

Despite increasing competitiveness in the developing world many renewable energy technologies are still struggling to become established, thanks, in part to the lack of financing options. Here Eric Usher and Myriem Touhami report on UN sponsored efforts to help banks begin lending for small scale renewables.

Engaging the banks

Financing small-scale renewables in the developing world

Technologies have evolved, costs have come down, and the need for new sources of accessible, affordable and clean energy has only increased in importance in the developing world. A number of recent publications have provided some insight to the size and structure of the renewable energy (RE) markets which in absolute terms have been growing quickly.¹ In terms of small scale solutions, solar PV, solar hot water and biogas digesters are just a few of the technologies that have been successfully commercialized in many developing countries.

And yet, on a global scale the uptake of these technologies has still been modest, much slower than hoped. According to the International Energy Agency (IEA) World Energy Outlook 2004, 1.6 billion people will still be without access to electricity in 2030 and 2.6 billion will continue to cook and heat with traditional and polluting forms of biomass supply, up from 2.4 billion today. We are only scratching the surface today of what can and needs to be done in order to mainstream new supply options into the energy mix. Besides the need for enabling policy frameworks and level playing fields, the other barrier to uptake has been the lack of financing needed to help these highly capital-intensive technologies compete with lower capital cost – albeit higher operating cost – conventional options.

Most RE companies in developing countries are frustrated by the lack of bank interest in their businesses, either to finance their operations or to lend to their customers. They claim that banks don't understand their business, their technology or their customers and generally lack incentive to innovate the financial services they have on offer. This issue will be one of many such industry engagement challenges that will be considered at the beginning of May when governments will meet in New York for the 14th session of the UN Commission on Sustainable Development. This year's

commission will focus on energy, and specifically will consider whether current development approaches are adequate for making the shift to a more sustainable energy mix. How to better engage the banking sector in financing renewable energy systems will be high on the agenda.

WHY AREN'T BANKS LENDING FOR RENEWABLES?

The macro economists' view might simply be that banks aren't lending because the RE sector isn't really economic yet. Banks, they might say, respond to market demand and if they haven't yet responded to sectors like PV or solar thermal, then surely this is a signal that these markets aren't yet commercially viable. This argument is somewhat akin to the tale about the two people walking down the street and the dollar bill one of them notices on the pavement. When he goes to pick it up his friend, an economist, tells him he must be mistaken since if a dollar actually existed there in the first place someone would surely have picked it up already. If RE sectors were economic and customer demand existed, then banks would have financed these systems long ago therefore there's no use in trying to get them to see the opportunities in the sector today. Disproving the analogy to the economist's tale is somewhat the basis of this article.

UNEP recent experience, now in a number of countries, has led us to believe that RE lending opportunities do exist 'on the street', under bankers' noses, and the reasons they have not been picked up have more to do with soft market development barriers than underlying economics. Perceptions and information asymmetries have generally prevented banks from engaging. This is quite a positive conclusion since it implies that although cost reductions and improved regulatory frameworks will always be important for increasing RE uptake, there are many countries where the local banking community



'RE companies in developing countries are frustrated by the lack of bank interest in their businesses, either to finance their operations or to lend to their customers'



A small photovoltaic installation on a roof-top in India SELCO

could start to lend today for small scale RE systems – if only certain information barriers could be removed.

As part of UNEP's Division of Technology, Industry and Economics, the Renewable Energy and Finance Unit has been working with the finance sector for some time on new approaches to financing sustainable energy. Through various programmes UNEP has implemented a variety of market instruments or financial catalysts aimed at helping financiers share risks, buy down transaction costs, build capacity and address various other barriers that restrict the creation of sustainable energy investment portfolios.

Regarding small scale technologies, UNEP has a number of programmes underway targeting two specific financing gaps the first at the early risk capital stage of project or enterprise development, and the second at the market expansion stage, when lack of end-user financing can constrain market growth.²

SHIFTING CASH MARKETS TO CREDIT

UNEP is not a bank, but we work to support the banking sector and other financial players in creating new clean energy finance markets. For sectors already commercialized on a 'cash and carry' basis, but where growth is constrained by a lack of end-user financing, UNEP has been implementing credit enhancement programmes that help local banks build dedicated loan portfolios. Today we have such programmes underway in India (PV), Tunisia (domestic SHW), Morocco (hotel-based SHW) and China (RE), and have other programmes in development. Although the local context for each varies considerably, there are many common elements that allow us now to generalize a little on how best to engage credit providers in financing small scale RE systems.

FINANCING SOLAR HOME SYSTEMS IN INDIA

In January, 2004 we reported on a loan programme started in 2003 for financing solar home systems in the Southern Indian states of Karnataka and Kerala (see article *Got finance?*, *Renewable Energy World* Jan-Feb, 2004). Although India has one of the most dynamic PV industries in the developing world, at the time little bank financing was available to customers which posed a severe constraint to market growth.³ The programme, supported by the UN and Shell Foundations, was aimed at helping establish an Indian consumer credit market for solar home system financing.

To recap on the programme, it involved providing two of

India's largest banks, Canara Bank and Syndicate Bank, with an interest rate subsidy, marketing support and a vendor qualification process. The interest subsidy was preferred by the banks over guarantees or other support mechanisms since, although they would not benefit directly, it enabled them to offer preferential banking terms to their customers in an efficient and transparent manner. The commercial interest rate for equivalent loan types at programme inception was 12%. UNEP's subsidy initially brought this rate down to 5%, but then was progressively phased out in 2% increments. The loans were offered through 1115 Canara and Syndicate branches as well as 1051 branches of 9 rural regional banks (the so called Grameens) sponsored through Canara and Syndicate.

Two and a half years into the programme the banks have financed 15,824 Solar Home Systems and the subsidy has been fully removed for one bank and shortly will be for the other. Although the solar home sector was pretty much a cash-only business in 2003, today over 50% of sales are financed. The credit market has responded well to the impetus. But will these banks stay engaged? The transition to a fully commercial credit market seems fairly promising so far, although two factors have slowed Canara and Syndicate's portfolio growth, one negative and one positive from the UNEP perspective.

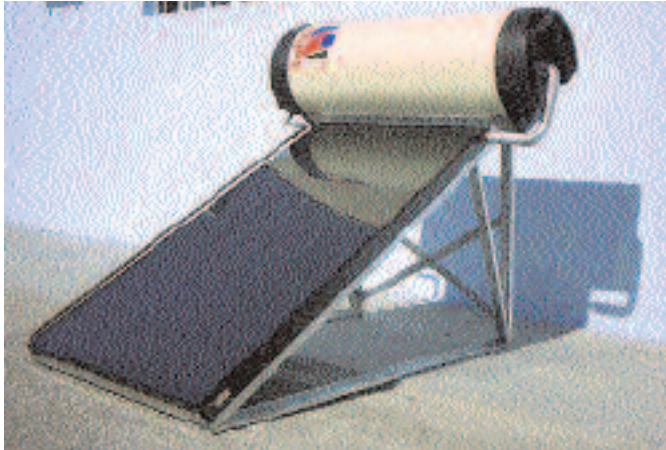
UNEP has RE finance programmes underway in India, Tunisia, Morocco and China

In 2005 the global shortage of PV panels increased prices about 20% and put a kink in the supply chain, forcing a number of solar vendors to halt sales while they secured new sources of panel supply. This has started to improve in 2006 although it's clear in the globalized PV business that the emerging markets are at the far end of the distribution chain and often are the first to feel the effects of supply shortages. In parallel to this issue there have also been changes in the banking community, with UNEP's partners no longer the only bankers in the solar PV market. Syndicate and Canara were the first major lenders to the sector, but a number of other banks started to compete in this new credit market in 2004, financing an additional 4000 loans by the end of 2005. Although Syndicate and Canara are not thrilled by this competition, it is a sign of a maturing credit market.

Interestingly, it has become apparent that although the interest subsidy did provide an incentive for customers early on, the real driver of market growth was the access to financing afforded by the 2076 bank branches that took part in the programme. Whatever the exact reasons, the programme was the first at UNEP to show that the barriers to bank engagement in clean energy can indeed have more to do with soft market development barriers and perceptions than underlying economics.

SOLAR THERMAL LENDING IN TUNISIA

A second loan support programme is now underway in Tunisia, this time for solar water heaters (SWH) and in an institutional context that is a little more complicated. The Tunisian solar



Consumer finance is often used for solar water heaters SOFTEN

thermal sector began to grow in the 1980s but mainly due to quality issues went into decline through the early 1990s. In 1996 the Tunisian Government launched a program aimed at improving the competitiveness of solar water heaters *vis a vis* LPG, the conventional water heating option. This effort, supported by the World Bank and Global Environment Facility (GEF), subsidized 35% of the capital cost of systems and enabled the industry to re-establish itself. Unfortunately, once the capital subsidies ran out the market dropped again with the two main barriers to sustainability being the skewed playing field and the lack of financing options. Banks were reluctant to lend for the poorly perceived SWH technology (Figure 1).

As part of the Italian funded Mediterranean Renewable

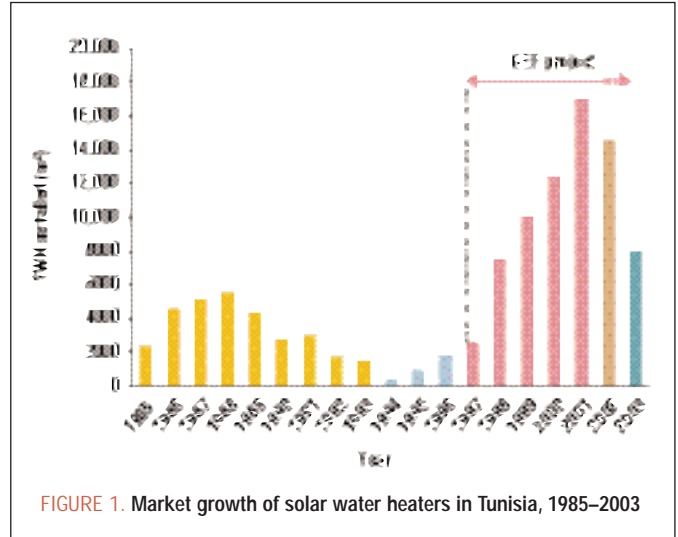


FIGURE 1. Market growth of solar water heaters in Tunisia, 1985–2003

Energy Programme (MEDREP), UNEP began in 2004 to work with the Tunisian government to address the bank engagement issue. This led to the launch of the PROSOL loan programme in April 2005. The facility is similar to the Indian programme, in that it helps local banks provide low cost financing to solar end-users, although in Tunisia the state utility STEG also plays an important role by recovering the monthly loan payments via their customers' utility bills.

The commercial lending rate for similar loan products in Tunisia is 14%. UNEP provides a 7% interest buy-down for loans disbursed in the first 12 months and 3% for subsequent loans. The banks involved – the leaders being Amen Bank and UBCI – have agreed to a further 7% reduction meaning the rate initially charged to customers is 0% and after 12 months 4%. At the same time, through PROSOL the Tunisian government has made an important policy change by making SWH eligible for the energy subsidy that previously was provided only to LPG. This decision was initially taken on a trial basis but based on the uptake of the sector the government passed new legislation that has made the decision permanent.

PROSOL began operating in April 2005 and during that year 7200 solar water heating systems were installed, the equivalent of 22,616 m³ which on an annualized basis was 60% higher than the previous best year in 2001. As in India, the market has once again responded to the impetus and credit financing seems to be playing an important role. In relative terms of market potential the Tunisian response has actually been significantly larger, although the support package is more substantial with the energy subsidy (of approx 20%) factored in. The interest subsidy will phase out over the next 6–8 months. The Tunisian government is now pushing very hard to scale up this programme, with a target of 250,000 m² of installations by 2009. The future for SWH in Tunisia looks bright, since with bank financing now available – and hopefully there to stay – and a level playing field, the conditions for market growth are in place.

However there is one cloud on the horizon. A particularity of channeling the financing through STEG is that the loans rest on the vendor balance sheets not the end-users and this is leading to excessive indebtedness for the vendors, even if the loans are considered lower risk. In other words, the environment for SWH financing in Tunisia has been turned on



its head, with the banks more willing to lend than the vendors are able currently to accommodate. Two solutions are currently being discussed, one where vendors would insure their accounts receivables, effectively outsourcing their customer default risk, and the other involving shifting the loans off their balance sheets to a third party.

FINANCING HOTEL BASED SWH IN MOROCCO

In January, 2006, UNEP launched a second MEDREP finance programme, this time in Morocco in partnership with the state utility, ONE, and three commercial banks. This one is a solar loan and leasing facility, targeting the financing of collective solar water heating systems on hotels. As in Tunisia, the partnership with ONE makes the loans and leases a low risk investment for the partnering banks as customers risk losing their electricity supply if they default on loan repayments. In return for the ONE guarantee the banks have agreed to reduce their rates from 10% down to 6%. UNEP has agreed to further buy down this rate, initially to 0% but then phased out over 2-3 years. The first financings under this programme are expected to be carried out in the 2nd quarter of 2006, with 17 hotels engaged so far.

GREEN MICRO CREDIT IN CHINA

In April 2005 in the Yunnan province of China, UNEP launched a *GreenVillage Credit* initiative in partnership with The Nature Conservancy to provide local villagers with financing for a range of sustainable energy systems and for related productive

use activities. *GreenVillage Credit* makes loans of up to US\$1250 for 18 months with an annual interest rate of 5%. The loan capital is entrusted to the Lijiang Old Town District Rural Credit Cooperative Union, a local bank that serves as the platform for credit delivery. Loans are provided directly to the villagers, but co-signed through solidarity groups consisting of 5 member households from the village association. As of today, 286 loans have been disbursed, mainly for solar water heating and biogas systems. This is a smaller programme than the ones in Tunisia and Morocco, with only about 500 loans expected in total, and is operating in a more risk adverse banking

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environment. However based on the experience with the initial loans discussions are now underway with the Credit Cooperative to shift to an interest subsidy approach, whereby they would begin to lend their own capital and then just rely on UNEP/TNC to improve the affordability of loan repayments for the villagers.

THE FUNDAMENTALS OF A BANK ENGAGEMENT PROGRAMME

So, what sort of instruments and related support activities are needed to tempt banks into the clean energy sectors? UNEP experience to date has shown that there is no standard bank engagement strategy, however there are a range of support activities that can be useful, depending on the context. This includes general awareness raising, loan officer training and marketing support; technical support for setting up dedicated loan instruments; and financial support mechanisms such as interest subsidies or guarantees.

In terms of awareness raising, it's important to provide banking institutions with the information needed to gain awareness of and experience with RE systems, and in so doing to influence their willingness to begin lending to the sector. This can involve working with bank training institutes to integrate RE loan product curricula into loan officer training programmes or can also involve dedicated banker training programmes. In India, Winrock ran a banker training programme in 2002 with USAID support that sensitized loan officers to solar lending. This helped set the stage for UNEP's loan programme the following year.

However awareness raising is not so much inward within the bank, but rather outward to the market that the bank is looking to enter. For the Tunisian programme, UNEP worked with the banks and a communications consultant to develop a TV media campaign based on the slogan 'Buy cheaper, pay slowly' (rough translation from Arabic). Banks typically reserve a small share of their commercial margins for marketing individual loan programmes. However new loan portfolios are generally too small in volume to produce sufficient marketing budgets. External support can help give loan programmes added visibility, helping to ensure customer uptake. For



Solar hot water systems in Tunisia ANME

example, in the Indian programme UNEP offered a marketing incentive to participating banks whereby they initially received 250 rupees (\$5) per loan to cover marketing costs. This fee decreased as loan volumes grew.

In terms of direct technical inputs, the banks have typically sought help in ensuring that vendors satisfy technical criteria, in terms of product specifications, and are able to provide the required after sales service and suitable warranty support. In UNEP programmes this has generally been done through vendor qualification panels. Vendors are added and deleted from the panel from time to time depending on audits of their performance and their compliance with qualification criteria. In India UNEP managed the vendor qualification process directly. In Tunisia the qualification panel is implemented through the national energy agency ANME.

For larger financing activities in the commercial or industrial sectors, it can also be effective to provide banks and financiers with targeted expertise to evaluate loan proposals. The support provided can come in the form of grant or contingent grant funds for the contracting of expert consultants to advise on first time transactions in a particular sector and cover incremental costs and advisory work for RE projects. Through the Sustainable Energy Finance Initiative and MEDREP the UNEP collaborating centre BASE is testing such a Transaction Support Facility in Morocco and Tunisia where two banks will receive dedicated support facilities for scaling up their engagement in the sector.

FINANCIAL CATALYSTS

In some markets the use of financial support mechanisms will also be needed to reduce the front-end barriers that hinder the development of credit markets for an RE sector. Specific financial support mechanisms, or credit enhancements, can be introduced to reduce risk for the local lending institutions or to facilitate increased demand for their loans. Credit enhancements are a variety of approaches for softening loan financing, either for the lender or the borrower. The concessionality comes in the form of interest-rate reductions or risk sharing. Interest rate softening, guarantees, collateral support, loan duration extensions and other forms of credit enhancement can all be useful at growing credit markets, depending on the context.

Interest rate softening lowers the cost of financing for the

borrower and can be an effective means of helping banks build loan portfolios in specific target sectors. By having the bank retain the entire credit risk, their interests are fully aligned with those of the donor, both in terms of minimizing defaults and continuing lending activity after the donor support has been phased out. The exit mechanism is also straightforward; as loan disbursements increase, the subsidy can be progressively phased out to leave the market on commercial terms at the programme's completion. However this approach is subtle and therefore will only work in the more commercial RE markets where banks can be confident of building sizeable loan portfolios quickly. In less developed markets transaction costs might outweigh the benefits for the bank.

Guarantees, another form of credit enhancement, are most effective at addressing elevated banker perceptions of risk; once a bank has gained experience managing a portfolio of RE loans they are in a better position to evaluate true project risks. Buying down the risk can mean lower costs of financing for the borrower or decreased collateral requirements. One benefit of guarantees is that if they work effectively – in other words don't get drawn down too quickly – they can be more sustainable than interest subsidies. But they require much more precision in aligning interests between the donor, the bank and the borrower and therefore are generally more open to moral hazard.

Although UNEP remains open to considering any form of financial support mechanism, after careful preparatory consultations in each country the mechanism chosen in India, Tunisia and Morocco were all different forms of interest subsidy. It was originally planned to use a partial risk guarantee in Tunisia, managed through the Tunisian guarantee agency Sotugar. However once STEG agreed to collect the loan payments the need for a guarantee decreased and the market boost afforded by the interest subsidy was deemed the most promising approach, which has been borne out in the results so far. In India the approach taken was essentially a scale-up of an existing vendor initiative, whereby the company Selco had been providing a supplier rebate to local banks which was passed on to the customer in the form of low interest financing.

However a detailed comparison of guarantee instruments with interest subsidies is beyond the scope of this article. The specific context and the views of stakeholders is what should determine the right instrument. In general the right finance intervention model has several dimensions – it encourages the market to grow and vendors to innovate in their product and service offering; it does not substantially distort the market; and it includes a predetermined exit strategy.

STRUCTURING MARKET ORIENTED APPROACHES

Whatever the form of financial mechanism used, a more important programme design issue is how to work with and through the banks and RE companies. Generally UNEP has opted for a multi-bank/multi-vendor model as the most market oriented approach. This means offering the same support package through several banks and qualifying any RE vendor that can meet basic qualification criteria. This approach creates competitive forces both between the banks and the vendors and therefore lets the market dictate pricing and system configurations.



The alternative is direct tendering to a 'winner takes all' lowest bidder. When one vendor is chosen over the others, a market where a number of experienced RE companies already do business can easily be distorted. Although it might drive prices down in the short term, tendering generally reduces the number of active vendors and does little to promote long term market sustainability. It is better to design a programme that builds off the leadership of the market innovators, such as Selco in India or Soften in Tunisia, but to do so in a way that allows all credible vendors access to these new credit markets.

Besides working with the markets, getting all relevant stakeholders involved from day one is key. Tunisia is perhaps the best example of this, where the ministry of energy, the energy management agency ANME, the state utility STEG, the banks, vendors and UNEP have all cooperated closely to put in place a loan instrument, a broader support programme and a policy that together have effectively helped to scale up the SWH sector.

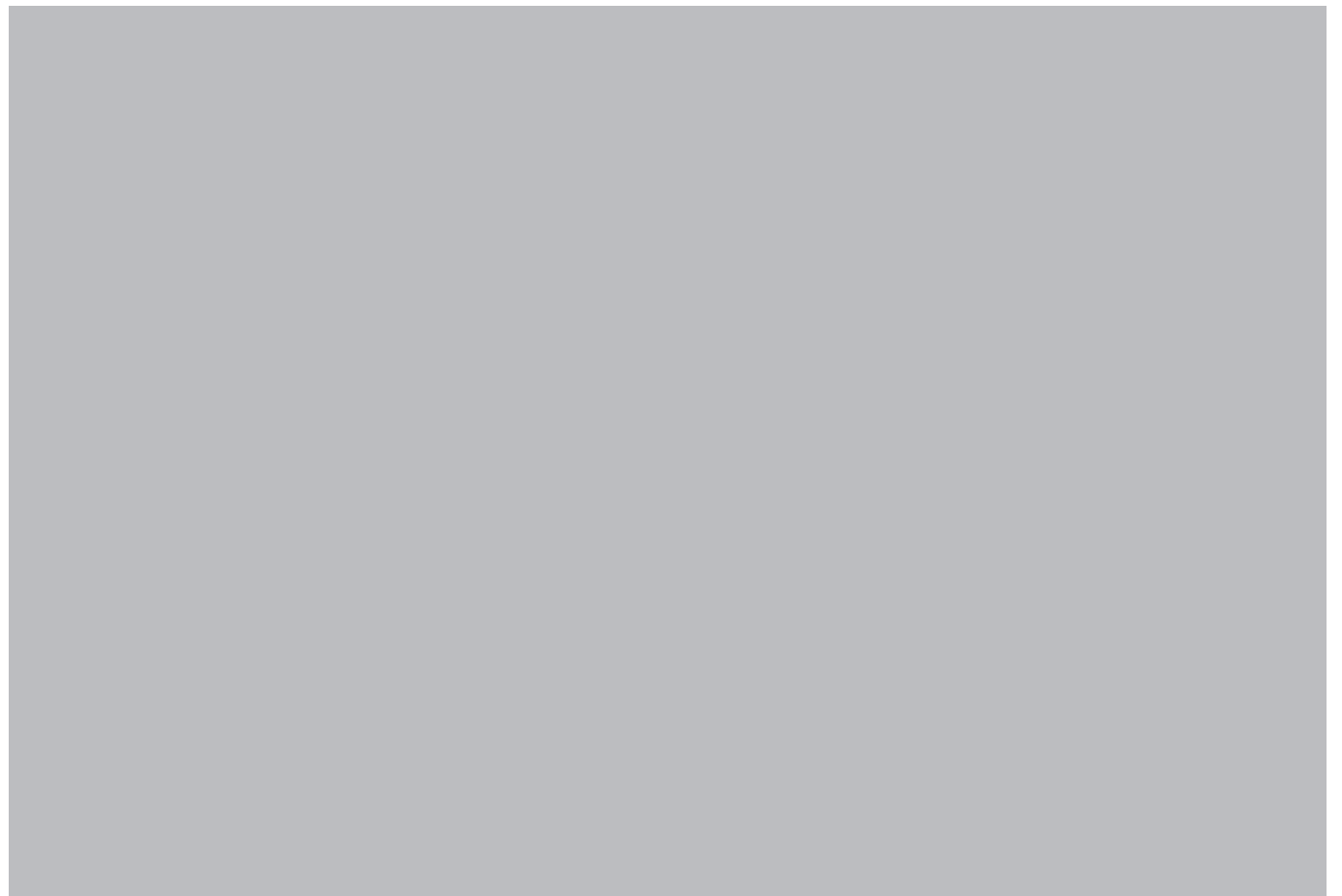
LINKING BANK LENDING TO POLICY MAKING

An interesting lesson taken from efforts to date is that there can be an effective feedback loop from the actions of the banking sector to policy makers. When banks begin to scale up lending to an RE sector it sends a positive signal to policy makers that the technology is mature and ready to play a significant role in the country's energy mix. This change in perception can go a long way towards convincing policy makers of the need for shifts in policy frameworks, often from a narrow technology demonstration approach to a broader fiscal or regulatory approach. This has now happened both in

Tunisia, with the change in energy subsidy policy, and in India, where the government is looking to shift its PV support programme away from capital subsidies and towards the interest subsidy approach. This contradicts the conventional wisdom that investment only engages once the right policies are in place. Rather our experience has been that financing and policy development can evolve somewhat in parallel, with one constantly influencing the actions of the other.

SHIFTING GEARS

Coming back to the economist and his friend, it is clear that many small scale renewable energy markets already exist 'on the street' and that bankers can, and are willing to be helped to see them more clearly. Today banks in many developing countries have sufficient liquidity (i.e. capital) and in general are seeking to develop new loan products. It is the combination of the newness of RE technologies and inconsistencies in the quality of product/service offered by the different vendors that can make lending difficult for them. In these situations development agencies and International Financial Institutions need to shift away from simply relying on traditional credit line approaches and as well start to focus on credit enhancements and other soft support that helps banks set up their first loan portfolios and gain experience with the clean energy sectors. It's cost effective – the programs in India, Tunisia and Morocco have each cost in the \$1 million range, far less than usually needed for conventional public finance programmes; and are catalytic – each will generate \$5-\$10 million in commercial financing to between 10,000 and 20,000





household systems, although fewer larger systems in Morocco.

Looking beyond the few UNEP initiatives there are also a number of other RE loan programs that have seen significant uptake in recent years, for instance in Sri Lanka and Bangladesh where 66,000 and 43,000 solar home systems have been financed, respectively, through World Bank and GEF sponsored efforts involving microfinance institutions, commercial banks and leasing companies.

Are these various efforts enough to change the finance sector's view on clean energy? Our experience has been that once loan portfolios get beyond 10,000 systems then the sector is considered a pretty commercial credit market and the banks will generally take it from there. Getting past this 10,000 threshold could help accelerate RE uptake in many countries.

Eric Usher heads the UN Environment Programme's Renewable Energy and Finance Unit (REFU), working to engage the finance sector in the shift towards cleaner energy infrastructure.

Myriem Touhami is programme manager within REFU responsible for MEDREP activities, including the loan programmes in Tunisia and Morocco.

EPILOGUE

A number of other credit support programmes are in development at UNEP, including in Indonesia for both solar PV and solar thermal systems, in Ghana for RE/ICT enterprises, and in Egypt for solar thermal. UNEP and UNDP are also preparing a large solar water heating programme through the Global Environment Facility that could see new credit markets for

SWH initiated in up to fifteen developing countries. We hope to see this activity grow, and to continue learning.

ACKNOWLEDGEMENTS

This work builds off of and is often carried out in partnership with other UNEP teams and collaborating agencies, particularly the UNEP Risoe Centre and the Basel Agency for Sustainable Energy (BASE). Also involved are many experts working within the various agencies and banks cited in the article, as well as Crestar Capital in India, and Apex and Alcor in Tunisia.

NOTES

- 1 Two of the most complete papers on this topic are the *2005 Global Renewable Energy Status Report* published by REN21 and the report *Increasing Global Renewable Energy Market Share: Recent Trends and Perspectives* prepared for the 2005 Beijing International Renewable Energy Conference.
- 2 An analysis of the finance continuum for small scale off-grid RE companies is included in the Bonn Thematic Background Paper on Mobilizing Finance for Renewable Energies available at <http://www.renewables2004.de/pdf/tbp/TBP05-financing.pdf>
- 3 Approximately 1400 loans had been provided to the solar sector by a range of banks in the years preceeding the UNEP programme, mostly through vendor-bank tie-ups that each financed in the range of 100–300 loans

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