

Subsidies and Sustainable Rural Energy Services:

Can we Create Incentives Without Distorting

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Subsidies and Sustainable Rural Energy Services: Can We Create Incentives Without Distorting Markets?

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**Joint UNDP/World Bank Energy Sector Management Assistance Programme
(ESMAP)**

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Introduction

At present about two billion people do not have access to electricity in the world, and an equal number rely on biomass energy for cooking. Higher income households generally have electricity, and the world's poorest and mostly rural households do not. For petroleum products and other "modern" fuels, the scenario is similar. The poor also often spend a significant proportion of their time or income collecting or purchasing energy for their household needs. The "modern" fuels used by households in developing countries include electricity, liquefied petroleum gas (LPG), and kerosene.¹ The supply of these fuels is often irregular, and policies on their use range from taxation to subsidies in various countries.

In many circumstances, development assistance programs have been directed towards making the supplies of these fuels more regular, reliable, and efficient. Unfortunately, attempts to improve sector performance have not always considered those without access to such services. For example, in countries which have embarked on wholesale sector reform, efforts have focused predominately on reducing costs, improving service, and reducing budgetary burden of utilities servicing predominantly urban areas. Also, the populations in developing countries without access to modern energy services also are among the poorest households in the world. It is hard to conceive how such households can work their way out of poverty without utilizing some form of modern energy. Electric lighting provides a strong foundation for improving literacy and children's education. LPG can eliminate problems of indoor air pollution.

Many governments have succeeded in bringing modern energy services most of their populations. Such countries as diverse as Costa Rica and China have achieved household electrification rates over well over 80 percent. But many other programs that have sought to extend access in rural areas have floundered, despite a great expenditure of time and money. Most successful rural energy programs involve some form of subsidy, but the subsidies enhance rather than detract from the viability of the program. Many developing countries have subsidized provision or consumption of energy in an effort to reduce costs to un-served households. But many of these efforts have had the opposite effect—preventing business from promoting access to rural electricity by the poor. Businesses go after the subsidies rather than concentrating on the development of financially sound, rural energy service businesses.

¹ "Modern" energy is used here to differentiate it from the use of biomass fuels in traditional stoves. Thus, for cooking modern fuels would include LPG, kerosene, and the use of biomass in improved stoves. For lighting, the connotation of modern energy refers to the use of electricity, because of the significant differences in efficiency when electricity is compared to the direct burning of kerosene or other petroleum products.

This paper examines public policies for creating an enabling environment for promoting sustainable provision of decentralized electricity services in rural areas. The concept of sustainability of service encompasses several dimensions: enhancement the quality of service; reduction of expenditures of the poor for energy; preserving the resource base; and encouraging businesses to serve poor rural populations. We focus on two key inter-related elements of the enabling environment: the design of subsidies and alternative service delivery models, particularly for off-grid areas where the majority of the rural poor reside. To accomplish this we will first examine the justification for subsidies, then turn to possible design of the subsidies, and finally discuss the possible institutional models to implement such programs.

Welfare Benefits of “Modern” Energy -- Justification for Government Intervention

Although access costs and barriers are high, for the poor who adopt quality energy services the social and economic benefits are very high. The use of modern energy sources such as electricity, kerosene and LPG is clearly desired by many rural people. They want electricity for lighting, as this provides the ability to extend the day and read in the evening (Barnes, 1988). Children in the family also can study longer hours, which will raise educational levels (Bose, 1993; Domdom and co-authors, 1999). Electricity service makes this possible because of the high quality of light; typically the light of an electric light bulb gives of about 200 times more light than a kerosene lamp (van der Plas and de Graf, 1988; Nieuwenhout and co-authors, 1998). For household lighting, families that use electricity have lower lighting expenditures while receiving 6 times more light than households using kerosene (ESMAP, 1990, Fitzgerald and co-authors, 1990). For cooking, the urban poor often pay more for wood or charcoal than they would for LPG, after adjusting for the end use efficiencies of the fuels (Alam and co-authors, 1998; ESMAP, 1999; Barnes and co-authors, 1999). Thus, subsidizing access may assist them in lowering expenditures on energy for cooking, as well as avoiding the serious health problems associated with indoor air pollution. Recent evidence from India indicates that indoor air pollution may be responsible for over 400,000 premature deaths per year (Smith, 1999, 1987).

Energy subsidies and other interventions to stimulate rural energy markets may be justified because the welfare gains -- either from the benefits of energy services or through the reduction of cash expenditures on energy -- often are much higher than the long term costs involved in providing “modern” energy service. Unfortunately, the up-front investments required to reach such customers and the small ensuing revenue flows do not attract many businesses or service providers, especially those with short term profit goals. Moreover, oftentimes the poor lack the means to pay for these long-term costs at the initiation of service or over a short-term period. As a consequence, the service provider -- whether public or private -- has little incentive to market energy services to poorer segments of the population. In countries that do not have facilitating policies, the rural and poor will more often than not be precluded from the benefits of modern energy. In many instances some form of subsidy may be required to assist poor households in obtaining higher quality energy services either by providing direct subsidies to the poor or, where service networks are non-existent, by providing incentives to businesses to develop such networks. However, energy subsidies should be directed at encouraging access to services rather than subsidizing the operating costs of providing the services. Because the poor and rural

people typically are the ones without service, such access subsidies can be well directed towards them in most instances.

Past Subsidy Programs Poorly Targeted

Despite laudable objectives, subsidies have often failed to meet their stated objectives of making services more affordable to the poorest. All too often subsidies have become the grist of politics, and have been provided to those already with access to modern services. It is no coincidence that in developing countries the populations with access to energy services are the middle and upper income households. Even well intended subsidy programs can have problems. Subsidies have often been *implicit*, such as default or non-payment of electricity bills; *untargeted*, such as a subsidy for energy used by all; *indiscriminant*, such as a subsidy for a quantity that is well above that needed by poor or rural populations; *complex*, or difficult to administer to targeted groups; and *overly restrictive* with respect to end use or technology, depriving users of choice.

Mis-targeting of subsidies grows as different interest groups attempt to capture the rents implicit in such programs. For instance, Indonesia has had a policy to direct kerosene subsidies to the poor for cooking. Although many poor people are now cooking with kerosene, many, indeed most of the beneficiaries are middle and higher income classes (ESMAP, 1990). In Ecuador cheap kerosene was diverted to the transport sector, and much of it never reached the poor, especially in rural areas (ESMAP, 1994). In the former case the subsidy, while reaching the poor, was not well targeted (errors of inclusion). In the latter case, the design of the subsidy introduced distortions in the energy market, and many of the intended beneficiaries did not benefit from the subsidy (errors of exclusion).

In some cases subsidies appropriate for the poor are not properly dimensioned. One such case is the misuse of lifeline electricity tariffs. A lifeline rate is usually a cross-subsidy that enables poor people who use minimal services to pay a lower price than more wealthy households that are using higher levels of service. Lifeline rates can be self-targeting because poor people can only afford to use very little electricity, mainly for lighting and televisions. The advantage of properly targeted lifeline rates is that they are directed both towards the poorest households and towards the part of energy demand that provides high levels of benefits -- namely initial lighting services. But in many countries, the lifeline rate is set at very high levels. In Chad the lifeline was set at 200 kWh per month which encompassed well over 90 percent of the population. Thus, even potentially sound subsidy mechanisms can be misapplied, with the result that those who are willing to pay higher prices for electricity actually receive most of the benefits.

India illustrates the difficulty of phasing-out subsidies after they have outlived their usefulness. In the early stages of the green revolution the government heavily subsidized electricity prices to encourage irrigation. As the productivity gains paid off in the form of higher incomes, the subsidy was no longer justifiable. But the farmer lobby has not only been successful in keeping the subsidies in place, but in some states has persuaded politicians to provide farmers electricity for free. As a consequence the state electricity boards, which are the primary public electricity companies in India, have been severely de-

capitalized and cannot finance the necessary investments to maintain reliability and extend service to the poor who still lack access.

Designing Energy Subsidies to Reach the Poor

Subsidies should improve access of the poor while not seriously distorting energy markets. To achieve these two goals, subsidy policies should be carefully assessed by their relative efficacy, efficiency, and cost-effectiveness. Efficacy means that the subsidy reaches those for whom it is intended, the poor (minimizing errors of inclusion and exclusion). Sector efficiency means that the subsidy is structured in such a way that it encourages provision of service at least cost. This is one aspect that needs to be addressed more thoroughly in energy sector restructuring work, which often does not consider access issues, particularly in remote rural areas. Cost-effectiveness means that the subsidy achieves social goals at the lowest program cost while providing incentives to businesses to serve poor and rural populations. In taking decisions on target groups, the form, eligibility criteria, and financing of subsidies, these three criteria should be borne in mind

Subsidies can come in many different shapes and sizes depending on the country's institutional endowment and on government policies. Their impact depends not only on the instrument but also on government administrative capability. Alternative subsidy mechanisms may include cross-subsidies between user groups, subsidized interest rates on loans, equity investment by a government to promote service expansion, low bulk tariff rates for distribution companies expanding service, taxes/fees earmarked for a subsidy fund, and government budgetary contributions.

Who to Subsidize

As a general rule, in developing countries, subsidies should be directed at those currently without access to higher-quality energy services, typically rural households and the poor. In the case of electricity the share of the population without service varies significantly, from 10%-40% of the population. Households that already have service are generally the better off. In the case of petroleum-based products the boundaries of the target group (and the best form of intervention) may not be so clear cut. The poor may have access to kerosene at very high prices because of the small quantities that they purchase, though they generally have difficulty getting LPG because of the large purchases and service initiation fees involved.

What to Subsidize

Subsidies should be applied to access costs (connections), not to operating costs (ongoing consumption). As noted, the poor spend a significant amount of their income or their time on low-quality energy services. Subsidizing some of the access barriers that they face can encourage the poor to climb the energy ladder to better services. For example, the electricity connection fee for poor households can be kept low by providing a partial subsidy for the capital costs of a connection, and perhaps rolling the rest of the cost into monthly bills. An example of such a subsidy program is Chile's rural electrification program where subsidies are provided to rural communities for the capital costs of

acquiring electricity service. This program encourages businesses to service rural populations by subsidizing the costs of connections for poor consumers. Similarly, to encourage poor households to use LPG in urban areas and for businesses to extend service to more remote areas, the initial service fees could be provided a modest subsidy and smaller bottles developed to lower the initial costs of service.

How to Subsidize

The choice of instrument and implementation mechanism is a significant determinant of the efficiency and efficacy of a subsidy in improving the welfare of the poor. In general, demand side subsidies work better than fuel or supply side subsidies because they have better targeting properties and provide stronger incentives for expanding coverage and sustaining services. Demand-side subsidies involve partial funding of connections or partial payment of regular energy bills. Supply-side or fuel subsidies are easier to implement but should generally be avoided because they are hard to target and often undermine efficient service delivery, raising costs above what they would otherwise be. The Indonesian kerosene case mentioned earlier is one example. Another case is India which has used a 25 percent fuel subsidy for LPG for cooking for many years. Unlike Indonesia, India has had to import LPG. To limit the fiscal cost, India has limited imports of LPG and the number of authorized retailers. There are long waiting lists for the subsidized LPG and the subsidies go mainly to the well-off and middle classes.

In a few countries with strong administrative capability, supply side subsidies (cross subsidies and under-pricing the bulk "commodity") have not unduly undermined the financial viability of the businesses involved. One example is the rural electrification program in Thailand. The subsidy was important for expanding electricity to more than 90 percent of the population and, unlike the Indian electricity boards, the Thai program was sustained because of the many measures taken to keep costs low and to safeguard the financial viability of the service providers. Where governments have ample resources to spend on service expansion and where efficiency considerations are not paramount, supply schemes may work, but at a cost to the country

There is a fine line between subsidies that encourage service provision and those that encourage only the purchase of equipment. This is an especially important problem for renewable energy, since most of the costs of service are the capital costs of the systems themselves. In Peru, for example, a village without electricity was selected to receive household photovoltaic systems. The systems involved 100 percent subsidies. After several years a return visit to the village revealed that many households had sold their systems. Similarly, many of the photovoltaic programs in India encouraged manufacturers to produce for the government subsidy rather than for the market. Another case of disincentives to provide service after the equipment was installed occurred in the Asunto Valley in Bolivia where the possible installation of a free micro-hydro system actually could cause the local distribution company to lose money because of the increased costs associated with adding the capacity. The challenge is to dimension the subsidy so poor households can afford access to the service while not destroying business incentives to serve them.

Sustainable Provision of Electricity in Remote “Off-Grid” Areas: Alternative Service Delivery Mechanisms

Unfortunately, some past donor approaches to projects involving renewable energy have experienced problems. The traditional failed approach to promoting renewable energy is well known. A donor contacts a government with a proposal and money; the government selects recipient communities and the contractors; the contractors provide installation and perfunctory training and then return to the capital city; and the service fails as undervalued equipment breaks down or is sold. In the case of some countries implementing sector reform, attempts have been made to provide service to off-grid areas through subsidy funds from the proceeds of the sale of the public electricity companies. However, simply creating and capitalizing a rural electrification fund under such circumstances has not solved the problem. More often than not the urban-based utility (public or private) acquires the majority of funds, extending service marginally along the periphery of the existing grid. An equally problematic outcome is that the funds remain unutilized as the traditional utilities, public or private, face strong political and financial pressures to focus their resources on the urban and peri-urban customer base.

Thus, the design and implementation of subsidy instruments is closely intertwined with the service delivery mechanisms available in a particular country context. The delivery model strongly determines the degree to which potential service providers are able and willing to enter the market, put their capital at stake, and respond to local demand. The delivery mechanism also strongly influences the ongoing costs of operation and the choice of subsidy instrument itself. Here are some recent experiences with alternative service delivery mechanisms that have met with some success. Although there is still some experimentation taking place with these models, they provide an indication of the way forward in promoting sustainable off-grid electrification. In this section we examine some of the models utilized to deliver rural electricity services, and the advantages and disadvantages of the typical subsidy mechanisms involved. The models comprise dealers, concessions, the retailers, and the cooperatives.

The Dealer Model

The dealer model emphasizes the development of dealers that can sell equipment, usually photovoltaic equipment, to people living in rural areas distant from the grid. This model builds on existing retailer networks in developing countries that service rural areas. They are typically very weak, undercapitalized, and have limited service territories. The idea of providing some form of subsidy to such dealers is to provide a subsidy to lower the cost of the product and therefore increase consumer demand. Various ways have been attempted to strengthen the dealer networks, mainly for the delivery and servicing of photovoltaic systems. However, the programs have resulted in only mixed success.

Probably the best known programs involve projects in Sri Lanka and Indonesia, where a combination of Global Environment Facility funds and Bank loans or credits were to be offered to dealers to on-lend to customers. The goal was to expand the market by making credit and partial subsidies available for the purchase of photovoltaic systems from “qualified” dealers. The programs have experienced problems, mainly because of limited

dealer interest in participating in the program. In Indonesia the project was overtaken by the financial crisis and currency devaluation that followed. Although some dealers have signed up, in general they appear to be resistant to assuming responsibility for extending and recovering loans, preferring equipment sales.

Such programs appear to work better in countries that already have strong dealer networks. For instance, in Kenya, partly because of the very low grid rural electrification rate, the market for photovoltaic systems developed when PV dealers began selling systems through small rural sales points such as general stores, mainly for cash. Now more than 100,000 households use PV systems, usually purchased piece by piece and in low watt increments that lower the first-cost barrier. A 12-watt system appears to be the standard. There is a similar situation in China, where a World Bank loan will be providing credit to PV retailers. In China, the subsidy for renewable energy systems is connected to systems sales, and it does not depend on any type of lending by retailers. Also, in contrast to other programs, the dealers in the remote provinces of China are much stronger, and there is a market segment that has relatively high incomes for remote areas (Tuntivate and co-authors, 2000). Thus, for the retailer model to work there must be a number of factors in place, including an already strong retailer network. In Kenya today, the retailers are beginning to offer systems for lease, which appears to be a more accepted approach than extending loans to purchase equipment. It is noteworthy that even under these favorable circumstances the retailer approach generally is not able to reach the poorest households.

In this case, the subsidies are intended to increase renewable energy system sales by lowering the cost to consumers and thus expanding sales. By providing increased profits and lower cost to rural consumers, the subsidies do theoretically provide business incentives to service rural areas. But the problem is that, at least in the initial stages, the subsidies will go to the more wealthy households in rural areas. Also in practice, the dealers in Indonesia did not want to get into the business of providing loans to consumers, and therefore participation in the program was very weak. Therefore, the program may provide business with incentives, but the goal of reaching the poor households in a cost-effective way is more of a future goal of the subsidy. The grid electrification programs in developing countries faced these same problems when initiating their programs -- the early adopters are mainly more wealthy households.

The Concession Model

The concession model for the development of off-grid electrification was developed as a way to minimize budgetary subsidies and encourage private sector participation. The model depends on regulation by contract more than market forces, but helps ensure that scale economies are achieved. In Argentina, for example, franchise rights for rural service territories are being granted to concessionaires that offer the lowest subsidy to service rural households and community centers. Concessionaires can select from a wide range of off-grid technologies, although solar PV is anticipated to be a cost-effective choice in many cases. Users pay a connection tariff and monthly service fee (set by the government), and a declining subsidy is provided to the concessionaires based on the provisions of their contract.

The concession model developed for Argentina may or may not be useful for many other countries, but it highlights several important issues regarding off-grid electrification. The first is that without subsidies, there is little potential business in remote rural areas, especially a business directed towards serving the poorest households. The concession model attempts to address this problem by allocating subsidies to the businesses that meet the criteria for serving off-grid markets, and minimizing them through competitive bidding for rights to the concession. The second is that assured demand in terms of schools and other government facilities can be important in the development of commercial strategies for off-grid rural areas. Finally, the concession model is not technology driven, in that the concessionaire can use any technology to meet energy demand, including local generation with petroleum fuels.

In Argentina, the level of subsidy for rural communities comes through a bidding process. Given that over 90 percent of the households in Argentina already have electricity, it is the poorest regions that will receive the subsidy, so it is well targeted. Depending on the competition involved in the bidding process, it may or may not be cost effective. If the service providers ask for very large subsidies, and there is not competition for service territories, then it is doubtful if it will be very cost effective. Also, the subsidies do not go directly to the population without service, so there can be questions about effectiveness. But it is clear that the subsidy is directed towards the poorest part of the population. Thus, the “success” of subsidies in the concession model as applied in Argentina is clearly dependent on the level of competition for the service territories.

The Retailer Model

The electricity retailer model is an approach to electricity service that at least initially involves a decentralized approach to providing electricity to household that do not have access to grid service. Under this model a community, organization, or entrepreneur develops a business plan to serve local demand for electricity (for greater details, see ESMAP, 1999). The plan is submitted to the off-grid electrification committee for approval. If the plan is approved, depending on the situation a loan or a subsidy is given for the development of the business. The retailer deploys the system through a fee-based service arrangement to recover the costs, repay the loan, and earn a profit. This approach ensures significant local involvement and consumer choice. In this, as in other models being pursued, a goal is to keep transaction costs from escalating and to realize scale economies.

Although there are a wide variety of approaches that can be loosely define as the retailer approach, the key to this model is a local business that develops a plan to provide electricity service. This is often done with technical assistance from one or more groups that are knowledgeable about feasible technologies. The idea is that the combination of making funds available and the provision of technical assistance to promote and provide knowledge and information on technical options is key to the development and support of local groups that are willing to provide electricity services. This model had been successfully implemented in several projects that generate electricity, including India and Sri Lanka (micro-hydro component) and in a broader context in Laos (ESMAP, 1999). At present the Laos off-grid electricity component is only in its first year of implementation, but the results are encouraging. The business plan models have been developed and two

communities are participating in the program, with many more expressing interest in participating.

Variations of the retailer model have also been successful on a limited basis. For instance, there has been a very successful fee for service program by Enersol in the Dominican Republic. In this case a business with technical assistance from donor agencies has developed a program to install PV systems in rural service territories. A “technician” has responsibility for one service territory, and is responsible for installing, maintaining and collecting fees. Accordingly, a key component of the Enersol model is a network of locally managed NGO credit programs to finance systems using revolving loan funds capitalized by external donors. Recipients must repay full capital, installation, and market interest costs with monthly payments over two to five years. The default rate for these credit programs is less than 1 percent, though late payments are not uncommon. Other rural Dominicans have purchased systems with cash or informal three- to six-month loans provided by system suppliers. In addition to building capacity for household systems, Enersol created a program to help communities finance and implement PV water-pumping and community-lighting projects.

The electricity retailer model also fits in well with the trend towards private sector participation in the electricity sector. This process involves a reconfiguring of the ways in which subsidies and technical assistance for rural energy are provided to reach rural consumers. The idea is that the service provider has access to technical assistance and perhaps some loan funds, so that they deal directly with consumers. The service provider can be an entrepreneur, an NGO or even a community. In order to get the subsidies or the credit, the service provider must develop a business plan for providing electricity service to rural consumers. Because the program is dealing with local businesses, who must demonstrate that they are going to serve the poor, the subsidies are well-directed and the program costs are kept to a minimum. However, there always is the risk that the service provider does not live up to his contractual responsibilities.

Rural Electricity Cooperatives: Lessons from a Grid Model

The final model that we will discuss involves the development of rural electricity cooperatives that serve rural consumers. The rural electric cooperatives in many developing countries are patterned after the rural electrification program in the United States. They are mainly distributors of grid electricity to rural communities. Although some are involved in renewable energy as well, this business is relatively small compared to their main business of grid service to rural consumers. As a consequence, we will indicate how these rural electricity service businesses were subsidized.

In Bangladesh, prior to approval all new cooperative service areas must satisfy revenue requirement standards. Feasibility studies are performed to determine if the revenue requirements are met, not only for the entire cooperative (PBS), but also for each service area within the PBS. Some communities may remain un-electrified for several years until population and the associated potential for productive uses loads grow to the point that they will qualify to be included in the PBS electrification plan.

The revenue requirement standards allow for financial losses, referred to as negative margins, during the first several years of PBS operation, reflecting the fact that load growth may be gradual as the system infrastructure is being developed. The electrification program is designed to support the process of PBS development by providing cash flow support as well as low-interest loans with long repayment periods. The program support funds allow PBS operations to mature through the first five years of service. After this period of developing load and markets, the PBSs are expected to reach financial stability. The program support funding, while available to all PBSs, is quite limited and is very closely monitored. Subsidies are in the form of subsidized loans that are used mainly for electricity expansion, and a cross-subsidy in the form of lower power purchase costs from the public utility.

The goal of financial and operational viability is explicit in the development of the cooperatives. The subsidies are intended as incentives to develop a business to serve rural populations. For the most part they are cost-effective because the program administration costs of the subsidies are not very high, as they come in the form of subsidized interest rates on loans to the cooperatives, and the cooperatives are responsible for ensuring that rural people have access to energy services. As indicated, in the beginning phases of most rural electrification programs, the subsidies are not very well targeted, because the early adopters of electricity from the grid are usually wealthy households. However, over the longer term the grid expansion reaches mainly poor populations. Finally, the subsidy is targeted towards the grid distribution program and generally is unavailable for other energy service providers, so there is some limited distortion in energy markets. A better, though more difficult to administer, policy would be to provide all energy service companies with the same incentives.

Conclusion

The welfare benefits for rural and poor people of having access to electricity are quite high. As indicated, the use of one electric light bulb is far superior to kerosene lamps and candles. In addition, throughout most of the world the more wealthy households already have electricity service. Given that the growing body of evidence that the private sector on its own initiative will not go after rural markets, there is a case for temporary, well designed subsidies. As indicated previously, many rural electrification programs have suffered from poorly applied subsidies, and the same problem can occur for renewable off-grid businesses as well. To be cost-effective, efficient, and useful for rural and poor people, energy subsidies should have two main goals. The first is to assist the poor in gaining access to higher-quality energy services, which points toward having a subsidy that helps lower front-end costs for poor consumers. The second is to provide business incentives to serve rural and poor consumers who would not otherwise be served, without significantly distorting energy markets

There are some new models for intervention, including the development of rural electrification funds such as in Chile. In Chile, communities can apply for subsidies for both grid and renewable electricity access. This system of subsidies was developed after the progress of rural electrification lagged as a result of the privatization of the power sector. As other countries go through the process of restructuring their electricity sectors,

it is clear that special consideration should be given to those people that do not have access to electricity service, which is mainly poor and rural households. The challenge is to develop a privatization model or framework that does not significantly distort efficiency in the energy sector, but does take into consideration societal goals of expanding access to energy services by poor and rural populations.

One overriding lesson emerging from recent experience is that the design of subsidies and the concomitant service delivery models needs to be oriented toward providing business incentives to serve rural consumers who would not otherwise be served. The challenge is doing so in a manner which does not distort energy markets and must also be practicable within the financial and human resource endowments of the country in question. For the service delivery model to be self-replicating -- a basic feature of sustainability -- any subsidy should stimulate new business development rather than becoming an end in itself. Similarly, the service delivery model should provide strong incentives to ensure that service is continued and maintained long after the equipment is installed. Rural people desire electricity. But there are still very important challenges in developing proper incentives and subsidy mechanisms for providing rural electricity services.

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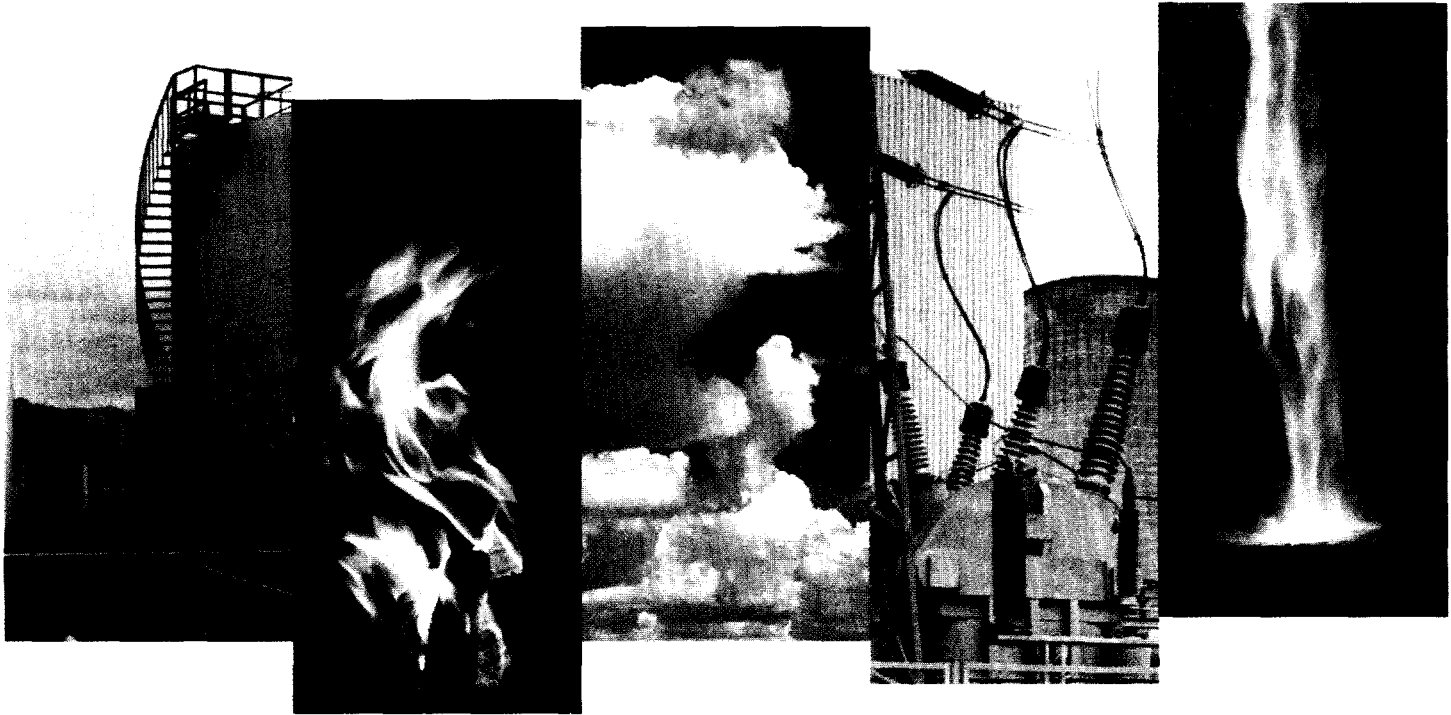
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