

Turning off the lights:

GATS and the threat to community electricity in Sri Lanka

There are 1.6 billion people worldwide who do not have access to electricity. Electricity is needed to light schools and homes, to run health clinics and to power small industry and enterprise. It is essential for poverty reduction. The conventional approach to electrification will often marginalise rural communities who are far away from the grid. Decentralised renewable energy options, such as micro-hydro, wind and solar power, are often the most cost effective way to electrify remote communities. They can use resources more efficiently, empower local communities and deliver strong environmental benefits. ITDG¹ argues that increasing pressure from the GATS negotiations for developing countries to privatise and liberalise their electricity industries could threaten these decentralised, community run schemes. The case of electricity reform in Sri Lanka clearly demonstrates the need for caution as developing countries are pushed towards power sector liberalisation, to safeguard the needs of poor, marginalised communities.

1 Introduction

The Sri Lankan electricity industry is suffering from severe problems. There have been serious shortages of electricity in the past five years, due to delays in completing investments in power stations and infrastructure to meet growth in demand, irregular monsoon rainfall and bad administration by the Ceylon Electricity Board (for example purchase of plants that do not function properly). Emergency measures to increase the amount of power available, through, for example, the installation of diesel generators, have reduced the shortages but have led to serious increases in electric prices. The General Agreement on Trade in Services (GATS) negotiations, to which Sri Lanka is a party, will put pressure on developing country governments to break up their national electricity industries, and open them to international investment. Far from solving its problems, opening up the Sri Lankan electricity industry to international participation could leave the Sri Lankan government with a system that does not work and which, under GATS rules, cannot be abandoned.

One success story for the Sri Lankan electricity industry in recent years has been the use of small scale generation sources to bring power to communities that cannot economically be connected to the network. These systems not only bring major welfare benefits to the communities they serve, they are also environmentally sound and represent resources that the communities can control. The use of small-scale generating technology to bring power to isolated communities is not just of relevance to Sri Lanka: with 1.6 billion people worldwide without access to electricity, it is a policy that many developing countries can follow and has the potential to bring major welfare benefits to poor communities. Unless specific measures are taken to protect and encourage further development of such systems, the reforms could have an adverse impact on existing schemes and choke off development of new projects.

¹ www.itdg.org

The need for decentralised power supply worldwide

Access to electricity is not a luxury for poor communities. Global poverty will not be reduced without energy to increase production, income and education, create jobs and reduce the daily grind involved in having to just survive. Over 1.6 billion people do not have access to electricity (27% of the world's population). In South Asia only 40% of the population have electricity, and in sub-Saharan Africa the electrification rate is only 22.6%. Four out of five people without electricity live in rural areas. Private utilities will not extend networks to areas where it is unprofitable to do so, unless the governments provide subsidies to pay the costs.

There is significant evidence around the developing world to show that decentralised, community based electrification will be essential for providing electricity to many of the world's poorest people. In China there remain over 70 million people without electricity, mostly in remote, sparsely populated areas with limited access to roads, markets and services. In Peru, the government has admitted that those with no access to electricity include populations in rural, remote localities where 45% of the population live in poverty. Mozambique has the lowest rate of electrification in sub-Saharan Africa, at 7.2%, and only 1% of the rural households has grid connection.

In rural areas where grid extension would be extremely costly and populations are too dispersed for conventional distribution, it can be shown that decentralised electrification is a viable and cost effective option for many remote communities. (See Annex 1)

2 GATS

Sri Lanka has always been in the vanguard of trade liberalisation measures. It was one of the first signatories, in July 1948, of the first major international agreement on trade liberalisation, the General Agreement on Trade and Tariffs (GATT). It ratified the Marrakech Agreement in 1994 which set up the World Trade Organisation (WTO), the body whose job it is to administer international trade agreements under the GATT. The WTO replaced the GATT organisation that had previously carried out this job. On March 31, 2003, there were 146 members of the WTO with a further 30 countries in the process of negotiating membership. By far the most powerful members of the WTO are the USA and the EU, which negotiates for all 15 member states of the EU. 'Ministerial Conferences' are the top-most decision-making body under the WTO and these conferences must take place at least once every two years. The Cancun meeting, now taking place, is the next scheduled Ministerial Conference.

The Marrakech agreement came at the end of the 'Uruguay Round' of trade negotiations (1986-94) under which, for the first time, the agenda was broadened to include commodities other than 'goods' under trade agreements. The General Agreement on Trade in Services (GATS) was part of the Marrakech Agreement.

Signatories to the Marrakech Agreement are committed under GATS to progressively open their service sectors to international entry and liberalisation. A new 'round' of negotiations on services started in 2000 and under the Doha agreement of 2001 (the Ministerial Conference prior to Cancun), is scheduled to end on January 1, 2005.

In the major service sectors such as water, energy and telecoms, companies from industrialised countries dominate throughout the world. Few expect the opening up of service

sectors to result in companies from developing countries making major inroads into industrialised country markets. Even before GATS has had much impact, industrialised country service companies are increasingly dominating developing country markets. So GATS seems likely to be a process that will benefit industrialised country companies. By itself, this is not necessarily a problem for developing countries. As long as GATS does bring more efficient services to poor people in developing countries and there are corresponding moves that open industrialised country markets to developing country goods and services, its impact on developing countries could be positive. However, attempts to open up industrialised country markets in sectors where developing countries could benefit, such as agriculture, have had little success.

Energy in GATS

Given that energy is such a major service both in terms of its economic significance and also its importance to consumers, there is surprisingly little reference to energy in the GATS classification of services. Under the GATS agreement, 12 categories of service are identified and within each of these broad categories, there are a number of subcategories, which are broken down even further. In all, there several hundred subcategories. Energy appears only once amongst these subcategories as 'services incidental to energy distribution', which is one of 20 sectors within the 'Other business services' category of 'business services'. 'Services incidental to energy distribution' appears a rather limited set of activities, implying consultancy activities. However, reference to a more detailed classification (the United National Provisional Central Product Classification) reveals that it includes core distribution and transmission activities. Indeed, the USA and the EU are proposing that electricity generation be included in this category as a service under GATS. Classifying it as a 'good' would bring it under the general GATT agreement. Negotiations are now underway to define energy as a separate sector and resolve how electricity generation should be classified.

The GATS mechanism

Under the GATS, service sectors are to be opened under a system of 'request and offer'. Members are required to 'offer' to open service sectors up and were required to make an initial 'offer' to open up activities by March 31 2003. Members can make a 'request' to another member to open a sector and the GATS agreement stated initial requests should be made by June 30, 2002. The process is being reviewed at the Cancun Ministerial Conference in September 2003. Request and offer negotiations are expected to continue until January 1 2005 when a Ministerial Conference will take stock of the negotiations. It seems likely that the Cancun Conference will decide how negotiations will proceed between then and the 2005 deadline.

The response to this initial timetable was poor, and by June 12, 2003, only 26 members of the WTO had made offers. The response on requests is not easy to estimate because these requests are made bilaterally with no requirement to inform the WTO. A hint of the nature of the request process was given when the EU's list of requests was leaked to the public. Requests were made to 109 members of the WTO in twelve sectors, including energy. In about 40% of the cases (46), the EU requested an opening of the energy sector. Compared to most other sectors, especially, for example, telecoms (106 out of 109), the number of requests to open up the energy sector was lower.

Sri Lanka's initial offers made in the period 1995-99 are listed on the WTO web site². No offers have, as yet, been made in the energy sector. The offers were in the telecoms, financial services and tourism sectors. According to the WTO, by June 26 2003, Sri Lanka had still not met its obligation to make its initial offers by March 31, 2003.

Critique of GATS

Commitments made under GATS must be taken very seriously. Once a country has made a commitment to open a sector, there is little scope to withdraw it.

In practice, the request and offer process is very unbalanced. Industrialised countries have ample resources to identify countries and activities that could provide good opportunities for national companies. Making a request is essentially a cost-free act: it makes no commitment on behalf of the requesting country. By contrast, an offer has far-reaching consequences for the economy of the country making the offer and developing countries often lack the resources to evaluate the consequences of making such a commitment. They may also be reluctant to turn down a request from trading blocs on which they rely for aid.

The GATS process is being carried out in a very secretive way. Industrialised countries have not made their requests public, and developing country governments are unwilling to open up the process to public debate, despite the far-reaching consequences of a decision to open up an activity. For example, the heading of the EU request to each country states 'Member States are requested to ensure that this text is not made publicly available and is treated as a restricted document'. No public debate has been opened in Sri Lanka about what services should be offered under GATS.

The WTO protests that it is no part of the GATS agenda to force countries to liberalise and privatise its service industries, but this is disingenuous given that written into the GATS is a commitment by WTO member governments to progressively liberalise trade in services. The two major trading blocs, the USA and the EU, are clearly using the GATS negotiations to pressure developing countries to privatise and liberalise their energy sectors. In its communication to the WTO's Council for Trade in Services of March 2003, the EU stated³:

'The recent experiences of liberalisation in some energy sectors and the already well established presence of third country suppliers in other sectors like oil and gas, are showing the way for a win-win opening up of national markets to competition and to foreign suppliers.'

A US communication to the Council for Trade in Services (December 2000) stated:

'Competitive conditions in a nation's energy services markets enhance the competitiveness of domestic energy consumers as well as incentives for foreign investors to invest in both energy services and energy-consuming sectors. They also can benefit residential consumers and social services, as well as employment, through the beneficial impact on energy-dependent services and manufacturing sectors.'

²

http://tsdb.wto.org/wto/Public.nsf/FSetReportPredifinedAffich?OpenFrameSet&Frame=F_PredefinedReport&Src=_c5trn8rpf1qm4r39ccn6ssr65ssmcp9l6kp3cdhhcgoj2p9g74om6c9i6kr3gohg60o3co9n69j3abpoccp3ichm70q6co9o6ksj4dhlccoj4d9m74r68c1g6cq3gohl6cvkap39eh26uorldlimst00_

³ http://www.wto.org/english/tratop_e/serv_e/s_negs_e.htm

3 Micro-systems for isolated communities

It is estimated that for about 20% of Sri Lanka households (about 640,000 homes), it will not be economic to bring them grid supplied electricity. However, Sri Lanka is rich in renewable resources, such as small-scale hydro, solar, biomass and wind, which could be used to provide power to these isolated communities. These can be community-run systems that offer limited, but reliable supplies of electricity at prices not affected by world fuel market conditions. They generally use technology that can be produced and maintained locally. The main technology used at present is micro-hydro, although other technologically proven options, such as wind-power can also be used. Worldwide interest in small-scale decentralised power sources is likely to make additional options, such solar power and biomass (using specially planted trees) economically viable.

Micro-hydro

The viability of off-grid micro-hydro technology for rural electrification was first demonstrated in Sri Lanka by ITDG in 1991. Micro hydro units are one hundred percent managed by the village communities. A formal society is formed (Electricity Consumer Societies), to handle the main functions such as operation, maintenance and tariff collection, and responsibilities such as management, maintaining discipline and ensure all the members maintain the procedures and standards set up by the society leadership.

A recent survey carried out by the Energy Conservation Fund operating under the Ministry of Power and Energy in Sri Lanka reveals that there are 161 micro hydro units in operation in good condition providing basic electricity requirements of 3,687 households. The total capacity is 1,622kW. Provincial Councils have played an active role in taking this technology to the remotest parts of the country. Uva, Sabaragamuwa and Southern Provincial councils have endorsed the technology by including it in their policies and by setting up separate ministries for renewable energy. So far provincial councils have partly or fully invested in 70 off-grid micro hydro schemes. The World Bank funded Energy Services Delivery (ESD) project during the period March 1997 to June 2002 developed 56 off-grid micro hydro power plans with a total capacity of 5,74kW providing electricity for 2,800 households.

Kithulritiella Village Micro-hydro Project

The Kithulritiella village hydro project was completed in the year 2001. With a capacity of 5.5kW provides electricity to 16 households and four small businesses, as well as to the temple in the village. The total cost of the hydro project was Rs.728,000 (about US\$7,000). A loan of Rs.240,000 (US\$2,400) repayable in five years has been obtained by the beneficiaries from the DFCC Bank under the World Bank Energy Service Delivery (ESD) project for the project construction work and its repayment is near completion. An Association of Electricity Consumers formed by the sixteen beneficiary households is responsible for the management, operation and maintenance of the hydro project. Each electricity-using household has to pay a monthly fee of Rs.150/- (US\$1.50) for the electricity that they consume and another Rs.180/- (US\$1.80) as their monthly loan installment. The villagers use the electricity for lighting, television, radio and domestic appliances. In addition two local businesses use the power for battery charging, which provides battery power to households who do not yet have electricity connection. The power has improved two other enterprises in the village, one repairing radios and a tailoring business.

ITDG carried out a survey to assess the off-grid micro hydro potential in Sri Lanka for the ESD project in year 2000. The results show an estimated meteorological potential of 41,490kW in 1,023 sites in 10 districts of the Uva, Central, Sabaragamuwa and Southern provinces. The past experience shows that this capacity is sufficient to meet the basic power requirements for nearly 190,000 households (on the basis of 200W per household).

Small wind systems

Following the approach of its successful experience in the micro hydro sector, in 1998, ITDG designed a small wind generator suitable for rural electrification with a capacity of 250W. The cost of fabrication and installation is around US\$550. Initial piloting of these systems in the Southern Provinces of Sri Lanka was carried out subsequently. Along with pilot testing local manufacturers were trained in constructing small wind systems. Since then 22 systems have been installed in Sri Lanka and are in operation. The experience so far shows that small wind systems are a viable technology option to cater the rural electrification needs.

Recently the Ceylon Electricity Board (CEB) carried out a wind mapping exercise in Sri Lanka with the financial support from the US government aid agency (USAID). The results show very positive meteorological potential in many parts of the island especially in the Northern, Eastern and Southern provinces.

Dendro (wood fuel) Thermal Energy

Biomass based electricity generation is another technology option for rural off grid electricity generation. In this method, fuel wood is transformed into electrical energy. There are three technologies tested and proven to transform dendro (fuel wood) energy into electrical energy world wide, but these have not yet been demonstrated in Sri Lanka in small scale operations. Energy Forum, a network of experts and stakeholders in the energy sector in Sri Lanka, is in the process of testing the viability of community-based off-grid dendro thermal electricity generation.

Sri Lanka has a total land area of 6.5 million hectares, out of which 3.7 million hectares are agricultural land. Nearly one third of these lands are under shifting cultivation in the dry zone areas. Shifting cultivations are cyclic and therefore at any given time majority of these lands are under-utilised. These lands can be effectively used for fuel wood farming. The labour force in the agriculture sector can be involved in fuel wood farming which would provide additional income from the agricultural sector.

Solar Home Systems

Solar photovoltaic (PV) technology has emerged as a further alternative electricity generation option in rural Sri Lanka. Solar PV was introduced to Sri Lanka in 1980s and since then there has been a gradual development in the market for this technology. Unlike off-grid micro-hydro and small wind systems, solar home systems are promoted and marketed mainly by the private sector. Currently there are about 20,000 solar home systems installed in Sri Lanka. A recently completed solar resources mapping exercise in Sri Lanka revealed a very high meteorological potential for solar energy utilisation.

Institutional issues

The legal status of these small isolated systems needs to be clarified in Sri Lanka. The two nationally owned companies that distribute electricity in Sri Lanka, the CEB and Lanka Electricity Company (LECO), have exclusive rights to supply electricity in their franchise

regions, so it would appear that the position of the existing schemes is anomalous because they are not owned by CEB or LECO. However, while this situation is clearly unsatisfactory, the Sri Lankan government has strongly supported these schemes, which are helping it to achieve its policy goals on electrification and its ownership of CEB and LECO means that in the present situation, the schemes are not under threat.

4 Problems with the Sri Lankan electricity system

The Sri Lankan electricity system has been controlled by the CEB since 1969, the only major change being the creation of the LECO in 1983 to distribute power to parts of Colombo and some coastal regions. The total installed capacity of power plants in Sri Lanka is about 20,000MW, 58% of which is hydro-based. The rest is fossil-fuel based using small steam turbines, gas turbines and diesel engines. Fossil fuel options, especially coal are expected to account for a large proportion of new generating capacity in Sri Lanka. About 41% of electricity consumption is accounted for by households, 37% by industry and the rest by commercial consumers.

The increase in generation capacity has failed to keep pace with increase in demand for electricity. The repeated failure of monsoon rains led to reduced reliability of Sri Lanka's main power source – hydro. Planned power projects, both thermal and hydro have been subject to long delays due to legal battles, public protests and sometimes indecision within the ranks of authority. The resulting instability of the system, together with the expense of emergency power generation through short-term alternatives, has adversely affected domestic and industrial consumers.

The reasons for the lack of investment are complex, but the most commonly cited ones are: shortage of investment capital; lengthy and indecisive procedures for obtaining acceptance of new power plants; and lack of a government energy policy framework to direct investment. Emergency measures to meet these shortages have reduced the extent of power cuts but at the cost of dramatically higher consumer prices.

5 Reforms to the electricity sector

As a result of these problems, the government is proposing reforms to the sector that would lead to the break-up and probable eventual privatisation of the nationally owned companies, the CEB and LECO. The structure proposed would follow the 'British Model' with five regional distribution companies, a national transmission company and a number of generation companies. However, unlike the way in which the 'British Model' is normally implemented, there would be little scope for competition. Wholesale power would be bought by a 'Single Buyer' with no effective market and consumers would not be offered choice. New generating capacity would be built by new investors building Independent Power Projects. Distribution companies would not be allowed to generate electricity.

Critique of the reforms

This structure and its mechanisms can only be seen as unproven. The Single Buyer model, under which, a central agency is responsible for purchasing power from a variety of generating companies has never been tested.

Despite the perception that the British Model is a proven and effective way to run an electricity system, even in Britain, it is clear that the British Model could not be implemented. The British

Model is widely portrayed as being highly successful, and while on the face of it, the results have been good, closer examination suggests that these good results have been the consequence of highly favourable circumstances. The central objectives of the British Model such as creating a wholesale electricity market that sets electricity prices and creating retail competition have either not been achieved (in the case of the wholesale market) or have been highly disadvantageous to small consumers (in the case of retail competition).

The British Model was designed for industrialised country markets with mature infrastructures, limited and stable demand growth, and is not appropriate for developing country systems, which have very different priorities. The primary objective of reforms of electricity industries in developing countries is often ensuring sufficient investment capital is made available to meet growing demand. The British Model is not well designed to achieve this partly because it channels foreign capital into already existing assets and partly because the replacement of a monopoly by a competitive market is likely to inhibit investment because of the extra risks inherent in a market system.

A particular problem that developing countries face is extension of the grid to unserved consumers. This is not an issue for developed countries and is not catered for in the 'British Model'. In Sri Lanka, only 55% of the population are served by grid electricity, whereas it is estimated that about 80% could reasonably be served by grid extension. The Sri Lankan government needs to think carefully to ensure that mechanisms are in place in the new structure, for grid extension to be continued at an appropriate rate and without excessive cost to the public. This is likely to require direct government subsidy. The grid extension programme must be managed by government to ensure that these subsidies are well spent and do not end up as extra profits for foreign investors.

In Britain, there were attempts to keep generation and distribution separate at a corporate level, but these efforts failed and now the British electricity system is dominated by five companies that generate electricity and supply power to their own final consumers. A system cannot be built on independent power projects (IPPs) because they are only economically feasible if they are given long-term Power Purchase Agreements (PPAs), which provide guaranteed income (in international currency). Experience elsewhere suggests that unless IPPs represent only a small element of the system, they represent a big risk to consumers, especially if the local currency declines in value or demand falls.

In practical terms, even with highly favourable terms to investors, it may not at present be possible to attract international investors either to build IPPs or take over publicly owned Sri Lankan electricity companies. None of the US electricity companies that invested outside the USA in the past decade are now investing in new projects and most are selling or even abandoning existing holdings, while European companies have shown little interest in the region and are retrenching to less risky European markets.

Impact of the reforms on isolated systems

The proposed reforms to the Sri Lanka electricity system seem to jeopardise one of the few success stories there, the introduction of micro-systems to supply remote communities that it would not be economic to supply with grid electricity. There are two main issues. First, the five distribution companies proposed would have exclusive rights to supply electricity in their franchise region. This could mean that they could expropriate the existing systems and block proposals by isolated communities to build new schemes. Second, under the new system,

companies generating electricity would not be able to supply this power to final consumers. In theory, this could mean that micro-systems, providing only a few kW, could be forced to divide into two parts.

If the reforms are to proceed in anything like their current proposed form, clear unequivocal exemptions must be written in that allow existing micro-systems to continue in community ownership as an integrated operation, i.e., generation and supply to consumers within the same organisation. Isolated communities not yet supplied with power must be free to set up new micro-systems without the need for the approval of the distribution company whose territory they are located in.

6 Conclusions

The GATS

The GATS process is very one-sided with the cards stacked in industrialised countries' favour. Industrialised countries have far more resources and political power than developing countries and can ensure the process of 'offer and request' turns out favourably to them. The system of offer and request is unbalanced because industrialised countries, which have the resources to identify and target countries and service sectors where lucrative opportunities exist, can make requests that commit them to nothing and are merely 'door-opening' actions. By contrast, developing countries often do not have the resources to evaluate properly the consequences of what are essentially irreversible decisions to open up a market. Developing countries are under heavy pressure from industrialised country governments and from institutions such as the World Bank to open up and liberalise their markets. These may be seen as 'an offer they cannot refuse'.

The way in which GATS is being negotiated is closed to the public and secretive. The process should be opened to the public so it can make an informed judgement on the commitments that countries like Sri Lanka make. Few of the offers and requests are being made public and, for example, the EU warns those receiving its requests not to publicise them. Such momentous changes to the way in which national economies are run should not take place without the informed consent of the public.

The Sri Lankan electricity system

The reforms to the Sri Lankan electricity industry endanger existing and future decentralised non-grid solutions for communities not connected to the central electricity grid. Decentralised power generation sources have proved themselves to be a reliable, cost-effective and environmentally desirable alternative to grid supplied electricity for small isolated communities. Under the current Sri Lankan structure, their legitimacy is not clear because the CEB and LECO have exclusive rights to distribute electricity. However, their advantages, acknowledged by government, and state ownership of the CEB and LECO, mean that their anomalous position has not been a problem. However, in a reformed electricity system, especially if ownership of the distribution sector is no longer public, it could be. It is therefore essential in any reforms that the position of existing schemes as community owned and operated integrated facilities are safeguarded and that isolated communities that decide to build their own decentralised generation and distribution system are not prevented from doing so.

The position of consumers without electricity that can reasonably be connected to the grid should not be forgotten: 25% of the population of Sri Lanka are in this position. Unless there are clear government commitments, and requirements on new investors where appropriate, extension of the grid to these consumers will not happen.

While the Ceylon Electricity Board may have failings, it has in the past proved itself capable of meeting growing electricity demand efficiently. Reforms to it that did not involve its break-up could mean that current problems could be solved, whilst still leaving intact an organisation that could be a valuable tool in Sri Lanka's development. Liberalising reforms around the world are running into a range of problems, from difficulty ensuring the right amount of investment takes place to unpredictable and rapidly rising electricity prices. The option of improving the CEB whilst still retaining its characteristic as a publicly-owned and accountable entity should be seriously investigated.

The widespread retreat of the electricity companies from markets outside the USA and Europe means it would be unwise to assume that opening up the Sri Lankan electricity sector would lead to investment by international companies. Any reforms that rely for new investment on foreign investors coming into the Sri Lankan market are very risky at present. International investors have lost large amounts of money in international markets and the major electricity companies are, at present, unlikely to want to invest in developing country markets because of the apparent risks. This will place countries that have reformed their electricity industry on the expectation of attracting foreign investment in a difficult position. They may be forced to shift even more of the risks of operating the system away from foreign investors and on to local consumers. For example, international investors will be wary about currency risk and risk of unstable demand patterns. They will also be unwilling to sign up to meaningful performance guarantees. This will leave local consumers bearing far more risk than they already do. Developing countries may also be forced to use companies that do not have sufficient financial and technical capability to the job properly.

GATS and the Sri Lanka electricity system

It appears that the GATS negotiations are being used by industrialised countries to reinforce the already heavy pressure on developing countries to privatise and liberalise their electricity industries.

The liberalised, privatised electricity model is clearly unproven in developing country conditions. If energy and specifically electricity, is to continue to be part of the GATS agenda, industrialised countries should be far more cautious in recommending an unproven model to countries that often do not have the resources to judge whether such a model is appropriate. Similarly, developing countries should resist pressure to open up their electricity industries until there is strong evidence that the new model they are adopting for the electricity industry really will meet the needs of their population, especially the poorest people.

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⁴ www.psir.org

Annex 1: the need for decentralised power supply worldwide

Over 1.6 billion people do not have access to electricity (27% of the world's population). In South Asia as a whole, only 40% of the population have electricity, and in sub-Saharan Africa the electrification rate is only 22.6%. Four out of five people without electricity live in rural areas.

The International Energy Agency⁵ estimates that over the next thirty years, investment in new power generating capacity will amount to US\$2.1 trillion, but this will still leave 1.4 billion people with no grid connection. Much of this investment will be focused on electrification in urban areas, which is far less costly than supplying rural communities with grid electricity. The IEA admits that private utilities will not extend networks to areas where it is unprofitable to do so, unless the governments provide subsidies to meet the costs. In rural areas where grid extension would be extremely costly and populations are too dispersed for conventional distribution, the IEA recommends decentralised micro-projects. This will require comprehensive strategies for micro-credit, technology uptake and capacity building to allow access for remote communities to access decentralised power.

There is significant evidence around the developing world to show that decentralised, community based electrification will be essential for providing electricity to many of the world's poorest people. The examples below give an illustration of the potential demand for decentralised power in three very different countries⁶.

China has made great progress in electrification in the past two decades and more than 94% of the rural population has access to electricity. However, there remain over 70 million people without electricity, mostly in remote, sparsely populated areas with limited access to roads, markets and services. A number of efforts, with international and national funding, are under way to increase access to electricity through decentralised renewable sources, such as solar home systems and wind power.

In Peru, the government has admitted that those with no access to electricity include populations in rural, remote localities where 45% of the population live in poverty. Peru has 70% electrification, but only 20% of the rural population (about 6 million people) have any grid connection. Rural electrification projects under the privatised power companies in Peru have suffered from high investment costs, high power losses and very high financial losses. By contrast, as in Sri Lanka, ITDG has shown that decentralised micro-hydro power is a viable option for many remote communities. ITDG has facilitated loans, provided by the Inter-America Development Bank, to 24 micro-hydro projects, which now serve 15,000 rural people in remote communities with a high quality power supply.

Despite having tremendous hydro-power resources, Mozambique has the lowest rate of electrification in sub-Saharan Africa, at 7.2%. Only 1% of the rural households have grid connection. Under current plans grid extension is focused on supply to urban centres, with local government administrative posts to be electrified through the use of solar systems. With a very dispersed rural population, it can be shown that decentralised options are by far the most cost effective options for the majority of the population.

⁵ International Energy Agency, World Energy Outlook 2002.

⁶ Sustainable Energy for Poverty Reduction, ITDG and Greenpeace, 2002, at www.itdg.org

Access to electricity is not a luxury for these communities. Global poverty will not be reduced without energy to increase production, income and education, create jobs and reduce the daily grind involved in having to just survive. Reducing hunger will not come about without energy for more productive growing, harvesting, processing and marketing of food. Improving health and reducing death rates will not happen without energy for the refrigeration needed for clinics, hospitals and vaccination campaigns. Children will not study at night without light in their homes. Clean water will not be pumped or treated without energy. Lack of access to electricity has significant health consequences. About two and a half billion people are dependent on biomass fuel (wood, dung and charcoal) for cooking and heating. Globally, about 1.6 million people per year die from indoor air pollution from cooking on biomass stoves. Access to energy remains a very urgent need for poor people, and lack of affordable, clean and efficient energy could keep people in poverty for many years to come. The UN Commission on Sustainable Development (CSD) identified access to sustainable energy services as an essential element of sustainable development. The Commission stated that, *“to implement the goal accepted by the international community to halve the proportion of people living on less than US \$1 per day by 2015, access to affordable energy services is a prerequisite”*.⁷

⁷ Commission on Sustainable Development, ninth session, Agenda Item 4, Decision, Energy for Sustainable Development, Section 6.22