

Renewable Energy for Development

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The CDM after Montreal: assessing the dividends for renewables and development

by Michael Lazarus, SEI

Editor's note: The future direction of the Clean Development Mechanism (CDM) was a major issue at the recent Montreal climate conference. A number of decisions were taken on project eligibility and guidelines, although several concerns remain unresolved. While the CDM has worked fairly well from the perspective of economic efficiency, it has been less successful in promoting renewable energy and stimulating sustainable development. This article highlights conference outcomes relevant to renewable energy for development, and suggests some future directions that might enhance development benefits and promote the expansion of renewables.



Conference leaders at the conclusion of COP11/MOP1 in Montreal

winds swirled outside, delegates from 189 countries negotiated long hours inside the Palais de Congres. Observers from business and NGO communities partook in dozens of “side events” – a conference of ideas within the conference of negotiations – and others intensively lobbied the delegates.

The CDM was among the hottest topics both inside and out of the formal negotiations. The basic administrative rules of the CDM – the so-called Marrakesh Accords – were formally approved at the negotiations. Formal approval was indeed a crucial step, as this made the CDM “official”. However, these rules are incomplete and open to multiple interpretations. As a result, side events and ne-

When the international negotiations came to a close at 6 am on a frigid December Canadian morning, the spin machines swung into action. Ministers exalted in their 40-odd “decisions”, press statements flowed forth with praise and a renewed air of optimism pervaded headline stories across the globe. Agreements among the countries with binding emissions commitments pulled the Kyoto Protocol from the abyss into which it could have easily fallen. Other major emitters outside the Kyoto limits, including the US and major developing economies, agreed to join in a dialogue about long-term actions.

Overall, the Montreal conference outcome exceeds most expectations. But when the dust finally settles, what will the optimism and detailed decisions really add up to? In particular, for RED readers, what will they mean for renewable energy and development?

COP/MOP in Montreal

Montreal was the setting for the Eleventh Session of the Conference of the Parties to the UN Framework Convention on Climate Change and the historic First Meeting of the Parties to the Kyoto Protocol. While the snow and cold

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gotiations focussed on several long-standing concerns, from additionality to inequities among regions and insufficient delivery of sustainable development benefits. In the end, the Montreal meeting addressed many – but certainly not all – of these concerns.

CDM moving forward

Despite many dire predictions and loud complaints to the contrary, it is now clear that the CDM market is “working” and that this market will continue to develop and expand as a result of the Montreal decisions. About 500 CDM projects are in the formal validation pipeline, and over half of these are renewable energy activities. Hundreds more are under development. The first 80 or so projects are already officially registered and capable of generating real revenue from their Certified Emission Reductions (CERs). Prospective CER buyers have now parked over \$5 billion in carbon funds. Big money and big actors are now in the game.

The administrative infrastructure (the CDM Executive Board along with its panels and supporting staff) appears to be, at long last, adequately funded. Procedural bottlenecks that have plagued many a project participant should dissipate over time. Transaction logs will be established, which will facilitate the needed liquidity in the market. Other decisions taken in Montreal call for capacity-building and other actions to address the inequity in the regional distribution of CDM activities, especially for Africa, which has attracted only about 4% of the expected credits (see Chart 1).

Programmes, as well as projects, are now eligible for CDM support, one of

the major – although somewhat overlooked – accomplishments from Montreal. These decisions open the door for governments to establish enabling policies, such as the appliance efficiency standards proposed in Ghana, and for CDM money to flow to related implementation activities. These new rules also make it easier to bundle many small project activities together (e.g. stove or biogas projects), vastly reducing transaction costs. These changes allow the CDM to be more easily tapped in support of decentralised energy options with strong linkages to sustainable development goals.

Decision on biomass projects

A recent controversy regarding a decision on projects that claim credit for avoiding use of “non-renewable biomass” appears on the way to resolution. Under the Marrakesh Accords, projects cannot claim credit for emissions reductions from avoiding deforestation. Regardless of the merits of this decision, by logical extension, projects avoiding the use of “non-renewable” biomass should also be ineligible to the extent that such CERs result from avoiding non-renewable harvest of biomass, i.e. deforestation.

Unfortunately a formal project category for non-renewable biomass existed for two years before the Executive Board made the decision to disallow such crediting. Not surprisingly, a backlash has ensued, since the disallowed projects (e.g. improved stove or village-level fuel-switching projects) are those typically aimed at less developed countries (LDCs) and lower-income communities, which are so notably underserved by the CDM

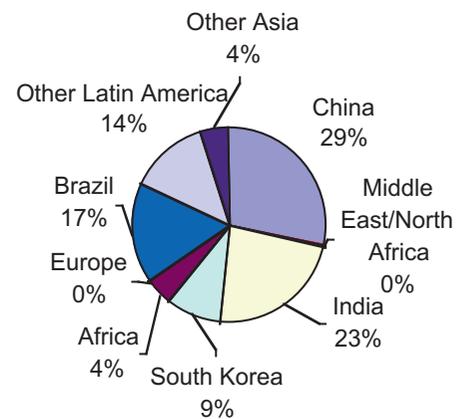


Chart 1: Shares of expected annual average Certified Emissions Reductions, CERs

to date. The good news is that the Executive Board realises this dilemma, and it is quite likely that new methodologies will emerge without directly implying credits for avoided deforestation (e.g. based on eventual displacement of kerosene).

So what's not to like?

Judging by the countless side events calling for improvement and streamlining of the CDM, there remains a fair bit of unhappiness with the rules for the CDM. The Montreal decisions addressed some of the articulated concerns, but several others are fundamental to the CDM itself, and they won't go so quietly into the night. A number of the key unresolved concerns are outlined briefly below.

Post-2012 paralysis

It's simple economics – no demand, no supply. The Montreal decisions call for discussions on how the system should be structured after the first Kyoto compliance period ends (2012), but without clear

The Stockholm Environment Institute (SEI) is an international research institute focusing on sustainable development. The Institute works through an international network of centres, associates, and field staff around the world.

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signals for emissions reductions commitments, buyers and funders will become increasingly reluctant to support new projects. The problem becomes especially acute for projects with longer lead times or that depend on many years of revenues to amortize high capital costs, a situation that characterises many renewable energy projects.

Yet another round of emissions reduction commitments for a five-year period (e.g. 2013-2017) won't solve the basic problem, even if agreed to by 2008 (being optimistic). By that time it will again be too late to leverage a significant number of additional renewable energy projects through the CDM. Lead times of 3-5 years to get projects up and running mean that CERs could be reliably generated for 6 years at best, and fewer in most cases.¹ Given that the CDM remains perhaps the most widely anticipated source of international support for new renewable energy efforts in the South, this dilemma suggests that new approaches to support renewables will be needed.

Renewable energy finance

It has been widely observed that CDM revenues do not solve the fundamental challenge of project finance for renewable energy projects. Guaranteeing a market for CERs well beyond 2012 is a key element to overcoming the reluctance of financiers, so too is the low price of CERs (about \$10 per ton CO₂) relative to the incremental cost of many renewable energy projects.

So where's the "development dividend"?

The CDM is undeniably a political animal, and much like a typical politician, it makes more promises than it can ever reasonably deliver. As defined within the

Kyoto Protocol, the CDM promises both economic efficiency for Annex 1 countries and sustainable development and technology transfer for non-Annex 1 countries. Now in place, the CDM's true colours show. The primary demand for CERs, the CDM commodity, comes from the fact that Annex 1 parties can acquire them more cheaply and easily than they can create emission reductions at home. The \$5 billion invested in the CDM market is there because countries need a large number of CERs to help meet their Kyoto obligations.

Application of sustainable development criteria is the domain of the in-country Designated National Authorities (DNAs), who have yet to reject many prospective CDM projects on this basis. The Chinese government recently and quite wisely agreed to tax industrial gas (HFC23 and N₂O) projects (which account for nearly half of the CDM market in CERs) to the generous tune of 65%, with the promise of putting the revenues to work toward Sustainable Development goals. However, until the well runs dry on industrial gas and other low-cost projects with high emissions reduction potential, renewable energy projects will fail to compete effectively in the CDM market.

A recent and widely-circulated report lamented the failure of the CDM to deliver its much-anticipated "development dividend".² Though not necessarily intended, the choice of the term "development dividend" itself is quite telling. In financial markets, dividends represent the cream of profits that companies choose to skim off and share with their investors; dividends are good for business, but *not* central to the *actual function* of the markets. So too, in the case of CDM, one can ask whether sustainable devel-

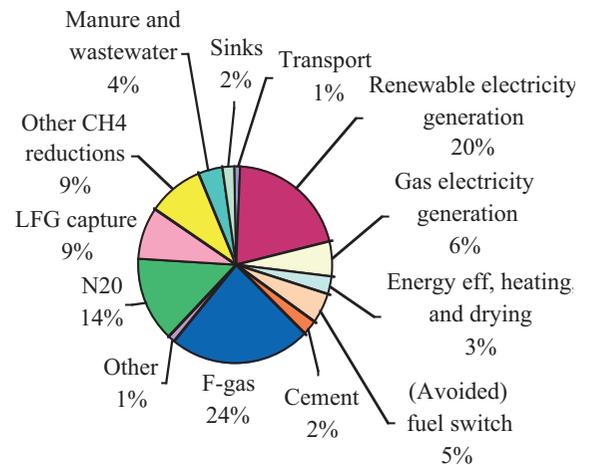


Chart 2: The CDM market share

Source: *The Developing CDM Market*, Jane Ellis, Ellina Levina, OECD/IEA Information Paper (2005)

opment is now merely the occasional dividend of a much-larger market mechanism.

The role of capacity-building

Although capacity-building can help, it won't address fundamental regional inequities. There is no question that various capacity-building initiatives have helped to strengthen DNAs, raise awareness of CDM opportunities, and identify potential projects in smaller and less-developed countries. Voluntary efforts also have a role, such as the World Bank's Community Development Carbon Fund, which sets aside some fraction of investment for the Least Developed Countries. But market fundamentals once again mean that the big CDM money will tend to bypass smaller and poorer countries.

Price competition is in the nature of markets

When renewables have to compete against industrial gas projects that cost as little as \$1 per ton CO₂³ to implement, not surprisingly, they lose. And yet delivering low-cost emissions reductions is sign that CDM markets are working

¹ Assume, under an optimistic scenario, that a decision to commit to a second commitment period (2013-2017) is made in 2008 by Kyoto parties or a subset thereof (e.g. the EU). If a project developer can then put a project into operation in 2011, then only 6 years remain before the 2nd commitment period would end.

² "Realizing the Development Dividend: Making the CDM Work for Developing Countries," International Institute for Sustainable Development (IISD), www.iisd.org, May 2005.

³ \$1/t CO₂ translates to about \$0.001/kWh in a coal-based electricity system, and even less elsewhere.



Peoples' concerns about Climate Change were expressed in this wall mural

to deliver economic efficiency, a central goal indeed, but not the only one.

Renewables' share of CDM projects

Although 20% of the current CDM market (and half of all projects) in renewable energy may not sound disappointing, it isn't so impressive either. Some would argue that a number of renewable energy projects in the pipeline have been only mildly assisted to fruition by the CDM, i.e., their additionality is questionable. The presence of the CDM provides a helpful if small market signal for more renewables, and a useful high profile context to draw finance and attention to prospective projects. But for now, at least, it is not making a major dent in business-as-usual power sector development, or in other renewable energy markets (off-grid, biofuels, etc.).

Additionality... here we go again

The Montreal decisions reopen the Pandora's box called additionality – the quest to ensure that the CDM is a catalyst for new projects and investment, and not just icing on the cake for projects that would have gone ahead regardless. The latter outcome not only offers no sustainable development benefit, it effectively increases global emissions. However, the tools cur-

rently used to indicate additionality are far from perfect. They ask project proponents to show how their project overcomes barriers and exceeds common practice in a given context. Despite wide variation in how these tools can be applied, some view them as a hindrance to project development, and others as a necessary safeguard. The Montreal decisions reopen the additionality debate, yet amid common misperceptions and highly partisan lobbies, significant advances are unlikely.

Ironically, the additionality question is most easily resolved for the project types that provide the fewest sustainable development benefits. Projects involving the destruction of methane and other high warming potential industrial gases have few motivations other than CDM revenues. The more that a project already provides local benefits, the harder it becomes to detect the CDM signal from the noise of many actors already working to implement it. This situation suggests that support for project types with high development as well as emission reduction benefits, such as renewable energy, might be better addressed through a different set of rules or a new mechanism altogether. It may simply not make sense for renewable energy or other high local benefit projects (energy efficiency, mass transit, etc.) to compete head-to-head with projects like HFC and N20 destruction.

Where to next?

After some early growing pains, the CDM appears to be on track for success as an instrument of economic efficiency, and to a lesser extent, one of technology transfer – it will help Kyoto parties to meet their commitments, and several billion dollars and some new technological expertise will flow to developing countries. It will require a post-2012 signal fairly soon to avoid collapse, but the market fundamentals are there. The CDM is proving to be an effective tool that should be strengthened and maintained, *for what it does well, i.e. deliver economic efficiency*. The CDM should also retain and strengthen its sustainable development provisions.

However, perhaps it's time to stop tweaking and torturing the CDM to deliver the type and scale of support needed to address both the climate and sustainable development challenges. It's time, arguably, to reopen the discussion on a CDM variant or another mechanism that can target the projects, programs, and policies that simultaneously promote development and climate change mitigation, and avoid being at the mercy of competition with project types that provide mitigation without development benefits. Such a parallel mechanism could aim to directly target support for renewable energy or energy efficiency, for example.

A "political realist" might suggest that CDM is the only game in town, and that it is folly to complicate an already delicate negotiation process with notions of a new mechanism, especially one that might venture into the perilous realm of defining cross-cutting criteria for sustainable development, or "picking winners" like renewables and efficiency. However, without such a discussion, we might still be looking back another precious decade from now, wondering yet again what happened to that much-awaited development dividend. ■

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Lighting the Darkness: A case study of improved energy conditions in a tribal forest village in Madhya Pradesh, India

by Abhishek Kar, Indian Institute of Forest Management, Bhopal

“Turn your face to the Sun and the shadows fall behind you”: Maori Proverb.

India has installed electric power capacity of 123542 MW¹ with transmission and distribution losses averaging about 25%.² Over 78 million rural households don't have electricity while those that do face erratic power supply and voltage fluctuations (due to 9% peak demand deficit¹). To attain the objective of “Power for All by 2012” the Government of India is taking steps to generate and store electricity closer to the point of consumption (distributed generation) in order to reduce distribution costs and transmission losses while improving the quality and reliability of electricity.

Solar energy for rural India

Solar energy can help to fulfil rural India's energy needs, particularly through solar photovoltaic (PV) cells, which convert incident solar radiation directly into electricity at 10%-15% efficiency. Being modular in nature, PVs can be installed in any capacity based on the specified requirements. India, a tropical country, receives 5 trillion MW⁴ of solar energy, or about 4 to 7 kW/m² depending on location factors. The installed capacity of PVs in India is currently about 86 MW.³ It is estimated that 324,293 so-



Map of India. The approximate location of Yarnagar village, Madhya Pradesh State, is indicated in red

lar home light systems and 53,125 solar streetlights⁵ are currently used in India, mostly in rural areas.

In 2002, under the Integrated Rural Energy Programme (IREP) in Madhya Pradesh, a pilot project was initiated to provide alternative energy sources in 30 remote villages, one of which was Yarnagar. The implementing agency was the Madhya Pradesh Urja Vikas Nigam (MPUVN), which is the State nodal agency for promotion of renewable energy. This project helped to “light up”

⁵ http://mnes.nic.in/annualreport/2004_2005_English/ch5_pg9.htm *

the lives of the tribal villagers of **Yarnagar**, essentially all of whom live below the poverty line.

Yarnagar Village socio-economic profile

Yarnagar is a typical Indian village and is located in the heart of a dense forest under the jurisdiction of Rehati Range of Sehore Forest Division. It is 108 kms from Sehore town and 8 kms from the nearest road that is accessible by motor vehicles, located in Semari. It was a barren land until 1960 when a clan of Bhil Tribesmen named Bareli settled down there. The Forest Department was happy to accommodate their move, since at that time there was often a shortage of daily labourers. Over the years they have built “kuccha” (clay) huts around their small patches of agricultural lands.

The villagers work as agricultural labourers – harvesting millet and maize for two-thirds of the year. A few relatively better-off families also harvest gram, paddy and wheat. For the remaining four months they either work for the Forest Department at a wage of Rs.50/day or as migrant labourers in cities for Rs.40/day, toiling from 8 am to 5 pm. All families have livestock, the “poor man's capital”. They don't have agricultural loan facilities and must arrange loans from money lenders at exorbitant interest rates of 24% to 120% .

Table 1: Yarnagar at a glance (as of 8/9/2005)

Population	223
Male: Female	1:1.3
Number of Households	32
Sample Percentage of Households	43.75
Average Household Land Holding (Acres)	2.715
Average Household Livestock Ownership	11.2
Average Annual Household Income (Rs=Indian rupees)	6500
Average Annual Household Income* (EURO)	123

¹ http://powermin.nic.in/JSP_SERVETS/internal.jsp *

² Gokak Committee Report on Distributed Generation, 2003, submitted to GoI.

³ http://mnes.nic.in/annualreport/2004_2005_English/ch2_pg3.htm *

⁴ Banerjee, R., 2004, Comparison of options for distributed generation in India. Carnegie Mellon University, USA.

*Accessed on January 1, 2006.

The path towards electrification

There was no chance of conventional grid-based electrification of the village in the foreseeable future. The Indian Supreme Court strictly bans any electrification if it causes harm to Indian Forests. As with about 120,000¹ other villages in India, the villagers in Yarnagar had never experienced light in the midst of darkness. When Mr. R.R.Tripathy, District Rural Energy Officer (DREO) explained the idea of solar electrification to the villagers, they were at first quite sceptical. They had never heard of anything like that and there was apathy (if not antipathy) towards the government, its projects and its personnel.

However, the enthusiasm and dedication of officials infused interest in villagers that helped to propel the project forward. The village of Yarnagar had access to solar electricity by the end of 2002 under the USHA KIRAN URJA GRAM YOJNA (Solar Energy in Village Programme). The total cost of the project was Rs.385,065. The Ministry for non-Conventional Energy Sources (MNES) provided 37.65% of the total amount; the government of Madhya Pradesh under the IREP programme contributed 41.46%; and “Janpad Panchayat” (Local Governing institution), Budhni, chipped in with the balance.

Administrative issues

The villagers elected a 10-member Energy Committee with AapSingh Barela (village head) as President, who pledged full support from the villagers’ side. It was made responsible for security of the installed products, collection of fees from villagers and maintenance issues. The committee nominated Kailash Singh (village primary school teacher and the only literate adult in the village-intermediate collegiate) as the “Maintenance In-Charge”.

A joint account of the DREO and the President of the Energy Committee was opened in a nearby bank with a nucleus fund of Rs.50,000, provided by the government. A monthly honorarium is paid to Kailash out of the interest received from this amount, which is kept as a fixed deposit. Each beneficiary household was

required to deposit Rs.40/month, to that account, to build up a fund for the replacement of batteries every five years. Kailash was given a tool-kit for minor repairs and day-to-day maintenance after successful completion of training in the Centre for Energy Studies and Research, Indore.

Service installation

Technicians from REETIKA, a solar manufacturer from New Delhi, installed one PV home lighting system and one “Improved Chula” (clay oven operated by fuelwood) in every village household. Two influential villagers (Kailash and his brother AapSingh) were also given solar cookers on an experimental basis. In addition, five street lights were placed at various strategic points after consultation with the Energy Committee. The manufacturers provided a two-year warranty and a four-year annual maintenance contract. The technicians conducted a brief training session for the villagers.

Unfortunately the solar cooker was not successful, mainly because of three reasons:

- (1) It cooks too little for one family’s consumption, providing barely enough food for one hardworking male tribal farmer.
- (2) Traditionally, villagers cooked daytime food early in the morning for the entire family, thus saving fuel wood. The male workers go to the fields after a meal at 8-9 am. But solar-cooked food may not be ready until 12 noon when they don’t need it.
- (3) There seems to be a lack of awareness and interest among females about use of the solar cooker. They feel that the cooker is useful only for tasks such as boiling eggs, potatoes and cucumber seeds (used in tribal delicacies). Recipes oriented to the capabilities



Outdoor activities in the evening

Photo: Abhishek Kar

ties of the solar cooker should have been taught to them.

Use of the “Improved Chula” has proved to be a boon. Rough estimates suggest that using a traditional Chula, a typical household of six members needs twenty kilograms of fuel wood every day for cooking two meals a day. With use of “Improved Chula” there is a 25% decrease in fuel wood consumption leading to savings of about 5kgs per household per day. Over fifty tons of fuelwood is thus being saved annually in Yarnagar.

Lighting the village

Streetlights are truly a blessing for the villagers. Earlier mothers were afraid to send their children to neighbouring houses. They have learned that wild animals avoid the lighted surroundings. So the streetlights give them enough courage to lead small groups of children to study together in evening. The elderly now go to answer nature’s call at night with less fear of snakes, bears and occasional tigers.

The PV home lighting system has had an amazing effect on people’s lives due to its effectiveness and simplicity. On average villagers get six hours of cool white light every night. Even on the worst of cloudy days the duration of glow is more than two hours. It has provided them with three distinct benefits:

- a) Earlier they had to cook under the dim light of kerosene lamps and eat in virtual darkness, occasionally ingesting small insects along with the food. Now cooking

and dining at night is more comfortable.

b) Earlier the children only studied at noontime after lunch when they felt sleepy, while the afternoon was for playing. At night they did not want to study under a kerosene lamp, as it strains the eyes. Moreover, most families could not afford to burn the lamps for long hours. Now the children study comfortably under a solar lamp giving light intensity equivalent to a 60-watt conventional electric bulb.

c) On average, a half litre of kerosene is consumed to burn one lamp every evening. Every two-room household used about one litre of kerosene everyday for one lamp in each room. For 250 days (the rest of the time they are out of the village as migrant labourers) each household expended Rs.2500 (250 litres @Rs.10/litre). Now it has halved (one lamp still needed for another room) leading to a savings of Rs.1250 p.a., which is 20% of the average monthly household income.

For the last three years the project has been running successfully without any major damages or repair needs. Maintenance is carried out regularly. MPUVN officials are in regular contact with the villagers and showcase Yarnagar as a model village. Solar electrification has elevated the status of Yarnagar among neighboring villages, instilling a distinct sense of pride among the villagers as well as improving the quality of their lives. Even quieter members of the village now advocate installation of other solar appliances. The project's success has been reported in national media like "Aaj Tak" and "Dainik Bhaskar".



Evening lessons for children in the village

Scope for improvement

There is nevertheless scope for improvement, including in the functioning of the Energy Committee, the take-up of new energy services, and the financial arrangements. The "Improved Chula" was not an instant hit among all families as some did not want to switch from what they were used to. At the same time, there was little effort on the part of Energy Committee to educate/counsel the villagers who were resistant to change.

The comparatively better off "Patels" (small businessmen) of the village had essentially become permanent defaulters, not paying the paltry sum of Rs.40/month. Though discussed in Committee meetings, no punitive measures were taken against them. Observing that no action was initiated against 'Patels', other villagers followed suit. Kailash, also the collection agent, became frustrated as the list of defaulters was increasing day by day. The situation later improved through the intervention of MPUVN. It is clear that the Committee needs to be more proactive and consistent in its approach.

Conclusions

The essence of the success of this project is that it proves that management of such projects on long-term basis at village level is possible (belying opposition of sceptics who call solar projects a "management nightmare") even by "illiterate and poor" villagers with minimum intervention from external agencies. Comparing the market-valued solar systems with heavily state subsidised conventional electricity and labeling the former as "prohibitively costly" is grossly unfair. The cost of solar electrification needs to be weighed against the opportunity loss and social cost of non-electrification of about 25,000⁶ remote villages, where conventional electrification is not only economically infeasible but also technologically daunting.

India has the potential to generate 20 MW/km² using PVs.³ So the need is for large-scale



Enjoying light after dark

adoption of solar technology to provide clean and affordable energy to the deprived sections of rural India. This "mature" technology is scientifically proven as the "preferred option for small remote systems"⁷ used in villages. Bold policy vision and collective efforts of Government agencies, people's representatives, experts, NGOs and the public can create eco-friendly, economically feasible, reliable, virtually inexhaustible and self-sufficient energy units in remote villages. It is interesting to note that it is projected that by 2030, India's oil import dependence will be 94%.⁷ The case of Yarnagar exemplifies a new means of increasing energy self-sufficiency by adopting solar systems and reducing the burden on the country's fuel economy.

Note: All amounts mentioned are in Rs. (Indian Rupees); 1 Euro ~53 Rs.

⁶ http://mnes.nic.in/annualreport/2004_2005_English/ch2_pg2.htm *

⁷ World Economic Outlook 2002, International Energy Agency.

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Conference Report: Beijing International Renewable Energy Conference (BIREC) 2005

by Yong Chen and Francis Johnson, SEI

The Beijing International Renewable Energy Conference was held last November with the goal of fostering improved international cooperation on renewable energy technologies. The meeting included Minister-level addresses, plenary sessions, four parallel forums, an assembly of the delegates, and a number of side events. The Beijing Declaration on Renewable Energy for Sustainable Development was adopted with endorsements from the country delegations as well as the support of many international organisations and NGOs.

A high-level international conference on renewable energy was held in Beijing 7-8 November 2005, with a special focus on how to widen deployment of renewables for sustainable development in both developed and developing countries. The meeting also emphasised business opportunities and commercial partnerships. The Conference attracted more than 1,000 participants from nearly 100 countries, including about 30 Ministers of Energy or Environment.

The Conference was organised jointly by the National Development and Reform Commission of China (NDRC) with support from four sources:

- German Federal Ministry for Environment, Nature Conservation and Nuclear Safety
- German Federal Ministry for Economic Cooperation and Development
- United Nations Department of Economic and Social Affairs
- European Commission

Follow-up to Bonn

This follow-up of the Bonn Renewable Conference, which was held in May



Session at the BIREC Conference

2004, not only highlighted the important role that developing countries are playing in addressing intricate energy-and-development issues, but also signalled the trend that development of renewable energy sources is no longer led only by OECD countries, as pointed out by Stavros C. Dimas, EU Environment Commissioner, in his opening remarks. The Conference also highlighted the increasing cooperation between the EU and China, which has arguably become the most significant axis of global cooperation on renewable energy.

Being the largest developing country and recognizing the growing energy demand in other developing countries, China has made considerable efforts to promote South-South cooperation, complementing the North-South cooperation framework established in the Bonn conference. This also indicates that some larger and/or more technically-advanced developing countries are taking the lead in developing and disseminating modern technologies to exploit renewable energy sources. Beyond that, the South-South cooperation provides a valuable developing country platform for exchange of information and experiences with policy and institutional issues, tak-

ing advantage of commonalities in their socio-economic situations and political goals.

Conference sessions

The Conference consisted of receptions, opening and closure sessions, plenary sessions, side events, evening dinner/entertainment, exhibitions, and parallel forums with dedicated themes. Side events were sponsored by companies or international groups and were held mainly during lunch-time or in the evenings, while exhibitions ran throughout the conference.

A pre-conference reception was hosted by REN21, the Energy Policy Network for the 21st Century (www.ren21.net), whose members are mainly policy-oriented professionals based primarily in OECD countries. Copies of the Renewables 2005 Global Status Report, a concise and informative summary of world renewables prepared by the Worldwatch Institute, were distributed during the reception.

The high-profile plenary speakers on the first day of the Conference emphasised a similar message with regard to energy, environment, and development: that energy supply from renew-

able sources has an important role in mitigating climate change, reducing poverty, and realizing the transition towards sustainable patterns of economic development. Furthermore, they also emphasised that expansion of renewables required international cooperation and broad collaboration.

In parallel to the politically-oriented plenary conference, the following forums took place:

- Investment and Finance Forum
- Renewable Energy Industrialists and Entrepreneurs Forum
- Renewable Energy Technology Forum
- South-South Cooperation Forum

A brief summary of each forum is provided below.

Investment and Finance Forum

At the Investment and Finance Forum, the focus was almost exclusively on China, given the huge potential market and enormous business opportunities. Participants indicated awareness that money for renewable energy development would not become available without the creation of an attractive investment environment. A number of speakers from the banking sector, including Klaus Gerhaeusser of Asian Development Bank, Peter Pischke of Kfw, Zhuang Laiyou of China Development Bank and Jamal Saghier of the World Bank, not only analysed the challenges but also put forward innovative models and presented successful cases in terms of financing renewable energy development.

The prospects for renewables in China were underscored by China's ambitious targets for renewable energy development, for instance 30 GW generation capacity of wind power by 2020 compared to the current 30 kW, as presented by Mr. Wu Guihui, Vice Director General of Energy Bureau of NDRC. However, without a massive amount of investment, this will not materialise. Mr. Wu stated that 1.5 trillion Chinese Yuan (equivalent to approximately 187 billion USD) was needed for achieving the targets by 2020, of which 200 billion Yuan (approx. 25 billion USD) would go to additional wind power installation.

Renewable Energy Industrialists and Entrepreneurs Forum

Similar issues were discussed from other perspectives in the parallel event, Renewable Energy Industrialists and Entrepreneurs Forum, also known as CEO Forum since thirty CEOs from the world's leading renewable energy manufacturers and developers attended. In the face-to-face debates among CEOs and the policy dialogues with important policy makers including Vice Director of NDRC Zhang Guobao, the German Environment Minister Jürgen Trittin, the British Secretary of State for the Environment Margaret Beckett, the focus was on how to create an enabling environment with an effective political framework and market-oriented supportive schemes, that would allow development of renewable energy industry to be self-sustained when the governmental intervention is phased out.

In addition, the renewable energy industry appealed to bring renewables from the margin into the mainstream of the current energy system, implying a need to change the fossil-dominant mindset of many energy policy makers. The CEOs urged that least-cost energy planning be replaced by portfolio-based energy planning, and that energy pricing systems be revisited and modified in order to level the playing field in support of renewable energy development.

Renewable Energy Technology Forum

The Renewable Energy Technology Forum spanned both days of the Conference, and covered market analysis and programme reviews from all the major classes of renewable energy sources: solar, wind, biomass, geothermal, and hydropower. The overall organiser of the Forum was the International Energy Agency, which has a long history with international cooperation in technology development across many different options and platforms.

Most of the talks were focused on the heat and power sector, with the exception of a talk on the Brazilian liquid biofuels programmes and a talk on solar

water heating systems for buildings in China. The key issues that arose in the sessions and discussion were related to the different steps in technology development, which can be summarised as follows:

- resource assessments: solar, wind, biomass
- research, development, and demonstration (RD&D)
- technology promotion and dissemination
- deployment and scaling-up

The challenges were often identified not so much with respect to technology development *per se* but rather in terms of matching applications and end-users to resources and innovative entrepreneurs, i.e. matching supply and demand in the different spatial and economic contexts. Both North-South and South-South cooperation are needed, especially since technology developers in the North often do not properly adapt design or implementation issues to the prevailing conditions and institutions in developing countries.

South-South Cooperation Forum

The South-South Cooperation Forum focused on the role of renewable energy in rural development and poverty alleviation. The Forum was divided into three components:

- Renewable Energy Success Stories in developing countries
- Renewable Energy in Rural Development for Poverty Alleviation and Gender Equity
- Networks and Prospects for South-South Cooperation

The first two components were organised around five presentations each, whereas the third component had a roundtable panel format. The speakers and panellists were drawn from more than ten different developing countries in Africa, Asia, and Latin America, and represented international organizations, universities, research institutes, governments, and NGOs.

The main focus was on how to meet the challenge of poverty reduction and the Millennium Development Goals, given



Entrepreneur Forum

that there are around 1.6 billion people in the world, mostly in isolated rural areas, with no access to modern commercial energy of any sort. Furthermore, more than 2 billion people use fuel for cooking and heating that is derived from indigenous biomass such as fuelwood, dung and agricultural residues. The dire situation in many regions, particularly in sub-Saharan Africa, calls for urgent South-South cooperation on energy-and-development issues.

Discussions also focused on the remaining obstacles for further development of renewable energies, and socio-economic implications of renewable energy development in close connection with for example poverty alleviation and gender equity issues. Mechanisms by which South-South cooperation in technology transfer, international trade and capacity building could be improved were also raised.

Plenary session with delegates

A plenary session on the second day with the official delegations (national governments and international organisations) was chaired by Dr. Mohamed El-Ashry, Senior Fellow with the UN Foundation and former CEO and Chairman of the GEF. The purpose of this session was to solicit final feedback from the delegations in order to complete the drafting of the Beijing Declaration, which was intended to provide a basic platform for international cooperation on renewables, based on the outcome of the conference.

Many country delegations, with the exception of the U.S., agreed with the calls to be more explicit in linking renewable energy promotion to Kyoto and COP/MOP. Many delegations also agreed with the need for an International Renewable Energy Agency. In spite of this, neither made it into the Beijing Declaration, with the exception of mentioning CDM as an important financing mechanism. The Chair explained that since COP/MOP provides a process in and/of itself for addressing climate change, it was not appropriate to duplicate elements of that process here. The resulting Beijing Declaration nevertheless reflected the discussion fairly well.

Beijing Declaration

Prior to the closure, the Beijing Declaration on Renewable Energy for Sustainable Development, as a key outcome of the Conference, was adopted with endorsements from 78 countries. The Declaration is mostly in line with the Political Declaration of the Bonn Conference 2004. Both Declarations explicitly give top priority to poverty alleviation in terms of the role that renewable energy sources can play.

One difference from the Bonn Declaration lies in the second priority, which in the Bonn Conference was mitigation of greenhouse gas emissions. In the Beijing Declaration, creating job opportunities and improving local air quality and public health are instead highlighted.

This shows how renewable energy

development is driven by different motives in developed and developing countries. This difference is also reflected throughout the two declarations, for example related to the importance of issues of poverty, capacity building and scale-up of renewable energies particularly in the least developed countries.

A second difference arises in the Beijing Declaration's mention of the Clean Development Mechanism (CDM) as a financing option for renewable energies along with the others provided via International Financial Institutions such as the World Bank and the Regional Banks. The fact that the Kyoto Protocol entered into force on February 16th, 2005 made this reference possible.

A third difference lies in the fact that the Beijing Declaration highlights the role that renewable energy sources can play in enhanced security of energy supply in the context of volatile prices of imported energy, which is primarily a result of the significant increases in oil prices experience during the past one and a half years.

Finally, the Beijing Declaration is somewhat more concrete compared to the Bonn Declaration. For example, clauses 8 and 10 list details with regard to successful experiences of scale-up of renewable energy use and capacity building in developing countries.

However, the Declaration makes weaker commitments to developing the renewable energy industry compared to what the renewable energy industry had hoped for, particularly since the Conference was held in China, a place with huge market potentials for renewable energy technologies.

The Beijing Conference is widely seen as one step forward toward global development of renewable energy sources. A roadmap and cooperation platforms are being developed. The more important question is how to set out and follow the pathway designed, in other words how to move "from talking to doing". ■

Full text of Beijing Declaration: http://www.birec2005.cn/news_show.asp?ClassId=16&id=35

The Power of International Partnerships

Report on the 3rd Assembly of the Global Network on Energy for Sustainable Development (GNESD)

by Francis Johnson and Yong Chen, SEI

The GNESD was first launched as a Type II initiative (see box) at the World Summit on Sustainable Development in Johannesburg. The GNESD is grounded in the belief that access to affordable, modern energy services is a pre-requisite for sustainable development and poverty alleviation, thereby fulfilling the UN's Millennium Development Goals (MDG)

On 9 November 2005, the 3rd GNESD Assembly was held in Beijing, with the participation of 20 representatives from the steering committee, member centres and partners. The meeting was co-chaired by Prof. Thomas B. Johansson and Prof. Ogunlade R Davidson. The Assembly reported the key outputs from the first GNESD theme "Energy Access", presented progress of on-going work, discussed future thematic focuses, summarised the outcome of a series of regional workshops on electricity and development, and addressed a number of administrative issues.

Prof. Ram Shrestha of Asian Institute of Technology (AIT) presented the outcome from three regional workshops held in Africa, Asia and Latin America. The workshop included stimulating debates on Electricity and Development Linkages, Financing, Governance, and Fair and Equitable Electricity Tariff. One thought-provoking question "*Electricity for what,*" which was raised in the Asian workshop, triggered a detailed discussion on the fundamental goals related to access to modern energy and the financing of renewable energy.

Under the on-going theme of Renewable Energy Technologies (RETs), which is implemented in two phases, a particular focus is on identifying the con-

Type II Partnerships for Sustainable Development



The so-called "Type II" partnerships are voluntary multi-stakeholder initiatives contributing to the implementation of Agenda 21, Rio+5 and the Johannesburg Plan of Implementation.

GNESD is one of several Type II partnerships in the field of energy that were launched at the World Summit on Sustainable Development (WSSD) in Johannesburg, August 2002. GNESD co-operates with several Type II partnerships across the globe in order to maximise the impact of the work carried out and to create synergies across the partnerships. These include:

Global Village Energy Partnership (GVEP); www.gvep.org
Renewable Energy and Energy Efficiency Partnership (REEEP); www.reeep.org
EU Energy Initiative (EUEI); www.euei.org

For more info on the UN Type II partnerships, see:
<http://www.un.org/esa/sustdev/partnerships/partnerships.htm>

tribution and barriers related to RETs for poverty alleviation, and providing policy-oriented options and recommendations. Daniel Bouille of Bariloche Foundation gave an introduction on this theme. He also highlighted the issue of productive uses of energy services (e.g. enhanced food security, income generation and improved productivity) for the poor. Without the potential of income generation and/or other economic benefits, it is proven difficult to maintain modern energy services in a sustainable way. The costs associated with operation and maintenance seem to pose a significant barrier for RETs penetration.

Intermediate research results derived from the key case studies were synthesized and presented to the Assembly:

- East Africa – a study of selected non-electrical RETs for productive use and poverty reduction;
- South Africa – an initial assessment

of selected RETs (biodiesel, solar water heaters and fuel wood) focusing particularly on income generation and job creation in disadvantaged rural areas;

- Senegal – the role of renewable energy in rural West Africa for implementing water irrigation and drainage systems, and to process and preserve harvested products to increase their economic value;
- China – creating an enabling environment for renewable energy options to support the poor rural population in the western areas;
- Thailand – the role of renewable energy options in rural areas to increase resource productivity and to generate more income for business/industry sectors.

The Assembly discussed and approved the following new subjects with a special focus on the linkage between

energy and the Millennium Development Goals, which will be underpinned by a joint scoping paper by the two Steering Committee co-chairs. These new thematic activities will officially be launched by the middle of 2006:

- Role of energy in other sectors in the rural areas
- Contribution of energy management and energy efficiency to poverty alleviation

- The role of energy in achieving the MDGs
- Methodological approaches to develop Sustainable development policies for the energy sector.

A number of administration issues were also discussed, including membership, potential collaborations with partners and other type II initiatives, future work program, as well as budget status and plans. In addition, ideas regarding how to im-

prove the outreach of GNESD outputs through publications, website and newsletters were shared by the participants. Prof. Thomas B. Johansson and Prof. Ogunlade R Davidson were invited to continue their Steering Committee chair-personship. ■

For more info, see: <http://www.gnesd.org>

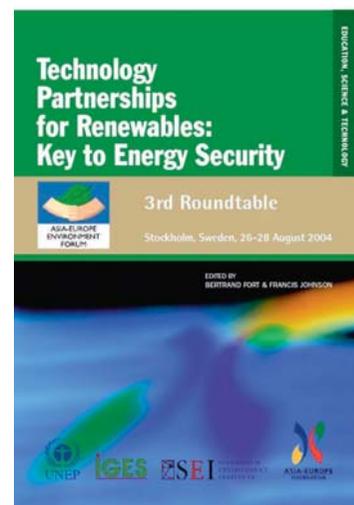
Recent Publication from ASEF and SEI:

Technology Partnerships for Renewables: Key to Energy Security

Proceedings of the 3rd Roundtable of the Asia-Europe Environment Forum edited by Bertrand Fort (ASEF) and Francis X. Johnson (SEI). Copyright 2005, 272 pp. ISBN 981 05 4099-X.

Renewable energy cooperation between Europe and Asia is arguably the world's most significant axis of international cooperation in light of concerns over energy security, future economic competitiveness, and climate change. The EU has led the expanded deployment of renewable energy technologies, while Asia represents the main growth region for future energy consumption. Excellent business opportunities and policy co-ordination are emerging, and cooperation between Europe and Asia is a key factor in facilitating the renewable energy expansion in a way that is economically feasible, socially acceptable, and environmentally sustainable.

This volume is based on the 3rd Roundtable of the Asia-Europe Environment Forum, held in Stockholm, Sweden from 26-28 August 2004. The papers in this volume address the organisational and institutional context of renewable energy, with a focus on the electric power sector. A number of papers consider the process by which renewable energy technologies and implementation platforms move from RD&D through small-scale application into large-scale commercialisation. In addition to business partnerships, the authors emphasise the importance of Asia-Europe collaboration in stimulating technical innovation, expanding the capabilities of financial institutions,



harmonising environmental standards, and the provision of training and capacity building.

Hard copies can be ordered through ASEF (<http://www.asef.org>).

Advanced International Training Programme Opportunity

ECOLOGICAL SANITATION

The overall objective of the training programme is to disseminate knowledge and to develop skills for alternative sanitation options to support urban dwellers to reduce human health risks, to enhance people's nutritional status, to increase biomass production, and to protect water resources and other environmental assets.

Ecological sanitation (ecosan) is an eco-systems based approach to sanitation. It is multi-disciplinary in character and includes cultural and social desirability, human health, greywater treatment, safe processing of human excreta, protection surface and ground water, financing, technical performance, community involvement, social marketing, partnership-formation, policy development and related institutional issues, etc. Ecosan implies closing of water and nutrient cycles within the wider context of households, freshwater management and agriculture/biomass production.

For details re target group, target counties, content, conditions and schedule kindly refer to: www.ecosanres.org or www.sei.se.

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