



A SUMMARY REPORT FROM VILLAGE POWER 2000

**VILLAGE POWER 2000 CONFERENCE AND WORKSHOPS
4-7 DECEMBER 2000**

The Village Power 2000 conference and workshops took place on 4-7 December 2000 at the World Bank headquarters in Washington, D.C. The event was sponsored by Winrock International and the World Bank's Rural and Renewable Energy and Rural Development Thematic Groups, the United Nations Development Programme (UNDP)/World Bank Energy Sector Management Assistance Programme, the U.S. Agency for International Development (USAID), and the National Renewable Energy Laboratory (NREL), with Astropower, Bergey Windpower Company, Honeywell and ORMAT as corporate partners. The event was attended by 600 participants from 52 countries representing international financing institutions, intergovernmental organizations, governments, non-governmental organizations, and business and industry. The focus of Village Power 2000 was on exploring ways to advance rural transformation by improving access to modern clean energy services for: income generation; community needs in health and education; and home use.

On Tuesday and Wednesday, 5-6 December, conference participants met in plenary and break-out sessions to hear presentations and discuss issues including: a new vision for rural transformation and poverty alleviation; renewable technologies for global markets; the linking of energy and rural development; scaling-up of rural energy services; traditional fuels and household energy; and how to ensure equitable benefits from rural energy services. Participants heard keynote speeches by Nicholas Stern, Senior Vice President and Chief Economist, the World Bank; Robert Thompson, Director of Rural Development, the World Bank; Richard Truly, Director, the National Renewable Energy Laboratory, and Sir Mark Moody-Stuart, Chair of the Royal Dutch Shell Group.

On Tuesday, 5 December, James Wolfensohn, President of the World Bank, addressed conference participants and inaugurated a solar village set up in the World Bank atrium in conjunction with the Village Power conference. The conference was closed on Wednesday, 6 December, after a wrap-up session summarizing the meeting's major issues and themes.

Village Power 2000 also incorporated workshops held on Monday, 4 December, and Thursday, 7 December. The workshops addressed a variety of issues related to renewable energies and sustainable development, including: micro-enterprise and introduction of technology to indigenous peoples; rural telecommunications and digital technologies; village power models and computer-based analysis for rural energy development; long-term world energy scenarios and the role of renewable technology; gender in energy; small wind energy tutorial; clean water delivery; and energy and poverty.

REPORT OF THE CONFERENCE

The two-day Village Power conference commenced on Tuesday, 5 December, with a morning opening session. Participants then met in plenary sessions with numerous presentations and discussion on the following themes: a new vision for rural transformation and poverty alleviation; renewable technologies for global markets; linking energy and rural development; and success stories and their replication. In an evening session, James Wolfensohn, President of the World Bank, addressed conference participants and inaugurated a solar village set up in the World Bank atrium in conjunction with the Village Power conference. Larry Flowers, NREL, presented the Village Power 2000 achievement awards.

On Wednesday, 6 December, participants split into four morning break-out sessions to hear presentations on issues related to scaling-up of rural energy access and traditional fuels and household energy. After a joint session in which Sir Mark Moody-Stuart, Chair of the Royal Dutch Shell Group, delivered the keynote address, the conference split into afternoon break-out sessions with presentations and discussions on: ensuring equitable benefits from rural energy services; bundled services – transforming rural markets; technology update and applications; and pilots with promise. The conference was closed at 6:15 pm after a joint wrap-up session summarizing the meeting's major issues and themes.

OPENING SESSION

Nemat Shafik, Vice President of Private Sector Development and Infrastructure, the World Bank, welcomed participants and called for practical solutions to advance rural development, highlighting the role of modern energy as the foundation for basic services.

Sustainable Developments is a publication of the International Institute for Sustainable Development (IISD) <info@iisd.ca>, publishers of the *Earth Negotiations Bulletin* ©. This issue is written and edited by Malena Sell <Malena@iisd.ca> and Mark Schulman <markschulman@hotmail.com>. The Editor is Tonya Barnes <tonya@iisd.org>. The Director of IISD Reporting Services (including *Sustainable Developments*) is Langston James "Kimo" Goree VI <kimo@iisd.org>. Funding for coverage of this meeting has been provided by Winrock International. The authors can be contacted at their electronic mail addresses and at tel: +1-212-644-0204. IISD can be contacted at 161 Portage Avenue East, 6th Floor, Winnipeg, Manitoba R3B 0Y4, Canada; tel: +1-204-958-7700; fax: +1-204-958-7710. The opinions expressed in *Sustainable Developments* are those of the authors and do not necessarily reflect the views of IISD and other funders. Excerpts from *Sustainable Developments* may be used in other publications with appropriate academic citation. Electronic versions of *Sustainable Developments* are sent to e-mail distribution lists (ASCII and PDF format) and can be found on the Linkages WWW-server at <http://www.iisd.ca/linkages/>. For further information on *Sustainable Developments*, including requests to provide reporting services, contact the Director of IISD Reporting Services at <kimo@iisd.org>.

SUSTAINABLE DEVELOPMENTS

Keynote Speakers: Nicholas Stern, Chief Economist, the World Bank, highlighted development as the enhancement of opportunity, empowerment and security, and said that improving rural infrastructure plays a vital role in overall poverty reduction. Highlighting a case in India, he noted lack of progress in terms of poverty reduction in rural areas and underscored the need to reverse this trend.

Robert Thompson, Director of Rural Development, the World Bank, highlighted the need to review the Bank's rural development strategy and programs. He underscored the need to invest in human capital and rural healthcare, infrastructure, public policy, and community leadership. He also called for a holistic multi-sectoral approach to rural development, with more partnerships at the government, public and local level.

Richard Truly, Director of NREL, U.S. Department of Energy, emphasized institutional, government and private sector collaboration in achieving energy sustainability. He advocated poverty reduction through the improvement of rural economies, education, clean water, health and communications, all of which require clean, low-cost electricity.

In the ensuing discussion, one participant noted that dissemination of new technologies is too slow due to bureaucracy. In response, Nicholas Stern stressed the need for a broad approach focusing on governance reform to simplify bureaucracies. Nemat Shafik added that there is an inherent conflict in this situation, as market-based solutions may entail greater access for rural populations to energy, while the prices may be higher than in a publicly subsidized situation. She advocated innovative ways of targeting subsidies to poor communities and concessions with private providers. In response to another question from the floor on how to disseminate clean technologies more effectively, Richard Truly said that providing the actual technologies is not sufficient, but social and cultural challenges must be overcome as well.

A NEW VISION FOR RURAL TRANSFORMATION AND POVERTY ALLEVIATION

Tim Wirth, President, UN Foundation, moderated a session on rural transformation and encouraged Village Power participants to address the simultaneous challenges of over-consumption in the North and poverty in the South, through, inter alia, disseminating sustainable forms of energy production.

Brady Anderson, Administrator, USAID, discussed the Agency's initiatives in providing sustainable energy to rural areas around the world. He stressed that providing energy to the developing world is not enough, but that the energy must be safe with regard to public health and the environment. He said USAID works with both the public and private sectors in developing countries to forge policies that encourage renewable energies, as these allow developing countries to become more self-sufficient and help avoid problems related to pollution and climate change.

Gerardo Zepeda Bermúdez, Honduras Minister of Science and Technology, discussed the dissemination of energy and telecommunications to remote areas, highlighting the example of the San Ramon village, a solar "Net Village." He explained that the installation of solar panels and high-speed Internet connections have led to new educational opportunities in the village, a more functional health center with opportunities for telemedicine and micro-enterprise activities that can

be marketed online. He said the San Ramon solar Net Village serves as a model for how the digital divide in the world can be bridged through initiatives at the local level.

Frank Tugwell, President of Winrock International, said that the Village Power process has been productive in bringing key players together to address technical energy alternatives in rural communities, but proposed canceling future meetings until participants could measure and monitor actual results. He proposed a target of bringing energy sources to 500 million people in the next 10 years and stressed continued partnership between governments, NGOs, the private sector, and other stakeholders. He also called for improved policy and regulatory frameworks, and financial resources at the small business level.

Graham Baxter, British Petroleum (BP) Solar Headquarters, highlighted the benefits of solar applications in bringing electricity to rural and remote communities. He noted that the solar photovoltaic (PV) market is growing rapidly in both grid-connected and remote off-grid applications, and that costs are decreasing. He described several BP solar projects in Indonesia, the Philippines, Malaysia, Ethiopia and Algeria, which he said are instrumental in providing lighting, refrigeration, water pumping and telecommunications to remote areas.

In the ensuing discussion, participants noted barriers to renewable energy projects, the need for understanding social and cultural aspects of their implementation, and the role of women as energy-users. Graham Baxter also underscored the need for an enabling environment in terms of appropriate policies and institutions, for the success of renewable energy projects. In response to a question on how the San Ramon solar Net Village will be able to afford maintenance, Gerardo Zepeda Bermúdez highlighted the opportunities the community has for income generation due to access to the global market through the Internet.

RENEWABLE TECHNOLOGIES FOR GLOBAL MARKETS

Dan Reicher, Assistant Secretary for Energy Efficiency and Renewable Energy, U.S. Department of Energy, discussed the need to improve the efficiency of traditional centralized power production, as well as the need to move towards decentralized forms of power generation. The future of sustainable energy, he said, is based on technology breakthroughs, capital cost, effective government policies, financing mechanisms, market drivers and environmental concerns. He highlighted the US government's commitment to alternative technologies, including solar and wind energy, geothermal and hydropower, biomass, fuel cells, micro-turbines and reciprocating engines, and indicated the economic and environmental benefits that come with such renewable technologies. He also emphasized the importance of continued large-scale partnerships with the private sector, universities and other government agencies.

LINKING ENERGY AND RURAL DEVELOPMENT

Session Chair Griffin Thompson, USAID, stressed that energy cannot be extracted from the broader context of development. He said new energy technologies will reshape social structures and highlighted their relationship to core values, such as social justice, equity and freedom. He suggested links between decentralized energy production and self-governance, and added that such energy production can cata-

SUSTAINABLE DEVELOPMENTS

lyze democracy and individual freedom. Griffin introduced the session's five panelists who presented on the topic of linking energy and rural development.

Linking Faces with kWhs—End-Users have Names: David Kittleson, National Rural Electrification Cooperative Association, stressed the need for energy professionals to listen to rural people when planning to bring electricity to remote areas. He emphasized that energy must be linked with rural development, since electricity is necessary but not sufficient for development. He also encouraged participants to do their utmost to provide electricity to the estimated two billion people without access, and to improve servicing for the four billion people that do have access.

Anchoring Energy in the Poverty Reduction Strategy: Arun Sanghvi, the World Bank, supported energizing rural transformation to reduce poverty in developing countries and recognizing access to electricity as one important factor. He advocated a paradigm shift, with a focus on the private sector, decentralized systems and holistic thinking. He also suggested a strategy for integrating electrification with other development sectors, and advocated partnerships with relevant stakeholders.

Linking Energy and Rural Development: Lulu Gwagwa, Independent Development Trust - Africa, emphasized a coordinated and integrated approach to rural development. She said development strategies must be driven by local community needs, with special attention given to women and youth. She also stressed the importance of local partnerships in identifying and facilitating energy and other development requirements.

Bridging the Digital Divide: Charles Gay, Greenstar Foundation, emphasized bridging the digital divide through global access to energy, e-commerce and digital culture. He highlighted his company's role in providing solar community resource centers and telecommunication systems for small off-grid communities in developing countries. He said that such access allows rural communities to benefit from media distribution of their traditional culture through sales of art, CDs and other digitalized products over the Internet.

Poverty and Production—The Role of Energy in Asia: K.V. Ramani, Asian and Pacific Development Centre (Malaysia), noted that poverty defies conventional wisdom, as both welfare and market approaches fail to resolve the problem. He said that the creation of wealth at the level of the poor is the only enduring solution to poverty and this should be the driving force for energy initiatives. He supported a combination of both conventional top-down market penetration and bottom-up market creation for energy provision among the poorest.

SUCCESS STORIES AND THEIR REPLICATION

Judith Siegel, Winrock International, chair of the session on rural energy and development success stories, emphasized the need to address proven approaches to mitigating barriers in the areas of awareness, policy, financing, and capacity building. She introduced five panelists, who focused their discussions on solutions and lessons learned.

Telesecundarias—Rural Distance Learning in Mexico: Ciro Martinez, Secretaria de Educación Pública (Mexico), highlighted the Telesecundaria remote educational system, which is part of Mexico's public school system. He said that Telesecundaria utilizes the EDUSAT system, which produces 5000 hours of educational material each year

via satellite. He also said that Mexico has cooperation agreements with all Central American countries to deliver EDUSAT signals, allowing 23,000 students to have access to these educational resources.

Product Quality and System Performance in the Kenyan Solar-Home-System Market: Daniel Kammen, University of California at Berkeley, spoke of his experience with the private sector-based solar energy market in Kenya. He underscored several design and installation problems related to the solar home systems and suggested improvements including capacity building and outreach; technician and vendor training; and development of research partnerships to identify and solve PV market problems.

Combining Productive Uses and Village Power: Adam Harvey, AH Associates, presented the success story of village power programs in Laos. He highlighted projects in two villages, one solar and one pico-hydro, that were designed to provide rural, social and economic improvements, as well as help both villages start their own local businesses based on improved energy sources. He noted that small generating capacities can go a long way and are important to cash poor communities because they are affordable and manageable.

Successful Capacity Building to Meet Rural Energy Needs in Nepal: Matthew Mendis, Alternative Energy Development, highlighted the success of the Nepal biogas support program. He attributed the success of the model to, inter alia: effective working relationships between the donor, host government, private sector and NGOs; the development of affordable indigenous technology; and an approach that meets the actual needs of the local community. He also underlined the environmental (reduced greenhouse emissions and deforestation), health and gender benefits of the program.

Agricultural Modernization in Mexico: Manuel Contijoch Escontria, Mexican Secretariat of Agriculture, discussed initiatives in the agricultural sector that aim to increase rural incomes through both introducing renewable energy sources and changing agricultural practices. He noted experiences in range management and dairy and highlighted the importance of strengthening institutions, promotion and publicity, market development, specification and certification, and investment.

VILLAGE POWER 2000 ACHIEVEMENT AWARDS

World Bank President James Wolfensohn addressed participants in the Village Power meeting. He ensured participants that the World Bank would support renewable energy initiatives, as part of the Bank's broader development agenda. He said renewable forms of energy had been revolutionized in terms of technology and cost and that the goal of providing access to electricity in rural communities is achievable. He underscored the need for different actors to work together in partnership with civil society and the private sector, and to scale up quickly rather than focus on pilot projects.

Larry Flowers, NREL, presented Village Power 2000 achievement awards. He gave Paul Hassing, Dutch Director-General of International Development Cooperation, the Village Power "Donor Award" for his leadership and support in the advancement and scaling-up of renewable energy to address global energy and development needs. Anil Cabraal, the World Bank, was presented (in absentia) the Village Power "Road Warrior" Award for his vision and commitment to delivering real renewable energy results in the field. James Wolfensohn noted their dedication to providing electricity for the rural poor and to poverty alleviation.

SUSTAINABLE DEVELOPMENTS

WEDNESDAY MORNING BREAK-OUT SESSIONS

On Wednesday, 6 December, the second day of the Village Power conference, participants split into four break-out sessions in the morning. The sessions were clustered around two themes: scaling up rural energy, with sessions on policy issues in scaling up rural energy services and on rural electrification financing; and traditional fuels and household energy, with sessions on resource management – “power to the people” and on commercial conversion of rural resources. All break-out sessions included many presentations by panelists and were moderated by session chairs.

SCALING UP RURAL ENERGY ACCESS—Policy Issues in Scaling Up Rural Energy Services: Session Chair Robert Annan, Winrock International, stressed the need to develop economies of scale for renewable forms of energy in developed countries so that the developing world can benefit from lower prices.

Christopher McLean, U.S. Department of Agriculture, gave a historic overview of the dissemination of services to rural areas in the U.S. starting in the 1930’s, stressing standardized engineering and community involvement as key factors for success. He highlighted the current Rural Utilities Service and new initiatives relating to broadband extension and telemedicine.

Douglas Banks, Rural Area Power Solution (South Africa), highlighted the South African off-grid programme, which involves a public-private partnership and merges social service delivery with for-profit companies. He noted challenges faced by rural energy delivery companies as, inter alia, innovation cost and risk management.

Charles Feinstein, the World Bank, sought to dispel two myths related to village power: that local desires for clean air function as the driving force of the renewable energy market; and that the recent collapse of the climate change negotiations would hinder market development. He highlighted climate mitigation and the potential carbon market as real drivers of the village power agenda, and called for clear rules for the Clean Development Mechanism under the United Nations Framework Convention on Climate Change that allow for the development of small projects.

Luis Velázquez Molieri, Nicaraguan National Energy Commission, discussed the privatization process in the provision of energy services and implications for rural electrification. Highlighting a current action plan, he said social and economic rural development objectives would be integrated, initial investments subsidized, and rural electricity rates differentiated.

Afonso Moreira Santos, Agência Nacional de Energia Elétrica (Brazil), spoke on the initiative for universal access to electricity in Brazil within five years and the use of market principles to reach the target. He said that rural cooperatives could play an important role in conjunction with utilities, noted that a mix of grid-extension and decentralization would be needed, and stressed the role of biomass in Brazil.

Rural Electrification Financing: Session Chair Saud Siddique, International Finance Corporation, opened the panel discussion by emphasizing the market opportunity inherent in rural electrification.

Wolfgang Mostert, Mostert and Associates (Denmark), discussed the use of Renewable Energy Funds (REFs) in Uganda, stressing the need to use subsidies as effectively as possible. He explained that REFs function as instruments for coordination and long-term management of donor grant funding, and said policies for project selection and funding need to be carefully defined.

Eric Martinot, the World Bank, underlined emerging lessons on solar PV projects from experiences with the Global Environment Facility’s solar PV portfolio. These lessons include: viable business models must be demonstrated to sustain market development; evolution and testing requires time and flexibility; and overall energy policy should provide certainty to the market.

Eufemia Mendoza, Development Bank of the Philippines (DBP), discussed how the DBP is responding to emerging trends related to environmental protection and sustainable development, and presented examples of renewable energy projects being financed.

TRADITIONAL FUELS AND HOUSEHOLD ENERGY: Resource Management—“Power to the People”: Willem Floor, the World Bank, chaired a morning panel discussion on resource management relating to traditional fuels in Africa.

Gérard Madon, Marchéage et Gestion de l’Environnement (MARGE), provided an assessment of tropical dry-land forest management (TDLF) in West Africa. He noted that human impact (i.e. farming, fire use, pastoralism and woodfuel gathering) has been largely responsible for TDLF destruction, but that degradation can be reversed with proper intervention. He also added that a majority of donor-financed activities to combat TDLF deforestation, such as improved cooking stoves, improved charcoal-making techniques, forestry plantations, and legal and fiscal measures have failed. He said, however, that trends could be reversed by: geographically redirecting and rationalizing woodfuel harvesting; improving forest management by rural people; and streamlining woodfuel harvesting into a legitimate business.

Ismail Touré, National Department of Hydrology and Energy of Mali, presented a case study of village-driven forest management in Mali and stressed the need for sustainable management of forest resources. He highlighted the main goals of the domestic energy strategy in Mali as: improving access to energy; increasing usage efficiency; and implementing rational management of forestry resources by rural communities. He also noted that recent legal frameworks and forest policies are encouraging local populations to better manage their natural resources.

Commercial Conversion of Rural Resources: Elsen Karstad, Chardust, spoke on charcoal briquette production from sawdust and bagasse (coal dust) in Kenya. He noted the unsustainable pressures on Kenya’s indigenous forests and the need to develop alternative fuels. He said briquetting is one way of supporting a sustainable domestic fuel supply and can play a major role in environmental conservation and in the sustainable use of charcoal.

Hubert Stassen, Biomass Technology Group, discussed the advantages of charcoal briquette production by means of an agglomeration process. He noted that agglomeration technology is a small-scale village level production process characterized as clean and as providing uniform lighting. He supported the development of biomass gasification in rural electrification as an alternative to small generators, batteries and solar home systems.

Hari Sharan, DESIPower, shared his experience of biomass-based power stations in India. He stressed the importance of supplying electricity and energy services to villages in joint ventures with local partners. He also stressed the need for a legal framework to promote decentralization of the power sector and for commercializing rural electricity.

SUSTAINABLE DEVELOPMENTS

KEYNOTE ADDRESS

After the morning break-out sessions, conference participants met in Plenary. Peter Woicke, International Finance Corporation, emphasized the World Bank's goal of finding new ways to improve access to sustainable energy, particularly in developing countries. He introduced the keynote speaker, Sir Mark Moody-Stuart, Chairman of the Royal Dutch Shell Group and Co-chairman of the G8 Renewable Energy Task Force.

Mark Moody-Stuart outlined the Task Force's goal to identify the barriers and solutions to increasing the use of modern forms of renewable energy, particularly in developing countries. He said the Task Force will report its recommendations back to the G-8 leaders in June 2001. He stressed the importance of a joint public-private sector approach and the need to include input from all stakeholders, including the private sector, governments, multilateral institutions and NGOs, from both developed and developing countries. He called on the conference participants to provide examples, both success stories and failures, from the many ongoing renewable energy projects that they are currently working on. He added that the success of the report would be based on whether or not it can increase support for renewable energy technologies and on practical recommendations that can be implemented by G8 governments.

In the discussion that followed, one participant stressed the need for the G8 task force to address public-private partnership in risk capital in developing countries, as well as the need for seed money to launch projects. Participants also raised issues relating to, *inter alia*: linkages between provision of rural energy services and other basic services; contributions of the NGO community in the renewable energy sector; restructuring of subsidies in the energy sector; development of human capacity to service renewable energy technologies; and the possibility to integrate debt-swaps into the financing of renewable forms of energy production.

WEDNESDAY AFTERNOON BREAK-OUT SESSIONS

Participants split into four afternoon break-out sessions on Wednesday, 6 December. The sessions covered the following topics: ensuring equitable benefits from rural energy services; bundled services – transforming rural markets; technology update and applications; and pilots with promise. All break-out sessions included many presentations and were moderated by session chairs.

ENSURING EQUITABLE BENEFITS FROM RURAL ENERGY SYSTEMS: Session Chair Dominique Lallement, UNDP/World Bank Energy Sector Management Assistance Programme (ESMAT), introduced the panelists. Speaking on quantitative measures of benefits from rural electrification in the Philippines, Aleta Domdom, Ateneo de Manila University, highlighted a study based on household surveys of a broad set of indicators to assess benefits of rural electrification. She noted the need to understand the context when evaluating social infrastructure outcomes.

Katja Winkler, Fundación Solar (Guatemala), spoke on linking gender and energy in Central America. She highlighted the lives of women in Central America, noting their disadvantaged position and implications for energy use. She said the Gender in Sustainable Energy (GENES) network in Central America aims at empowering women to control their energy resources and to make energy-related decisions,

and highlighted activities facilitated through the network that relate to information exchange, gender/energy training and project development support.

Dipal Barua, Grameen Shakti (Bangladesh), discussed the need to mobilize local entrepreneurship for delivery of rural services. He highlighted alternative financial packages that Grameen Shakti provides to poor people in order for them to buy solar PV systems. He also gave examples of opportunities for income generation, such as renting lamps and mobile phones that can be recharged by solar panels.

On the topic of integrating renewables and indigenous peoples, Bruce Walker, Centre for Appropriate Technology (Australia), underscored the "fourth world" nature of remote aboriginal communities in Australia. He said that the state of energy services in aboriginal communities is disappointing, despite a government welfare system for financing energy services. He stressed the need to ensure that energy solutions are demanded locally and are equitable.

Hasna Khan, Prokaushali Sangsad (Bangladesh), highlighted an initiative to allow women to function as service providers, not just as energy users. She said lessons learned from this project include that cooperatives of rural women are effective entrepreneurs and innovators and that long-term low-interest loans will be needed to activate the market for solar home systems.

BUNDLED SERVICES - TRANSFORMING RURAL MARKETS: Session Chair Susan Goldmark, the World Bank, introduced the panel discussion on transforming rural markets. Speaking on the topic of micro-hydropower in Peru, Teodoro Sánchez Campos, Intermediate Technology Development Group (Peru), compared the dissemination of small hydro-schemes with conventional energy production projects. He noted, *inter alia*: the significant outreach at both the pre-investment and implementation stage in relation to small hydro-schemes; their lower overall costs; and the need for further training and capacity building at the village level on energy issues.

Pavankumar Siddhi, Sungrace Energy Solutions (India), discussed a project that makes solar lanterns affordable to poor villagers through installment schemes. He said the schemes involve outside support and build upon existing rural cooperatives. He said the market potential is great, and that common, pre-existing rural cooperatives can be used.

Philippe Renzy de Martin, Shell Solar, said solar energy systems installation in rural markets will take place in three phases, with a bundling of more sophisticated services at each phase. He also said that incentives are vital for promoting solar projects at present levels of market development and noted that existing projects are still at an experimental stage.

TECHNOLOGY UPDATE AND APPLICATIONS: Michael Bergey, Bergey Windpower, promoted the use of small wind systems for rural energy supply. He also emphasized the use of hybrid systems, such as turbines, PV and diesel, as more sustainable and affordable sources of energy.

Bikash Pandey, Winrock International, spoke on hydropower in Nepal. He noted the importance of community-based, entrepreneur-led, and grid-connected models.

Kurt Naas, Honeywell Power Systems, discussed the advantages of using micro-turbine technology, which involves low-maintenance costs, low emissions and little environmental impact. He added that the technology is affordable, flexible, and reliable for rural electrification.

SUSTAINABLE DEVELOPMENTS

Lawrence Flowers, NREL, highlighted the options of diesel retrofitting and hybrid systems (solar, wind, battery) for extending a village's hours of access to electricity. He added that a 24-hour power system in remote areas is necessary for economic development.

Lucien Bronicki, ORMAT International, noted that geothermal energy could supply a very significant portion of new electricity for remote areas in developing countries. He added that geothermal energy on a commercial basis is competitive with fossil fuels, and that the market is growing through public-private partnerships.

PILOTS WITH PROMISE: Clemente Abavana, Renewable Energy Services Project, presented an example of a renewable energy service project in Ghana. The main goal of the project is to build in-country capacity in the use of renewable energy technologies (PV, wind, diesel, and hybrid systems). He added that the program is needed to provide electricity services to off-grid communities on a sustainable and affordable basis, and stressed the importance of community participation.

Ian Gould, NREL, described a commercial wind-diesel system in Alaska, which supplies public power and electricity for a local airport. He added that the wind-diesel combination is cheaper than the diesel-only system currently being used, and is thus a bankable project.

WRAP-UP SESSION AND CONCLUDING REMARKS

A wrap-up session was held in the evening to summarize the meeting's major issues and themes, and to provide a plan for future action. Frannie Léautier, the World Bank, moderated the wrap-up session panel. She stressed the importance of the Village Power Partnership and its outcomes in the form of a communiqué, by which the sponsors of Village Power call on governments, multilateral development organizations, the private sector and NGOs to collaborate on a 10-year initiative to enhance rural development through affordable energy services. The partnership would seek commitments from stakeholders to join a global initiative in renewable energy-based off-grid electrification, support developing countries in designing appropriate policies and programs, and facilitate access to financing. It stresses the importance of applying renewable energy, energy efficiency and other decentralized energy options to improve health and educational services, increase productivity and create jobs in rural communities. In particular, Frannie Léautier emphasized a target in the communiqué for 30 countries to develop national-scale renewable energy-based rural programs.

Suresh Hurry, United Nations Development Programme, called for partnerships that would seek to enhance rural development through affordable energy services. He added that grants are very useful for addressing policy and institutional development issues, and called for more private sector investment.

Richard Jones, UK Department for International Development, stressed the linkage between information and communication technology (ICT) and the energy sector. He advocated more awareness about the energy issue, and preferred to focus on energy as a tool for development rather than a general sector.

Paul Hassing, Dutch Director-General for International Development Cooperation, emphasized the need to put the communiqué into practice, and called for massive investment in human resources as a critical enabling action. He challenged the conference participants to find a way to mobilize the public funds needed to catalyze sufficient commercial investment to fulfill the goals of the communiqué.

Louis Boorstin, International Finance Corporation, stressed the role of the private sector in the development of a market for renewable forms of energy. He said that concessional funding still is needed, but added that it must be used wisely for projects that help the marketplace grow, and cautioned against the public sector distorting the market or crowding out the private sector.

Judy Siegel, Winrock International, spoke on behalf of NGOs, highlighting their contributions and support for, inter alia: technology, application and delivery model diversity; gender and equity linkages; smart incentives and subsidies; and market-based solutions relating to renewable energies.

Jamal Sagir, the World Bank, stressed the need to put the principles on renewable energies highlighted at this meeting into practice, and assured the audience of the Bank's support for them.

Griffin Thompson, USAID, supported building bridges between the renewable energies sector and other areas on the development agenda.

In his concluding remarks, Larry Flowers, NREL, thanked the organizers of Village Power 2000, and closed the meeting at 6:15 pm.

WORKSHOPS

On Monday, 4 December, and Thursday, 7 December, workshops were held to address a variety of issues related to renewable energies and sustainable development, including: micro-enterprise and introduction of technology to indigenous peoples; rural telecommunications and digital technologies; village power models and computer-based analysis for rural energy development; solar technician training and certification; long-term world energy scenarios and the role of renewable technology; gender in energy; small wind energy tutorial; clean water delivery; and energy and poverty – a framework for guiding country strategy development.

INTRODUCING TECHNOLOGY TO INDIGENOUS PEOPLES AND THE ROLE OF VILLAGE POWER

A full day workshop on introducing technology to indigenous people and the role of village power was held on Monday, 4 December. The workshop included an introductory session and panel presentations and discussions around "challenges," "issues," "the experience" and models for micro-enterprise relating to technology, indigenous peoples and village power.

Larry Flowers, NREL, opened the workshop by stressing the global need for electricity in rural communities and the importance of creating an enabling environment for dissemination of renewable technologies at the community level. Todd Bartholf, independent consultant and moderator, noted overlapping issues related to the introduction of new energy technologies and to micro-enterprise.

ISSUES: Griffin Thompson, USAID, chaired the first panel discussion. He highlighted the role of cultural, social and technical aspects in relation to the diffusion of technologies for sustainable development.

Speaking on affordability and income generation, David Kittleson, NRECA, stressed the need to understand the interplay between spiritual, cultural, political, health-related and economic aspects of life for people in rural communities in order to successfully approach rural development, poverty alleviation and electrification issues. In terms of

SUSTAINABLE DEVELOPMENTS

affordability, he said that either costs need to be driven down or incomes of the population increased, and highlighted productive uses of electricity-generating income.

On cultural impact sensitivity, Bob Gough, Tribal Council on Utility Policy, highlighted the possibilities inherent in the development of wind power for Native Americans of the Northern plains, and emphasized the need for consideration of cultural and spiritual values. He stressed the potential for a Native American leadership role with regard to the development of wind power, and underscored the importance of working in consultation with local indigenous peoples. He stressed that native peoples dependent on subsistence economies will be especially hard-hit by environmental changes occurring as a result of climate change.

On gender considerations, Lisa Büttner, Winrock International, said gender considerations are important since men and women have different energy needs and priorities, and highlighted the issue of energy for cooking rather than just for electrification. On how to increase women's participation and develop gender-sensitive energy solutions, she said that: demand assessment should include gender analysis; all stakeholders should participate in project development, including on issues considered technical; training should be directed to women; and women's roles in credit management and in spreading information on new practices should be encouraged.

On quality of service, Art Lilley, Community Power Corporation, said the issue is relative depending on the point of departure and on expectations. He highlighted an example of a Shell solar project in which the customers now have access to clean, more reliable electricity with positive health effects and high-quality service, rather than having to rely on kerosene, dry cells and batteries.

On building and maintaining local capacity, Andrew McCallister, University of California at Berkeley, stressed the need to help indigenous and rural people figure out their priorities in enabling safe and informed decisions regarding unfamiliar technologies. He highlighted batteries as a maintenance issue for remote communities and stressed the need for appropriate education and training on their use at different levels. He noted that maintenance problems are most pronounced with regard to disbursed technologies.

THE EXPERIENCE: Highlighting the issue of lighting, Phil Covell, Solar Development Group, gave a presentation on renewable energy technology marketing. He suggested that promoters of these technologies use marketing science to respond to needs of rural markets and to understand cultural perceptions and values, and said that market research needs to be carried out.

Robert Foster, New Mexico State University, spoke on experiences relating to sustainable water development with renewable forms of energy. He said requirements for successful development of renewable energy technologies include strategic planning, capacity building, cultural acceptance, sustainable markets and an evaluation process. He stressed the need to work within cultural norms, use appropriate technology and build local capacity.

James Casey, NTTA, spoke on the introduction of telecommunications in Native American communities, noting that this is expensive in remote areas. He questioned the assumption that new technologies are disseminated from urban areas to rural, highlighting an example of seven rural tribal entities creating their own teleservices, which sell

excess capacity to urban areas. He stressed the role of partnerships between rural communities and commercial providers of telecommunications, and underscored that the rural communities themselves must make the decisions regarding their access to telecommunications.

Ken Olson, SoL Energy, discussed solar energy at rural health clinics, with a focus on conservation of vaccines. He recommended a focus on training, donor involvement, integrating community and economic development, standards for procurement, improved resource data, and income generation.

Bruce Walker, Centre for Appropriate Technology (Australia) highlighted the Australian experience with renewable energy systems in very remote communities, which are difficult to service. Showing a film to demonstrate the issues, he stressed the need to include culture in decisions on disseminating technologies.

André Verani, Enersol, highlighted examples from the Dominican Republic/Honduras on knowledge transfer to catalyze solar electrification. He said Enersol has focused on training solar technicians who service rural areas and on systems sold on a commercial basis to clients. He provided lessons learned, stressing: the importance of cross-cultural skills and of overcoming linguistic barriers; and the need to avoid over-subsidizing PV equipment.

Debby Tewa, Hopi Solar, spoke on the experience of Native Americans using solar technologies on the Hopi reservation, and noted the importance of user training.

Jagan Nath Shresta, Nepal Solar Energy Society, spoke on domestic market potential of PV technology. He presented examples of successful implementation of solar energy systems in Nepal for telecommunications, homes, water pumping, drip irrigation, and education, and discussed income-generating activities such as rural telecom services, cordless telephone systems, photocopying machines, fax and e-mail.

MODELS FOR MICRO-ENTERPRISE: Session Chair April Alderdice, NREL, introduced the panel discussion on micro-enterprise. Dipal Barua, Grameen Shakti (Bangladesh), presented a slideshow on the Grameen Bank, a lending institution, which services some 2.4 million landless peasants in Bangladesh. The bank incorporates a solidarity structure as the guarantee system. He highlighted the activities of Grameen Shakti, a renewable energy corporation within the Grameen group. He said Grameen Shakti has a strong focus on solar energy systems, and provides training and maintenance for users as well as local technician training. He also noted that the quality of life of those with PV system access has improved, due to better opportunities for education, longer working hours, security and increased income.

Robb Walt, Community Power Corporation, highlighted a project in the Philippines, as a model for sustainable energy services for economic development. He supported new market-driven technologies and new commercial models, and highlighted the benefits of the Internet in accessing new markets.

Harish Hande, SELCO India, described the dissemination of solar technologies in rural areas in southern India, which are financed through an existing rural financing network. He stressed marketing through demonstration, and affordability without subsidies by the rural poor, with appropriate financing schemes. He also stressed the need to work at the grassroots level.

SUSTAINABLE DEVELOPMENTS

Charles Gay, Greenstar Corporation, spoke on the Greenstar vision—a new for-profit model for development. He said that the Greenstar Corporation provides renewable energy systems and telecommunication, as well as basic services to remote rural villages, while marketing their culture in the form of digital products.

RURAL TELECOMMUNICATIONS & DIGITAL TECHNOLOGIES

On Monday, December 4, a workshop was held on rural telecommunication and digital technologies. Numerous speakers discussed the issue during five consecutive sessions.

SESSION I: OVERVIEW OF TELECOMMUNICATIONS AND INFORMATION TECHNOLOGIES FOR RURAL DEVELOPMENT:

Christopher Rovero, Winrock International, introduced the morning session by highlighting the workshop's goals. They include: presenting the experience and trends in rural applications of information and communication technologies (ICT); presenting experience with commercial use of renewable energy systems in telecommunications networks; addressing energy related constraints and solutions for rural use of ICTs; and establishing links between people working in rural energy and people working in rural applications.

Juan Navas-Sabater, the World Bank, discussed the use of telecommunications and information technologies in rural development, noting the importance of targeting rural communities as a key element for economic and social development. He stressed the need to close the access gap through market efficiency, privatization, and transparent regulatory frameworks. He also highlighted the World Bank's rural telecommunication experience in some 20 countries through various studies, pilot projects, seed investments, and integrated rural telecommunication and energy projects.

Joanne Capper, the World Bank, discussed rural distance education technologies and programs. She emphasized the benefits of Internet learning in terms of being learner-controlled, interactive, globally accessible and cost-effective. She added that not all computer/Internet-based instruction resulted in better learning, and that there are restrictions for e-learning in developing countries, including limited information infrastructure, limited IT capacity, high costs of Internet connectivity relative to income, and costs of online courses. Solutions offered included increased affordable Internet access, agreements by e-learning providers for reduced rates for developing countries and the establishment of community centers.

Rebecca Mayer, International Telecommunication Union (ITU), addressed the challenges to implementing ICT networks and services in rural areas. She noted that such challenges include equipment installation, lack of main power supply, lack of funds for initial capital investment, operation and maintenance, affordable coverage, and lack of technical support and computer repair facilities. She also described the activities of the ITU's Rural Applications Focus Group, including a recent report and series of recommendations. Recommendations from the Rural Applications Focus Group, include: promoting low-cost information appliances for rural use; creating a renewable energy handbook on small-scale power systems for rural ICTs; increasing collaboration with micro-finance organizations to develop communications-based rural businesses and applications; and conducting pilot projects of packet-based wireless access infrastructure.

SESSION II: EXPERIENCES AND LESSONS LEARNED FROM RURAL DEPLOYMENT OF TELECOMMUNICATION AND INFORMATION TECHNOLOGIES:

Maria Kendro, National Telephone Cooperative Association (NTCA), emphasized the importance of rural telecenters. She said that not only do they provide publicly accessible community needs (i.e. phones, fax, computers and Internet access), but they also benefit the community by contributing to economic, social, educational, and political development. She added that telecenters promote development by creating employment, developing human resources, making information accessible and providing savings in transport costs.

Donald Richardson, Telecommons Development Group, spoke on rural development impacts of ICT and poverty reduction in rural communities. He said the two major obstacles in rural ICT are regulatory problems and the lack of understanding of rural markets. Using Grameen Telecom in Bangladesh as a case study, he emphasized that the rural telecommunication market is profitable not only for international companies, but also for local ownership and management. He then emphasized the need to link rural telecom initiatives with credit programs and established rural revenue collection systems.

Anthony Bloome, the World Bank, discussed the use of the Internet in developing country schools. He highlighted the World Bank's World Links for Development Program's mission to bridge the digital divide through computer education and through establishment of a global network linking thousands of youths and educators worldwide. To date, the program has set up 500 Internet learning classrooms, training modules, and mobile Internet learning centers in rural communities.

Francisco Xochipa Sanchez, Mexican Secretariat of Public Education, presented his country's satellite-based Internet initiatives in rural schools. He emphasized that the Mexican government is working with rural communities in delivering the Internet to schools, particularly at the junior high and high school levels. He added that the government is also integrating the use of telecommunications to improve the teaching-learning process and extend opportunities for in-service and pre-service teacher training.

Steen Hansen, TELE Greenland A/S, shared his country's rural telecommunication and information technologies experience. He emphasized the importance of teleservice centers, which include telephony, Internet, video conferencing, and tele-education services. He added that telecommunication systems were also instrumental in assisting teachers in public schools and doctors diagnosing patients in remote areas. Greenland is looking into several ways to provide power to such teleservice centers, including public mains, solar, windmills, generators and batteries.

SESSION III: REMOTE POWER SYSTEMS FOR DEPLOYMENT OF ICT SYSTEMS IN UNELECTRIFIED RURAL AREAS:

Charles Hanley, Sandia National Laboratories, discussed off-grid power systems for rural distance education schools. He emphasized the need to consider requirements and costs when taking a grid connection off-grid. He also showed a comparative example of two schools to illustrate that with more efficient loads, energy systems could be much smaller.

Derek Botha, AstroPower, spoke on commercial power systems for wireless rural technology, particularly in South Africa. He emphasized his company's role in a program to introduce digital enhanced cordless telecommunications and PV technology in rural areas where there is no grid supply. He noted that theft of telecommunications systems was a major obstacle for sustainability.

SUSTAINABLE DEVELOPMENTS

SESSION IV: TAKING THE INITIATIVE - EXAMPLES

FROM DIFFERENT ORGANIZATIONS: Alexander Pentland, MIT Media Lab, said that communications, and more significantly, sensors and actuators, were part of a major revolution where new technology changed current economic models and new players emerged. He emphasized the creation of LINCOS telecenter units, which include digitally delivered health and environment services, training and education centers, and video communications. He also favored wireless communications because of their low cost and high efficiency.

Paul Loeffelman, American Electric Power, Renato Dias, STM Wireless, and Ron Swenson, SolarQuest, talked about their US Department of Energy-sponsored solar power and broadband Internet access partnership in the Amazon. The project, which represents the first US private-public partnership of its kind, concentrates on providing remote areas in Bolivia with power systems, communications and Internet educational services.

William Howley, Winrock International, concluded the session with a discussion on ICT and clean energy in rural development and the steps Winrock International was taking to integrate ICT into Winrock's rural development program. He stressed that the productive use of renewable energy is key to rural markets strategy and that productive uses of ICT in rural areas are key to market growth. He added that any systematic approach to accelerated diffusion of technologies and approaches requires partnerships, and that ICT can help develop new models of technical assistance by moving away from the traditional North-South/urban-rural linkages to South-South/ rural-rural linkages.

SESSION V: DISCUSSION ON THE INTERSECTION OF RURAL ENERGY AND RURAL DEPLOYMENT OF ICT SYSTEMS:

A panel discussion on the need and opportunities for public-private partnerships was moderated by Marie-Louise Caravatti of the US Department of Energy. Panelist included: Gloriana Guillen, Discovery Channel Global Education Fund; Karin Stahl, E-Bay Foundation; Bob Granger and Jim Sheats, Hewlett Packard E-Inclusion; Ron Sackman, Lucent Technologies; Victoria Hedrich, SunGuard; Mark Grobmyer, ICSI; and Alan Baer, Solar Quest. During the discussion, participants highlighted the importance of forming partnerships with organizations and corporations to bridge gaps in rural energy and communications in order to: reach larger numbers of people in rural communities; help set up telecenters; and assist governments with economic development at both the micro and macro-levels.

Chris Rovero, Winrock International, closed the workshop with a group discussion on future opportunities, challenges and possible solutions. He underscored the need to: better integrate rural energy programs with rural telecom programs; take energy requirements in rural ITC programs into consideration; and drive down costs for these projects in order for them to be sustainable in the future.

One participant called for more promotional materials and indicators for rural ITC. Another participant stressed the need for a country-by-country impact assessment for developing telecentres. There were also calls for increased capacity building and recognition of the significance of different stakeholders and partnerships in ICT issues.

CLEAN WATER DELIVERY WORKSHOP

A half-day workshop on clean water delivery was held on Thursday, 7 December. The workshop included nine presentations on integrated approaches and putting tools into practice.

OVERVIEWS OF INTEGRATED APPROACHES:

Charles Hanley, Sandia National Laboratories, opened the morning workshop session on clean water delivery for rural populations in developing countries. He noted that the workshops were designed to provide overviews of successful systematic approaches to clean water delivery and sanitation to energy and development specialists.

Param Iyer, World Bank, outlined the Bank's Water and Sanitation Program, whose strategy is to influence donors in expanding policies, building global knowledge networks and targeting poverty more effectively. He emphasized the importance of a community-driven and demand-responsive approach to implementing projects at the local and community levels. He also supported: institutional reform; decentralized partnership arrangements between local governments, communities, NGOs and the private sector; development of financially sustainable approaches; and promotion of private sector provision of operating services.

Morris Israel, USAID, gave a historical perspective of USAID water and sanitation for environmental health projects. He stressed the importance of sanitation and hygiene in improving health and the need for community-based decision-making. He added that effective aid needs to be focused on building local institutions and transferring skills, and requires an interdisciplinary and participatory approach for maximum sustainability.

Robert Foster, New Mexico State University, spoke on water supply and purification with specific examples from Mexico. He emphasized the use of alternative water pumping options such as those derived from gravity flows, PV and wind power. He also offered a range of purification technologies that include: aeration, pasteurization, chlorination, filters, deionization, reverse osmosis, UV, ozonation, mixed oxidants and distillation. He said success of renewable development water projects is based on strategic planning, capacity building, sustainable markets, evaluation and monitoring follow-up.

CASE STUDIES - PUTTING THE TOOLS INTO PRACTICE:

François Münger, World Bank, highlighted the success and sustainability of PV pumping for community water in Mauritania. He noted that solar technology is an appropriate solution for Mauritania's small village populations, but stressed the importance of good operation, maintenance and management on the part of government departments and private water providers.

Elwyn Ewald, Waterhealth International, presented a case study of a business model in Mexico for delivering sustainable water treatment systems to rural and peri-urban areas. He promoted ultraviolet energy technology as a means to produce safe, affordable drinking water from contaminated sources, and said that the system can be powered by renewable energy, particularly solar power. He said advantages of the system include high efficacy, low energy, simple maintenance and installation in remote locations. Benefits include a reduction in morbidity and mortality, productivity gains, improved health care and energy cost savings.

André Verani and Shannon Graham, Enersol, spoke on PV community water delivery in the Dominican Republic and Honduras. They stressed the importance of incorporating concepts of cost-recovery and sustainability through small-scale projects, decentralized service and involvement of local business enterprises. They noted that the lack of a suitable payment collection mechanism has been a major obstacle to water-pumping activities in rural communities and said that the key to

SUSTAINABLE DEVELOPMENTS

success would be to find ways to guarantee revenue stream. They also highlighted the need to develop new mechanisms for community tariff collections, water allocation and systems management.

Henk Alberts, Bombas de Mecate, discussed the use of community rope pumps in Nicaragua. He noted the high production rate and usage of this technology and its integration into many international aid projects. He characterized rope pumps as being highly efficient and available, socially accepted, and easily installed and maintained. He also highlighted the low start-up costs and noted the potential for South-South technology transfer.

Deborah Boldt, International Development Enterprises, discussed the challenges of rural marketing. She highlighted the organization's goal to identify and introduce new and affordable products, such as water pumps, drip irrigation systems, diesel engines and solar technology, to poor rural communities. She noted the importance of local commercial markets and their customers and said that challenges relating to promotion of products in rural markets include inaccessible markets, slow uptake of ideas, traditional and conservative farmers, building the capacity of the supply chain and establishing credibility.

MOVING TOWARD EQUITY AND SUSTAINABILITY IN RURAL ENERGY: PUTTING GENDER CONCEPTS INTO ACTION

A workshop on gender in energy was held on Thursday, 7 December, convening from 8:30 am - 3:30 pm. Dominique Lallement, Energy Sector Management Assistance Programme (ESMAP), and Lisa Büttner, Winrock International, welcomed participants at the opening of the workshop. They noted the growing interest in gender and energy-related issues and the need to integrate these issues at the project level.

PANEL 1: PROGRAMS, NETWORKS, AND CAPACITY BUILDING SUPPORTING GENDER IN ENERGY: Panel Chair Dominique Lallement highlighted the Energy Sector Management Assistant Program (ESMAP), a joint UNDP/World Bank global technical assistance program. She said the current ESMAP business plan includes the establishment of a Gender Facility within the programme, and provided examples of studies, pilot projects, outreach and dissemination activities that are being implemented. She said a leadership program for women in energy would be launched and more networking and new projects incorporating a gender perspective carried out.

Joy Clancy, the ENERGIA Network for Gender and Sustainable Energy, said the Network serves both advocacy purposes and develops concrete case studies, including one in Zimbabwe. She pointed to the need for capacity building on gender and poverty considerations in the private sector in developed countries, since private providers from the North are likely to operate in developing countries as well. She presented a working position paper drafted by ENERGIA to provide input to the Commission on Sustainable Development-9 process.

Jamal Gore, Winrock International, spoke on how to translate gender concepts into practice and advocated using existing tools, such as those developed and put into practice by the African Women Leaders in Agriculture and Development network, to empower women and apply gender sensitive approaches to needs assessments and project implementation. He underscored the importance of "speaking the same language" to bridge the gap between energy, gender and other aspects of development, and emphasized the need for local ownership and ongoing consultation.

PANEL 2: EXPERIENCES WITH APPLYING GENDER

METHODS: Panel Chair Barbara Farhar, NREL, said that the recognition of gender in energy is being institutionalized.

Rekha Dayal, Mallika Consultants (India), discussed how to move gender methods from concepts to frameworks and on to application. She said gender analysis tools are adequate only for highlighting the issues, and that gender consideration needs to be integrated into the real policy tools, such as country assistance strategies. She said that for results to be obtained, commitment, capacity, consistency and funding is needed. She also said there is a need to involve borrowers as well as international financing and other institutions. She highlighted the extensive work that has been done in the water sector on developing gender sensitive performance indicators, and suggested that there are lessons to be learned from this.

Rogério Miranda, Project for the Modernization of Fuelwood Use and Production (Nicaragua), highlighted the development of a high-efficiency stove to conserve forests, improve indoor air quality, and improve the lives of women in Central America. He described a market-based approach to the dissemination of the stoves through the promotion of tortilla businesses run by women. This approach addresses key factors along the supply chain, including how to meet local women's needs, training of women and men for manufacturing the stove locally, as well as the promotion of micro credit management.

K.V. Ramani, Asian and Pacific Development Centre, discussed the ENSIGN project, which aims at providing micro-finance for energy services and income-generating opportunities for the poor. He emphasized that the loans do not have a technology bias and commented that most renewable energy initiatives are technology-driven and not sufficiently focused on income-generating services. Regarding the gender dimension of the project, he said that women constitute the majority of the borrowers and have benefited in terms of reduced labor hours and enhanced self-confidence.

Mukami Rimberia, Winrock Kenya, highlighted a participatory gender approach in the assessment of household on-farm and micro-enterprise use of clean energy systems in Kenya. She said the study, implemented in conjunction with Energy Alternatives Africa, has allowed Winrock to take a needs-based approach to identifying productive opportunities by targeting the right client for the right intervention in support of sustainable development. She noted that among the key findings was a need for greater energy efficiency of traditional technologies, such as kilns and fish drying techniques.

Michael Bamberger, the World Bank, presented on the integration of gender into the World Bank transport program. He said barriers include the assumption of gender neutrality, lack of gender-disaggregated data, and difficulties in scaling-up culturally sensitive pilot projects. He offered lessons for the energy sector, including the development of: an economic rationale for including gender aspects; hard data; well designed, evaluated and documented pilot interventions; and "do-it-yourself" packages for task managers.

Dieneba Cissa, Winrock Mali, presented on renewable energy, gender and energy policy in Mali. She said women should be involved as agents for change, as they are most affected by, and interested in, energy issues. She highlighted lack of access to information and decision-making as well lack of literacy and technical skills as constraints, and recommended training, awareness-raising in technology and women's self-help groups.

Lisa Büttner, Winrock, concluded the session by briefly summarizing the challenges facing the integration of gender and energy and called on participants to identify some next steps for addressing them.

SUSTAINABLE DEVELOPMENTS

SMALL GROUP DISCUSSION AND FEEDBACK: The workshop participants broke into small groups for discussion around three themes: policy, the information gap, and “operationalizing” gender and energy. The small group discussions were facilitated by Hilary Sims Feldstein, International Center for Research on Women; Christiane Frischmuth, Gender and OD Consultant; and Sheila Scott, Winrock International. The small groups reported back on the outcome of their discussions to the workshop in a plenary meeting chaired by Hasna Khan, Prokaushali Sangsad (Bangladesh). Hasna Khan noted the need to disseminate information about gender and energy effectively to the broader development community, and drew attention to the need to address the social dimension of technology. She said issues related to gender and energy should be dealt with in partnership between men and women, and challenged the participants to report one year from now on steps taken to increase gender sensitivity in their own work.

Policy—Identifying key points of influence, barriers, and strategies for getting gender into energy policy (Group A): A rapporteur for the group noted the lack of good strategic models and major barriers for gender-related issues. She suggested building bridges to other sectors, finding allies and involving stakeholders and the public by using the media.

The information gap—Identifying the gaps between the field and the research community to learn lessons and improve energy planning and implementation (Group B): A rapporteur for the group noted a disconnect in the understanding of energy and developmental impact, and a lack of information/data and multidisciplinary research efforts. She highlighted the need for an integrated, sustainable rural livelihoods framework, and called for the use of existing studies and their more effective dissemination, as well as new studies to overcome the gap. She also called for more participatory approaches to data collection and collection of gender-sensitive data, and said donor institutions and non-energy specialists need to be sensitized to energy and gender issues.

“Operationalizing” gender and energy—Identifying strategies for adapting and applying gender methods to energy projects and programs (Group C): Rapporteurs for the group noted the need for tools to bridge the disconnect between technical energy planners and social scientists. They said gender and energy should be mainstreamed, and recommended that legislation requiring gender and energy analysis be passed both in donor and recipient countries. They underscored the importance of gender training, inclusion of women in energy projects, and the development of specific tools to aid practitioners in incorporating a gender focus into their work. They questioned whether energy projects as such are needed, or whether the focus should be on energy components of other development projects.

After a brief open discussion, Dominique Lallement told participants that the messages on gender and energy derived from this workshop would be forwarded to the organizing committee for Village Power, and closed the workshop.

THINGS TO LOOK FOR

GLOBAL FORUM ON SUSTAINABLE ENERGY: This forum will be held at the International Institute for Applied Systems Analysis (IIASA) in Laxenburg, Austria, from 11-13 December 2000, and is

intended as a platform for multi-stakeholder dialogue on issues pertinent to sustainable development. For further information and registration, contact: Amb. Irene Freudenschuss-Reischl, tel: +43-1-263-729120; fax: +43-1-263-7281; e-mail: Irene.freudenschuss-reicjl@bmaa.gv.at

CSD-9: The Ninth Session of the Commission on Sustainable Development will be held in New York from 16-27 April 2001. This session will focus on: atmosphere; energy/transport; information for decision making and participation; and international cooperation for an enabling environment. The topic of the multi-stakeholder dialogue segment will be energy and transport. Prior to CSD-9, intersessional meetings of the Energy Expert Group will be held from 26 February – 2 March. For more information contact: Zehra Aydin-Sipos, Major Groups Focal Point, Division for Sustainable Development; tel: +1-212-963-8811; e-mail: aydin@un.org; Internet: http://www.un.org/esa/sustdev/csd9/csd9_2001.htm#

WORLD SUSTAINABLE ENERGY DAY 2001: This meeting will take place on 28 February – 2 March, 2001 in Wels, Austria. For more information contact: Christine Oehlinger, O.Oe. Energiesparverband; tel: +43 732 6584 4861; fax: +43 732 6584 4383; e-mail: christine.oehlinger@esv.or.at; Internet: <http://www.esv.or.at>

UNFCCC SB-14/RESUMED COP-6: The 14th session of the Subsidiary

Bodies of the UN Framework Convention on Climate Change will take place from 21 May – 1 June 2001, in Bonn, Germany. This meeting may also serve as the resumed COP-6 (as outlined under COP-6 decision FCCC/CP/2000/L.3). For more information, contact: the UNFCCC Secretariat; tel: +49-228-815-1000; fax: +49-228-815-1999; e-mail: secretariat@unfccc.int; Internet: <http://www.unfccc.int>

INTELEC 2001 INTERNATIONAL TELECOMMUNICATIONS ENERGY CONFERENCE: This conference will be held on 14-18 October 2001 at the Edinburgh International Conference Centre, UK. For more information contact Simon Edwards tel: (+44 20) 2709 2000; email: intelec@iee.org.uk

18th WORLD ENERGY CONGRESS: This meeting will take place on 21-25 October 2001 in Buenos Aires, Argentina. The topic covered will be Energy Markets: The Challenges of the New Millennium. For more information contact: World Energy Council, Regency, House 1-4 Warwick Street, London W1B 5LT, United Kingdom; tel: (+44 20) 7734 5996; fax: (+44 20) 7734 5926; e-mail: info@worldenergy.org or 18th-wec@congresosint.com.ar; Internet: <http://www.mbendi.co.za/wec/contact.htm>

UNFCCC COP-7: This meeting is scheduled to take place from 29 October - 9 November 2001, in Marrakech, Morocco. For more information, contact: the UNFCCC Secretariat; tel: +49-228-815-1000; fax: +49-228-815-1999; e-mail: secretariat@unfccc.int; Internet: <http://www.unfccc.int>