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The Energy *Numbers Game*

MONIQUE BARBUT describes successful attempts to build renewable energy markets and local clean energy enterprises in developing countries

When it comes to energy and development, it's easy to get lost in the numbers: millions here, billions there, and trillions into the future. Consider these four: 2 billion people without modern energy services; 500 billion dollars invested annually in energy infrastructure; and 4 billion tonnes of CO₂ dumped into the atmosphere every year from a 60 trillion dollar global economy. Taken together, they add up to a daunting challenge to the world.

Taken individually and broken down, however, they offer a different, much more immediate perspective. In Africa and India, we see houses without electricity, and smoke from fires of dung and wood. In China, we see vast tracts of slow growing forests disappearing along with the rich biodiversity that supports all life. And in New York, Paris and other developed world cities, we see refrigerators, DVDs and a range of other 'essential' conveniences.

The individual numbers are also frightening — not because they are big, but because they are so small. Less than \$25

buys a better cookstove that cuts in half both the amount of fuel needed to cook and the indoor smoke and soot that kills and incapacitates women and children, causing 5 per cent of global disease.

For less than a thousand dollars — the price of a new high definition television or laptop — a family can purchase a solar home system that uses the sun's clean, renewable energy to power lights and small appliances, and allows the family to extend their children's education or generate a better income.

These sums are not beyond what most families can pay — if they can get an affordable loan. But that is a big if, because most banks consider such loans too risky — either because the technology is unfamiliar or the returns too meagre. So they charge high interest rates, pricing families out of improving their lives.

Innovative partnership

For UNEP's Energy Programme, this is the real scale of the energy challenge. Over the past six years, UNEP Energy

has explored different ways to think big by acting small — small enough to make a difference for a family or village. Its projects and activities are helping to create the 'tipping points' for 'epidemics' of development, which do not have the environmental and social costs that have plagued developed economies.

The price of a tipping point may be quite cheap — as little as the one million dollars UNEP has invested in the Indian Solar Loan Programme. By creating an innovative partnership with two of India's largest banks — the Canara Bank and the Syndicate Bank — UNEP has been able to 'buy down' the cost of loans for solar home systems. Families pay a lower interest rate and banks build new loan portfolios that eventually give them the confidence — and financial returns — to lower the rate on subsequent loans.

In less than three years, the Programme has helped almost 20,000 southern Indian families to buy better energy services using clean, renewable energy. When it finished at the end of 2005, the market for solar home systems had grown and banks — including some that were not part of the original Programme — were ready to lend. UNEP has now expanded the concept to solar water heaters in the Northern Mediterranean.

Building markets

This shows the potential of building markets for cleaner energy services. Promoting new ways to finance these markets is the main focus of UNEP's Sustainable Energy Finance Initiative — or SEFI. Together with the UNEP collaborating centre, BASE — the Basel Agency for Sustainable Energy — it provides financiers with the tools, support, and global network needed to conceive and manage investments in the complex and rapidly changing marketplace for clean energy technologies.

Another successful approach is to build enterprises. Since 2001, UNEP's Rural Energy Enterprise Development Initiative — or REED — has worked with the United Nations Foundation and E+Co to develop new clean energy enterprises in five West and Southern African countries (AREED), Northeast Brazil (B-REED) and China's Yunnan Province (CREED). The programmes provide enterprise development services and early stage seed finance for promising new entrepreneurs with good business ideas to improve energy services, particularly in rural areas.

AREED is the most advanced with ►

debt and equity investments ranging from \$20,000 to \$120,000 in 40 clean energy enterprises. It has helped to develop businesses in solar crop drying, sawmill waste charcoal production, efficient cook stove manufacture, wind water pumping, solar water heating, liquefied petroleum gas (LPG) distribution and energy efficiency. B-REED has invested in eight enterprises that include PV irrigation, solar drying and solar hot water, while CREED is working to address the continuing deforestation and increasing industrial waste in Western China — one of the world's biodiversity 'hotspots'.

CREED has also begun GreenVillage Credit with its partner The Nature Conservancy, providing villagers with two types of credit: one to purchase higher quality energy efficient and renewable energy systems; the other for activities that can generate income using the new and improved energy services, such as vegetable and cash-crop plantations, animal husbandry, and tourism services.

The credit is available in three villages of Northwest Yunnan and will eventually cover six villages and a total of 500-600

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households. These households on average consume around 6 cubic meters of wood in fuel each year, and the project expects to reduce consumption by 15,000 to 20,000 cubic meters over the 15 to 20-year life of the installed sustainable energy system. Some households report a 30-60 per cent reduction, in turn helping to protect forest resources, better manage watersheds, and reduce greenhouse gas emissions.

Quantum leaps

Nature often shows how to solve several problems simultaneously. UNEP similarly understands that any approach addressing a single environmental issue can be used to tackle others at the same time. Our collaborating centre, the UNEP Risoe Centre for Energy, Development and Climate, for example, is exploring the many links between outcomes that are good for development and the environment, particularly in reducing the threat of climate change.

There are also many opportunities for developing countries to make 'quantum leaps' to better futures, by-passing mistakes made by developed countries. The energy sector can learn from the way mobile phones have replaced fixed land lines in many developing countries as the technology of choice. They have done so — mostly without government or institutional aid — because they simply provided a superior solution to an increasing need. They also offer new services beyond telecommunications — such as transferring small amounts of money to relatives and friends via phone credits.

UNEP Energy is working through a number of international partnerships and initiatives to make cleaner energy services a similarly superior solution. With funding from the UNF and Telecom Management Partner — a subsidiary of the Norwegian multinational, Telenor — its three-year e-Commerce and Renewable Energy (eCARE) initiative in Ghana is expanding access to both clean energy and modern telecommunications services.

Working with small entrepreneurs, eCARE establishes rural business centres selling voice telephony, internet connectivity and clean energy products and services to rural and peri-urban users. These mobile, self-contained centres have both telecommunications equipment and the solar photovoltaic system to power it. They are deployed through a franchising mechanism managed by Ghana Telecom, the country's first telecommunications service provider. Each qualifying franchisee receives start-up financing combined with a package of tools, training and enterprise development services to start their rural business centers.

All UNEP Energy activities are on a modest scale, but they demonstrate the potential for rapid expansion. If we can harness the potential of a hundred REED or Indian Solar Programmes, we can truly start to make sense of the pressing numbers, the people, who yearn for the better life that sustainable development can bring ■

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