



Caribbean Sustainable Energy Forum Bulletin

A Summary Report of the First Caribbean Sustainable Energy Forum
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THE CARIBBEAN FORUM ON SUSTAINABLE ENERGY: 24-26 JUNE 2008

The First Caribbean Sustainable Energy Forum (CSEF) was held from 24-26 June 2008 at Taylor Hall, St. George's University (SGU), Grenada, in conjunction with the Fourth Caribbean Environmental Forum (CEF-4). The meeting brought together a diverse cross-section of stakeholders and was facilitated by the Austrian Development Cooperation (ADC) together with the German Technical Cooperation Agency (GTZ).

The CSEF focused on energy efficiency, renewable energy and energy security for Caribbean small island developing states (SIDS). The meeting drew approximately 50 representatives from government agencies, UN bodies and international organizations, academia, business and industry, civil society and financial institutions. Participants discussed a variety of topics, including energy efficiency, energy policy, wind energy production, solar energy, biofuels, advances in renewable energy, and financing of renewable energy projects. Updates on specific energy projects based in Caribbean countries were also presented.

The CSEF was organized as a follow-up up to the 2007 meeting on "Energy Efficiency for Developing Countries" of the Global Forum on Sustainable Energy (GFSE), a platform that facilitates international dialogue, produces new opportunities and enhances existing initiatives in the field of sustainable energy.

Delegates also participated in the launch of the Photovoltaic (PV) Test Field at SGU and attended a variety of technical tours.

A BRIEF HISTORY OF THE GFSE AND SUSTAINABLE ENERGY

The GFSE was launched by Austria's Foreign Minister in 1999. The initiative stems from outreach efforts of the World Energy Assessment, which was organized by the UN Development Programme, the UN Department of Economic and Social Affairs and the World Energy Council. The GFSE provides a platform for multi-stakeholder dialogue aimed at facilitating decision-making on energy policy issues in relevant fora. It also seeks to foster public-private partnerships.

GFSE-1: The first GFSE meeting convened from 11-13 December 2000, in Laxenburg, Austria. GFSE-1 addressed the theme "Rural Energy – Priorities for Action," and contributed to preparations for the ninth session of the Commission on Sustainable Development (CSD-9), which took up various energy-related issues. Participants at GFSE-1 considered the linkages between rural energy and sustainable development, enabling frameworks for attracting investment for rural energy, lessons learned, financing issues, the challenges and opportunities of regulatory reform, and innovation.

GFSE-2: The second GFSE meeting convened from 28-30 November 2001, also in Laxenburg, and addressed the issue of "Energy Technologies – Cooperation for Rural Development." Participants heard presentations and engaged in discussions on: stocktaking of the international energy discourse; facilitating the transfer of energy technologies suitable for rural development; case studies on successful modalities for transfer of energy technologies; and enabling policy environments and creating conditions for private sector involvement in the transfer of energy technologies for rural needs. Participants met in regional working group sessions on rural electrification and clean fuels for rural needs in Africa, Asia and Latin America. Participants also considered the desired outcomes of and proposals for the World Summit on Sustainable Development (WSSD).

WSSD: Energy was one of the key areas addressed at the WSSD held from 26 August to 4 September 2002, in Johannesburg, South Africa. In the Johannesburg Plan of Implementation (JPOI) agreed at the WSSD, governments committed to improve access to reliable and affordable energy services, promote sustainable use of biomass, and support the transition to the cleaner fossil fuel technologies. Energy issues were also addressed in JPOI chapters pertaining to SIDS, Africa, regional initiatives, and health and sustainable development. The WSSD encouraged the development of new "Type II" initiatives: voluntary public-private partnerships aimed at advancing implementation on the ground. Several of these Type II initiatives were launched in the area of energy for sustainable development.

GFSE-3: The third GFSE meeting convened from 27-29 November 2002, in Graz, Austria, and addressed public-private partnerships for rural energy development.

IN THIS ISSUE

A Brief History of the GFSE and Sustainable Energy	1
Report of CSEF.	2
Inaugural Ceremony.	2
CEF-4 Plenary Session.	2
Panel: Post-Bali Implications for the Caribbean	4
Launch of the PV Test Field of the PV Research Programme at the Windward Islands Research and Education Foundation Institute of SGU.	5
CSEF technical sessions.	5
CEF-4 Closing plenary.	8
Upcoming Meetings	9
Glossary.	9

It considered the relevant outcomes of the WSSD and sought to support the further development of initiatives to promote WSSD implementation, including the EU initiative on Energy for Poverty Eradication and Sustainable Development. Plenary sessions held during GFSE-3 covered topics such as innovative financial instruments for private sector involvement in rural energy development; implementation of the energy outcomes of the WSSD; making the WSSD work in Africa and Asia; and the role of operational international organizations and funding agencies for rural energy development.

CSD-11: CSD-11 took place at UN headquarters in New York from 28 April to 10 May 2003. Delegates discussed the future work of the Commission, which had been created in 1992 to ensure effective follow-up of the UN Conference on Environment and Development (UNCED) in monitoring and reporting the implementation of the Earth Summit Agreements at the local, national, regional and international levels. At CSD-11, governments adopted a new work programme for the period 2004-2017. CSD-11 agreed that future sessions would consider a limited number of topics, or “thematic clusters.” These clusters were to be examined over two-year “implementation cycles.” Energy issues were included in the thematic cluster for the 2006-2007 cycle.

GFSE REGIONAL SEMINAR: From 27-28 November 2003, GFSE held a regional seminar in Vienna, Austria, that focused on district heating in south-eastern Europe. This seminar underlined the importance of district heating for the social and economic well-being of large parts of the population in the countries of south-eastern Europe and emphasized the important contribution that improved district heating and combined heat and power generation could make to sustainable development.

GFSE-4: This meeting, entitled “Energy for Sustainable Development: Reconsidering the Role of Incentive Measures,” was held from 18-20 February 2004, in Vienna. GFSE-4 focused on renewable energy issues in order to provide input to the International Conference for Renewable Energies held in Bonn, Germany, in June 2004. GFSE-4 also brought together various energy-related partnerships announced at the WSSD in order to discuss their progress, and sought to contribute to ongoing work on the use of incentive measures for sustainable energy.

GFSE REGIONAL WORKSHOP: This GFSE regional workshop for countries that are members of the International Centre for Integrated Mountain Development was held from 24-26 November 2004, in Paro, Bhutan. The meeting considered the theme of “Access to Rural Energy for Sustainable Development and Policies for Rural Areas.” The workshop emphasized increasing the awareness about the rural energy supply for sustainable development as part of the Millennium Development Goals (MDGs) among the countries of the Hindu Kush-Himalaya Region (Afghanistan, Bangladesh, Bhutan, China (Tibet), India, Myanmar, Nepal, and Pakistan) and donor countries.

GFSE-5: The fifth GFSE was held from 11-13 May 2005, in Vienna, under the theme “Enhancing International Cooperation on Biomass” and placed special emphasis on strengthening institutional capacity to promote South-South cooperation. Participants addressed a variety of relevant topics, including: potentials and challenges of increasing biomass use; synergies and risks between food and biofuel crops; biofuels for sustainable transport; and biomass for electricity production and household heating.

CSD-14: The fourteenth session of CSD met from 1-12 May 2006, at UN Headquarters in New York. CSD-14 was tasked with reviewing progress in the areas of energy for sustainable development, industrial development, air pollution/atmosphere, and climate change. CSD-14 included thematic discussions, expert panels, a multi-stakeholder dialogue, and a high-level segment. The meeting was dominated by the energy agenda, with discussions focusing on energy security, the impact of oil and gas prices, and the respective roles of renewable energy technologies, fossil fuels, nuclear power and the post-2012 multilateral climate change regime.

GFSE-6: The sixth GFSE was held from 29 November to 1 December 2006, in Vienna. The meeting convened under the theme “Africa is Energizing Itself” and focused on sustainable energy in the African continent, with particular attention to sub-regional issues, biofuels, hydropower, opportunities in Africa for the Kyoto Protocol’s Clean Development Mechanism (CDM), GFSE’s contribution to CSD-15, and financial engineering for energy in Africa.

CSD-15: CSD’s fifteenth session met from 30 April to 11 May 2007, at UN headquarters in New York. Building on the outcomes of CSD-14, CSD-15 focused on expediting the implementation of commitments in the areas of energy for sustainable development, industrial development, air pollution/atmosphere and climate change, as contained in Agenda 21, the Programme for the Further Implementation of Agenda 21, JPoI and the Millennium Declaration. Delegates were unable to agree on policy decisions on practical measures and options to expedite implementation of commitments, and a Chair’s Summary was issued in lieu of a negotiated outcome.

GFSE-7: The seventh GFSE took place from 21-23 November 2007, in Vienna. The meeting convened under the theme “Energy Efficiency for Developing Countries – Strong Policies and New Technologies,” and considered policies, case studies, and initiatives related to improving and promoting energy efficiency in developing countries, as well as opportunities, barriers, and the way forward. For more information on previous GFSE events, visit: <http://www.gfse.at/Activities.31.0.html>.

REPORT OF CSEF

INAUGURAL CEREMONY

The series of events began with an Inaugural Ceremony on the afternoon of Monday, 23 June, which was attended by dignitaries and Forum participants. Keith Mitchell, Prime Minister of Grenada, gave the official opening address and formally opened the ceremony. Amb. Ernst Martens, German Embassy for the Caribbean Region, Trinidad and Tobago, and Amb. Marianne Feldmann, Austrian Embassy for Venezuela and the Caribbean, Venezuela, addressed the gathered participants and emphasized the importance of the sessions and events during the Forum.

This report outlines all the presentations and discussions of the CSEF. The CSEF was held in conjunction with the broader CEF-4 conference, and this report also contains an account of the opening and closing session of the CEF-4, which marked the beginning and end of the series of events of which the CSEF was an integral part.

CEF-4 PLENARY SESSION

The opening plenary of the fourth Caribbean Environmental Forum (CEF-4) was held in three consecutive sessions on Tuesday, 24 June. These sessions focused on a number of

topics, including sustainable development in Caribbean small island developing states (SIDS), economic and social benefits of improved sanitation, implications of climate change and safe water on public health, and the role of sustainable energy.

Patricia Aquing, Executive Director, Caribbean Environmental Health Institute, chaired the first session.

Ann David-Antoine, Minister of Health, Social Security, the Environment and Ecclesiastic Affairs, Grenada, formally opened the session. Sally Edwards, Regional Advisor in Environmental Epidemiology, Office of Caribbean Programme Coordination, Pan-American Health Organization (PAHO), outlined some of PAHO's work in the area of climate change and health, such as expert and country consultations. She stressed that PAHO is keen to place human health issues on the climate change adaptation and mitigation agendas.

Hans-Peter Debelius, Director of Regional Office for the Dominican Republic and the Caribbean, German Technical Cooperation Agency (GTZ), presented some of GTZ's work on sustainable energy in the Latin America and the Caribbean (LAC) region, which includes tailoring solutions to local conditions and supporting partners to train specialists in various fields, define conditions needed to achieve energy supply scenarios, and plan national and regional energy strategies. Noting the renewable energy potential in the region, he said GTZ advises governments and private sector institutions on how to integrate environmentally friendly renewable energy technologies into energy policies and facilitates the transfer of know-how to stakeholders.

Amb. Angus Friday, Representative of Grenada to the UN and Chair of the Alliance of Small Island States (AOSIS), presented the imperatives for achieving the goals of sustainable development in Caribbean SIDS. Stressing the importance of new and sustainable energy sources, he said the Caribbean should not follow the same development path as developed countries and emphasized the need for a new global agenda which is proactive, not reactive. Friday then described some of the sustainable development imperatives as: education, including basic, adult and public education; increased public awareness of sustainable energy sources; capacity building; increased investment in sustainable energy; energy efficiency; and sustainable urban transport, such as public transportation and bicycles.

Senator Elizabeth Thompson, Barbados, compared the current food and fuel crises to a "perfect storm", saying that the Caribbean, like the rest of the world, is under a storm warning because of high food and rising oil prices, changing global conditions and the threat of climate change. She said the Caribbean region needs to be adequately prepared to face and survive the storm. She called for the development of renewable energy markets and plans to cope with energy costs in developing such markets, and emphasized the importance of a transition to renewable energy technologies. Giving the example of the Brazil's use of alternative power, she said developing countries are capable of forming legislation and policies to make the transition to sustainable energy sources. She highlighted Barbados's use of solar energy for heating and underscored that the Caribbean is capable of cutting-edge development and innovation.

The ensuing discussion focused on the drawbacks of not incorporating best practices from developing countries, conditionality of foreign aid and the goal of promoting sustainability among all Caribbean countries.



L-R: Ambassador Angus Friday, Representative of Grenada to the UN and Chairman of the Alliance of Small Island States; Patricia Aquing, Executive Director, Caribbean Environmental Health Institute; Elizabeth Thompson, UNEP Champions of the Earth Award Recipient 2008, Barbados; Hans-Peter Debelius, Director of Regional GTZ Office for the Dominican Republic and the Caribbean; and Sally Edwards, Regional Advisor in Environmental Epidemiology, Office of Caribbean Program Coordination, Pan-American Health Organization

Vincent Sweeney, Regional Project Coordinator, Global Environment Facility Integrating Management of Watershed and Coastal Area Management (GEF-IWCAM) Project, chaired the second session.

Sharunda Buchanan, Division Director, Centers for Disease Control and Prevention (CDC), US, presented on the public health impacts of climate change. She drew attention to projections by the International Panel on Climate Change (IPCC), suggesting increased heat waves, heavy precipitation events, more intense tropical cyclones, increased drought, and more incidences of extremely high sea levels. She noted a set of "priority actions" that form the cornerstone of the CDC Climate Action Plan and stressed adaptation strategies including: research, monitoring and evaluating progress; diagnosing and investigating; informing, educating, empowering and mobilizing; developing policies and enforcing laws; facilitating access to health care for those adversely affected; and ensuring a competent workforce. She drew attention to the fact that several factors affect the public health outcome of severe climate events, citing Hurricane Jeanne's disproportionate death toll in Haiti. She concluded by noting that climate change must be framed as a public health issue, that opportunity costs for not taking action are high, and that there are effective, science-based activities and messages for the public health sector to conduct and deliver.

Jon Lane, Executive Director, Water Supply and Sanitation Collaborative Council (WSSCC), gave an overview of rural and urban sanitation globally, noting that most Caribbean states have met or nearly met the Millennium Development Goals (MDGs) with regard to sanitation. He stated that improved sanitation saves time, reduces direct and indirect health costs, improves school attendance, safeguards water resources and boosts tourism. He also underscored the social benefits of improved sanitation, including gender equality, increased dignity, and poverty eradication. Lane drew attention to 2008 as the International Year of Sanitation, which has been devised by the UN to raise awareness about sanitation. He stressed that fixing the sanitation problem will involve hard work in local communities, using plain language to include sanitation in political dialogue, strong leadership, and creating demand for sanitation services through hygiene promotion.

Amb. Irene Freudenschuss-Reichl, Director General, Austrian Development Cooperation (ADC), Austrian Ministry for European and International Affairs, described the history of the GFSE and expressed hope that future CSEF meetings will be convened. She noted the existence of seven government organizations based in Vienna that deal with energy issues and drew attention to a fund that provides opportunities for

developing country representatives to establish offices in Vienna to work alongside these organizations. She stressed that the world has to satisfy the energy needs of developing countries while paying attention to social justice issues and global environmental

concerns. Freudenschuss-Reichl called for a scaling up of support for sustainable energy projects, highlighted the importance of regional cooperation and human ingenuity, and stated that developed countries must turn their political obligations regarding sustainable energy into concrete action. She underscored that changing patterns of consumption and production will be necessary worldwide. In conclusion, she expressed hope that the meeting would inspire greater appreciation of nature, integration of equality, justice and solidarity, and recognition that there is only one Earth for everyone.

Martin Forde, Department of Public Health, St. George's University (SGU), chaired the third session.

Dennis Pantin, Sustainable Economic Development Unit, University of the West Indies, said that to avoid reaching the climate change tipping point, a "tectonic" shift in consumption and production patterns is required, which should lead to a symbiotic relationship with nature. He termed this shift "econologism" and proposed that SIDS should act as pilot laboratory-scale models to achieve the shift. Pantin outlined some of the policies that could be used to support the framework for achieving this shift, including "green" accounting to measure and value the environment, and industrial, trade, human resources, fiscal and monetary policies.

Neville Trotz, Science Advisor, Caribbean Community Climate Change Centre (CCCCC), presented on the environmental implications of climate change for the Caribbean region. He described current impacts, such as weather extremes, an increase in the number and intensity of hurricanes, coral bleaching and an increase in pest infestation. He also described future projected impacts on agriculture, water, tourism, food security, health and human settlements, such as water scarcity, severe coral bleaching, reduced agricultural yields and migration of fish out of the Caribbean. Trotz emphasized the importance of putting the energy sector on a more sustainable footing.

Indra Haraksingh, Department of Physics, University of the West Indies, presented the energy implications of climate change for the Caribbean region. She suggested the use of photovoltaic (PV) technology, explaining that PV-powered traffic devices and temporary shelters using PV-powered devices such as refrigerators can be utilized in the aftermaths of hurricanes, when there are usually energy shortages. Haraksingh said renewable energy technologies can provide insurance against volatility and risk of high oil prices, promote increased electrification, provide a tool in the fight against disasters, and slow down global warming and climate



L-R: Ambassador Irene Freudenschuss-Reichl, Director General, Austrian Development Cooperation, Austrian Ministry for European and International Affairs; Vincent Sweeney, Regional Project Coordinator, GEF-IWCAM Project; and Jon Lane, Executive Director, Water Supply and Sanitation Collaborative Council, Geneva

change. She concluded that the way forward involves energy conservation and efficiency, and requires political will and vision to develop renewable energy technologies.

Robert Müller, CDM Projects Staff, Atmosfair, Germany, spoke on the impacts of tourism on climate change, particularly as a result of air traffic, and suggested that as a solution people could take fewer, but longer, trips. He described Atmosfair's initiative to address this impact of tourism, which involves offering tourists and tour agencies the opportunity to offset their carbon footprint by making financial contributions to renewable energy and energy efficiency projects in the regions they visit. He said Atmosfair has recently started a cooperation programme with Thomas Cook, where every tourist has the opportunity to fund projects, such as renewable energy projects in the Caribbean.

PANEL: POST-BALI IMPLICATIONS FOR THE CARIBBEAN

The panel discussion took place on Tuesday and was introduced by co-moderators Cletus Springer, Director, Department of Sustainable Development and Environment, Organization of American States (OAS), and Thomas Scheutzlich, Principal Advisor, Caribbean Renewable Energy Development Programme (CREDP)/GTZ Project.

Jennifer Ellard, Special Advisor to the Prime Minister of Grenada on Sustainable Development, warned against "ecocolonialism" and exclusively foreign-owned solutions to technology problems. Jerrol Thompson, Minister of Telecommunications, Science, Technology and Industry, St. Vincent and the Grenadines, noted that rising prices have forced Caribbean Community and Common Market (CARICOM) countries to provide fuel subsidies and discussed the difficulties of integrating sustainable energy alternatives with the use of diesel. Sharunda Buchanan highlighted the importance of looking toward developing countries for models of best practices and reminded participants to reflect on health and quality of life. Elizabeth Thompson called for the development of a regional negotiating team and underscored the increasing connections between trade and environmental issues. Angus Friday cautioned against letting a 2°C temperature increase become the common parlance in UN Framework Convention on Climate Change (UNFCCC) negotiations, suggested that Caribbean SIDS work more closely with US governors and NGOs to bring the climate change issue to the top of the US policy agenda, and talked about human rights as the basis for a legal framework to protect states vulnerable to climate change. Neville Trotz called for countries to engage at every level and proposed a carbon levy for all cruise and airline passengers in the region.



L-R: Thomas Scheutzlich, Principal Advisor, Caribbean Renewable Energy Development Programme/GTZ Project; Jennifer Ellard, Special Advisor to the Prime Minister of Grenada on Sustainable Development; Jerrol Thompson, Minister of Telecommunications, Science, Technology and Industry, St. Vincent and the Grenadines; Ambassador Angus Friday, Representative of Grenada to the UN and Chairman of the Alliance of Small Island States; Elizabeth Thompson, UNEP Champions of the Earth Award Recipient 2008, Barbados; Neville Trotz, Science Advisor, Caribbean Community Climate Change Centre; and Sharunda Buchanan, Division Director, Centers for Disease Control and Prevention, US

The ensuing discussion focused on preparing for and participating actively in post-Bali UNFCCC negotiations, and the practicality of reaching consensus among developing countries.

LAUNCH OF THE PV TEST FIELD OF THE PV RESEARCH PROGRAMME AT THE WINDWARD ISLANDS RESEARCH AND EDUCATION FOUNDATION (WINDREF) INSTITUTE OF SGU

At an outdoor reception on Tuesday, Dirk Burkhardt, Research Fellow, WINDREF Institute/Managing Director and Chairman, Grenada Solar Power Ltd. (GrenSol), Detlef Loy, Consultant, CREDP/GTZ, and Thomas Scheutzlich launched the PV Field Test of the PV Research Programme, described the tests they are conducting with different types of PV panels, discussed opportunities and challenges for PV technology in the Caribbean region, and presented a short video about the latest PV technology.

CSEF TECHNICAL SESSIONS

Thomas Scheutzlich facilitated the six CSEF technical sessions, which began on Wednesday, 25 June, with four sessions and concluded on Thursday, 26 June, with the final two sessions.

The first technical session was chaired by Indra Haraksingh.

Joseph Williams, Programme Manager for Energy, CARICOM Secretariat, presented an update of the development of a regional energy programme for the Caribbean. He explained that motivating factors for developing this programme include the rapid increase in oil prices, the creation of a CARICOM Single Market and Economy (CSME), the fact that energy is intricately linked with and critical to economic development, and the problem of climate change. He said the development approach is programmatic, rather than project-by-project, and involves: listening to concerns of CARICOM member states and stakeholders in the different sectors; understanding and reviewing regional issues and studies in the energy sector; and reviewing past energy initiatives to identify successes and lessons learned. Williams highlighted some areas for consideration, such as the need to strengthen regional collaboration and capacity to facilitate the transformation of the energy sector and integrate energy with other key sectors. He gave examples of ways to address these issues including creating a regional standing committee on energy, and developing and adopting a framework for national energy planning and implementation.

Keith Nichols, Head of the Environmental and Sustainable Development Unit, Organization of the Eastern Caribbean States (OECS), St. Lucia, gave an overview of the OECS Energy Initiative, which he explained does not duplicate CARICOM's regional energy programme but tries to address the particular energy needs and concerns of smaller SIDS, who are the members of the OECS. He presented some of the challenges for a sustainable energy framework for the OECS member states, which are, *inter alia*, low consumption density, high transmission and transportation costs, and the low purchasing power of the population. He outlined the following as energy options for the OECS: the development of a comprehensive energy policy, including transportation, energy efficiency, energy management, renewable energy and demand-side management; reform of the electricity supply acts of member states; development of energy efficiency and renewable energy programmes; consideration and development of alternative energy supply sources; continued development

of a regional regulatory instrument for electric utilities; development of a regime for carbon trading; capacity building; and development of a Caribbean regional energy conservation programme.

Thomas Scheutzlich outlined some of the barriers to sustainable energy in the Caribbean region, which include: a lack of consistent energy policies and strategies; universal monopolies of utilities; high debt burden that makes government guarantees difficult; a lack of knowledge and confidence in renewable energy and energy efficiency; the low bank rating of borrowers; and the hesitance of banks to accept higher risks of renewable energy and energy efficiency projects. He presented sustainable energy options in the Caribbean, including developing hydropower stations and bundling wind power initiatives in order to make projects more attractive to investors. Scheutzlich concluded that: an improved framework for renewable energy and energy efficiency now exists; utilities are open to renewable energy and energy efficiency; and governments are more supportive of renewable energy, recognizing the need for energy sector policies and long-term strategies.

Irene Freudenschuss-Reichl gave an overview of the activities of the ADC in the energy sector, which include working with the EU-Africa Trust Fund on infrastructure, hydropower development in Bhutan and Albania, rural electrification in El Salvador, biofuel and biogas projects in Serbia, and forum policy initiatives such as the GFSE. She outlined the policy approach of the ADC in the energy sector as: providing and improving access to modern energy services for marginalized groups and poor rural and suburban regions; implementing sustainable and "pro-poor" energy projects with specific quality criteria; combining hardware and software interventions; supporting international efforts to harmonize donor activities; cooperating with regional organizations in partner countries and other donors; and helping ADC partner countries participate in the CDM.

In the ensuing discussion, participants commented on the need to involve relevant stakeholders in the development of the Caribbean regional energy programme, the potential of the CDM, the need to improve the energy efficiency of appliances in the hospitality sector and in households, and ways to coordinate the various energy projects being undertaken in the region.

The second technical session was chaired by Natalie Da Breo, Communications Consultant, CREDP/GTZ.

Otto Garcia, Energy and Environment Partnership (EEP), El Salvador, spoke about achievements regarding renewable energy in Central America, concentrating on his organization's progress in promoting and developing renewable energy projects. He highlighted: micro-hydropower systems in Nicaragua and El Salvador; biodiesel production in El Salvador; solar systems for drying fruits, geothermal energy for fruit processing and "ecostoves" in Guatemala; PV panel use at isolated health centers in Honduras, Panama and Nicaragua; solar refrigeration for fishermen in Panama; windmills built from local materials in Nicaragua; ongoing assessments of wind power in El Salvador, Guatemala, Costa Rica, Belize and the Dominican Republic; and ongoing tests of different biomass fuels in Honduras. Garcia also highlighted the Central American Carbon Guide recently published by his organization as well as a meeting on bioenergy, forestry resources and energy efficiency to be held in October in Honduras.

In introducing the next speaker, Cletus Springer drew attention to a high-level sustainable energy meeting for the Caribbean Region to be held in July in the Bahamas. Kevin de Cuba, Department of Sustainable Development, OAS, spoke about the energy activities of the UNIDO-Global Sustainable Energy Islands Initiative (GSEII) Programme and the OAS in the Caribbean. He reflected on the history and goals of the GSEII, noting the primary objective as overcoming market barriers to renewable energy. He described the development of Sustainable Energy Plans (SEPs) within Caribbean countries, which assess resources, identify barriers, define targets for energy transformation and identify project opportunities. He highlighted the SEP that has been adopted in St. Lucia and implemented as a national plan, and elaborated on the current SEP drafting process in St. Kitts and Nevis. He noted that over the next three years, the GSEII will use funding from the EU to expand to seven new countries, including Antigua and Barbuda, St. Vincent and the Grenadines, Barbuda and the Bahamas.

Mentor Poveda, Electricity Official, Latin American Energy Organization (OLADE), Ecuador, noted the vision of OLADE to be a political and technical support organization that contributes to regional energy integration, sustainable development and supply security by advising its member countries and promoting coordination among them. He drew attention to the Regional Energy Efficiency Programme (PEER-OLADE) and described its activities to raise awareness, identify energy efficiency equipment and produce technical bulletins. He called for additional financial support to implement energy efficient measures in public and commercial buildings, reduce transportation fuel use, and educate professionals about energy efficiency. Poveda also called attention to the First Latin American and Caribbean Energy Efficiency Seminar, to be held in August in Venezuela.

Mona Whyte, Director, Caribbean Energy Information System (CEIS), Jamaica, presented a synopsis of the activities of the CEIS. She noted some of the 1300 information requests her organization has received since January 2007, including those regarding the grades of fuel in the Caribbean, how to set up a PV system at home, which ethanol plants operate in the region, petroleum statistics for the last ten years, electricity tariffs across the Caribbean, and how to produce biodiesel fuels. She highlighted her organization as the only regional information system for CARICOM countries and described the three main CEIS branches: inquiry services, research services and consultancy services. She concluded by underscoring the importance of tapping the institutional memory in the region.

In the subsequent discussion, participants focused on information gathering, data capture and analysis.

Nigel Hosein, Executive Director, Caribbean Electric Utility Service Corporation (CARILEC), St. Lucia, chaired the third technical session.

Gerard Alleng, Clean Energy and Climate Change Specialist, Inter-American Development Bank (IDB), described the Bank's Sustainable Energy and Climate Change Initiative (SECCI) and the opportunities it creates for the LAC region. He explained that the SECCI is the IDB's contribution to the new international clean energy investment framework. He said the main objectives are to: support the region to find economically and environmentally sound energy options; expand the development and use of renewable energy and energy efficiency technologies and practices; and promote and finance climate change adaptation. Alleng outlined the four

strategic pillars of the SECCI as renewable energy and energy efficiency sustainable biofuel development, carbon financing and climate change adaptation.

Felix Finisterre, Consultant, International Union for Conservation of Nature (IUCN), discussed a proposed partnership between IUCN and the Caribbean region towards the attainment of a sustainable energy future for the region. He said the partnership is currently being formulated and will involve governments, public utilities, the private sector, regional institutions and international partners. He explained that the partnership aims to: accelerate the transition to energy systems that are ecologically sustainable, socially equitable and economically efficient; lend credible science and knowledge to global energy debates; and develop expertise through action-based programmes. He detailed the potential niches for the new programme as: scientific advice on environmental implications of different energy options; information and forums to support stakeholder engagement; tools to assist businesses make effective sustainable energy decisions; and support for the testing of new technologies, especially at the grassroots level.

Oscar Jimenez, Energy Project Manager, Center for the Management of Priority Projects and Programmes (GEPROP), Cuba, discussed energy efficiency on Isla de la Juventud, an island with 86,000 inhabitants located in the south-west of Cuba. He compared Isla de la Juventud to various CARICOM islands, noting the similarities, and elaborated on power generation options and fuel consumption patterns over the last few years. He drew attention to the recent introduction of wind power, solar thermal heaters in households and biomass gasification. He reflected on further wind power, forestry biomass and hydropower possibilities and discussed projections for the use of renewable energy in 2013.

Margo Guda, Manager and Senior Scientist, Antillean Energy Foundation (FAPE), reported on wind power activities in the Dutch Antilles. She noted the location of wind farms in Curaçao and discussed their power generation. She outlined average availability, delivered kilowatt-hours, installed capacity and average energy yields at two different sites, and concluded by reflecting about an aging wind farm that has reached the end of its economic life.

In the ensuing discussion, participants conversed about the size and placement of power generating equipment in areas prone to hurricane damage.

Thomas Scheutzlich chaired the fourth technical session.

Detlef Loy presented an overview of Germany's energy efficiency policies and highlighted experiences from which he said the Caribbean region could learn. He noted various sectoral and cross-sectoral measures, including: financial support programmes, particularly for building rehabilitation; a legal framework comprising, *inter alia*, an Energy Saving Act, an Energy Saving Ordinance, a Renewable Energy Sources Act and an Energy Consumption Labeling Law; and technology innovation support programmes. Loy noted that primary energy consumption and CO₂ emissions have decreased in Germany and identified key factors for the success of the policies as: setting clear objectives; creating general awareness; targeting different sectors and branches; implementing mandatory and voluntary agreements and funding programmes.

Nigel Hosein described his organization's position on renewable energies. He outlined services provided by CARILEC, including training courses, technical studies and benchmarking information, disaster relief coordination and stakeholder relations. He emphasized that the sustainable growth of the economy relies upon a reliable and affordable

supply of electricity, and proposed focusing on alternative technologies that are economical and realistic to implement, given the Caribbean's size. Hosein underscored the need for incentives and called for regional stakeholders to consider pooling resources.

Robert Müller discussed financing of renewable energy projects by describing the model of Atmosfair. He underscored that air traffic is responsible for 5-10% of global warming and explained the importance of channeling funding from private donors into renewable energy projects. He called for further cooperation with businesses, travel companies, NGOs and government organizations. He warned against false marketing and called for high standards for emissions offset projects. He described the approval procedure his organization uses to select projects, and stressed the importance of monitoring. He concluded by noting registered projects in Jamaica, Cuba and the Dominican Republic.

Steve Kaufman, Executive Director, Green Markets International, discussed innovative financing for solar water heating (SWH), commented on the role international carbon trading can play, and highlighted work supported by the Renewable Energy and Energy Efficiency Partnership. He drew attention to the fact that heating of water is responsible for 20-40% of worldwide household energy consumption and proposed a business model in which companies install SWH systems on rooftops in return for rental fees, which reduce upfront consumer costs. Kaufman described existing "Fee-for-Service" SWH programmes in Canada, Brazil and Austria as well as proposed programmes in South Africa and the US Virgin Islands. He described carbon market programmes that are applicable to the Caribbean and concluded by underscoring that participation in these programmes can help boost SWH and other sustainable energy activities in the region.

The subsequent discussion addressed incandescent lighting and the benefits and drawbacks of applying European technology to the Caribbean.

The fifth technical session was chaired by Thomas Scheutzlich.

Natalie Da Breo described a proposed pilot programme on energy efficiency in the Caribbean domestic sector, to be piloted in St. Lucia and St. Vincent and the Grenadines. She explained that the aim is to use information and education to support a redefinition of the energy consumption culture across the Caribbean, in order to reduce fossil fuel consumption, national import bills and greenhouse gas emissions. She outlined the objectives of the programme, which are to: influence consumers to adopt energy efficiency practices; show policymakers, their technical advisors and administrators the possibility to reduce levels of energy consumed through education and information on best practices; and convince consumers that it is possible to reduce energy consumption and bills without reducing quality of life. Da Breo described the project, saying it will involve a specialist consultant working with families in St. Lucia and St. Vincent and the Grenadines to educate them on energy efficiency measures and help them reduce their energy consumption. She said the general public will be kept informed about the programme and its results through a website and radio and television programmes, which will also encourage them to participate in the process.

Benjamin Jargstorf, Consultant, CREDP/GTZ, Chile, presented the options for wind energy in the Caribbean region. He concluded that wind energy is very viable in the Caribbean because of the high average wind speed, which gives rise to an above-average capacity factor of the wind generator. He said

that given these resources, each island could meet at least 50% of its electricity needs using wind power. He gave examples of wind park configurations being planned in some islands, such as a 13MW park in St. Lucia. Jargstorf explained that projects below 10MW are unlikely to be of interest to manufacturers and proposed forming or joining wind power pools. He concluded by introducing the Caribbean Wind Energy Initiative, a wind power pool that includes St. Lucia, St. Vincent and the Grenadines and Barbados as members.

James Post, Senior Consultant, Mainwind BV, the Netherlands, described the benefits of windmills from upgraded wind parks. He said upgrading windmills is economically feasible, as they can usually still be used for several years. He noted that upgrading is less expensive than installing new ones, and the price per kilowatt-hour of the old windmills is competitive compared to larger and newer units. He highlighted that financing can be obtained from independent power producers and development banks, and mentioned that local and regional financing is generally cheaper. He underscored the need to educate local banks on the benefits of investing in windmills. Post concluded by emphasizing the need to promote efficiency in the use of renewable energy sources.

Indra Haraksingh discussed the requirements for transitioning to a sustainable energy future in the Caribbean. She said this transition requires, *inter alia*, developing policy and legal frameworks to reduce the barriers to renewable energy, and fostering Caribbean integration in the field of higher education through joint initiatives, curricula review and training of teachers. Haraksingh described various renewable energy options in the region, including solar, hydropower, geothermal, fuel cell, wind and ocean thermal energy conversion. She called for more capacity building in the Caribbean, for universities to continue research in related fields, such as materials for solar energy, and for increased training for decision makers.

The sixth technical session was chaired by Mona Whyte.

Alida Saleh, Programme Manager for Renewable Energy and Sustainable Development, Trow International Ltd., Canada/Extension School, Harvard University, US, and Ramon Sanchez, School of Public Health, Harvard University, US, spoke about the production of biofuels through micro-algae farming operations in the Caribbean. Sanchez highlighted micro-algae as the most efficient converters of solar energy into biomass. He explained that the organisms do not require fresh water or good agricultural land and underscored that micro-algae farming does not compete with food production. Sanchez described the process of micro-algae energy production, recent research findings, and health and environmental risks, and Saleh highlighted market challenges and the need for strong legal frameworks to attract investors.

Andrea Jordan, School of Chemical Engineering and Advanced Materials, Newcastle University, UK, discussed the gasification of biomass and municipal solid waste for power production in the Caribbean. She explained the gasification process and drew attention to different gasifier types. She commented on Newcastle pilot plants and discussed the importance of fuel pre-treatment. She concluded by highlighting the annual power production potential from gasification in different parts of the Caribbean.

Kevin de Cuba spoke about the potential and limits of "Waste-to-Energy" technology. He discussed waste impacts in the region, noting that many landfills are nearing capacity and that enforcing regulations and laws related to waste disposal is challenging. He described the benefits of "Waste-to-Energy"

technology, such as the generation of revenue and the decrease in environmental problems associated with improper disposal of waste. He concluded by reflecting on the challenges, including public and political resistance and the fact that capital investment may be considered prohibitive for Caribbean countries.

Dirk Burkhardt explained grid-tied PV systems and discussed GrenSol's operations in Grenada. He underscored that solar energy requires the least capital investment of the different renewable energy options because PV systems are small and can be purchased by individual homeowners. He highlighted, however, that upfront financing remains an existing bottleneck. He concluded by drawing attention to PV technology's role in eco-tourism.

Maikel Oerbekke, Carbon Director, Ecological Technologies Ltd. (Eco-Tec), Jamaica, presented on behalf of Christian Holter, CEO, Solar Installation + Design (SOLID). Oerbekke focused on large-scale solar heating and cooling possibilities in the Caribbean. He explained how SOLID's large-scale solar plants can be used to heat and cool office buildings, hotels, swimming pools and prisons. He described energy generation using solar power, and drew attention to a solar-thermal system recently installed at the Olympic Sailing Village in China. He discussed commercial applications for SOLID's products in the Caribbean, highlighting that solar-thermal technology requires less space than PV technology. He called for a strong incentive package, low-cost financing and the development of electrical installation standards.

The ensuing discussion addressed SOLID's focus on commercial systems, the amount of investment required for gasification, and whether different islands should specialize in different types of resource recovery.

CEF-4 CLOSING PLENARY

On Thursday afternoon, delegates met for a final plenary session, which was chaired by Patricia Aquino and Aine Brathwaite, Chair, Grenada Solid Waste Management Authority/National Chair, CEF-4.

Martin Forde presented the Caribbean Eco-Health Programme (CEHP) as a model for developing intra-regional and institutional capacity. He highlighted the CEHP's thematic areas as research, capacity enhancement and training. He said the research will focus on persistent organic pollutants, the burden of illness, and microbial contamination of rainwater harvesting systems and that the CEHP will provide training courses on coastal zones and human health. He described the benefits of the model as: its multidisciplinary nature, bringing together specialists from a variety of disciplines; its geographic diversity, involving organizations from several Caribbean countries and from Canada; and its heterogeneous mix of institutions, involving universities, regional institutions and health organizations as core agencies.

Cletus Springer presented on the topic of "ecoeconomics" and management effectiveness of the coastal zone in the Caribbean. He outlined the socio-economic benefits that integrated coastal zone management can generate, including the creation of income for the poor, improvement of watersheds, conservation of biodiversity and improvement of public health and infrastructure. He outlined some proxies that can be used to calculate the value of resources, such as damages sought in courts for environmental degradation and estimates of lost income from bio-prospecting. He concluded by noting that gasoline priced below the market price can increase overfishing and emphasized the importance of protecting cultural heritage.

Peter Murray, Programme Officer, OECS Environment and Sustainable Development Unit, St. Lucia, presented a strategy for SIDS regarding Island Systems Management (ISM). He drew attention to the complexities of ecological processes in island systems, noting that forestry exists in the uplands and lowlands, roads span uplands, lowlands and shore areas, and commercial fishing is important in offshore areas and oceans. He outlined the four key areas needed for an effective institutional framework for ISM as: collaboration, coordination and cooperation; efficiency in implementation, monitoring and enforcement; awareness and public participation; and high-level political support.

Martin Barriteau, Project Manager, Sustainable Grenadines Project (SusGren), Union Island and St. Vincent and the Grenadines, presented on the achievements of SusGren. He drew attention to a variety of training and sector planning workshops, as well as 16 mini-projects implemented by school clubs, NGOs and one government organization. Barriteau mentioned the celebration of annual events such as World Wetlands Day and the International Coastal Cleanup Day and highlighted several associated projects, such as the Water Taxi Project, funded by the GEF Small Grants Programme and the EU, as well as the People and Corals Project, funded by the National Fish and Wildlife Foundation and UN Environment Programme (UNEP). He noted that the Grenadines are home to the largest area of coral reefs in the eastern Caribbean. He concluded by discussing the future of SusGren and the possibility of establishing the Grenadines as a World Heritage Site.

Richard Byron-Cox, Programme Officer, UN Convention to Combat Desertification (UNCCD), discussed the urgent need to implement the UNCCD in the Caribbean. He emphasized that land degradation occurs for many reasons, including natural factors, such as storms, as well as human actions. He called for Caribbean countries to develop National Action Programmes (NAPs) to serve as blueprints for sustainable land management. He underscored that the demise of the banana and sugar industries and the increase in the price of oil and other products make implementation of the UNCCD more urgent, and concluded by discussing the economic, social and political consequences of delaying implementation.

The subsequent discussion focused on holistic management of the Caribbean Sea as a biological corridor and how delegates could communicate the outcomes of the Forum to critical decision makers.

Chair Aquino reflected on the discussions, announced an offer from Jamaica to host CEF-5, joined Chair Brathwaite in thanking all participants and panelists, and closed the meeting at 3:59 pm.

UPCOMING MEETINGS

G8 SUMMIT: The Group of Eight Summit will be held from 7-9 July 2008 in Hokkaido, Japan. For more information, contact: Japanese Ministry of Foreign Affairs, tel: +81-3-3580-3311; internet: <http://www.mofa.go.jp/policy/economy/summit/2008/index.html>

TENTH 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; tel: +44-1273-625-643; fax: +44-1273-625-768; e-mail: asayigh@netcomuk.co.uk; internet: <http://www.wrenuk.co.uk/wrecx.html>



CARIBBEAN REGIONAL SUSTAINABLE ENERGY HIGH-LEVEL SEMINAR: This seminar, sponsored by the OAS Department of Sustainable Development, the IDB, the Inter-American Institute for Cooperation on Agriculture, and the US Government, will be convened on 23 July 2008 in Nassau, the Bahamas. It is designed to offer a forum to high level participants from Caribbean governments and the donor community for identifying: key impediments to promoting renewable energy and energy efficiency alternatives; priority technical and capacity building needs; and opportunities for improving coordination among the entities working in the region. For more information, contact: Francisco Burgos; tel: +1-202-458-6818; fax: +1-202-458-3560; e-mail: fburgos@oas.org; internet: <http://www.oas.org>

OPPORTUNITIES IN THE CARIBBEAN

RENEWABLE ENERGY SECTOR: This business roundtable will take place on 24 July 2008, following the Caribbean Regional Sustainable Energy High-Level Seminar, in Nassau, the Bahamas. For more information, contact: Energy Business Forum; tel +1-305-348-7663; e-mail: energy@business.fiu.edu; internet: http://krcem.fiu.edu/DOS/index_files/agenda.htm

FIRST LATIN AMERICAN AND CARIBBEAN ENERGY EFFICIENCY SEMINAR: This seminar, sponsored by OLADE, will be held from 4-5 August 2008 in Isla Margarita, Venezuela. The purpose of the seminar is to share experiences, present technologies and disseminate the benefits of renewable energy. For more information, contact: OLADE; tel: +593-22598-122; fax: +593-22531-691; e-mail: mentor.poveda@olade.org.ec; internet: <http://www.olade.org>

INTERNATIONAL CONFERENCE ON "FINANCING FOR CLIMATE CHANGE – CHALLENGES AND WAY FORWARD"

This conference will convene from 15-17 August 2008 in Dhaka, Bangladesh. Arranged by a Bangladesh-based think tank, Unnayan Onneshan, this conference will focus on financial mechanisms for supporting mitigation activities to combat climate change. For more information, contact: Nazmul Huq, Unnayan Onneshan; tel: +880-2-815-8274; fax: +880-2-815-9135; e-mail: nazmul.huq@unnayan.org; internet: <http://www.unnayan.org>

THIRD SESSION OF THE AD HOC WORKING GROUP ON LONG-TERM COOPERATIVE ACTION UNDER THE UNFCCC AND SIXTH SESSION OF THE AWG UNDER THE KYOTO PROTOCOL: The third meeting of the *Ad Hoc* Working Group on Long-Term Cooperative Action under the Convention (AWG-LCA) and sixth session of the AWG on Further Commitments for Annex I Parties under the Protocol (AWG-KP) will take place in Accra, Ghana, from 21-27 August 2008. For more information, contact: UNFCCC Secretariat; tel: +49-228-815-1000; fax: +49-228-815-1999; e-mail: secretariat@unfccc.int; internet: <http://unfccc.int>

29TH SESSION OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (IPCC-29): IPCC-29 is scheduled to take place in Geneva, Switzerland, from 1-4 September 2008. The meeting will celebrate the IPCC's 20th anniversary. For more information, contact: IPCC Secretariat; tel: +41-22-730-8208; fax: +41-22-7 30-8025/13; e-mail: IPCC-Sec@wmo.int; internet: <http://www.ipcc.ch>

BIOENERGY, FORESTRY RESOURCES AND ENERGY EFFICIENCY IN LATIN AMERICA: This meeting, sponsored by the Energy and Environment

Partnership with Central America, the Ministry of Natural Resources and Environment of Honduras, and the Central American Bank for Economic Integration, will be held from 22-24 October 2008 in Telcucigalpa, Honduras. The meeting will focus on sharing experiences and know-how between Central America and Europe on the sustainable use of forestry and bioenergy resources. Participants will also discuss how to support energy efficiency issues, promote projects which contribute to climate change mitigation and find financial opportunities. For more information, contact: Yanira Pascasio de Ayala; tel: +503-2248-8920; fax: +503-2248-8899; e-mail: ypascasio@sica.int; internet: <http://www.sica.int/energia>

2008 EU PRESIDENCY RENEWABLE ENERGY

POLICY FORUM: This forum will take place from 17-22 November 2008, in Paris, France. The event will be a major platform for discussions on the European Renewable Energy Directive. For more information, contact: Sophie Liberatore; tel: +32-2-546-19-33; fax: +32-2-546-19-34; e-mail: sophie.liberatore@ec.europa.eu; internet: <http://www.erec.org/nc/calendar-of-events>

FOURTEENTH CONFERENCE OF THE PARTIES TO THE UNFCCC (COP 14) AND FOURTH MEETING OF THE PARTIES TO THE KYOTO PROTOCOL (COP/MOP 4): UNFCCC COP 14 and Kyoto Protocol COP/MOP 4 are scheduled to take place from 1-12 December 2008 in Poznan, Poland. These meetings will coincide with the 29th meetings of the UNFCCC's subsidiary bodies and the fourth meeting of the AWG-LCA and resumed sixth session of AWG-KP. For more information, contact: UNFCCC Secretariat; tel: +49-228-815-1000; fax: +49-228-815-1999; e-mail: secretariat@unfccc.int; internet: <http://unfccc.int>

GLOSSARY

ADC	Austrian Development Cooperation
AOSIS	Association of Small Island States
CARICOM	Caribbean Community and Common Market
CDM	Clean Development Mechanism
CEF	Caribbean Environmental Forum
CREDP	Caribbean Renewable Energy Development Programme
CSD	Commission on Sustainable Development
CSEF	Caribbean Sustainable Energy Forum
GEF	Global Environment Facility
GFSE	Global Forum on Sustainable Energy
GTZ	German Technical Cooperation Agency
IDB	Inter-American Development Bank
IPCC	Intergovernmental Panel on Climate Change
IUCN	International Union for Conservation of Nature
LAC	Latin America and the Caribbean
MDGs	Millennium Development Goals
OAS	Organization of American States
OECS	Organization of the Eastern Caribbean States
PV	photovoltaic
SGU	St. George's University
SIDS	small island developing states