a major threat to all our economic and political systems.



Participants in the ministerial luncheon heard addresses by Maud Olofsson, Deputy Prime Minister and Minister for Enterprise and Energy, Sweden and Graeme Wheeler, Managing Director, Operations, The World Bank Group

UPCOMING MEETINGS

ASIA 2008 – SECOND INTERNATIONAL SYMPOSIUM ON WATER RESOURCES AND RENEWABLE ENERGY DEVELOPMENT IN ASIA: This Symposium will take place in Danang, Vietnam, from 10-11 March 2008. The agenda includes country reports from national authorities in various Asian countries, invited lectures on specialist topics and submitted papers. For more information, contact: Maria Flintan, Aqua~Media International; e-mail: mf@hydropower-dams.com; internet: <http://www.cig.ensmp.fr/~iahs/conferences/2008Danang.pdf>

G8 GLENEAGLES DIALOGUE ON CLIMATE CHANGE, CLEAN ENERGY AND SUSTAINABLE DEVELOPMENT: The Fourth Ministerial Meeting of the G8 Gleneagles Dialogue will take place in Chiba, Japan, from 14-16 March 2008. The Dialogue is a multi-year, multi-government, public-private policy dialogue on climate change and clean energy issues, the findings of which will be submitted to the G8 summit process this year in Japan. For more information, contact: the Preparatory Task Force for the G8 Environment Ministers Meeting, Ministry of the Environment Japan; e-mail: G20_CHIBA@env.go.jp; internet: <http://www.env.go.jp/earth/g8/en/g20/index.html>

FIRST SESSION OF THE AD HOC WORKING GROUP ON LONG-TERM COOPERATIVE ACTION UNDER THE UNFCCC AND FIFTH SESSION OF THE AWG UNDER THE KYOTO PROTOCOL: This meeting will take place in Bangkok, Thailand, from 31 March-4 April 2008. For more information, contact: UNFCCC Secretariat; tel: +49-228-815-1000; fax: +49-228-815-1999; e-mail: secretariat@unfccc.int; internet: <http://www.unfccc.int>

28TH SESSION OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE: This meeting will take place in Budapest, Hungary, from 9-10 April 2008. The Panel will make recommendations on key elements of the future IPCC work programme, in particular, on the need for a Special Report on Renewable Energy. For more information, contact: IPCC Secretariat; tel: +41-22-730-8208; fax: +41-22-730-8025/13; e-mail: IPCC-Sec@wmo.int; internet: <http://www.ipcc.ch>

INTERNATIONAL RENEWABLE ENERGY CONFERENCE IN AFRICA: This Conference will be held in Dakar, Senegal, from 16-18 April 2008. The conference will focus on policies, technologies and finance for scaling up renewable energy markets in Africa. It is jointly organized by the African Union, the Government of Senegal, the German Ministry of Economic Cooperation and Development and UNIDO. For more information, contact: Alois Mhlanga, Industrial Development Officer, UN Industrial Development Organization; tel: +431-260-265-169; fax: +431-260-266-855; e-mail: a.mhlanga@unido.org; internet: <http://www.unido.org/en/doc/76539>

GLOBAL MARINE RENEWABLE ENERGY CONFERENCE: This Conference will take place in New York, US, from 17-18 April 2008. It will convene international and US-based leaders and innovators to exchange the latest information on marine renewable energy. For more information, contact: Energetics Incorporated, Conference Services; fax: +1-410-423-2193; e-mail: cs@energetics.com; internet: <http://www.globalmarinerenewable.com>

MAJOR ECONOMIES PROCESS ON ENERGY SECURITY AND CLIMATE CHANGE: Convened by the US Government, the third Major Economies Meeting is expected to be held in France, and is tentatively scheduled to take place at the end of April 2008. For more information, contact: internet: <http://www.state.gov/g/oes/climate/mem/>

INTERNATIONAL GEF WORKSHOP ON EVALUATING CLIMATE CHANGE AND DEVELOPMENT: RESULTS, METHODS AND CAPACITIES: This workshop will take place in Alexandria, Egypt, from 10-13 May 2008. The GEF Evaluation Office is organizing this workshop, during which participants will share experiences in evaluating projects and programmes that target the nexus between climate change and development. For more information, contact: Global Environment Facility; tel: +1-202-458-8537; e-mail: IntWorkshop@thegef.org; internet: <http://www.esdevaluation.org>

G8 ENVIRONMENT MINISTERS' MEETING: This meeting will take place in Kobe, Japan, from 24-26 May 2008. The meeting will convene in preparation for the 2008 G8 Summit, to be held 7-9 July 2008 in Hokkaido, Japan. For more information, contact: Preparatory Task Force for the G8 Environment Ministers Meeting, Ministry of the Environment, Japan; e-mail: G8_KOBE@env.go.jp; internet: <http://www.env.go.jp/earth/g8/en/index.html>

28TH SESSIONS OF THE UNFCCC SUBSIDIARY BODIES: These sessions are scheduled to take place in Bonn, Germany, from 2-13 June 2008. It is expected that the second meeting of the *Ad Hoc* Working Group on Long-Term Cooperative Action under the Convention and the resumed fifth session of the *Ad Hoc* Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol will also be held. For more information, contact: UNFCCC Secretariat; tel: +49-228-815-1000; fax: +49-228-815-1999; e-mail: secretariat@unfccc.int; internet: <http://www.unfccc.int>

G8 SUMMIT: This summit will convene in Hokkaido, Japan, from 7-9 July 2008. For more information, contact: internet: <http://www.mofa.go.jp/policy/economy/summit/2008/info/index.html>

10TH WORLD RENEWABLE ENERGY CONGRESS: This Congress will be held in Glasgow, Scotland, UK, from 19-25 July 2008. For more information, contact: A. Sayigh, World Renewable Energy Congress/Network; e-mail: asayigh@netcomuk.co.uk; internet: <http://www.wrenuk.co.uk/wrecx.html>



Participants strolled through the convention center lobby between ministerial sessions and the trade show