



Asia Clean Energy Forum Bulletin

A Daily Report of the Seventh Asia Clean Energy Forum (ACEF) 2012

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ASIAN CLEAN ENERGY FORUM 2012 HIGHLIGHTS: WEDNESDAY, 6 JUNE 2012

The seventh Asia Clean Energy Forum 2012, themed “Accelerating low-carbon energy for all,” opened in Manila, the Philippines. In the morning, participants convened for the opening plenary. In the afternoon, eight breakout sessions were held under the meeting’s theme.

OPENING OF THE SESSION

Opening the session, Haruhiko Kuroda, President, Asian Development Bank (ADB), highlighted that as Asia is now at the center of the world’s economic growth, the region must focus its efforts on providing energy access and reducing energy poverty. He emphasized measures to ensure that the region remains on a low-carbon growth path, including: mobilizing resources for green growth through increased partnerships; scaling-up demand-side initiatives; and providing clean energy technologies to the poor.

Robert Orr, US Ambassador to the ADB, reaffirmed his country’s commitment to low-carbon energy for all. Highlighting estimates from the International Energy Agency (IEA) indicating that the world is set to double carbon emissions and therefore raise global temperatures by 6 degrees Celsius, he noted the significant threat this would pose for cities, national economies, and global food security. Drawing attention to the US government’s efforts to promote low-carbon energy, including new policies aimed at eliminating fossil fuel subsidies, he called on participants to share best practices and ideas to further clean energy solutions for the region.

Bindu Lohani, ADB, introduced the forum’s four tracks: technology; policy and regulation; financing; and energy for all. He highlighted the need for global momentum to support universal energy access, stressing that more knowledge is necessary to move clean energy from an exception to the norm.



Haruhiko Kuroda, President, Asian Development Bank (ADB) delivering his opening message to the forum.

Zhengrong Shi, CEO, Suntech Power Holdings, provided insights on prospects for the solar industry, acknowledging current challenges such as macroeconomics, market capacity, and trade barriers. He highlighted the main trends that will support the solar industry’s move into the next phase of cogeneration and energy-storage, including: cost reduction innovation through technological innovation, improved supply chains, and policy support; diversification of regions utilizing and producing solar technology; bankability improvement; and development of smart grids.

Daniel Kammen, University of California, Berkeley, said, despite hard work, the energy community has not yet made progress and energy poverty remains a critical issue. He stressed the need for clear and concise communication on why the world should pay attention to and engage in development and deployment of clean energy.

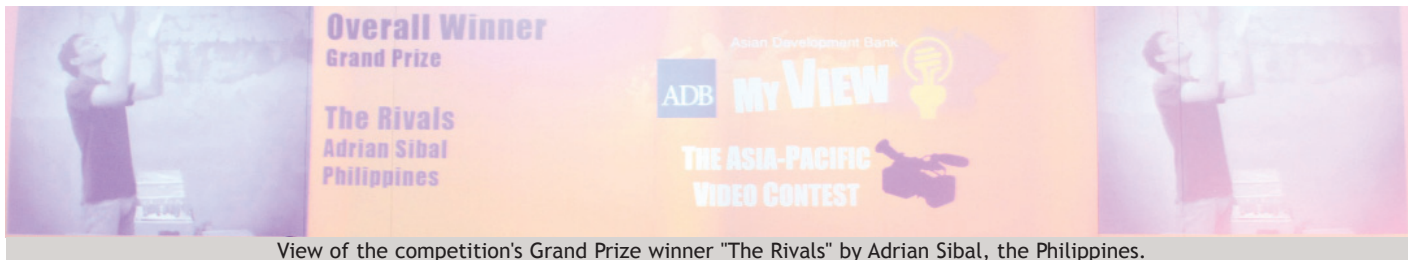
During the ensuing discussion, participants raised questions on, *inter alia*: trade barriers; communicating systems thinking on clean energy to policy makers; clean energy solutions for the poor; and energy storage. On private sector contributions to achieve universal energy access, Shi said a bottom-up approach is required for each sector because each has different solutions. Kammen said policy stability is necessary and highlighted the “Lighting Africa” initiative as an unexpected success in clean energy technology deployment.

Ann Quon, ADB, presented the ADB 2012 “My View Contest” awards, themed Renewable Energy/Energy for All. Kai Syuen Loh, Malaysia, was the Under 21 Category recipient for his short film titled “A Day in the Life of Energy,” while Carlo Marco Cruz, the Philippines, won the Over 21 Category for his film titled “The Smarter Species.” The grand prize was awarded to 26 year old Adrian Sibal, the Philippines, for his silent film “The Rivals.”



Daniel Kammen, Founding Director, Renewable and Appropriate Energy Laboratory, University of California, Berkeley, and Zhengrong Shi, CEO, Suntech Power Holdings, answering questions from participants.

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View of the competition's Grand Prize winner "The Rivals" by Adrian Sibal, the Philippines.

BREAKOUT SESSIONS

PARADIGM TO THE INTERNATIONAL YEAR OF SUSTAINABLE ENERGY FOR ALL YEAR: Athena Ballesteros, World Resources Institute, moderated the session. Bikash Pandey, Clean Energy, Winrock, observed that that type of institutions involved in providing modern energy services for the poor have changed dramatically with an emphasis now on decentralized entities, and enterprise playing a bigger role. He said that despite this shift, the loan and investment portfolios of multilateral development banks (MDB) had not progressed accordingly to support these types of institutions.

Thiyagarajan Velumail, UNDP, called for making poverty reduction the central objective, cautioning against only focusing on energy access. He drew attention to the energy access disadvantage in rural areas.

Edita Bueno, National Electrification Administration (NEA), noted the past the focus had been on generation and transmission and distribution had not received sufficient attention. She also highlighted the role that government can play in supporting energy access and efficiency.

Ingmar Stelter, European Union Energy Initiative Partnership Dialogue Facility, emphasized that energy access targets could not be achieved without private sector involvement, although no one has a clear idea on how to do this. He called for appropriate policies, support of governments, and for MDBs to move towards early stage funding.



Athena Ballesteros, WRI

Discussing scale, Jim Liston, ADB, observed that due to the ADB's procedures, projects had to be of a certain size to warrant consideration with anything below US\$ 50 million being unfeasible. On ADB's role, he emphasized that, amongst other things, the bank can be instrumental in bringing about policy change to encourage renewable energy developments.

During the discussion, participants raised issues including the: need for a

multi-stakeholder project approach; need for energy strategies

View of a packed Session 2 discussing *inter alia* problems of energy poverty, energy efficiency and financing.

to take into account the agricultural sector; foreign exchange risks, which put pressure on costs; non-monetary benefits of energy provision; and moving beyond projects to programmatic approaches for energy provision.

SOLAR ENERGY IN ASIA: Dave Renne, Solar Energy Society, moderated the session, stressing the importance of collaboration among government, private sector, research, and financial institutions to grow the solar sector. On challenges, he highlighted the need to develop an adequate work force for a viable future.

Joel Conkling, Google, presented how Google strives to be a sustainable business by improving data center efficiencies, purchasing renewable energy and carbon offsets, and investing in renewable energy. He identified the company's interest in expanding investment beyond the US borders by drawing on the lessons learned in the US, such as deal structuring to manage risk and aggregating small power purchases.

Mikael Jakobsson, COWI Energy Group, called for integrated energy solutions and smarter grids, sharing perspectives from solar heating experiences in Denmark, highlighting targeted and time limited subsidies. Demchigjav Chimeddorj, Energy Authority Mongolia, shared experiences from Mongolia, outlining the high demand for solar heating due to cold weather and poor air quality and pointing to the need to conduct feasibility studies and initiate pilot projects in city centers.

Aiming Zhou, ADB, detailed the process of developing a rooftop solar project for ADB, identifying risks and the need for innovative financial mechanisms for small projects to achieve bankability. He explained how this rooftop project demonstrates ADB's commitment to environmental and social responsibility without requiring upfront costs, and being credit worthy.

Pushkala Lakshmi Ratan, TÜV SÜD Asia Pacific Pvt. Ltd, addressed mitigating risks for: resource through site assessment and resource monitoring; technology through prototype testing, design review, and demonstration installations; counterparty by credit worthiness and reputation; financial by environmental finance products; and regulatory through stable policy development and incentives.

In the following discussions, panelists commented on: significant barriers and opportunities in southeast Asia; technical due diligence; operations and maintenance; and insurance.

LOW EMISSION DEVELOPMENT STRATEGIES AS A CLEAN ENERGY DRIVER: Session chair, Orestes Anastasia, USAID Regional Development Mission for Asia, highlighted a process to achieve Low Emissions Development Strategies (LEDS), including: assessing the current situation and aligning it with nationally and locally-specific development goals; prioritizing and developing action plans, including implementation and finance plans; and implementing and monitoring the plans chosen, including designing appropriate monitoring systems.

Sitanon Jesdapipat, Chulalongkorn University, highlighted: Thailand's Power Development Plan; its Energy Efficiency Plan 2010-30; and its Development Plan for Renewable Energy and Alternative Energy for 2008-2020, noting the need to reevaluate policies on climate change, and the importance of governments sending clear signals that prove to consumers that clean technologies are worth investing in.

Darius Nassiry, Global Green Growth Institute, drew attention to the Republic of Korea's Institutional Framework for Green Growth initiated in 2008, noting the government's



Session 3 dais on Solar Energy in Asia: Industry Dynamics, Business Models, and Potential for Expansion

five year growth plan committing to invest approximately US \$100 billion in research and development for clean technologies and acceleration of their deployment.

Pan Tao, Institute for Sustainable Communities, presented on experiences with LEDS planning and development initiatives in China, highlighting key challenges that need to be overcome in order for national and provincial LEDS programmes to succeed, including providing greater incentives to attain the high provincial LEDS targets; and creating local level awareness to complement the high global priority for LEDS.

Nguyen Manh Hai, Central Institute for Economic Management, Vietnam, presented Vietnam's draft Green Growth Strategy (GGS) as a LEDS and its implications for clean energy development, listing three strategic tasks, including: reducing GHG intensity and promoting the use of clean renewable energy; greening existing production processes; and greening lifestyles and promoting sustainable consumption patterns.

The ensuing discussion focused on the impact of national-level policies and frameworks and business-driven green growth initiatives, and the different focuses for LEDS in both high- and low-emissions countries.

ACCELERATING THE DIFFUSION OF CLIMATE TECHNOLOGIES IN THE ASIA-PACIFIC: This session was chaired by Xuedu Lu, ADB. Rajiv Garg, UNEP, presented UNEP's efforts on technology transfer and said lack of experience and return on investment are key barriers in deployment and recommended networks as key tools for faster uptake of climate technologies, including the "Pilot Asia-Pacific Climate Technology Network and Finance Center."

Letha Tawney, WRI, explained that both the climate and energy communities have struggled with innovation. She stressed that clean energy is now cost competitive with other forms of energy and cost no longer represents a barrier to climate technology diffusion.

Peter Storey, CTI Private Financing Advisory Network (PFAN) Global Coordinator, PPL International, said bringing together finance and technology is the main barrier to climate technologies. He presented the PFAN as a model with good success rates and high financial leverage. He noted that lack of early stage financing represents an additional barrier.

Toru Kubo, ADB, described ADB's efforts on innovation, transfer, and diffusion for climate technologies, including the Asia Climate Change and Clean Energy Venture Capital initiative, which combines equity for financial capital funds with technology advisors.

In the ensuing discussion, participants discussed, *inter alia*, criteria for venture capital funds and the UN Convention on Climate Change, Green Climate Fund (GCF). Tawney said the GCF has the opportunity to build an enabling environment while reducing reduce risk for technology diffusion. Kubo highlighted non-financial barriers to climate technologies, such as ensuring that technology is available, affordable, and accessible. Garg stressed funding for technology transfer

and large-scale diffusion should only be done when there is national readiness and infrastructure to accept and support the technology.

MOVING OUT OF POVERTY THROUGH PRODUCTIVE USE OF ENERGY SERVICES: The session was moderated by Robert van der Plas, Energy for All Partnership.

Drew Corbyn, Practical Action, described lack of access to energy as "the cruel catch 22, which locks people in a cycle of poverty." He introduced the Poor People's Energy Outlook (PPEO 2012), observing that PPEO has examined home energy use and proposed the concept of total energy access, which goes beyond looking at supply side indicators and focuses on how people use energy. On livelihoods, he noted that energy access could: create new earning opportunities; improve existing earning activities; and reduce drudgery. He also noted that for reducing poverty, increasing agricultural productivity is essential.

Russell de Lucia, The Small Scale Sustainable Infrastructure Development Fund, Inc., emphasized the need for technology and financial inclusion, observing that access to energy alone does not automatically reduce the impacts of poverty or facilitate productive application. For productive use to have a greater impact he observed that households and enterprise would have to have the "know how" brought to them as well as access to financing and that value added capture has to be undertaken by the entrepreneurs.

Laurie Navarro, Alliance for Mindanao Off-grid Renewable Energy Program (AMORE) USAID, highlighted AMORE, a rural electrification programme aimed at providing access to modern energy services. She also emphasized the need for soft financing for small businesses.

Observing that the majority of the poor derive their living from the agricultural sector, Beau Damen, UN Food and Agriculture Organization, stressed that improving energy production of the agricultural sector will be one of the key challenges for the future, noting that food production increase will have to come from agricultural intensification.

Len Geroge, ADB, highlighted ADB's technical assistance programmes aimed at providing financing to small and medium-sized enterprises.

On addressing productive end use, one participant observed that it is important to ask the community what their needs are, noting that an energy analysis should not only be based on modern technology but also on peoples' lifestyles, and that understanding what the communities value in terms of energy products is important. Participants also addressed the role of gender and recommended that any initial needs assessment be gender sensitive.

SMART GRIDS AND GRID INTEGRATION OF RENEWABLE ENERGY: Moderator Pil-Bae Song, ADB, opened the session by acknowledging that smart grids can help address high growth demand in the Asia Pacific and help to achieve universal access.

Reji Kumar Pillai, India Smart Grid Forum, explained that the smart grid is a need, not a luxury, describing specific challenges in India requiring expanded energy access,



View of the morning plenary session.

improved quality, security and supply and reduced transmission losses. He highlighted the roadmap for the next five years summarizing the vision and projects with solutions for smart grid implementation.

David Elzinga, IEA, outlined how smart grid technology modernizes the grid to deploy a range of technologies required to establish energy security and climate stability. He reviewed the efforts required, including: building up of commercial scale demonstrations; developing global technology standards; and integrating with existing electricity infrastructure.

Dietmar Retzmann, Siemens AG, shared successes from wind energy installations in European offshore programs. He provided a technical explanation of how the energy links into the grid through new technologies such as SVC plus (Static Var Compensation) and high-voltage direct current plus.

Eddie Tan, GE Energy, stated that the most important strategy is to increase grid visibility, suggesting *inter alia*: reviewing network design; increasing assets rating and protection schemes; implementing grounding practices; and improving energy storage efficiency.

Cao Xiao, China Electric Power Research Institute, State Grid Corporation, explained the motivation for construction of a smart grid in China as 2/3 of power is generated in the west and southwest while 2/3 of the demand is in the east. He shared progress from the three-phase development to plan, pilot, construct, and enhance the smart grid by pointing to demonstration projects.

Panelists discussed methodologies for energy storage and differences in smart grid technology for each region. Song concluded the session by announcing the ADB would like to help member countries in smart grid development.

EMERGING REGIONAL INITIATIVES TO SUPPORT IMPROVED IMPLEMENTATION OF CLEAN ENERGY: Session Chair Gil-Hong Kim, ADB, introduced the session, noting the discussion would dwell on multi-level approaches to promote clean energy initiatives in the Asia-Pacific region.

Kala Mulqueeny, ADB, reported on the Asia-Pacific Dialogue on Clean Energy Governance and Regulation, noting that on energy services, one barrier that was discussed was Value Added Tax and import duties on lighting products and clean cookstoves, calling on policymakers to agree on standards for these, with a final goal of the elimination of these taxes.

Hongpeng Lui, the UN Economic and Social Commission for Asia and the Pacific (ESCAP), presented on enhancing energy security and sustainable development through regional connectivity in the Asia-Pacific region, highlighting a proposal to create an Asian Energy Highway, building on the successes of the Asian Highway Network and the Trans-Asia Railway. He said that ESCAP is working on a set of options regarding the functioning of the Network, which will be presented at the Asia and Pacific Energy Forum in May 2013.

Sven-Uwe Mueller, Director, GIZ, presented on the challenges for the implementation of renewable energy, highlighting experiences from Germany and China. He reflected on the need to create an efficient implementation mechanism through a strong administrative system; as well as the need for technology transfer and know-how, and a strong human resource support network.

Song-Kwen Kang, Korea Energy Management Corporation, presented on energy efficiency policies in the Republic of Korea, highlighting the government's work in promoting energy efficiency in the industrial sector by reducing GHG emissions; in the transport sector through tire-labeling among others; and in the equipment and appliance sector through a high efficiency certification programme among others.

The ensuing discussion focused on: financing the building of the Asian Energy Highway; developing a regional framework for electricity trade in the Asia-Pacific; securing the grid access of renewables; and discussing future plans of the Dialogue on Clean Energy Governance and Regulation.

NEW APPROACHES TO SCALING UP ENERGY EFFICIENCY INVESTMENTS IN ASIA: This session was chaired by Peter du Pont, Nexant Asia.

Thomas Dreesen, CEU EPS Capital Corp., said lack of access to available debt and equity on commercially attractive terms is a major barrier in energy efficiency projects. For energy efficiency projects in China, he said infrastructure investments are a low priority among investors. He described an Indonesian programme to promote and finance energy efficient products that minimize risk and transaction costs for local financial institutions and reduce barriers for industrial end-use energy consumers and industrial hosts.

Mek Meksarikul, Kasikornbank, described his bank's three-way partnership among the bank, the client and an energy service company (ESCO), which provided 100% loans to clients on energy efficiency projects.

Anil Kumar, SRC Global, Inc., presented a review of energy efficiency financing activities in India that identified high priority projects to scale-up industrial energy efficiency.

During discussion, participants highlighted how to: structure equity; replicate success; scale-up training for local financial institutions; aggregate energy efficiency projects; and cluster loans. On replicating success, Meksarikul recommended building capacity and raising awareness among bank officers so that they understand the benefits and risks of energy efficient project investments. On clustering loans, Anil shared his experience in identifying energy intensive projects for energy and carbon savings.



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ASIAN CLEAN ENERGY FORUM 2012 HIGHLIGHTS: THURSDAY, 7 JUNE 2012

In the morning, participants convened in plenary and considered “Financing Sustainability and Enabling Profitability: public and private perspective.” The day was organized into 12 breakout sessions.

PLENARY SESSION

Xiaoyu Zhao, ADB, noted the high potential of Asia-Pacific’s clean energy market and opportunities to contribute to poverty reduction.

Christine Lins, Executive Secretary, Renewable Energy Policy Network for the 21st Century (REN21), presented the REN21 Renewables 2012 Global Status Report, which includes new features on rural energy development and complementarity of energy efficiency policies. She said renewable policy frameworks are key for industry to invest in clean energy markets.

Moderator Andrew Revkin, The New York Times, led an interactive panel discussion on, *inter alia*: technology transfer; the future of the climate; and the role of natural and shale gas in the future energy mix.

Brian Castelli, Alliance to Save Energy, stressed the need for south-south technology transfer and the replication of successful initiatives by developing countries. Michael Eckhart, Citigroup, underscored that the world is currently in a “technological transformation.” S. Chander, ADB, emphasized focusing on population growth, resource management, and capital investment flows in renewables in the developing world to address climate change.

Castelli said that the move toward renewable energy is a generational one, and agreed with Eckhart that the future energy-mix will continue to feature fossil fuels, but energy efficiency will be emphasized.



View of the panel discussion during the morning plenary session



Protesters from Greenpeace depicting the use of dirty coal in the Philippines.

BREAKOUT SESSIONS

ENERGY FOR ALL: UP-SCALING MICRO-ENTERPRISES:

Bart Édes, ADB, moderated the session. Hanna Ebeling, LGT Venture, provided an overview of LGT’s Impact Venture Accelerator Programme, centered on philanthropic impact investments in emerging markets through a personalized and local approach. She explained that the accelerator programme incubates early stage enterprises by providing risk capital up to US\$ 50,000. Ebeling emphasized that the priority is on the reach and depth of social impact and that loans are provided at market rates to avoid distorting the local market.

Andrea Griffin, Orb Energy, explained that her company, a provider of solar home systems, developed their model by focusing on: distribution networks; provision of incentives to start franchisees; and after-sales installation and maintenance services. She observed that finding appropriate investments has been a challenge.

William Baron, Mercy Corps, noted his organization’s focus on market development in post-conflict states. He said their “one-step approach” in Timor Leste, involves working with existing businesses and identifying lead firms. On early stage incubation, he observed that some enterprises only need assistance accessing markets and do not necessarily need financing.

Ajaita Bothra, Frontier Markets, reflected on the importance of understanding whether the investor is providing the right fit for the micro-enterprise. She challenged the assumption that the poor do not have money and therefore could not afford products, noting that products would be bought if their value was understood.

During the discussion, one participant enquired about the definition of micro-enterprises, observing that the discussion appeared to be more focused on medium-sized enterprises. Participants also discussed the role of government and gender in up-scaling micro-enterprises.

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L-R: Andrew Revkin, the New York Times; S. Chander, ADB; Brian Castelli, Alliance to Save Energy; Michael Eckhart, Citigroup; and Christine Lins, Executive Secretary, REN21

CARBON CAPTURE AND STORAGE: REGIONAL UPDATE: This session was chaired by Ashok Bhargava, ADB. Alice Gibson, Global Carbon Capture and Storage (CCS) Institute, presented the global status of CCS, noting that it is already being demonstrated globally with eight operational projects and 72 large-scale projects in the planning, development, or operational stage.

Pradeep Tharakan, ADB, described challenges and opportunities for CCS in Southeast Asia and stressed that CCS can be conducted across sectors.

Annika Seiler, ADB, said, given growth scenarios of increased coal consumption across Asia, CCS is needed to avoid a high carbon growth path. She said developing countries face specific challenges, including that policymakers view CCS as a last priority, rather than as a strategic choice.

Gwen Andrews, Alstom, said CCS is ready to scale-up to large commercial demonstration projects. She noted an advantage to working on CCS in China is the emphasis on driving down costs, an approach that could be transferred to other Asian countries.

Participants discussed, *inter alia*: systems accounting; non-climate impacts of coal; public concerns on CCS safety; long-term storage liability; and chemical looping. Tharakan said there is a need to reduce all emissions, not only CO₂. Gibson and Andrews both emphasized securing finance for large-scale demonstration projects. Seiler stressed that concessional financing and a dedicated fund are essential for demonstration projects in developing countries.

DEVELOPMENT AND IMPLEMENTATION OF CLEAN ENERGY IN THE PHILIPPINES: Pete Maniego, National Renewable Energy Board, the Philippines, chaired the session.

Jose Layug, Department of Energy, the Philippines, outlined milestones and targets in the Philippines, describing

the fiscal and non-fiscal incentives and reported on recent activities to increase renewable energy use by 50% in the next 20 years. He provided a snapshot of renewable energy projects in the Philippines, explaining the range of available energy sources including biomass, geothermal, solar, hydro, tidal, and wind.



ACEF participants attending a session on clean energy in the Philippines

Katsumasa Hamaguchi, Japan International Cooperation Agency, described the legal framework development for energy efficiency and conservation in the Philippines, covering five sectors. Due to the Philippine's relatively low energy self-sufficiency, he stressed the need for energy conservation, concluding that the focus is not on making laws, but on implementing and enforcing laws.

Jasper Inventor, Greenpeace International, presented on the short-term versus the long-term thinking around feed-in tariffs (FIT). He stated that targets for 2030 are reachable by 2020, posing suggestions, *inter alia*: challenging ADB to support a FIT support facility for consumers; putting forth FIT implementing mechanisms as a nationally appropriate mitigation action (NAMA); and making FIT more socially acceptable.

Discussion topics included, *inter alia*: achieving grid parity; improving energy access; questioning government actions to allow new coal plants; improving and building momentum for energy efficiency; and mobilizing political will.

STRATEGIES FOR FINANCING SMALL-SCALE SOLAR POWER PLANTS: In a session chaired by Rehan Kausar, ADB, Tony Artiga, Sunco Clean Energy Solutions, presented bankable business models his company is developing for energy, water, and telecommunications. He highlighted the company's work in using the mobile phone pay-as-you-go model to link solar energy producers with consumers.

Stewart Craine, Barefoot Power/Village Infrastructure Angels, presented on long-term energy lending. Noting that banks are still reluctant to invest in small-scale solar projects, he called on MDBs and other investors to provide the US\$ 500 million in capital for the sector's growth.

Don Purka, ADB, presented on bridge-building efforts in addressing the concerns of local and foreign banks skeptical about investing in small-scale solar projects in India through the introduction of ADB's partial credit guarantees enabling solar power entrepreneurs to obtain loans to finance their projects.

Sicheng Wang, National Development and Reform Commission, China, presented on financing mechanisms for a distributed solar photovoltaics (PV) project. He drew attention to financing for grid connected PVs, noting that an evaluation standard for long-term PV power generation will be key in persuading insurance companies to back solar power entrepreneurs who will in turn be able to secure bank loans to finance their projects.

ENERGY FOR ALL: BUSINESS SOLUTIONS FOR PROMOTING ENERGY ACCESS: David Reed, WWF, moderated the session, observing that there is a radical difference between what governments think private sector investors want and what the investors themselves actually want.

Sameer Shetty, Boving Fouress Ltd, underscored lack of political will as the fundamental reason why clean energy cannot be delivered to the rural poor. He called for political championing to make energy accessible to those who do not have it, highlighting energy access as a means to eliminate poverty.

Advocating a bottom up approach, Harry Verhaar, Philips Lighting, highlighted: inspiration, through sharing of examples; aspiration, quantifying what one wants to achieve and by when; and perspiration, getting things done.

Lyndon Frearson, Cat Projects, observed that business is here to make money and therefore governments and MDBs need to be realistic about these objectives. He emphasized the



L-R: Bart Édes, ADB; Hanna Ebling, LGT Venture; Andrea Griffin, Orb Energy; William Baron, Mercy Corps, and Ajaita Shah Bothra, Frontier Markets

value of providing energy to the rural poor, and, highlighted constraints relating to finance, governance, and the supply chain.

On barriers, Glenn Tong, Propmech Corporation, cited the mindset of business leaders and politicians who are guided by the bottom line and do not see the potential of renewable energy. Frearson highlighted local community barriers including low levels of expectation and mistrust in the contractor and technology.

During the discussion, participants considered whether the UN Secretary-General's Initiative on Sustainable Energy for All could play a key part in garnering political will. Responding to a question on the role of finance, Shetty noted that the hydro energy business is financially viable and commercial banks have "jumped onto it," now that they see a model that works. On ADB's contribution to promoting energy access, Shetty responded that the ADB brings credibility to the table, required to foster political will. Verhaar observed that co-financing initiatives will expand the collective circle of influence, with Frearson adding that the ADB could build a knowledge based around the sector.

QUANTUM LEAP IN WIND POWER: This session was chaired by Jitendra Shah, ADB.

Steve Sawyer, Global Wind Energy Council, identified political commitment as a key condition for successful policy and regulatory regimes to facilitate wind projects. He compared wind policy options, noting that FIT markets and tax incentives are effective to initiate investments. He said trade and quotas are not effective measures and tenders are a risky option.

Gil Opina, Siemens Wind Power, presented technological advancements of the wind turbine industry in the Philippines, including rotors, wind energy conversion systems, control systems, towers and foundations, and operation and maintenance.

Pramod Jain, Innovative Wind Energy, Inc., compared tariffs to a fruit basket, with distinct types of fruit representing: published FIT; incentives; tax benefits; renewable portfolio obligations; renewable energy credits; and wind regimes.

Jitendra Shah, ADB, summarized a pre-forum wind workshop highlighting key findings, *inter alia*: hope from successful pioneer projects; discovery that technology is the easiest aspect of wind projects; and recognition that FITs have different components.

Participants discussed, the minimum capacity required to make a project feasible, and how to increase the comfort of bond buyers with wind farms as a secure, low-risk investment.

ADB'S KNOWLEDGE AND INNOVATION-BASED SUPPORT TO PRC'S CLEAN ENERGY DEVELOPMENT: Ashok Bhargava, ADB, chaired the panel and presented ADB support for China's clean energy development, describing rapid energy growth and transformation to a low-carbon, energy efficient economy. He specified priorities, *inter alia*: offshore wind; low-carbon district heating; CCS and concentrated solar power (CSP) demonstration; shale gas; fossil fuel power plants emission performance standards; tariff studies; and energy smart regulations.

Pradeep Perera, ADB, reviewed results achieved in China from 2006-2010, indicating areas of ADB support for the next five years to: mobilize US\$ 240 billion in investments to achieve energy savings; scale-up provincial energy efficiency programmes; implement, monitor, and channel financing; and develop market based approaches.

Woo Yul Lee, ADB, introduced CSP technology to convert solar energy into usable heat and electricity, providing flexibility, reliability, and predictability. He claimed that 15% of China's total energy could be produced by CSP by 2040 if deployed in time.

Annika Seiler, ADB, reviewed the benefits of clean coal technologies and integrated gasification combined cycle technology for China, considering the expected rise in use of coal. She recounted ADB support in three loan projects, acknowledging the capacity development and regulatory and safety support.

In the discussion, Pradeep responded to a question on how China can continue to manufacture and improve energy efficiency by suggesting value addition..

RAISING FUNDS AND MATCHING FINANCING WITH PROJECTS: This session was moderated by Samuel Tumiwa, ADB. Eric Usher, UNEP, presented lessons learned from the Seed Capital Assistance Facility (SCAF), noting that for Asia, SCAF activity has concentrated on investments in the Philippines and India, with a focus on small-scale hydro and wind power projects.

Tao Ren, European Investment Bank and the Global Energy Efficiency and Renewable Energy Fund (GEEREF), introduced the GEEREF as the only fund-of-funds providing risk capital to renewable energy focused on SMEs, acknowledging that much work needs to be done to build fund managers' capacity.

Youngsuk Seo, KPMG Korea, presented on the gap between developers and investors, noting that many projects presented for funding are not mature enough to be developed, highlighting country, technical and financial risks faced by the developer.

Husain Mugaibel, Islamic Development Bank (IsDB), presented his organization's experiences in energy project financing in the Middle East and North Africa, highlighting the IsDB's net approvals for the energy sector in 2011 as US\$ 78 billion.

Miles Stump, International Finance Corporation, noted barriers to sustainable energy investment include: the need for: financiers to provide a strategic focus to the entrepreneur; and the financial sector to provide holistic, comprehensive solutions to developers.

ENERGY FOR ALL: CLEAN COOKING SOLUTIONS FOR THE POOR: Sununtar Setboonsarng, ADB, moderated the session. Leslie Cordes, Global Alliance for Clean Cookstoves/UN Foundation, noted that billions of people cook on traditional or open fire stoves fueled by biomass. Highlighting the health risks, she observed that women are disproportionately affected. Cordes described the cookstove market as fragmented, comprising a variety of fuels and numerous manufacturers. Emphasizing scale, she highlighted the alliance's goal of 100 million households adopting clean cookstoves by 2020.



Siemens booth at the ACEF 2012

Wim van Nes, SNV, observed the need to create demand for clean cookstoves, following market-based approaches. On enabling environments, he said the question is how to engage in effective coordination mechanisms at the national level. On the supply side he noted the need to strengthen local organizations.

Michael Kelly, World LP Gas Association, highlighted the “huge opportunity at the base of the pyramid” for providing access to energy. Noting that LPG is primarily an energy source in developing countries, he said that it is a better solution for urban and peri-urban areas.

Heike Volkmer, GIZ, said that improving cooking behavior, by for example, not using wet firewood is a challenge. She expressed doubt on whether there is a global market for cookstoves. On scaling up, she advocated strengthening the supply chain, product development, and access to finance. Cordes responded that there is a market for cookstoves but not for advanced clean cookstoves.

Participants discussed: clean cookstove testing centers, affordability, and accessibility for the poor. van Nes noted that health benefits and efficiency could convince households to pay more for clean cookstoves.

TECHNOLOGY DEVELOPMENTS AND APPLICATION FOR BIOENERGY IN ASIA: This session was chaired by Jun Tian, ADB. Craig Jamieson, World Agroforestry Center, described Bioenergy with Carbon Capture and Storage (BECCS) as a viable, cost effective method to reduce atmospheric CO₂ concentrations. He said raising awareness on BECCS and inclusion in policy frameworks is necessary to accelerate the technology deployment and its use.

Pasi Rousu, Chempolis Asia & Pacific, Finland, described Chempolis’s formicobio as a superior solution for cellulosic ethanol, emphasizing the important role of biofuels in reducing dependency on fossil fuels, stressing that biomatter should not compete with land use for food.

Oktay Mammadov, Ministry of Economic Development, Azerbaijan, presented on Temiz Seher, a state owned company that aims to improve the city’s ecology and manage solid municipal waste disposal, including the development of a waste-to-energy plant that will produce energy for 50,000 households.

Gatot Prawiro, GE Energy-Gas Engines, highlighted the potential of distributed power from biomass and biogas and described GE efforts on biogas, palm oil, landfill gas, and special gas.

Participants raised questions on: use of gas engines and potential for third generation biofuel refineries in Asia, and food versus fuel, with one participant stating that there are sufficient sources of biomass that do not affect the food supply and another participant stressing high price volatility for food.

BUSINESS OPPORTUNITIES IN ADB’S ENERGY SECTOR: Yongping Zhai, ADB, chaired the panel and presented the ADB energy policy to promote energy efficiency, maximize energy access for all and support sector reforms and good governance.

Mukhtor Khamudkhanov, ADB, shared experiences on operations in southern Asia, highlighting 2012 lending programmes that focus on *inter alia*: energy sector reform and restructuring; non-lending programmes; and balanced physical infrastructure development.

Jim Liston, ADB, traced pathways to working with the programmes in ADB. He clarified the business cycle in the central and western Asia department, reporting on projects in the pipeline and associated opportunities.

Teruhisa Oi, ADB, shared the differing priorities for ADB operations in China and Mongolia that are addressed through ongoing loan projects and capacity building. He introduced proposed projects for 2012-13 including a project in China to improve energy efficiency in district heating.

Rehan Kausar, ADB, listed the projects in the pipeline in southeast Asia, describing loans and technical assistance including safeguards for biodiversity, highlighting Vietnam’s large portfolio.

In the ensuing discussion, Kausar clarified that Myanmar is a member country to ADB and that its energy sector strategy roadmap is in the initial stages.

MANAGING RISK IN CLEAN ENERGY PROJECTS: The session was chaired by Don Purka, ADB. Suzanne Etcheverry, Overseas Private Investment Corporation (OPIC), presented on innovative risk mitigation products for regulatory risk of FIT in the renewables resources space, and highlighted OPIC’s political risk insurance product. The product insures US-based businesses against currency inconvertibility; expropriation; and political violence.

Matt Daly, REC Solar, gave a technical presentation on the project financing approaches for utility-scale renewable energy, describing how both renewable energy developers and financiers can ensure themselves against financial risks with export guarantee programmes.

Stressing that within the renewable energy portfolio, energy efficiency provides the biggest opportunity to address climate change, James Maguire, Asia Aon Risk Solutions, presented on financial risk management instruments in developing the clean energy sector in Asia. He highlighted two financial risk management instruments utilized by his company: energy savings insurance; and performance guarantee facilities, noting the role of ENSOs in setting up the latter.

Tamsir Ndiaye, Organization for the Development of the Senegal River, presented on hydro-based regional energy integration. Ndiaye highlighted that access to low-cost energy boosts production/profits in other sectors of the economy and is thus a poverty reduction tool. He noted challenges facing the organization, including a difficulty in mobilizing sufficient funding and the different priorities of states on the use of the Senegal River.



Asia Clean Energy Forum Bulletin

A Summary Report of the Seventh Asia Clean Energy Forum (ACEF) 2012

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SUMMARY OF THE ASIA CLEAN ENERGY FORUM 2012: 6-8 JUNE 2012

The Asia Clean Energy Forum (ACEF) 2012, themed “Accelerating Low-Carbon Energy For All,” took place from 6-8 June 2011 in Manila, the Philippines. The meeting was preceded by pre-forum events, which were held from 4-5 June.

Approximately 850 participants, representing governments, financial institutions, civil society, academia, international organizations and the private sector, gathered in plenaries, parallel sessions, and side events.

The Forum was framed around four tracks: energy access; technology; policy and regulation; and finance and investment. Key messages from the Forum include the need for better knowledge sharing and technology transfer to move clean energy from the exception to the norm. For technology innovation the need for concessional financing and a dedicated clean energy fund were highlighted. The policy and regulation track highlighted ensuring implementation and enforcement of policies, supported by technical assistance, safeguards, and capacity building. The finance and investment track highlighted the importance of good demonstration projects and the role of the Asian Development Bank (ADB) in bridge-building.

The Forum highlighted successful strategies and mechanisms for accelerating access to affordable, low-carbon energy. Participants shared lessons learned about what works in the key areas of energy access, clean energy technology, policy and regulation, and finance and how stakeholders can work together to accelerate the uptake of low carbon energy technologies in the region.



View of the opening session of the Forum.

While renewable and clean energy sources have emerged as fundamental to meeting the challenges posed by climate change, they have also been recognized as being an essential foundation for meeting the livelihood needs of the poor, who are often not only economically impoverished, but energy-poor as well. Specifically, 1.6 billion people have no access to electricity and 2.5 billion lack adequate access to modern energy services. Alleviating this energy poverty is seen as a prerequisite to achieving the UN Millennium Development Goals (MDGs) by 2015, and renewable energies are seen as uniquely placed to begin overcoming this challenge by offering opportunities for small-scale, decentralized energy production, ideal for reaching rural and remote areas not serviced by existing energy grids.

Taken together, the environmental, social, and economic drivers behind renewable energy uptake have led to an increasing focus by the international community on the need to facilitate the scaling-up of clean and renewable energy both regionally and globally. To this effect, there has been an emerging UN process since the UN Conference on Environment and Development (UNCED) in 1992 in Rio de Janeiro, Brazil, including various UN organizations and agencies, as well as a series of international conferences and

A BRIEF HISTORY OF THE ACEF AND INTERGOVERNMENTAL CLEAN AND RENEWABLE ENERGY-RELATED PROCESSES

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.

In the 1990s renewable and clean energy increased in importance, given the environmental implications of rising greenhouse gas emissions linked to economic growth. Renewable forms of energy such as solar, wind, geothermal and biomass are those that can be regenerated without compromising future generations. Clean energy sources are differentiated from renewable energy in that, while their output is generally greenhouse gas neutral, their fuel source is a finite resource which must be extracted from the earth; examples include nuclear power and clean coal technologies.

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forums. Most recently, the International Renewable Energy Agency (IRENA) entered the scene in April 2011. IRENA's objectives are to provide an international institutional framework to consolidate policy efforts and facilitate information sharing to catalyze the transition toward a renewables-based society.

UN CONFERENCES AND SUMMITS

At UNCED, delegates adopted Agenda 21, an action plan for implementing sustainable development. Agenda 21 addresses sustainable energy in Chapter 9, Protecting the Atmosphere, which notes that controlling atmospheric emissions of greenhouse gases and other substances will increasingly require reliance on environmentally sound energy systems, particularly new and renewable sources of energy. The Chapter also addresses, *inter alia*, the need for research and development, the transfer and use of technologies; and measures to overcome barriers for 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 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 2001.

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 research and development 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 Reporting Services (RS) coverage of CSD 9 can be found at: <http://www.iisd.ca/csd/csd9/>.

CSD 15, in May 2007, 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 substantially the global share of renewable energy sources. The JPOI also addressed renewable energy issues in text on poverty eradication (Chapter II), small island developing states (Chapter VII), and Africa (Chapter VIII). At the WSSD, Gerhard Schröder, then German Chancellor, invited the international community to Germany for an International on Renewable Energy (Renewables

2004), which launched the series of IREC meetings. IISD RS coverage of WSSD can be found at: <http://www.iisd.ca/2002/wssd>.

RENEWABLES 2004: The International Renewable Energy Conference (Renewables 2004) took place from 1-4 June 2004 in Bonn, Germany. Participants addressed issues, including: policies for renewable energy market development; best-practice examples and success stories; financing options; strengthening capacities, research and policy development, and institutions; energy services and the MDGs; and the contribution of renewable energy in meeting the climate challenge. The outcomes of the conference included 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 of the Renewable Energy Network for the 21st Century (REN21). IISD RS coverage of Renewables 2004 can be found at: <http://www.iisd.ca/sd/ren2004>.

BIREC 2005: The Beijing International Renewable Energy Conference (BIREC), hosted by China in November 2005, addressed practical measures, success stories, and effective legislative and policy measures to create institutional and technical infrastructures. Participants adopted the Beijing Declaration, which recognized the need for significant financial resources, both public and private, for investment in renewable energy and energy efficiency, and emphasized the need for enhanced international cooperation for capacity building in developing countries, among other issues.

WIREC 2008: The Washington International Renewable Energy Conference (WIREC), convened from 4-6 March 2008 in Washington DC, US. Participants discussed four main themes: market adoption and finance; agriculture, forestry and rural development; state and local authorities; and research and development. By the end of the conference over 100 domestic and international pledges had been submitted for the Washington International Action Programme, to accelerate the global uptake of renewable energy. IISD RS coverage of WIREC 2008 can be found at: <http://www.iisd.ca/yimb/wirec2008>.

DIREC 2010: The Delhi International Renewable Energy Conference (DIREC) took place from 27-29 October 2010, in New Delhi, India. The conference's key outcomes included the DIREC Declaration and 30 new pledges by governments, civil society and the private sector under the Delhi International Action Programme to take concrete actions to up-scale renewable energy. IISD RS coverage of DIREC 2010 can be found at: <http://www.iisd.ca/yimb/energy/direc2010/>.

GLOBAL RENEWABLE ENERGY FORUM 2008: This Forum was held from 18-21 May 2008 in Foz do Iguaçu, Brazil, and endeavored to create a suitable environment to



ACEF 2012 Secretariat staff posing for a group photo after a successful conclusion of the meeting.

promote inter-regional dialogue and to set up joint actions between countries and regions to reduce poverty and enhance energy security through the use of renewable energy. IISD RS coverage of this meeting can be found at: <http://www.iisd.ca/yimb/greb2008/>.

GLOBAL RENEWABLE ENERGY FORUM 2009: This Forum was held from 7-9 October 2009 in León, Mexico, to encourage innovative multi-stakeholder and multi-regional partnerships for scaling-up renewable energy. The meeting concluded with several recommendations, including the need to: establish a global access fund to target chronic problems of access to energy; develop clear sustainability guidelines and standards for biofuels; strengthen regional research capacities through networks; and establish UN-Energy and industry partnerships. IISD RS coverage of the Forum can be found at: <http://www.iisd.ca/yimb/energy/greb2009/html/yimbvol128num3e.html>.

IRENA: The IRENA statute was adopted on 26 January 2009, and entered into force on 8 July 2010. The first meeting of the IRENA's Assembly, its governing body, was held from 3-5 April 2011, after two years of work by its Preparatory Commission. IRENA's purpose is to promote the widespread and increased adoption and sustainable use of all forms of renewable energy by acting as a global clearinghouse of knowledge on renewable energy and assisting member states in defining renewable energy strategies. As of June 2011, IRENA has 149 signatories, with 74 states and the EU having also ratified its statute. IISD RS coverage of IRENA's final Preparatory Commission and first Assembly meetings can be found at: <http://www.iisd.ca/irena/irenaa1/>.

ASIA CLEAN ENERGY FORUM 2006: The ADB's first Asia Clean Energy Forum was envisaged as a knowledge-sharing event for policymakers and practitioners, to consult on ADB's Energy Efficiency Initiative and its Energy Policy Review, share lessons learned on energy related technical assistance and to introduce ADB's Carbon Market Initiative.

ASIA CLEAN ENERGY FORUM 2007: The second Asia Clean Energy Forum was themed "Policy and Finance Solutions for Energy Security and Climate Change." Participants, including project developers, the financial community and policy makers, met to identify challenges related to project development and finance and explored innovative ways to tackle these challenges. The ADB also announced the launch of an annual target of US\$1 billion investments in clean energy.

ASIA CLEAN ENERGY FORUM 2008: The third Asia Clean Energy Forum was themed "Investing in Solutions that Address Climate Change and Energy Security." The meeting served as a platform for sharing best practices on: catalyzing public-private energy partnerships to increase deployment of clean energy technologies and systems; improving cooperation among stakeholders involved in financing clean energy programs; and identifying financing challenges for project developers and initiating follow-on assistance.

ASIA CLEAN ENERGY FORUM 2009: The fourth Asia Clean Energy Forum was conducted as part of ADB's first "Climate Change and Clean Energy Week" and focused on initiatives to simultaneously address climate change, strengthen long-term energy security, and help businesses overcome the global economic downturn. Discussions focused on: energy efficiency and renewable energy; urban and transport issues; access to energy for the poor; and energy and global climate change. At the Forum, the ADB revised upwards its annual

investment in clean energy initiatives to US\$2 billion per year by 2013 and launched the Energy for All Partnership, aiming to bring power to 100 million people in the region by 2015.

ASIA CLEAN ENERGY FORUM 2010: The fifth Asia Clean Energy Forum was themed "Meeting the Technology Transfer Challenge" and brought together policymakers, private sector firms, and non-governmental organizations to explore aspects of technology transfer relating to: policy and regulation; technology and program implementation; financing efficiency and renewables; climate change frameworks and carbon markets; and providing energy for all.

ASIA CLEAN ENERGY FORUM 2011: The sixth Asia Clean Energy Forum was themed "New Business Models and Policy Drivers - Building the Low-Carbon Future. The Forum was framed around four overarching thematic areas: policy and regulation; financing and investment; innovative business models; and energy for all. Important recurring messages of the Forum included: developing financial mechanisms to more effectively link both large and small scale project developers with private and public financiers; strengthening capacity to design and implement business models for clean and renewable energy projects; creating an enabling environment for markets; maturing the market for renewables; addressing operational and technical dimensions of renewable energy projects to develop credible financial products; and doing all of these things with special care to ensure that they are inclusive of efforts to improve energy access and eradicate energy poverty. IISD RS coverage of the Forum can be found at: <http://www.iisd.ca/yimb/energy/acef/2011/>.

REPORT OF THE FORUM

PLENARY SESSIONS

Participants convened in morning plenary discussions from Wednesday to Friday to address: accelerating low-carbon energy for all; financing sustainability and enabling profitability; public and private perspective; and the future of the global financial architecture for climate change.

OPENING PLENARY - TIME TO ACT:

ACCELERATING LOW CARBON ENERGY FOR ALL:

Welcoming participants on Wednesday, Haruhiko Kuroda, President, Asian Development Bank (ADB), highlighted that as



Haruhiko Kuroda, President, Asian Development Bank (ADB) delivering his opening message to the forum.

Asia is now at the center of the world's economic growth, the region must focus its efforts on providing energy access and reducing energy poverty. He emphasized measures to ensure that the region remains on a low-carbon growth path, including: mobilizing resources for green growth through increased partnerships; scaling-up demand-side

initiatives; and providing clean energy technologies to the poor.

Robert Orr, US Ambassador to ADB, reaffirmed his country's commitment to low-carbon energy for all. Highlighting estimates from the International Energy Agency (IEA) indicating that the world is set to double carbon emissions and therefore raise global temperatures by six

degrees Celsius, he noted the significant threat this poses for cities, national economies, and global food security. Drawing attention to the US government's efforts to promote low-carbon energy, including new policies aimed at eliminating fossil fuel subsidies, he called on participants to share best practices and ideas to further clean energy solutions for the region.

Bindu Lohani, ADB, introduced the Forum and highlighted the need for global momentum to support universal energy access, stressing that more knowledge is necessary to move clean energy from an exception to the norm.

Zhengrong Shi, CEO, Suntech Power Holdings, provided insights on prospects for the solar industry, acknowledging current challenges such as macroeconomics, market capacity, and trade barriers. He highlighted the main trends that will support the solar industry's move into the next phase of cogeneration and energy-storage, including: cost reduction through technological innovation, improved supply chains, and policy support; diversification of regions

utilizing and producing solar technology; bankability improvement; and development of smart grids.

Daniel Kammen, University of California, Berkeley, said, despite hard work, the energy community has not yet made progress and energy poverty remains a critical issue. He stressed the need for clear and concise communication on why the world should pay attention to and engage in development and deployment of clean energy.

During ensuing discussion, participants raised questions on, *inter alia*: trade barriers; communication systems thinking on clean energy to policy makers; clean energy solutions for the poor; and energy storage. On private sector contributions to achieve universal energy access, Shi said a bottom-up approach is required for each sector because each has different solutions. Kammen said policy stability is necessary and highlighted the "Lighting Africa" initiative as an unexpected success in clean energy technology deployment.

Ann Quon, ADB, presented the ADB 2012 My View Contest awards, themed Renewable Energy/Energy for All. Kai Syuen Loh, Malaysia, was the Under 21 Category recipient for his short film entitled "A Day in the Life of Energy," while Carlo Marco Cruz, Philippines, won the Over 21 Category for his film, "The Smarter Species." The grand prize was awarded to 26-year-old Adrian Sibal, Philippines, for his silent film, "The Rivals."

FINANCING SUSTAINABILITY AND ENABLING PROFITABILITY: PUBLIC AND PRIVATE

PERSPECTIVE: Xiaoyu Zhao, ADB, noted the high potential of Asia-Pacific's clean energy market and opportunities to contribute to poverty reduction.

Christine Lins, Executive Secretary, Renewable Energy Policy Network for the 21st Century (REN21), presented the REN21



Christine Lins, Executive Secretary, REN21

Renewables 2012 Global Status Report, which includes new features on rural energy development and complementarity of energy efficiency policies. She said renewable policy frameworks are key for industry to invest in clean energy markets.

Moderator Andrew Revkin, *New York Times*, led an interactive panel discussion on, *inter alia*: technology transfer; the future of the climate; and the role of natural and shale gas in the future energy mix.

Brian Castelli, Alliance to Save Energy, stressed the need for South-South technology transfer and the replication of successful initiatives by developing countries. Michael Eckhart, Citigroup, underscored that the world is currently in a "technological transformation." S. Chander, ADB, emphasized focusing on population growth, resource management, and capital investment flows in renewables in the developing world to address climate change.

Castelli said that the move toward renewable energy is a generational one, and agreed with Eckhart that the future energy mix will continue to feature fossil fuels, but energy efficiency will be emphasized.

FUTURE OF THE GLOBAL FINANCIAL ARCHITECTURE FOR CLIMATE CHANGE: After a welcome by Aiming Zhou, ADB, Rajat Nag, ADB, opened

discussion on climate financing.

Lakshmi Venkatachalam, ADB, highlighted the Green Climate Fund (GCF) to deliver finance to mitigation and adaptation, acknowledging lack of clarity on when it will be operational, the volume and source of finance that will be available, and the role it will play. She

encouraged panelists to consider: the level of ambition of mitigation goals in Asia; public-private partnerships; examples and models of resilient green economies; and private sector support for adaptation measures.

Mary Ann Lucille Sering, Climate Change Commission, Philippines, identified the need to balance private and public investments, sharing experience from the Philippines to strengthen the infrastructure for a green economy and identifying the need for technology. She explained the critical role of the GCF for the Philippines to sustain and finance adaptation strategies, address poverty, and promote inclusiveness.

Matt Spannagle, Australian Agency for International Development, declared the need for transformational rather than incremental change in order to be able to meet commitments to the two-degree target. He shared Australian's progress to meet the fast start finance commitments, explaining the need for investments to be viable and attractive and for incentives and penalties to plan for transformation and avoid human suffering.



Aiming Zhou, ADB

Noeroso Wahyuidi, Ministry of Finance, Indonesia, expressed hope that Rio+20 will build support for economic, social, and environmental development policies, underscoring the need to make a low-emissions approach to sustainable development.

Cliff Polycarp, World Resources Institute (WRI), identified the need for strategic utilization of financing. He drew attention to the wide range of private sector actors, in addition to communities, farmers and other groups, requiring changes in behavior to choose less carbon intensive options.

David McCauley, ADB, expressed optimism regarding the dynamism of and interest in renewable energy, noting that strategies to reinforce and scale up these trends would be required. He announced the launch of a Pilot Asia-Pacific Climate Technology Network and Finance Center from ADB in partnership with UNEP.

On the linkages between clean energy and poverty eradication, Mary Ann Lucille Sering, Climate Change Commission, Philippines, stated that cookstoves alone are not enough, stressing that the poor also need market knowledge and adequate opportunities. Spannagle said that energy access should be considered part of adaptation, citing examples from the Pacific where providing energy access builds community resilience.

Participants asked questions on, *inter alia*: making green investments viable and attractive; using climate finance in a way that changes consumer behavior; and the need to address both adaptation and mitigation. One participant, stressing that disbursing funds takes time, recommended that ADB develop a pipeline of projects to prove that funding exists.

Responding to a question about the “tough times” experienced in the carbon markets, David McCauley, ADB, said demand within the carbon market is rising again, pointing to Australian and Korean legislation and China’s experimentation with domestic markets. Spannagle added that Australia is committed to carbon markets as an effective and innovative intervention.

Chair Venkatachalam closed by stressing his optimism on the GCF and drawing attention to the upcoming Rio+20 meeting.

CLOSING PLENARY- PATHWAY TO A LOW-CARBON FUTURE: Stephen Groff, ADB, summarized the key findings of the Forum. He highlighted growing global momentum in support of universal energy access and noted that the notion that the poor do not have money and therefore cannot afford clean energy had been challenged. He also observed that, *inter alia*, the energy mix will continue to include fossil fuels but energy efficiency will be critical, and cost reductions will occur through technological innovation.

Harish Hande, SELCO-India, stressed that the poor are not monolithic and called for a paradigm shift in renewable energy business models. He said the current structure imposes Western business models on communities in the global South and had proved unsuccessful in many cases, calling for better service delivery to poor communities as well as a greater commitment towards understanding their needs, and described his company’s provision of solar energy financing to 150,000 under-served households in India.

Hans Olav Ibrekk, Norwegian Agency for Development Cooperation, urged participants to bear in mind gender aspects when creating plans for the sector’s development and to identify champions and entrepreneurs who can build upon and replicate successful models, stressing that scaling up remains a critical challenge.

Peter Ballinger, Overseas Private Investment Corporation (OPIC), emphasized the importance of partnerships for his organization in leveraging the technical expertise of NGOs and industry players in order to better engage in the region through private equity and insurance. He cited key partnerships, including the International Finance Corporation (IFC), the ADB, and private sector organizations. He described the history of his organization, highlighting the risks taken initially by entering into power purchase agreement (PPAs) with “catalytic projects” in the region. He noted the modification of the organization’s product line, drawing attention to insurance coverage for FIT.

Vivek Mehra, Aloe Private Equity-India, recognized that the regulatory environment has improved and drew attention to the significant opportunity to meet market demand for products and services at the “bottom of the pyramid.”

Woochong Um, ADB, stressed that the ADB “wants to be there,” underscoring its focus on leveraging knowledge and finance. On leveraging knowledge, he highlighted the ADB’s history of development, which can be used in deploying renewable energy in the region. On leveraging finance, he emphasized the need to address financial risks that plague investment in renewable energy development in order to increase private sector interest in the clean energy.

Responding to questions on accessing available finances: Ibrekk suggested revisiting the business model development and using performance based approaches to unlock potential; Mehra called for concessional support from governments; Ballinger emphasized the role of institutions; and Um reflected on the need for project development to increase the bankability of projects.

Hande congratulated ADB on the installation of their solar rooftop, noting, however that half of the panels could electrify 6000 homes close to the city and requesting ADB support to facilitate this.



Robert Guild, ADB; Chris Neidl, Arc Finance; Marina Olshanskaya, UNDP; and Stewart Craine, Barefoot Power/Village Infrastructure Angels

Responding to a question on an ADB webpage to post success stories of clean energy business projects, Um highlighted a new ADB center on knowledge sharing and lessons learned. He added that ADB is seeking to establish increased South-South cooperation on knowledge sharing.

Closing remarks: Winston Bowman, USAID Regional Development Mission for Asia, called on participants to view ACEF's theme as a shared goal that will be key in addressing issues of energy poverty and climate change. Highlighting the current negative global trends in greenhouse gas (GHG) emissions and the millions who still lack access to energy, he stressed that there can be no future unless it is a low-carbon future.

Bindu Lohani, ADB, recommended focusing on bringing clean energy to the poor and early-stage financing to encourage energy efficiency. He called for enhancing green infrastructure and reducing dependency on fossil fuels and proposed transforming ACEF into an Asian clean energy community.

ACEF7 closed at 5:50pm.

BREAKOUT SESSIONS

Throughout the meeting, participants attended 28 breakout sessions along the Forum's four overarching thematic tracks: energy access; technology; policy and regulation; and finance and investment. The following sections summarize these sessions under the respective thematic tracks.

ENERGY ACCESS: The On-the-ground Paradigm to the International Year of Sustainable Energy for All:

Athena Ballesteros, WRI, chaired the session. Bikash Pandey,



Athena Ballesteros, World Resources Institute (WRI)

Clean Energy, Winrock, observed that the type of institutions involved in providing modern energy services to the poor has changed dramatically, with an emphasis now on decentralized entities and enterprise playing a bigger role. He

said that despite this shift, the loan and investment portfolios of multilateral development banks (MDB) had not progressed accordingly to support these types of institutions.

Thiyagarajan Velumail, UNDP, called for making poverty reduction the central objective, cautioning against only focusing on energy access. He drew attention to the energy access disadvantage in rural areas.

Edita Bueno, National Electrification Administration, Philippines, noted that in the past the focus had been on generation and transmission, with distribution not receiving sufficient attention. She highlighted the role that government can play in supporting energy access and efficiency.

Ingmar Stelter, European Union Energy Initiative Partnership Dialogue Facility, emphasized that energy access targets could not be achieved without private sector involvement, although no one has a clear idea of how to do this. He called for appropriate government policies and support and for MDBs to move towards early stage funding.

Discussing scale, Jim Liston, ADB, observed that due to the ADB's procedures projects have to be of a certain size to warrant consideration, with anything below US\$50 million being unfeasible. On ADB's role, he emphasized that, amongst other things, the Bank can be instrumental in bringing about policy change to encourage renewable energy developments.

During the discussion, participants raised issues including: the need for a multi-stakeholder project approach; the need for energy strategies to take into account the agricultural sector; foreign exchange risks which put pressure on costs; non-monetary benefits of energy provision; and the need to move beyond projects to programmatic approaches for energy provision.

Moving out of Poverty through Productive Use of Energy Services:

This session was chaired by Robert van der Plas, Energy for All Partnership. Drew Corbyn, Practical Action, described lack of access to energy as "the cruel Catch-22, which locks people in a cycle of poverty." He introduced the Poor People's Energy Outlook (PPEO 2012), observing that PPEO has examined home energy use and proposed the concept of total energy access, which goes beyond looking at supply-side indicators and focuses on how people use energy. On livelihoods, he noted that energy access could create new earning opportunities, improve existing earning activities and reduce drudgery. He also noted that to reduce poverty increasing agricultural productivity is essential.

Russell deLucia, the Small Scale Sustainable Infrastructure Development Fund, Inc., emphasized the need for technology and financial inclusion, observing that access to energy alone does not automatically reduce the impacts of poverty or facilitate productive application. For productive use to have a greater impact, he observed that households and enterprise would have to have the "know how" brought to them, as well as access to financing, and that capture of value added must be undertaken by the entrepreneurs.

Laurie Navarro, Alliance for Mindanao Off-grid Renewable Energy Program (AMORE), USAID, highlighted AMORE, a rural electrification programme aimed at providing access to modern energy services. She also emphasized the need for soft financing for small businesses.

Observing that the majority of the poor derive their living from the agricultural sector, Beau Damen, UN Food and Agriculture Organization, stressed that improving energy production of the agricultural sector will be one of the key challenges for the future, noting that food production increases will have to come from agricultural intensification.

Len George, ADB, highlighted ADB's technical assistance programmes aimed at providing financing to small and medium-sized enterprises.

On addressing productive end use, one participant observed that it is important to ask the community what their needs are, noting that an energy analysis should not only be based on modern technology but also on peoples' lifestyles, and that understanding what the communities value in terms of energy products is important. Participants also addressed the role of gender and recommended that any initial needs assessment be gender sensitive.

Up-scaling Micro-enterprises: Bart Édes, ADB, chaired the session. Hanna Ebeling, LGT Venture, provided an overview of LGT's Impact Venture Accelerator Programme, centered on philanthropic impact investments in emerging markets through a personalized and local approach. She explained that the Accelerator Programme incubates early stage enterprises by



L-R: Bart Édés, ADB; Hanna Ebling, LGT Venture; Andrea Griffin, Orb Energy; William Baron, Mercy Corps, and Ajaita Shah Bothra, Frontier Markets

providing risk capital up to US\$50,000. Ebeling emphasized that the priority is on the reach and depth of social impact and that loans are provided at market rates to avoid distorting the local market.

Andrea Griffin, Orb Energy, explained that her company, a provider of solar home systems, developed their model by focusing on distribution networks, provision of incentives for starting franchises, and after-sales installation and maintenance services. She observed that finding appropriate investments has been a challenge.

William Baron, Mercy Corps, noted his organization's focus on market development in post-conflict states. He said their "one-step approach" in Timor Leste involves working with existing businesses and identifying lead firms. On early stage incubation, he observed that some enterprises only need assistance in accessing markets and do not necessarily need financing.

Ajaita Bothra, CEO, Frontier Markets, reflected on the importance of understanding whether the investor is providing the right fit for the micro-enterprise. She challenged the assumption that the poor do not have money and therefore could not afford products, noting that they would buy products if they understood their value.

Business Solutions for Promoting Energy Access: David Reed, WWF, chaired the session, observing that there is a radical difference between what governments think private sector investors want and what the investors themselves actually want.

Sameer Shetty, Boving Fouress Ltd. underscored lack of political will as the fundamental reason why clean energy cannot be delivered to the rural poor. He called for political championing to make energy accessible to those who do not have it, highlighting energy access as a means of eliminating poverty.

Advocating a bottom up approach, Harry Verhaar, Philips Lighting, highlighted: inspiration, through sharing of examples; aspiration, quantifying what one wants to achieve and by when; and perspiration, getting things done.

Lyndon Frearson, Cat Projects, observed that business is here to make money and therefore governments and MDBs need to be realistic about these objectives. He emphasized the value of providing energy to the rural poor and highlighted constraints relating to finance, governance, and the supply chain.

On barriers, Glenn Tong, Propmech Corporation, cited the mindset of business leaders and politicians who are guided by the bottom line and do not see the potential of

renewable energy. Frearson highlighted local community barriers including low levels of expectation and mistrust in the contractor and technology.

During the discussion, participants considered how the UN Secretary-General's Initiative on Sustainable Energy for All could play a key part in garnering political will. Responding to a question on the role of finance, Shetty noted that the hydro energy business is financially viable and commercial banks have "jumped onto it" now that they see a model that works. On ADB's contribution to promoting energy access, Shetty responded that the ADB brings credibility to the table, which is required for fostering political will. Verhaar observed that co-financing initiatives will expand the collective circle of influence, with Frearson adding that the ADB could build knowledge based around the sector.

During the discussion, one participant enquired about the definition of micro-enterprises, observing that the discussion appeared to be more focused on medium-sized enterprises. Participants also discussed the role of government and gender in up-scaling micro-enterprises.

Clean Cooking Solutions for the Poor: Sununtar Setboonsarng, ADB, chaired the session. Leslie Cordes, Global Alliance for Clean Cookstoves/UN Foundation, noted that billions of people cook on traditional or open fire stoves fueled by biomass. Highlighting the health risks, she observed that women are disproportionately affected. Cordes described the cookstove market as fragmented, comprising a variety of fuels and numerous manufacturers. Emphasizing scale, she highlighted the Alliance's goal of 100 million households adopting clean cookstoves by 2020.

Wim van Nes, SNV, observed the need to create demand for clean cookstoves, following market-based approaches. On enabling environments, he said the question is how to engage in effective coordination mechanisms at the national level. On the supply side, he noted the need to strengthen local organizations.

Michael Kelly, World Liquefied Petroleum Gas (LPG) Association, highlighted the "huge opportunity at the base of the pyramid" for providing access to energy. Noting that LPG is primarily an energy source in developing countries, he said that it is a better solution for urban and peri-urban areas.

Heike Volkmer, GIZ, said that improving cooking behavior, such as not using wet firewood, is a challenge. She expressed doubt on whether there is a global market for cookstoves. On scaling up, she advocated strengthening the supply chain, product development, and access to finance. Cordes responded that there is a market for cookstoves but not for advanced clean cookstoves.

Participants discussed: clean cookstove testing centers, affordability, and accessibility for the poor. Van Nes noted that health benefits and efficiency could convince households to pay more for clean cookstoves.

Financing Mechanisms for Sustainable Business

Innovations: The session was chaired by Robert Guild, ADB. Chris Neidl, Arc Finance, discussed barriers to energy micro-finance, noting that some micro-finance institutions (MFIs) are not interested in financing energy projects, or have limited energy lending programmes. On internal MFI challenges, he highlighted low levels of awareness and lack of strategic focus, where financing for energy access is perceived as a diversion from the core business. On poverty and income, Neidl observed that where income is limited and unpredictable, this has an impact on accessing credit.

Marina Olshanskaya, UNDP, highlighted the UN Capital Development Fund/UNDP CleanStart Programme, developed to assist poor households and micro-entrepreneurs to obtain access to sustainable, low-cost energy supplies through micro-finance loans. She noted that MFIs can address existing financial gaps.

Emphasizing the need to change the way that donor resources are disbursed, Olshanskaya observed that innovation was occurring within the development community. Drawing on the example of FITs, which have brought about massive investments in the energy sector, she emphasized that governments need to develop innovative public incentives for businesses.

Calling for a redesign of the micro-finance lending infrastructure, Stewart Craine, Barefoot Power/Village Infrastructure Angels, noted that when his company originally approached an MFI for a loan they were unsuccessful. He emphasized that it is up to entrepreneurs to design the micro-finance network themselves and not to rely on existing sources, adding that entrepreneurs have been selling products and now have to think about selling a service.



Stewart Craine, Co-Founder, Barefoot Power/Village Infrastructure Angels

During the discussion, participants considered, *inter alia*; the role of micro-finance for small and medium-sized enterprises; the impetus for MFIs to provide loans to households; and how MDBs can facilitate innovation.

Clean Energy Access in South Asia: Yongping Zhai, ADB, chaired the session. Priyantha Wijayatunga, ADB, presented on clean energy policy and regulation. He observed that 50% of households in South Asia are still using traditional biomass for cooking and 700 million do not have access to electricity. Highlighting current trends, he noted: exponential development of renewable energy in India; substantial progress in Sri Lanka; significant progress in expanding off-grid supplies in Nepal and Bangladesh; and increased emphasis on renewable energy in Bhutan and the Maldives through ongoing programmes. On actions needed, Zhai included tax credits/incentives, appropriate FITs, compensation to utilities, and renewable energy certificates. He called for extension of fossil

fuel subsidies to renewable energy, technology transfer for catalyzing penetration, South-South cooperation with adapted technologies, and leapfrogging technology.

P.N. Fernando, ADB, presented on the clean energy impact of South Asia cross-border power trade. He highlighted key energy sector challenges, including increasing energy deficits, single fuel dominance in the energy mix, limited exploitation of renewable energy resources, high dependence on traditional fuels, rising import dependence and lack of requisite energy infrastructure. On the regional power market expansion, he discussed optimal exploitation of energy resources, reduction of overall cost of supply, improved system reliability and energy security. Fernando observed that relevant economic analysis establishes the economic feasibility of all proposed interconnections.



Herath Gunatilake, ADB

Herath Gunatilake, ADB, presented a choice experiment study in Madhya Pradesh, India, on valuing electricity service attributes. He outlined a methodology for valuing electricity service attributes such as hours of service, quality, customer service, and accuracy of and transparency of billing. He noted the study demonstrated that: hours of supply captures the highest value; the uptake rate increases significantly when every aspect of service improves simultaneously; and understanding consumer preference and aligning the service accordingly is necessary to enhance development impacts.

Thierry Lefèvre, Center for Energy-Environment Resources Development, presented a diagnostic assessment of regional energy efficiency initiatives in South Asia. He outlined the concept of an energy efficiency road map and regional action plan by explaining that South Asia Subregional Economic Cooperation Programme (SASEC) countries could benefit from developing a common strategy for energy efficiency. Lefèvre noted that such cooperation would provide a framework for country mobilization to pool knowledge and analysis tools, strengthen and combine the training and research capabilities, and enable benchmarking by exchanging best practices.



Dave Renne, International Solar Energy Society

TECHNOLOGY: Solar Energy in Asia: Dave Renne, International Solar Energy Society, chaired the session, stressing the importance of collaboration among government, private sector, research, and financial institutions to grow the solar sector. On challenges, he highlighted the need to develop an adequate work force for a viable future.

Joel Conkling, Google, reflected on how Google strives to be a sustainable business by improving data center efficiencies, purchasing renewable energy and carbon offsets, and investing in renewable energy. He identified the company's interest in

expanding investment beyond US borders by drawing on the lessons learned in the US, such as structuring deals to manage risk and aggregating small power purchases.

Mikael Jakobsson, COWI Energy Group, called for integrated energy solutions and smarter grids, sharing perspectives from solar heating experiences in Denmark, and highlighting targeted and time limited subsidies. Demchigjav Chimeddorj, Energy Authority Mongolia, shared experiences from Mongolia. He outlined the high demand for solar heating due to cold weather and poor air quality and pointed to the need to conduct feasibility studies and initiate pilot projects in city centers.

Aiming Zhou, ADB, detailed the process of developing a rooftop solar project for ADB, identifying risks and the need for innovative financial mechanisms for small projects



Pushkala Lakshmi Ratan, TÜV SÜD Asia Pacific Pvt. Ltd.

to achieve bankability. He explained how this rooftop project demonstrates ADB's commitment to environmental and social responsibility without requiring upfront costs.

Pushkala Lakshmi Ratan, TÜV SÜD Asia Pacific Pvt. Ltd, discussed mitigating: resource risks through

site assessment and resource monitoring; technology risks through prototype testing, design review, and demonstration installations; counterparty risks by credit worthiness and reputation; financial risks by environmental finance products; and regulatory risks through stable policy development and incentives.

In the discussion, panelists commented on: significant



Pil-Bae Song, ADB

barriers and opportunities in Southeast Asia; technical due diligence; operations and maintenance; and insurance.

Smart Grids and Grid Integration of Renewable Energy:

Session Chair Pil-Bae Song, ADB, opened the session by acknowledging that smart grids can help address high growth demand in Asia-Pacific

and help to achieve universal access.

Reji Kumar Pillai, India Smart Grid Forum, explained that the smart grid is a need, not a luxury, and described specific challenges in India requiring expanded energy access, improved quality, security and supply, and reduced transmission losses. He highlighted the roadmap for the next five years and summarized the vision and projects that provide solutions for smart grid implementation.

David Elzinga, IEA, outlined how smart grid technology modernizes the grid to deploy a range of technologies for establishing energy security and climate stability. He reviewed the efforts required, including building up commercial scale



David Elzinga, International Energy Agency

demonstrations, developing global technology standards, and integrating with existing electricity infrastructure.

Dietmar Retzmann, Siemens AG, shared successes from wind energy installations in European offshore programs. He provided a technical explanation of how wind energy links into the grid through new technologies such as SVC plus (Static Var

Compensation) and High-Voltage Direct Current Plus.

Eddie Tan, GE Energy, stated that the most important strategy is to increase grid visibility, suggesting *inter alia*: reviewing network design; increasing assets rating and protection schemes; implementing grounding practices; and improving energy storage efficiency.

Cao Xiao, China Electric Power Research Institute, State Grid Corporation, explained the motivation for construction of a smart grid in China as 2/3 of power is generated in the west and southwest while 2/3 of the demand is in the east. He shared progress from the three-phase development to plan, pilot, construct, and enhance the smart grid by pointing to demonstration projects.

Panelists discussed methodologies for energy storage and differences in smart grid technology for each region. Song concluded the session by announcing the ADB's willingness to help member countries in smart grid development.

Carbon Capture and Storage: Regional Update: Ashok Bhargava, ADB, chaired this session. Alice Gibson, Global Carbon Capture and Storage (CCS) Institute, described the global status of CCS. She noted that it is already being demonstrated globally with eight operational projects and 72 large-scale projects in the planning, development, or operational stage.

Pradeep Tharakan, ADB, described challenges and opportunities for CCS in Southeast Asia and stressed that CCS can be conducted across sectors.

Annika Seiler, ADB, said that, given growth scenarios of increased coal consumption across Asia, CCS is needed to avoid a high carbon growth path. She said developing countries face specific challenges, including that policymakers view CCS as a last priority, rather than as a strategic choice.

Gwen Andrews, Alstom, said CCS is ready to scale-up to large commercial demonstration projects. She noted that one advantage to working on CCS in China is the emphasis on driving down costs, an approach that could be transferred to other Asian countries.

Participants discussed systems accounting, non-climate impacts of coal, public concerns on CCS safety, long-term storage liability, and chemical looping, *inter alia*. Tharakan said there is a need to reduce all emissions, not just CO₂. Gibson and Andrews both emphasized securing finance for large-scale demonstration projects. Seiler stressed that concessional financing and a dedicated fund are essential for demonstration projects in developing countries.

Quantum Leap in Wind Power: Jitendra Shah, ADB, chaired this session. Steve Sawyer, Global Wind Energy Council, identified political commitment as a key condition

for successful policy and regulatory regimes to facilitate wind projects. He compared wind policy options, noting that FIT markets and tax incentives are effective to initiate investments. He said trade and quotas are not effective measures and tenders are a risky option.

Gil Opina, Siemens Wind Power, reported on technological advancements of the wind turbine industry in the Philippines, including rotors, wind energy conversion systems, control systems, towers and foundations, and operation and maintenance.

Pramod Jain, Innovative Wind Energy, Inc., compared tariffs to a fruit basket, with distinct types of fruit representing published FIT, incentives, tax benefits, renewable portfolio obligations, renewable energy credits, and wind regimes.

Jitendra Shah, ADB, summarized a pre-forum wind workshop and highlighted key findings, including, *inter alia*: hope from successful pioneer projects; discovery that technology is the easiest aspect of wind projects; and recognition that FITs have different components.

Participants discussed the minimum capacity required to make a project feasible and how to increase the comfort of bond buyers with wind farms as a secure, low-risk investment.

Technology Developments and Application for Bioenergy in Asia: Jun Tian, ADB, chaired this session. Craig Jamieson, World

Agroforestry Center, described Bioenergy with Carbon Capture and Storage (BECCS) as a viable, cost effective method to reduce atmospheric CO₂ concentrations. He said raising awareness on BECCS and its inclusion in policy frameworks is necessary to accelerate the technology deployment and its use.

Pasi Rousu, Chempolis Asia & Pacific, Finland, described Chempolis's formicobio as a superior solution for producing cellulosic ethanol, emphasizing the important role of biofuels in reducing dependency on fossil fuels and stressing that biomatter should not compete with land use for food.

Oktay Mammadov, Ministry of Economic Development, Azerbaijan, presented on Temiz Seher, a state-owned company that aims to improve the city's ecology and manage solid municipal waste disposal, including development of a waste-to-energy plant that will produce energy for 50,000 households.

Gatot Prawiro, GE Energy-Gas Engines, highlighted the potential of distributed power from biomass and biogas and described GE efforts on biogas, palm oil, landfill gas, and special gas.

Participants raised questions on the use of gas engines, the potential for third generation biofuel refineries in Asia, and food versus fuel. One participant stated that there are sufficient sources of biomass that do not affect the food supply and another participant stressed high price volatility for food.



Jun Tian, ADB

E-vehicles for Developing Asia: Kamal Pande, Government of Nepal, chaired the session. He said e-vehicles are a gender friendly sector in Nepal, where two-thirds of the drivers are women. Participants stressed the long history of the electric vehicles and identified batteries, with their limited driving range, as industry challenges.

Sohail Hasnie, ADB, presented an ADB electric tricycle project in the Philippines that aspires to have 100,000 e-trikes on the road. Tomonori Kimura, PricewaterhouseCoopers (PwC) discussed the creation of the e-Trike consortium by PwC Japan, which aims to bid for the ADB/Department of Energy e-trike project.

Toru Tokushige, CEO, Terra Motors, said electric bikes are faster than gasoline bikes if designed with powerful motors and batteries. He described the growing e-scooter market, noting that the number of e-scooters has increased by 100 times over 10 years in China and are expected to replace two-thirds of the motorcycles in Japan.

David Son, LG Chem, Singapore, described LG Chem's efforts to advance lithium battery technology. Eun Seok Yun, Hyundai, stressed considering alternative materials to overcome technical limitations of lithium batteries and further develop battery technology.

Participants discussed, *inter alia*: if and when electric vehicles will replace current vehicles; the best time to purchase an e-vehicle; lessons learned from pilot projects; the mitigation potential of e-trikes; and standardization of charging across international borders. Responding to a question on charging infrastructure for e-trikes, Hasnie said most charging will be done at home, but added that he hopes the private sector will provide charging infrastructure, particularly for fast top-up charging.

Scaling up Geothermal Power Generation in Asia: Pradeep Tharakan, ADB, chaired this session. Fernando Sanchez Peñarroyo, International Geothermal Association, described geothermal use globally, highlighting Iceland as a success story. He said that it is more difficult to raise capital for the early stages of geothermal project development and discussed private equity, capital markets, and balance-sheet financing as three financing approaches. He added that technology sharing, training, and geological surveys represent additional forms of support.

Richard Tantoco, President and CEO, Energy Development Corporation (EDC), Philippines, presented on EDC's experiences with geothermal energy. He stated that the lack of risk-sharing mechanisms in the early stages of development represents an entry barrier to geothermal energy. He identified challenges to geothermal energy exploration, including temperature, water, and permeability. He clarified that geothermal energy is not as expensive as it is perceived to be because it is an integrated resource, meaning that once investment in the geothermal energy is made, you have "fuel for life."

Michael Crosetti, Director, Castlerock Consulting, shared developments in Indonesia's geothermal industry,



Mike Crosetti, Castlerock Consulting



L-R: ADB's Aiming Zhou; Gregoria Padua; and Kim Gil-Hong

noting that development has stagnated and progress has been limited. He said the Government is trying to revitalize the sector by addressing exploration risks for new areas, introducing FITs, and rationalizing the tender process for new areas.

During discussion, participants raised questions related to, *inter alia*: viability and replication of lithium mining technology and economies of scale. Responding to a question on the viability of enhanced geothermal systems (EGS), Tantoco compared it to shale gas 20 years ago and said it is a promising technology. Peñarroyo agreed that EGS is one of the most promising technologies.

POLICY AND REGULATION: Low Emission Development Strategies as a Clean Energy Driver:

Session Chair, Orestes Anastasia, USAID Regional Development Mission for Asia, highlighted a process to achieve Low Emissions Development Strategies (LEDS), including: assessing the current situation and aligning it with nationally and locally-specific development goals; prioritizing and developing action plans, including implementation and finance plans; and implementing and monitoring the plans chosen.

Sitanon Jesdapipat, Chulalongkorn University, presented Thailand's Power Development Plan, its Energy Efficiency Plan 2010-30, and its Development Plan for Renewable Energy and Alternative Energy for 2008-2020, noting the need to reevaluate policies on climate change, and the importance of governments sending clear signals that prove to consumers that clean technologies are worth investing in.

Darius Nassiry, Global Green Growth Institute, drew attention to the Republic of Korea's Institutional Framework for Green Growth initiated in 2008, noting the government's five year growth plan to invest approximately US\$100 billion in research and development for clean technologies and acceleration of their deployment.

Pan Tao, Institute for Sustainable Communities, presented on experiences in China, highlighting that key challenges to overcome in order for national and provincial LEDS programmes to succeed, include providing greater incentives to attain the high provincial LEDS targets and creating local awareness to complement the high global priority for LEDS.

Nguyen Manh Hai, Central Institute for Economic Management, Vietnam, presented Vietnam's draft Green Growth Strategy and its implications for clean energy development, listing three strategic tasks: reducing GHG

intensity and promoting the use of clean renewable energy; greening existing production processes; and greening lifestyles and promoting sustainable consumption patterns.

The ensuing discussion focused on the impact of national-level policies and frameworks and business-driven green growth initiatives, and the different focuses for LEDS in high- and low-emissions countries.

Emerging Regional Initiatives to Support Improved Implementation of Clean Energy: Session Chair Gil-Hong Kim, ADB, introduced the session, noting the discussion would dwell on multi-level approaches to promote clean energy initiatives in the Asia-Pacific region.

Kala Mulqueeny, ADB, gave a report of the Asia-Pacific Dialogue on Clean Energy Governance and Regulation. She noted that barriers to energy services include Value Added Tax and import duties on lighting products and clean cookstoves. She called on policymakers to agree on standards, with a final goal of eliminating these taxes.

Hongpeng Lui, the UN Economic and Social Commission for Asia the Pacific (ESCAP), presented on enhancing energy security and sustainable development through regional connectivity in the Asia-Pacific region, highlighting a proposal to create an Asian Energy Highway. He said that ESCAP is working on a set of options regarding the functioning of the Network, which will be presented at the Asia and Pacific Energy Forum in May 2013.

Sven-Uwe Mueller, Director, GIZ, presented challenges in implementing renewable energy, highlighting experiences from Germany and China. He reflected on the need to create an efficient implementation mechanism through a strong administrative system; as well as the need for technology transfer and know-how, and a strong human resource support network.

Song-Kwen Kang, Korea Energy Management Corporation, presented on energy efficiency policies in the Republic of Korea, highlighting the government's work in promoting energy efficiency: in the industrial sector by reducing GHG emissions; in the transport sector through, *inter alia*, tire-labeling; and in the equipment and appliance sector through, *inter alia*, a high efficiency certification programme.

The ensuing discussion focused on: financing the building of the Asian Energy Highway; developing a regional framework for electricity trade in the Asia-Pacific; securing the grid access of renewables; and discussing future plans of the Dialogue on Clean Energy Governance and Regulation.

Development and Implementation of Clean Energy in the Philippines: Pete Maniego, National Renewable Energy Board, Philippines, chaired the session. Jose Layug, Department of Energy, Philippines, outlined milestones and targets in the Philippines, describing fiscal and non-fiscal incentives, and reported on recent activities to increase

renewable energy use by 50% in the next 20 years. He provided a snapshot of renewable energy projects in the Philippines and explained the range of available energy sources, including biomass, geothermal, solar, hydro, tidal, and wind.



Jasper Inventor, Greenpeace International

Katsumasa Hamaguchi, Japan International Cooperation Agency (JICA) described the development of a legal framework for energy efficiency and conservation in the Philippines, covering five sectors. He concluded that the focus is not on making laws but on implementing and enforcing laws.

Jasper Inventor, Greenpeace International, presented on short-term versus long-term thinking around FITs. He stated that targets for 2030 are reachable by 2020, posing suggestions, *inter alia*: challenging ADB to finance a FIT support facility for consumers; recommending FIT implementing mechanisms as a nationally appropriate mitigation action (NAMA); and urging that FITs be made more socially acceptable.

The ensuing discussion included, *inter alia*, questions on: achieving grid parity; improving energy access; improving and building momentum for energy efficiency; mobilizing political will; and government actions to allow new coal plants.

ADB's Knowledge and Innovation-Based Support to the PRC's Clean Energy Development: Ashok Bhargava, ADB, chaired the panel and presented ADB support for China's clean energy development. He specified priorities including, *inter alia*, offshore wind, low-carbon district heating, CCS and concentrated solar power (CSP) demonstration, shale gas, fossil fuel power plants emission performance standards, tariff studies, and energy smart regulations.

Pradeep Perera, ADB, reviewed results achieved in China from 2006-2010, indicating areas of ADB support for the next five years to: mobilize US\$240 billion in investments to achieve energy savings; scale-up provincial energy efficiency programmes; implement, monitor, and channel financing; and develop market-based approaches.

Woo Yul Lee, ADB, introduced CSP technology to convert solar energy into usable heat and electricity, providing flexibility, reliability, and predictability. He claimed that 15% of China's total energy could be produced by CSP by 2040 if deployed in time.

Annika Seiler, ADB, reviewed the benefits of clean coal technologies and integrated gasification combined-cycle technology for China, considering the expected rise in use of coal. She recounted ADB support in three loan projects, noting capacity development and regulatory and safety support.

In the discussion, Perera responded to a question on how China can continue to manufacture and improve energy efficiency by suggesting value addition.

Business Opportunities in ADB's Energy Sector:

Yongping Zhai, ADB, chaired the panel and presented the ADB energy policy to promote energy efficiency, maximize energy access for all and support sector reforms and good governance.

Mukhtor Khamudkhanov, ADB, shared experiences on operations in southern Asia, highlighting 2012 lending programmes that focus on, *inter alia*, energy sector reform and restructuring, non-lending programmes, and balanced physical infrastructure development.

Jim Liston, ADB, traced pathways for working with the programmes in ADB. He clarified the business cycle in the central and western Asia department, reporting on projects in the pipeline and associated opportunities.

Teruhisa Oi, ADB, noted the differing priorities for ADB operations in China and Mongolia, which are addressed through ongoing loan projects and capacity building. He introduced proposed projects for 2012-2013, including a project in China to improve energy efficiency in district heating.



Rehan Kausar, ADB

Rehan Kausar, ADB, listed the projects in the pipeline in Southeast Asia, describing loans and technical assistance including safeguards for biodiversity and highlighting Vietnam's large portfolio.

In the ensuing discussion, Kausar clarified that Myanmar is a member country to

ADB and that development of its energy sector strategy is in its initial stages.

Energy Efficiency in Built Environment: Session Chair Peter DuPont, Nexant, provided the context for the panel discussion on the potential for energy efficiency in buildings, reiterating the three UN Sustainable Energy For All targets.

Malcolm Verdict, Energy Systems Laboratory, Texas A&M University, introduced the US presidential, Better Building Challenge initiative, a voluntary programme that has defined short-term goals for buildings to become 20% more efficient by 2020, producing cost savings and new green jobs.

Athena Ballesteros, WRI, outlined a report on the Institute for Building Efficiency initiative of Johnson Controls, highlighting its compilation of best practices and cases studies as well as its policy assessment. Reflecting on the potential for social, economic, and environmental benefits in green buildings, she highlighted the report's toolkit which: demonstrates good business sense through a simple process; targets access and availability of financial resources; and assists stakeholders in mobilizing to build capacity.

Edward Anggadajaja, Singapore Building & Construction Authority, presented an innovative, replicable, and scalable example from Singapore to increase the energy efficiency of buildings by 80% by 2030. He highlighted support available through the green building assessment tool, government policies and practices to demonstrate commitments, and green professional training.

Xiuqin Ma, Hebei University, presented results from her study on energy consumption in buildings in China. She showed how urbanization, growth in building development and environmental constraints necessitate energy efficiency to produce emissions reductions.

Responding to the need to have a champion for energy efficiency, Ballesteros suggested linking political commitments to delivery systems, such as the Pilot Asia-Pacific Climate Technology Network and Finance Center, hosted by ADB, as well as to donor readiness funds and to countries, such as Singapore, that are demonstrating progress to their commitments to build momentum and support institutional capacity strengthening.

Building Capacity for Effective Policies and Regulations:

Session Chair Rihan Kausar, ADB, introduced the panel discussions. Matthew Gardner, National Association of Regulatory Utility Commissioners (NARUC), US, introduced the work of NARUC as an association of regulators offering a variety of activities and exchanges, such as bilateral partnerships, to promote clean energy development.

Hans Schrader, IFC, presented experiences of regulatory reforms in Indonesia aimed at improving the environment for investment and driving economic growth, which focus on green buildings to lower GHG emissions, business costs,

and electricity demand and use. He explained methodologies used to narrow in on highest emitting buildings to make recommendations to policy makers by integrating perspectives from architects, developers, professional associations, and engineers.

Bek Chee Jin, International Copper Association, spoke on the harmonization of energy efficiency standards for air conditioners in ASEAN, based on the potential for high energy savings due to the high electrical consumption in households from air conditioning appliances. He reported progress on an ASEAN action plan for harmonization, including regional surveys, a strategic roadmap for standards, and stakeholder consultation workshops. Balawant Joshi, ABPS Infrastructure Advisory Private Limited, shared experiences from India, highlighting the National Solar Mission policy initiative, a component of the National Action Plan for Climate Change, which is aimed at increasing renewable energy by 20% by 2020. He discussed Phase One progress on leveraging solar potential through use of a bundling scheme to overcome initial challenges, which has resulted in increased solar capacity and tariff reduction.

FINANCE AND INVESTMENT: Accelerating the Diffusion of Climate Technologies in the Asia-Pacific: This session was chaired by Xuedu Lu, ADB. Rajiv Garg, UNEP, presented UNEP's efforts on technology transfer, noting that lack of experience and return on investment are key barriers in deployment. He recommended networks as key tools for faster uptake of climate technologies, including the Pilot Asia-Pacific Climate Technology Network and Finance Center.

Letha Tawney, WRI, explained that both the climate and energy communities have struggled with innovation. She stressed that clean energy is now cost competitive with other forms of energy and that cost no longer represents a barrier to climate technology diffusion.

Peter Storey, Global Coordinator, CTI Private Financing Advisory Network (PFAN), said bringing together finance and technology is the main barrier to climate technologies, but also highlighted the challenge presented by lack of early stage financing. He presented the PFAN as a model with good success rates and high financial leverage.

Toru Kubo, ADB, described ADB's efforts on innovation, transfer, and diffusion of climate technologies, including the Asia Climate Change and Clean Energy Venture Capital initiative, which links equity from financial capital funds to technology advisors.

Participants then discussed, *inter alia*, the GCF and criteria for venture capital funds. Tawney said the GCF has the opportunity to build an enabling environment while reducing risks for technology diffusion. Kubo highlighted non-financial barriers to climate technologies, such as ensuring that technology is available, affordable, and accessible. Garg stressed that funding for technology transfer and large-scale diffusion is only appropriate when there is national readiness and infrastructure to accept and support the technology.

New Approaches to Project-based Lending for Energy Efficiency Projects in Asia: Peter du Pont, Nexant Asia, chaired this session. Thomas Dreessen, EPS Capital Corp., said lack of access to available credit and to equity on commercially attractive terms are major barriers in energy efficiency projects. For energy efficiency projects in China, he said infrastructure investments are a low priority among investors. He described an Indonesian programme to promote and finance energy efficient products that minimize risk and

transaction costs for local financial institutions and reduce barriers for industrial end-use energy consumers and industrial hosts.

Mek Meksarikul, Kasikornbank, described his bank's three-way partnership among the bank, the client, and an energy service company (ESCO), which provided 100% loans to clients on energy efficiency projects.

Anil Kumar, SRC Global, Inc., presented a review of energy efficiency financing activities in India that identified high priority projects to scale up industrial energy efficiency.

In the ensuing discussion, participants highlighted how to structure equity, replicate success, scale up training for local financial institutions, aggregate energy efficiency projects, and cluster loans. On replicating success, Meksarikul recommended capacity building and awareness raising among bank officers in order to promote understanding of the benefits and risks of investments in energy efficiency projects. On clustering loans, Anil shared his experience in identifying energy intensive projects for energy and carbon savings.

Strategies for Financing Small-Scale Solar Power Plants: In a session chaired by Rehan Kausar, ADB, Tony Artiga, Sunco Clean Energy Solutions, presented bankable business models his company is developing for energy, water, and telecommunications. He highlighted the company's work in using the mobile phone pay-as-you-go model to link solar energy producers with consumers.

Stewart Craine, Barefoot Power/Village Infrastructure Angels, spoke about long-term energy lending strategies. Noting that banks are still reluctant to invest in small-scale solar projects, he called on MDBs and other investors to provide US\$500 million in capital for the sector's growth.

Don Purka, ADB, presented on bridge-building efforts to address the concerns of local and foreign banks skeptical about investing in small-scale solar projects in India, through the introduction of ADB's partial credit guarantees enabling solar power entrepreneurs to obtain loans to finance their projects.

Sicheng Wang, National Development and Reform Commission, China, presented on financing mechanisms for a distributed solar photovoltaic (PV) project. He drew attention to financing for grid-connected PVs, noting that an evaluation standard for long-term PV power generation will be key in persuading insurance companies to back solar power entrepreneurs so that they will be able to secure bank loans to finance their projects.

Discussions focused on, *inter alia*, the role of the Climate Investment Fund in the renewable energy sector and the role of the ADB in public sector energy financing in the region.

Raising Funds and Matching Financing with Projects: Samuel Tumiwa, ADB, chaired this session. Eric Usher, UNEP, presented lessons learned from UNEP's Seed Capital Assistance Facility (SCAF), noting that for Asia, SCAF activity has concentrated on investments in the Philippines and India, with a focus on small-scale hydro and wind power projects.

Tao Ren, European Investment Bank and the Global Energy Efficiency and Renewable Energy Fund (GEEREF), introduced the GEEREF as the only fund-of-funds providing risk capital to renewable energy focused on SMEs, acknowledging that much work needs to be done to build fund managers' capacity.



Peter du Pont, ADB

Youngsuk Seo, KPMG Korea, presented on the gap between developers and investors, noting that many projects presented for funding are not mature enough to be developed and highlighting country, technical, and financial risks faced by the developer.

Husain Mugaibel, Islamic Development Bank (IsDB), presented his organization's experiences in energy project financing in the Middle East and North Africa, highlighting the IsDB's net approvals for the energy sector in 2011 as US\$78 billion.

Miles Stump, noted barriers to sustainable energy investment, including the need for financiers to provide a strategic focus to the entrepreneur and the financial sector to provide holistic, comprehensive solutions to developers.

Participants then discussed the disconnect between the financing options and entrepreneurial ideas, the knowledge gap between the financiers and the entrepreneurs, and the need for capacity building and awareness creation for financiers in the energy sector.

Managing Risk in Clean Energy Projects: This session was chaired by Don Purka, ADB. Suzanne Etcheverry, OPIC, presented on innovative risk mitigation products covering the regulatory risk posed by FITs in the renewable energy arena and highlighted OPIC's political risk insurance product. The product insures US-based businesses against currency inconvertibility, expropriation, and political violence.

Matt Daly, REC Solar, gave a technical presentation on the project financing approaches for utility-scale renewable energy, describing how both renewable energy developers and financiers can insure themselves against financial risks with export guarantee programmes.

Stressing that within the renewable energy portfolio, energy efficiency provides the biggest opportunity for addressing climate change, James Maguire, Asia Aon Risk Solutions, presented on financial risk management instruments in developing the clean energy sector in Asia. He highlighted two financial risk management instruments utilized by his company: energy savings insurance and performance guarantee facilities, and noted the role of ESCOs in setting up the latter.

Tamsir Ndiaye, Organization for the Development of the Senegal River, presented on hydro-based regional energy integration. Ndiaye highlighted that access to low-cost energy boosts production/profits in other sectors of the economy and is thus a poverty reduction tool. He noted challenges facing his organization, including a difficulty in mobilizing sufficient funding and the different priorities of states on the use of the Senegal River.

Participants then raised questions on, *inter alia*, the various insurance options available to them and how energy efficiency discussions can feed into the climate change debate to make a positive difference.

Strategies for Developing and Monetizing Carbon Credits in Times of Transition: Session Chair Birgit Haberl, ADB, introduced the speakers, noting the previous uncertainty which had



Mek Meksarikul, Kasikornbank

plagued the Clean Development Mechanism (CDM) market due to questions surrounding the continuity of the regulatory framework.

Philippe Delhaise, CIS Carbon Management Consulting, noted that the CDM is still the best system for determining the eligibility of carbon credit projects. He stressed that the biggest challenge facing his firm is an inability to forecast or determine the price of the carbon emissions reductions. He cautioned that the more "escape clauses" there are in an Emission Reduction Purchase Agreement (ERPA), the more difficult it is to liquidate carbon credits.

Sam Priest, Baker & McKenzie, reported on regulatory risk, pricing and programmes of activities (POAs) in carbon contracting discussed a number of risks covered by ERPAs, including the compliance/eligibility risk and the regulatory risks.

Luis Cañete, ADB, spoke on the Asia-Pacific Carbon Fund, highlighting the 58 projects under this Fund. He called on least developed countries (LDCs) to take up the challenge presented by the post-2012 CDM market, which from January 2013 will only be accepting project proposals from LDCs. He summarized some of the criteria buyers in the CDM market consider, including: volume, price and delivery time of certified emission reduction credits (CERs), development benefits; transaction costs; and the sponsor's strength, experience and capability.

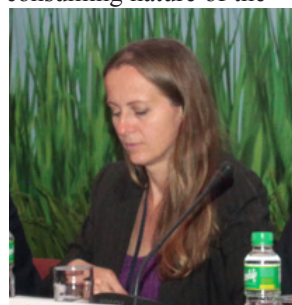
Govind Raj Pokharel, Executive Director, Alternative Energy Promotion Center, Nepal, shared experiences from his country, informing participants that Nepal currently has six energy-related CDM projects focused mainly on biogas and micro-hydro energy generation. He discussed the challenges faced in registering these projects, including the: previous uncertainty surrounding the continuation of Kyoto Protocol; fluctuation of the carbon market price; lack of local capacity and therefore a reliance on external consultants; high transaction costs; and the time-consuming nature of the process.

Strategies and Business Models to Expand Clean Energy:

This session was chaired by Mayur Karmakar, International Cooper Association. Aurelia Micko, USAID Indonesia, presented on the business opportunities in small-scale renewable energy development, and noted that one of the biggest constraints to the development and uptake of renewable energy is the massive fossil fuels reserves in Indonesia. She discussed the Indonesia Clean Energy Development (ICED) Project, USAID's biggest renewable energy endeavor in the country, and described its broad range of renewable energy projects in three provinces that focus on biogas, biomass, and hydropower.

Monali Zeya Hazra, USAID India, presented an Indian case study, drawing lessons from the Center for Power Efficiency and Environmental Protection (CenPEEP). Working with the National Thermal Power Corporation, CenPEEP aims to improve the efficiency of the India power center and reduce GHG emissions. She highlighted the achievements of the Center, including the avoidance of 99.1 million tonnes of GHG emissions from 1995-2010, and a massive savings of coal reserves.

Katsumasa Hamaguchi, JICA Philippines, presented on the role of local government in the development of micro-hydro power plants. He stressed the importance of involving the local government and surrounding community in the process of developing renewable energy schemes. He described a Global



Aurelia Micko, USAID Indonesia



Tamsir Ndiaye, Organization for the Development of the Senegal River

Energy Sustainability project, which partners with the local government in Ifugao, the Philippines, to run a micro-hydro project that supplies clean energy to the community.

Achyut Luitel, Practical Action, described smoke-hood technology, which offers a range of benefits to users of indoor cookstoves, noting communities piloting this in the mountains of Nepal. He underscored the health benefits to women and children particularly, noting the reduction of indoor smoke by 82%. On lessons learned through implementation of this public-private partnership, Luitel emphasized that local solutions could pave the way for global action.

Participants then discussed, *inter alia*, the rationale behind the smoke-hood technology and the choice of communities where it is used; USAID's experiences with other centers of excellence in India; storage as a barrier to the development of mini-hydro; and the role of gender in this financing area.

UPCOMING MEETINGS

G20 Summit 2012: This meeting will consider: economic stability and structural reform for growth and employment; strengthening of financial systems and procurement of financial inclusion for economic growth; improving international financial architecture in an interconnected global economy; mitigating negative effects on price level and volatility of commodities, in particular those affecting food security; and promoting sustainable development with a focus on infrastructure, energy efficiency, green growth, and financing the fight against climate change. **dates:** 18-19 June 2012 **location:** Los Cabos, Mexico **www:** <http://www.g20.org/>

Rio+20/UN Conference on Sustainable Development: The UNCSO will mark the 20th anniversary of the UN Conference on Environment and Development (Earth Summit), which convened in Rio de Janeiro, Brazil in 1992. **dates:** 20-22 June 2012 **location:** Rio de Janeiro, Brazil **contact:** UNCSO Secretariat **email:** uncsd2012@un.org **www:** <http://www.uncsd2012.org/>

Africa Energy Forum: This gathering is Africa's premier annual power and gas investment and business forum, where governments and state utilities address the international energy community on opportunities available in Africa's power and gas sectors. **dates:** 26-28 June 2012 **location:** Berlin, Germany **contact:** Rod Cargill **phone:** +44-(0)20-7370-8406 **email:** cargill@energynet.co.uk **www:** <http://www.energynet.co.uk/>

IUCN World Conservation Congress 2012: The Congress will explore many of the most pressing environmental and development challenges, and how strong and resilient nature is intricately linked to solving these issues, including nature+climate, nature+livelihoods, nature+energy, and nature+economics. **dates:** 6-15 September 2012 **location:** Jeju (Cheju-Do), Republic of Korea **contact:** Enrique Lahmann **phone:** +41 22 999 0336 **fax:** +41-22-9990002 **email:** congress@iucn.org **www:** <http://www.iucnworldconservationcongress.org/>

Asia Future Energy Forum & Exhibition: This meeting promotes leading-edge sustainable energy governance, business, investment, finance, and technology that enable the smart delivery of clean energy solutions. **dates:** 22-24 October 2012 **location:** Marina Bay Sands, Singapore **contact:** Rachel Low **email:** rachel.low@reedexpo.com.sg **www:** <http://www.afef.com.sg/>

The International Workshop on Advances in Energy

Studies 2012: This meeting is dedicated to advances, innovation and visions in energy and energy-related environmental and socio-economic issues. **dates:** 25-27 October 2012 **location:** Mumbai, India **contact:** Conference Secretariat **email:** karthikeya@igidr.ac.in **www:** <http://www.igidr.ac.in/>

UNFCCC COP18: The 18th session of the Conference of the Parties (COP 18) to the UN Framework Convention on Climate Change (UNFCCC) and the eighth Conference of the Parties serving as the Meeting of Parties to the Kyoto Protocol (COP18/MOP 8), are scheduled to take place in Doha, Qatar. **dates:** 26 November - 7 December 2012 **location:** Doha, Qatar **contact:** UNFCCC Secretariat **phone:** +99-228-815-1000 **fax:** +99-228-815-1999 **email:** secretariat@unfccc.int **www:** http://unfccc.int/meetings/doha_nov_2012/meeting/6815.php

Third Session of the IRENA Assembly: The third session of the IRENA Assembly is scheduled to take place in January 2013. **dates:** 13-14 January 2013 **location:** Abu Dhabi, UAE **contact:** Stephanie Roesch **phone:** +971-2-4179001 **email:** secretariat@irena.org **www:** <http://www.irena.org>

World Future Energy Summit 2013/ABIREC: The sixth World Future Energy Summit is scheduled to take place in 2013. It will host the Abu Dhabi International Renewable Energy Conference (ABIREC), the fifth installment of the "IREC" series, the world's highest level political conference series dedicated to renewable energy policy worldwide. The meetings are intended to create additional momentum for the advancement of renewable energy and energy efficiency policies as well as energy access, partnerships, and technologies through dialogue of government and industry stakeholders. **dates:** 15-17 January 2013 **location:** Abu Dhabi, UAE **contact:** Fiona Watson **phone:** +44-1451-830129 **email:** wfes@elsevier.com **www:** <http://www.worldfutureenergysummit.com>

GLOSSARY

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| ACEF | Asia Clean Energy Forum |
| ADB | Asian Development Bank |
| AMORE | Alliance for Mindanao Off-grid Renewable Energy |
| CCS | Carbon capture and storage |
| CDM | Clean Development Mechanism |
| CER | Certified emission reduction |
| ERPA | Emission Reduction Purchase Agreement |
| ESCO | Energy service company |
| FIT | Feed-in tariff |
| GCF | Green Climate Fund |
| GEEREF | Global Energy Efficiency and Renewable Energy Fund |
| GHG | Greenhouse gas |
| IEA | International Energy Agency |
| IFC | International Finance Corporation |
| JICA | Japan International Cooperation Agency |
| LEDS | Low emissions development strategies |
| MDB | Multilateral Development Bank |
| MFI | Microfinance institution |
| OPIC | Overseas Private Investment Corporation |
| WRI | World Resources Institute |