



Powering Economic Development

Pricing reforms would help attract much-needed investment

Financing investment in electricity infrastructure to meet rapidly rising demand is a major challenge for many developing countries. The adequacy, quality and reliability of grid-based electricity supply are critical to economic development and growth. Considerable investment will be needed to meet the increase in demand for both the quantity and quality of electricity services as well as to maintain and replace existing infrastructure that will be retired. Developing regions are looking increasingly to the private sector to fund at least part of the investment needed to finance electricity projects, mainly because of constraints on public funding. Yet, obtaining sufficient private-sector capital in many cases will be difficult, due to poorly developed local financial markets and an unfavourable regulatory and investment climate. Overcoming these obstacles will call for major improvements in governance, restructuring and far-reaching regulatory reform in the electricity sector.

For the world's poor, access to electricity is a vital component of social and economic development. It contributes not only to economic growth and household incomes, but also to the improved quality of life that comes with better education and health services. Certain energy services can only be provided effectively by electricity. It is the only practical means of running basic domestic appliances, such as telephones, refrigerators and small water pumps. And it provides the best quality and cheapest form of lighting. Good lighting enables people to extend the day so they can read or study longer, raising educational levels. Access to electricity also boosts economic productivity, by reducing manual labour. It also leads to better health, by replacing polluting indoor fuels, by improving hygiene with the use of refrigerators and by making it possible to provide modern health services.

Despite the considerable progress that has been made over the past few decades in extending power networks, an estimated 1.6 billion people in the developing world – mainly in south Asia and sub-Saharan Africa – still do not have access to electricity. This may well be an underestimate since “access” often means simply that electricity is available in a village, not that all households within it are actually connected to the grid. Most people who do not have electricity are located in rural areas and continue to use mainly traditional fuels for their basic energy needs.

Alleviating this manifestation of energy poverty is an urgent priority. But building additional generating capacity, centralised and distributed, and extending existing grids where this is feasible will call for more investment. The International Energy Agency projects that total cumulative investment needs in the power sector in developing countries will amount to \$5.2 billion over 2004-2030, an average of close to \$190 billion per year. Many of them will struggle to raise all the capital they need. Bringing electricity to the 1.6 billion people who are projected to still be without it in 2030 would require *additional* investment of the order of \$500 billion. This is barely 10% more. Yet taking on this extra burden will be extremely difficult. Public utilities charged with the task of electrification will struggle to find the money, while private utilities may not have a strong enough financial incentive to invest.

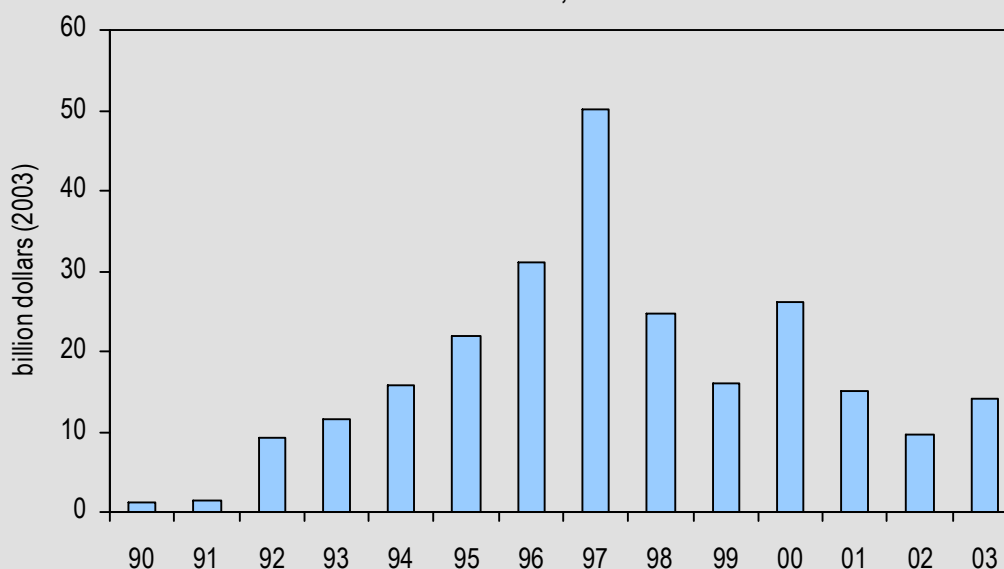
Governments, together with multi-lateral lending agencies such as the World Bank, have traditionally been responsible for investment in electricity infrastructure in developing countries. Public utilities in several large developing countries are unprofitable, so they are unable to finance directly new projects themselves. The poor financial health of public utilities results from a number

of factors, including under-pricing of electricity, under-collection of revenues, caused by non-payment or theft, and high production costs, because of low plant efficiency, high network losses, high capital costs, and high unit transmission and distribution costs.

In response to these problems, the 1990s saw an increasing number of countries turning to the private sector for part of the investment needed to finance the electricity sector. The initial response was encouraging, but private investment declined rapidly after 1997 (see Figure below). Total private sector investment in electricity between 1990 and 2003 in developing countries amounted to \$250 billion in 2003 dollars. Brazil and other Latin American countries attracted about half of it. The financial crisis in Asia in 1997-98 was the immediate cause of the drop in private investment. Other reasons include badly designed investment and energy policies and regulations, economic collapse and bad business judgments. The result was disappointing rates of return on investment. As a result, many private companies sold assets they had acquired in the early to mid-1990s.

Who Will Pay to Bring Power to the People?

Investment in Electricity Projects with Private Participation in Developing Countries, 1990-2003



Source: World Bank Private Participation in Infrastructure database.

Private investment rebounded in 2003 to just over \$14 billion, from less than \$10 billion in 2002 – its lowest level since 1993. The increase was focused on greenfield power plants in East Asia. There are signs that domestic and regional investors are becoming more prominent in the electricity sectors, especially in Asia. Maintaining the momentum of the growth in financing from this source will take time and appropriate policies. Today, private participation in the electricity sector remains relatively low across developing countries. It is generally highest in power generation and lowest in transmission and distribution, which are usually regarded as a public service. Participation also tends to be highest in the better-off countries. The role of the private sector is significantly larger in

Latin America than in any other part of the developing world. The Middle East and South Asia have been much less successful or interested in attracting private capital.

Boosting private-sector funding in poor countries will be difficult. Most countries that have tried to privatise their electricity companies in the past few years have suffered serious delays, largely due to strong public resistance. In several cases, privatisation has been held up by a lack of credible buyers. But the budgetary pressures on governments to seek greater private involvement in the electricity sector are not going to go away. The challenge for governments is to find an acceptable balance between private and public ownership that ensures adequate funding for development of electricity infrastructure and energy security. Of course, that is easier said than done.

The private sector generally welcomes business opportunities in rapidly growing developing economies, but they will invest only if it perceives a sufficiently stable and attractive legal framework and if it can expect returns high enough to compensate for the risks. That will require major improvements in governance and continued restructuring and reform in the electricity sector. Perhaps the most pressing challenge is to reform tariff structures to make prices reflective of costs and to improve revenue collection. Paradoxically, the problem in many cases is not that prices are too high, but rather too low. The challenge is to reform pricing in a way that encourages investment without undermining poor households' ability to afford basic electric services.

In fact, the problem of electricity access is one of both *availability* and *affordability*. Private companies will only invest if they can earn enough to cover their costs. This calls for cost-reflective pricing. But the flip-side is that poor households may not be able to afford the full cost of supply – especially in remote rural areas where the upfront connection and supply costs may be very high. If the initial investment cost is spread over a long period, the resulting electricity tariffs may still be too high for poor rural households to afford. Usage levels and revenue streams would, therefore, be too low to make that investment profitable for electricity service providers.

For these reasons, there is a widely accepted case for subsidising electrification in developing countries. But the way the public authorities go about subsidising electrification is crucial in determining how successful these policies are. Badly designed programmes can lead to waste and inefficiencies, which can actually impair the ability of electricity companies to extend service. Where this happens, the poor who are supposed to benefit from the subsidies can actually end up worse off. The public authorities need to ensure that electricity subsidies achieve the objective of promoting access to electricity for the poor in a cost-effective manner while ensuring the financial viability of the electricity-supply industry. In formulating or reforming an electrification-subsidy programme, the key questions that need to be addressed are:

- *Who should the subsidies go to?* Normally, subsidies ought to be limited to households and farmers that are not already connected to the distribution network. Subsidies to the poorest existing customers may also be justified if their consumption is very small because of high prices and low incomes.
- *What should be subsidised?* For customers without service, it may be reasonable to subsidise the initial cost of access to the service. For example, grants could be made available to cover part or all of the capital cost of connection, paid for out of the central or local government budget. For both new and existing customers, it may be necessary to subsidise the actual supply of electricity too through lifeline rates for the poorest households.
- *How to subsidise?* Demand-side subsidies, such as those aimed at reducing connection costs, often work better than producer subsidies in ensuring that subsidies go to targeted customer groups and in providing incentives for efficient service delivery. However, the management of demand-side subsidy programmes such as the distribution of connection grants can be

expensive. In some cases, it may be more practical to provide direct incentives to electricity companies to expand their services to targeted customer groups. Generally, subsidies on providing the service on an ongoing basis should be kept to a minimum to deter consumers from wasting electricity or using it inefficiently.

- *How much to subsidise?* In principle, subsidies should be large enough to provide an incentive to distributors to extend service to poor households that would otherwise not receive it without creating unnecessary market distortions. This will depend on local market conditions. Lifeline-rates, if used, should be limited to modest levels of consumption – less than 50 kWh per month in most cases. And they should be applied only to small consumers defined by their capacity or their average consumption level so that poor households get most or all of the benefit. This way, larger consumers would be obliged to pay the full cost-tariff for the whole of their electricity consumption, denying them any access to subsidised electricity (unless they cheat by signing up for more than one subscription at the same address). If the rate is applied to the first tranche of consumption regardless of capacity with full cost-based rates applied to higher levels of consumption, richer households benefit to the same extent in absolute terms as poor households.

Menecon Consulting has undertaken a considerable amount of work on electricity investment, the role of electricity and energy generally in economic development, electricity tariff design, subsidy reform and policy formulation. For example, we recently carried out an economic, financial and technical appraisal of a project to rehabilitate the electricity network in Havana on behalf of the OPEC Fund. We also assessed the prospects for electricity investment on behalf of the Organisation for Economic Cooperation and Development (OECD) as part of its International Futures Programmes. The results were published in July 2006 in *Infrastructure to 2030: Telecom, Land Transport, Water and Electricity*. For details of how to obtain a copy of the report, go to:

www.oecdbookshop.org/oecd/display.asp?tag=X4UHB8XX4X4X294X51OPSM&lang=EN&sf1=identifiers&st1=032006011P1

© Menecon Ltd 2006

Menecon Energy Briefs are intended to stimulate discussion and inform the energy debate. Reactions, questions and suggestions are welcome, and should be addressed to energybrief@menecon.com.