

**July 8, 2008 at United Nations Headquarters**

**The International Solar Energy Society and the United Kingdom Mission to the UN  
present:**

**“Latest Innovations in Small-Scale Wind and Other Renewables”**

The Mission of the United Kingdom to the United Nations cosponsored a panel discussion on July 8<sup>th</sup>, 2008 “Latest Innovations in Small-Scale Wind and Other Renewables.” The panel included speakers from the production, installation, and policy areas of the renewable energy industry presenting a comprehensive plan for renewable energy advancement under various circumstances with a focus on local level development in individual and commercial consumption.

To open the meeting, Ms. Roma Stibravy emphasized the current thinking about climate change that makes renewable energy so important to our times. The G8 Summit issued their declaration that morning to cut greenhouse gasses 50 percent by 2050. Also that morning, the General Assembly of the United Nations met on climate change, where the president declared that for his program this year, “climate change is my greatest challenge.” In addition, from the UN Economic and Social Council (ECOSOC) High-Level Substantive Session, the president of ECOSOC issued a statement that “we [nations of the council] are unanimous in our understanding of climate change.” Thus, new steps will be taken to, among other things, facilitate the transfer of renewable energy technology to developing countries.

The first speaker, Mr. Scott Sklar, is president of The Stella Group, Ltd., a strategic marketing and policy analysis firm focused on distributed generation, or the production of electricity from several different renewable energy resources. His clients include different renewable energy product manufacturers, governments, and foundations. With over 25 years in the energy field, Mr. Sklar has written two books and been selected as representative to an UN-created public-private partnership group, The Renewable Energy and Energy Efficiency Partnership (REEEP), specializing in renewable energy.

Mr. Sklar’s presentation framed the discussion with the feasibility of a large-scale transition to renewable energy. Two completely independent studies, sponsored by Green Peace with DRL (Germany’s NASA) and the American Solar Energy Society (ASES) with the National Renewable Energy Society, have confirmed that an aggressive movement towards energy efficiency (smart appliances, etc.) and renewability (solar, wind, etc. energy alternatives), can reduce carbon emissions by between 60 to 80 percent by 2030. The business community has supported this transition with \$200 billion invested in renewable energy in 2007 alone. These technologies will be especially effective if advances are made in resource mapping—a stratagem used to determine what technologies should go where based on their optimum effectiveness in particular locations. Three Tier, a company composed of 40 doctorate recipients, has mapped resources in 2 km squares and can produce diagnoses simply by plugging in coordinates.

While the business and science communities have been coming together, Mr. Sklar said a policy consensus has formed within governments as well. Europe's approach has been to adopt feed-in tariffs, or premium prices set by the government for energy produced renewably. The United States has focused on portfolio standards—percentage requirements for renewable energy out of the total energy produced by utilities. The World Bank and the Inter-American Development Bank have begun to integrate renewable methodologies into their developing country infrastructure loans to help them overcome the higher initial capital costs of the technologies. Sklar says that “[Long-term loans] do make, fundamentally, all the renewables cost-competitive, cash-flow positive, if you can get [the term] between 15 and 25 years, no question.”

Mr. Sklar noted that the breadth of renewable options is expanding. For building based power, solar thermal and geothermal exchange are the newest rage. Larger scale projects consist of concentrated solar plants, including eight currently being built in Spain. Photovoltaics have seen major changes. Now they are available as UniSolar solar roofing shingles or as print-outs on an every-day printer through Konarka. Wind has branched out into large-scale wind farms and small-scale home applications. In light of the current food crisis, biomass production is moving from foodstock sources to cellulosic sources (waste, sewage, algae, etc.). Water as a renewable energy source can be utilized through three tracks: tidal, wave, and free flow hydro. Geothermal energy systems can now function in reservoirs of less warmth.

To transform these varied technologies into an integrated energy system world wide, Mr. Sklar argued that there must be a global consensus on four points. The first was that of the resource mapping previously mentioned. Mr. Sklar questioned that if you would never drill for oil without first mapping the area to know it was there, why would you not do the same for renewables? The second point was the need for “standardized modular technologies, components, storage, and interconnection.” How do you “scale up and lower costs” without some sort of standardization and compatibility across the system, allowing for the integration of multiple renewables? A global consensus must also be reached on the need for renewable projects to be web-enabled, allowing for performance diagnostics to be done from afar. Most failures in the field, Mr. Sklar testified, are not failures of the technology but of the service provider and their knowledge base. Finally, Mr. Sklar advocated for increased length of term financing and bundled projects, or projects that incorporate maintenance and include replacement parts in the deal.

Mr. Andy Kruse, Executive Vice President for Business Development for Southwest Windpower, co-founded the company in 1987 and has built it into the world's leading producer of residential scale wind generators. Today, more than 100,000 of Southwest Windpower's wind generators have been sold in 120 countries. As an advocate of residential scale renewables, Mr. Kruse has written articles, won awards, and serves as the Chair of the Small Wind Committee of the American Wind Energy Association.

Southwest Windpower employs a little over 100 people for an entirely self-contained operation—all the processes of design and manufacture occur at their Flagstaff, Arizona headquarters. Mr. Kruse attributes his company's success to their focus on reliability,

noise reduction, and cost-effectiveness. They predict future success with improved blade technology, more efficient operation, and web-enablement.

Southwest Windpower uses two methods to harness wind energy with three distinct products. Micro-grid systems are stand alone systems that use several different renewables to charge battery banks and ensure 24-7 power. Grid-connected systems use the existing energy grid as their battery, resulting in a reduction of energy bills or a crediting to energy consumption accounts. Southwest Windpower's Skystream wind turbine was built especially for this set-up and can be used in residential environments. The *Whisper* model is Southwest Windpower's wind turbine for larger applications such as water pumping and telecommunications projects. *Air* is the typical stand alone model, showing the most potential in developing world villages and sailboats.

However, the wind energy movement is expanding beyond Southwest Windpower due to increased worries about climate change and energy dependence. Today, large companies such as Conenergy and SMA Solar Technology are capitalizing on the huge possibilities. On a smaller scale, communities have silenced their worries about sightlines in wind turbine installation. Berkeley has even passed an ordinance permitting 60 ft towers in every person's backyard. The United States national energy consumption per hour is 900kW. In the Northeast where air conditioning is used minimally, that number lowers to 500kW. Small-scale wind turbines can produce up to 400kW per hour, almost eliminating an electric bill. Southwest Windpower's turbines are a \$12,000-\$14,000 investment—everything (installation) included—that may be well worth it. In the developing world, a 400 Watt wind turbine costs between \$500 and \$800 and can provide energy to at least one, and perhaps two homes.

Mr. Kruse highlighted the various locations in which Southwest Windpower turbines are being used. Former President Bush has a Skystream turbine in Kennybunkport, Maine. Offshore oil rigs use them to power rig batteries. A bar owned by a woman in the Dominican Republic has received four times the business since a lighting system using the electricity from a turbine was installed. In an ambitious \$80 million project, Southwest Windpower is working with the Maldiv Islands' government owned utility to transition from 100 percent diesel consumption to an overall upgrade in infrastructure which includes 70 Skystream turbines and cleaner propane generators. The Maldiv Islands are not able to bargain down their oil prices and must buy diesel off the open market, resulting in a subsidized \$0.75 per KW/hour rate and a strangulation of their economy. This huge development project—the second or third largest in the country's history—will be funded by a Ministry of Tourism CO<sub>2</sub> tax on tourists travelling by air.

Mr. Kruse was quick to summarize the lessons he has learned since entering the renewable energy industry. One hundred percent subsidized systems do not work. Consumers must have value invested in the systems. Likewise, governments should eliminate monopolized energy systems to allow for more diversity of supply. In addition, dealer networks need to be developed to disseminate this technology. Dealers and consumers need to make sure they are dealing with quality equipment. Finally, there

cannot be “too many hands” in the industry—excessive middlemen drive prices up, slowing the industry.

Mr. Stephen Gitonga is an Energy Policy Specialist in the United Nations Development Programme’s Sustainable Energy Programme, Environment and Energy Group, Bureau for Development Policy where he advises on growing energy access for Sub-Saharan Africa. Previously, Mr. Gitonga worked for the GEF Small Grants Programme (SGP) for nearly 6 years as the Climate Change Programme Specialist. He has produced over forty thematic publications on energy, environment, and development.

Mr. Gitonga outlined the structure of the grant program at the Global Environment Facility (GEF) where grants are categorized by those up to \$5,000,000 and \$1,000,000, and the Small Grants Program of up to \$50,000. The small grants program targets, in particular, the 2.5 billion people on earth who do not have access to modern energy systems. Mr. Gitonga visually presented the program’s targeted demographic by displaying a map of the world under the cover of night, with Africa at its center. Areas with access to modern energy systems were visible by the glow of electric lights. Most of these centers were on the coast of Africa, while the 70 percent of the population in the middle laid in darkness. These are the “most energy poor.” They do not have access to grid systems, and thus the GEF’s small grants program focuses predominantly on renewable energy and not energy efficiency. Energy efficiency implies that the population has the energy to begin with. The small grants program is looking to benefit those disconnected from the power grid.

Small Grants Program proposals are grass-roots driven coming from local and community-based NGOs proposing projects that they can manage themselves. GEF removes the market barriers and allows private industry to enter by injecting this first bit of capital into the local economy. That local economy can then utilize these resources to supplement their already available social capital.

There are three main local consumers of the energy provided by renewable resources in the developing world. The first are the microenterprises. Energy leads to increased possibility for commerce. Something as simple as charging a cell-phone battery can make a world of difference. The second use of the energy is that of the individual within a household. Finally, the most often overlooked use is the mechanical—energy used for pumping water, irrigation, etc.

There are particular challenges to the emergence of renewable energy systems in the developing world. First, many rural inhabitants are aware of the technologies available, but have no way of obtaining them, either due to monetary restrictions or supply failure. In addition, communities in the developing world do not have large battery banks to store energy all day. Thus, a system must be developed that can meet the needs of these villages on a 24 hour basis. One important solution is to provide renewable energy technologies to national ministries of health, water, and agriculture for distribution. The services that these ministries provide require power. Advocates could promote their cause by offering renewable energy to these ministries as a more efficient way to fulfill their

functions. These ministries could facilitate power purchasing agreements that bundled energy systems and sold them to communities. On the other hand, it was argued that leasing would be the best route for small communities, as it would eliminate the risks associated with the output variability of some renewables.

Overall, Mr. Gitonga highlighted the theme of the panel discussion when he declared that a transition to renewable energy is possible, but it will require government grants, private sector involvement, and local community investment and support.