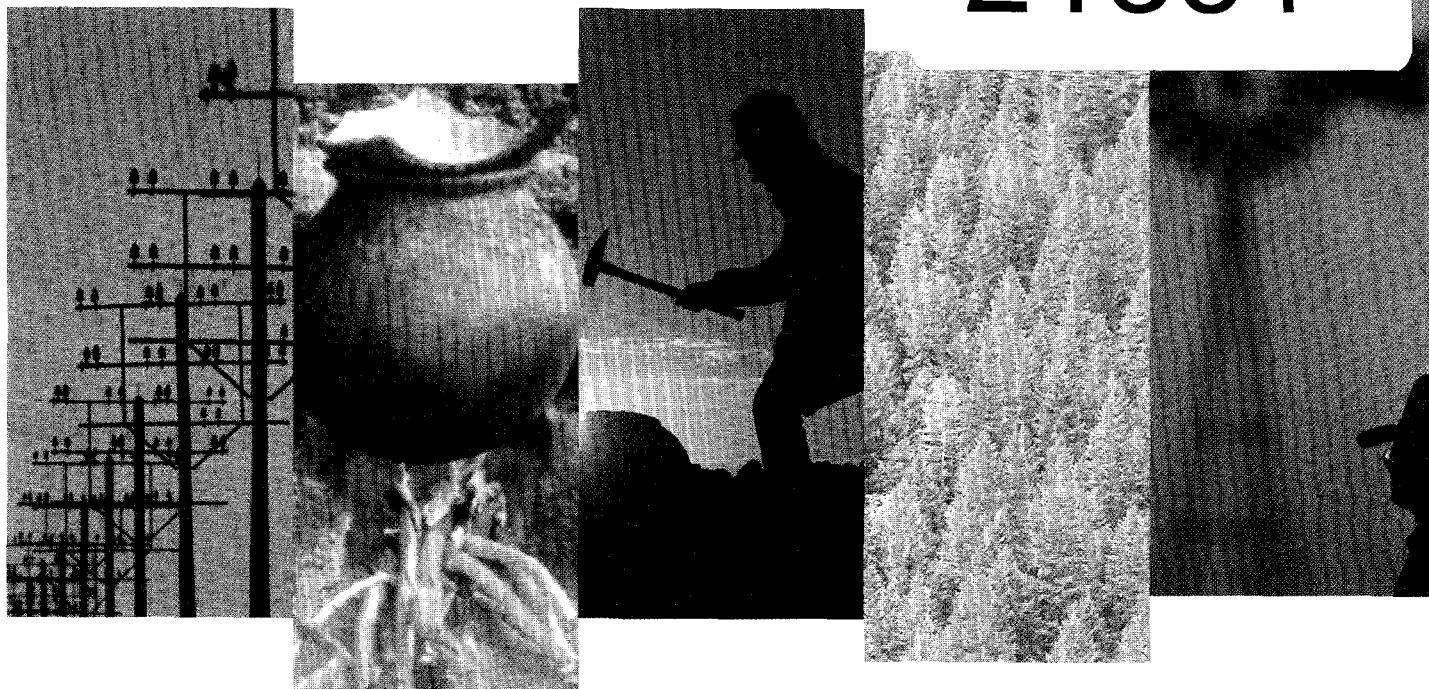


Impact of Power Sector Reform on the Poor

A Review of Issues and the Literature

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Impact of Power Sector Reform on the Poor A Review of Issues and the Literature

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May 1999

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

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First printing July 2000

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Impact of Power Sector Reform on the Poor

A Review of Issues and the Literature

Objectives and Scope

Prescriptions for the commercialization, restructuring and privatization of the energy sector (Box 1) are now in fashion. They are actively promoted by donors but fiercely decried by opponents. One crux in the debate is the apprehension that these reforms are a setback for the poor. The present note reviews the issues and the literature. Its objective is to inform rather than settle the debate and to suggest orientations for future research. Its focus is on the power sector and on developing countries.

Box 1 . Commercialization and Restructuring

Energy supply and consumption are often the source of economic waste and heavy fiscal burden. As with other infrastructure sectors, these can be traced to distorted pricing regimes, low quality of service, high technical and non technical losses, reduced equipment availability and efficiency, inefficient system operations, lack of commercial management skills, fuel and investment choices.

An analysis across time, countries and sectors show that the root causes of the shortcomings are "institutional," in other words, sector policies and structure, government interference, incentives systems and, in some cases, corruption. Many of the prescriptions apply broadly to infrastructure:

Regulatory reform, private participation in infrastructure (management, leasing, and concessions contracts and assets ownership through new projects or divestiture). Difficult issues relate to the labor transition arrangements, the degree of discretion afforded to regulators and their interaction with policy makers, planners and the judiciary.

A few restructuring options are specific to energy especially power and natural gas: (i) competition generally requires the unbundling of large integrated production and distribution conglomerates into market segments which can be made contestable by potential entrants; (ii) for production, it is feasible to organize competition in the market rather than settle for bidding for a share of the market; (iii) costs are sensitive to the ever changing supply demand balance and managing this volatility requires a high degree of sophistication by suppliers and users; and (iv) inter area trade can enhance risk management and reduce cost volatility but this requires a level of cooperation which is often elusive.

Findings and Recommendations

Opponents of the reform generally focus on its most immediate and visible impact i.e. the reduction in electricity price subsidies and the lower profile of governments in electrification programs. They tend to be less familiar of the reform indirect impacts and of hard won lessons of experience about the role of energy in development and the issues raised by energy subsidies.

The literature and data reviewed here strengthens the presumption that the impact on the poor has been positive in countries where the reform is most complete and mature. While the direct impact is often a tariff increase for many users, in these cases, the poor were protected against increases or benefited as group from the improvements that reform

brought about in the sector—better access and service—in government finances and in the economy at large. Information is sketchy, however, on many of these aspects and in what circumstances the results, good or bad were obtained; data is also limited to a handful of countries. Further work is strongly recommended along three directions:

1. **Post reform social assessments.** The direct social impact of price changes and privatization in countries that have implemented reforms needs to be quantified for the first time (Bolivia, Brazil, Peru, Cote d'Ivoire, Hungary, Kazakhstan, the state of Orissa in India) or updated (Argentina, Chile, Poland). Indirect impacts on access and public expenditures in social sectors need to be assessed for all. Countries that have implemented only a few reform components may allow the assessments to isolate the impact of those components, e.g. divestiture of power distribution in Brazil and system lease in Cote d'Ivoire. It would be preferable not to focus exclusively on power but include hydrocarbons and district heating where applicable.
2. **Good practices evaluation.** A good practice is one that fits with the new paradigms—success is not maximizing the rate of connection to a power grid while starving social sectors from public funds—and makes the right trade offs among conflicting concerns. Research is needed to recognize, document and evaluate good practice in both design and implementation of reforms in relation to the poor. The focus would be on delivery mechanisms and subsidization, on the policies and organizations put in place. The evaluation would determine what replicable ingredients make it good practice and on what is the role played by country factors and newly available technology. Candidates for good practices are most likely in Latin America but cases from other regions like Africa are crucial to strengthen the validity of the findings.
3. **Pre-reform social assessments.** Where there is an urgent need to reform but concerns about the social impact, assessments could be carried out to explore the benefits and costs of various reform options and recommend courses of action. Prototypes exist, a legacy from early reformers, but they could be vastly improved upon as evaluation progresses on post-reform results (see above proposals on impact and good practices). The market for such assessments is above all the countries beset by fiscal problems and where the government is keen to cut or re-deploy the budget: Indonesia, some states in India, Pakistan, countries eager to join the EU and the most reform inclined countries in Africa.

Poverty Reduction and Energy

People in OECD countries spend only 2 to 3 % of their income for energy, in the developing world; this share is 12% and even more for the poor¹. The poorest use energy mostly for cooking and consume fuel wood, charcoal and kerosene in larger amounts than LPG and electricity. On average, 76% of urban residents and 35% of the rural population have access to electricity, much less in Africa and South Asia². Decades of experience

¹ Karekezi 1999

² R &E Dev Rep 1996

have changed the paradigms about economic and social development and the role of the energy sector (Box 2). But whereas the need to conserve energy and respect the environment better has gained broad acceptance, public awareness is lagging about how the strategy of broad price subsidies has failed the poor and how reform could help them much better. The truth is energy can best help by supporting growth and promoting the poor's gainful employment, usually through increases in labor productivity; it plays a lesser role in fulfilling basic needs in health, nutrition and education.

Box2- New Development Paradigms

Poverty alleviation. Growth is good for the poor; poverty diminished in 77 out of 88 cases of decade-long growth. But the 1990 World Development Report, Poverty, stressed that a rapid and sustainable poverty reduction strategy has two equally important elements: (i) promote the productive use of labor and (ii) provide basic social services in health, nutrition and education. In addition, a few merit goods deserve to be subsidized because their public benefits are large but the private willingness to pay is insufficient e.g. rural roads, urban public transport and sewerage.

Environmental management. The 1992 World Development Report, Development and the Environment highlighted the difference between tradeoffs situations -- mostly in the exploitation of natural resources-- and win-win ones where efficient economic development produces environmental benefits. It shows that win-win situations are numerous in infrastructure services but they require sweeping institutional changes, in particular the elimination of energy price subsidies.

Subsidization Issues

Energy subsidies are highest in energy exporting countries but they exist everywhere. In the late 1980s, they amounted to about US\$300 billion in the aggregate for developing and transition countries³. This is more than the flow of aid or social budgets in many of them. But with few exceptions, governments have done little to reduce energy subsidies in recent years. The decrease to some \$200 billion observed in the 1990's is due mostly to the fall of oil prices in real terms and to the contraction of energy intensive economies in the former Soviet Union and Eastern Europe.

What to subsidize. Links between energy and health, nutrition, and education have seldom been delineated. Basic energy needs include space heating in cold climates, fuels for cooking and electricity for lighting. But even these compete with many high priority needs and energy ranks low among the goods deserving to be subsidized: its consumption increases more for the wealthy than for the poor when its price decreases so energy subsidies tend to be socially regressive; they do not promote sustainable growth, they rather support a growth that does not favor the poor because less labor intensive and more environmentally aggressive. Subsidized power for irrigation not only increases inequalities among farmers but also induces waste of energy and water and raises soil salinity. Also, the poor are in majority willing to pay the cost of modern energy because it is so much better than traditional fuels⁴. Subsidizing access costs e.g. LPG bottles,

³ Shah, Roberts, Huther 1996

⁴ Kosmo 1987

connection to the grid, is less socially regressive and harmful to the environment, but it can discourage the development of cheaper substitutes.

Whom to subsidize. Targeting subsidies is economically desirable but fraught with difficulties⁵. Good targeting may undermine political support for its funding or prove costly to administer. Eligibility criteria could accommodate a broad definition of disadvantaged populations (age, ethnic origin, and physical handicaps). The case has been made that the urban poorest deserve closer attention because they depend on biomass fuels the supply of which is more expensive, more damaging to the environment and more precarious than in rural areas where crop residues, animal dung and firewood can be collected⁶. The criteria should consider the users' assets and income and the relative burden of meeting basic needs. In practice, targeting mechanisms are generally absent or ineffective: subsidized block tariffs for electricity overwhelmingly benefits the middle class. Targeting for tradable fuels can be largely abused; for instance, kerosene subsidies for households often ended up in the hands of transport entrepreneurs.⁷

How to fund subsidies. While common, cross subsidization among users has many perverse impacts. First, the poorer the country, the more socially regressive it is because most of the poor are non users. Second, in some countries, electricity users in the industrial and commercial sectors are so overcharged that they evade payment and bypass grid service, thus shrinking the revenue base and resorting to uneconomic uses of diesel sets. Third, differentiated taxation also has perverse impact: overcharging fuels such as LPG indirectly raises the price caps spontaneously set by the markets to cheaper substitutes (charcoal and wood) used by the poor. Any fuel taxation reduces the affordability of energy for the poor, yet it is widely practiced as a sure way to raise fiscal revenues.

Revisiting access issues. Access to energy by the poor cannot be equated to rural electrification: (i) the poor are not the only ones with access problems; (ii) they are numerous in urban areas, and increasingly so as urbanization continues, and (iii) electricity is only one of many fuels, generally the most expensive one. The performance in terms of RE coverage is sobering (Box 3), even more so when socially weighted. The bottleneck was thought to be funding and technical skills, but actually it was and still is institutions: funds can be raised through policy reforms and rural development experience has shown that even well funded projects founder or fall in ruin and disuse because funds are missing and technical skills dissipate without adequate organizations; e.g. chambers of commerce, township/village councils are often needed to help identify priorities and ensure financial discipline.⁸

⁵ Gelbach, Pritchett 1997

⁶ Leach 1987

⁷ Even when targeting fails, part of the benefits may trickle down to the poor: housing subsidies captured by the middle class makes less desirable housing available to the poor; in the energy sector, this happens only with "nobler" energies, electricity, LPG freeing kerosene or fuel wood for use by the poor.

⁸ Freund, Wallich 1995

Box 3. Electricity so prized and yet so scarce!

Electricity costs less than kerosene, provides ten times more and better light and powers many labor-saving devices. Many poor are willing to pay the price. The main barrier is the connection fee of \$80-300. There is a positive relationship between opportunities made possible by electric lighting and higher lifetime. Electric lighting reduces air pollution inside the homes, kerosene poisoning and the number of burn victims. Welfare gains multiply when the poor have also access to all weather roads and clean water. There are still 2 billion people without electricity. Under a business-as-usual scenario this number will increase to over 3 billion by 2010. In particular in South East Asia and Africa, more people are born each year than are connected to some kind of service. The few countries that continued aggressive RE policies made only gradual headway and at great cost; these policies also often failed to bring about sector efficiency and join with other infrastructure services that have the synergy to leverage a greater welfare impact.

In sum, given that the poor efficiently choose the fuel mix; helping them best is giving them access on a commercial basis to a range of energy services, eventually subsidizing it for basic needs in a fair, efficient and sustainable way. Achieving the first objective has proven an indispensable prerequisite to pursuing the second one.

Impact of Power Reforms

Tariff changes. Bulk prices dropped almost everywhere competitive pools were set up, most notably in Chile and Argentina (20 to 50%). Tariffs decreased also for industry and commerce, but most often they rose for other customers because they were and still often are below the cost of supply, one of few exceptions was for the clients of EDENOR in Buenos Aires.

Several ex-ante assessments consider the impact of price jumps planned in the reform, eventually to suggest mitigation measures as for the Kyrgyz Republic⁹ but it is not generally clear how these measures can be financed. One such assessment does show that expenditures for the poor would increase done for Poland suggests that the immediate impact of a uniform price increases is not socially regressive; it hurts the well off more than the poor and; across all energy services, the welfare loss is greatest for electricity and across user groups, for those using district heating the most¹⁰.

Ex-post assessments tend to be fewer and more comprehensive, they all use different methodologies. A direct impact measurement in the UK and Hungary shows that removing cross subsidies in several infrastructure sectors did not affect the relative welfare of the rich and the poor, proving these were poorly targeted. The most comprehensive analysis was made for Argentina; the changes in sector performance are fed to a model which estimates the impact economy wide (GDP, prices, exports, etc); it finds that the private operation of utilities cut on average 30% of users' bills and that a more effective regulation would yield an extra 10%. Cuts benefit less the middle class than the poor and the rich: the middle class spends a lot on energy, but the poor gain the most from labor income gains and the wealthy from capital income ones¹¹.

⁹ Finkel Garcia 1997

¹⁰ Freund, Wallich 1995

¹¹ Chisari, Estache, Romero 1997

Refocusing subsidies. Once refocused, subsidies are more affordable. In Venezuela confining subsidies to “only” 33% of households would cost 2.2% of GDP one fourth of their current cost¹². Worldwide, extending power service to the first third of the 2 billion people without it would cost “only” \$80 billion, a fraction of the current consumption subsidies. Indeed, all reforming countries kept subsidies in some form after revisiting all aspects of the problem, notably:

- **Linkages to basic needs.** Chile and Argentina let municipalities set the priorities for the use of social development funds¹³. Chile does best by subsidizing access but not consumption: the private developer awarded an RE market receives a matching grant of 40% of total cost. In OECD countries, where access is already available to all, reform often target subsidies to reducing the bill through increased energy efficiency.
- **Targeting beneficiaries.** When they exist, eligibility criteria are often crude: number of bulbs and plugs, property values, etc. Chile and Argentina use better ones that are administered by municipalities for water and electricity. In the OECD, technologies are breeding new policies e.g. demand limiters prevent abusive consumption but avoid the abruptness of disconnection in case of non payment; prepayment meters avoid it all and enable targeting with personalized payment cards.
- **Funding schemes.** Cross subsidization is hard to avoid where tax systems are weak. However, as it cannot survive competition at retail level, policy makers have two choices¹⁴: (i) preserving the old price structure but requiring some suppliers to provide cheap services and obliging competitors to share the financial burden; (ii) funding subsidies from tax revenues. The first option was applied by Spain (Australia for telecom), the second one by Chile. In Argentina, a sector specific levy funds a part of the electricity bills and service extension for the poor.

Indirect Impact of Power Reform

Reforms indirectly benefit the poor in many ways (i) enabling delivery mechanisms that expands energy access, voice and choice for consumers; (ii) freeing fiscal resources for high priority social spending and (iii) reducing the environmental and social impact of energy supply to which the poor are the most exposed. Only the first impact is relatively well documented. The third one is not and the second one is overlooked: even the good work for Argentina assumes government expenditures are a constant share of its income.

Facilitating access. Allowing scheduled payments (Bolivia) or micro-finance (Sri Lanka) for the hook up to the grid dramatically increased the rate of access. Opening up the access business by itself reduces the need for subsidies (in India, LPG market

¹² Gutierrez 1995

¹³ Alejandro 1997

¹⁴ Irwin 1997.

liberalization increased the affordability of wood fuels by the poor¹⁵). But where reform lags, delivery models are slow to diversify and improve¹⁶.

For extending access to electricity, the utility model prevails almost everywhere but there have been successful experiments with bulk sales to private individuals for on-sales through their own non-standard network. For RE, cooperatives were tried long ago with some good results in Bangladesh, Costa Rica; and Bolivia¹⁷ but the ingredients of success are elusive as shown by the demise of many coops in the Philippines. Chile and Argentina introduced competitive bidding for RE among established utilities and new entrants.

The scope for cost reduction (25-50%) is much higher than is usually assumed but prevailing rules and habits often inhibit technical and managerial innovation. Private distributors tend to do better; in Buenos Aires they were able to reduce drastically theft, and supply electricity to slum areas with reduced subsidies. Indeed, the reform in Argentina has spawned innovative solutions for imposing at minimum cost universal service obligations on private operators, with mixed results it seems¹⁸.

In non-grid situations, the dealer model seems best: stand-alone individual systems are either bought or leased from private entrepreneurs or NGOs. Technology for the decentralized production of energy is increasingly competitive and perhaps more amenable to financing and management with local resources than centralized solutions. However, market-oriented reforms are needed to remove the barriers to its development.

Fiscal relief. In 1990-97, private investors brought some 1997 US\$130 billion to the power sector of developing countries. This inflow provided enormous relief to governments who usually provide a sizable amount of equity and capital subsidies to state-owned utilities. Divestitures in Latin America alone brought about \$35 billion at a crucial time when funds were needed to stabilize the economy and shore up social budgets e.g. Chile in the 1980s, Bolivia, Argentina under the Brady plan, then Peru, Brazil and Colombia in the mid 1990s. Private operators also saved governments heavy operating subsidies. No details are available on the extent that fiscal relief benefited the poor, but it is true that macro-imbalances and inflation tend to hurt the poor more than the non poor.

Environmental management. Reform, especially privatization helps enforcing standards both by disallowing licenses and by imposing penalties. Privately owned and operated plants are often cleaner plants than state-owned ones because of the quality of the technology, the fuel and plant operations; one good example is India where the poor are the most exposed to the pollution of coal-fired plants. However environmental management, has occasionally fallen between the cracks when the role of private investors was not carefully defined. This occurred for hydropower where for long under

¹⁶ Barnes, Van der Plas, Floor 1997

¹⁷ Covarrubias, Alvaro, Maia 1994

¹⁸ Chisari, Estache 1999

the exclusive province of government endangered species were hurt, not people, but the potential exists for incomplete reforms to adversely impact resettlement programs.

Emerging Lessons

Privatization is a catalyst. Among the many components of reform, privatization is the most powerful motivation for governments to refocus subsidies; deficits alone do not, they just elicit across the board, or “luxury” consumption tariff increases that aggravate the problems of cross subsidies. It also helps reform because its proceeds can be used to finance the social costs of reform: the province of Alberta in Canada auctioned the rights to low cost generation and escrowed part of the windfall gains to a customers’ account.

A proactive social touch is needed. Policy makers may miss opportunities for innovative solutions if social issues are overlooked when reform is planned. Left on their own, private developers pay little attention to access by the poor and are more attracted to urban markets than rural ones. Simply requiring private power utilities to expand service with the help of cross subsidization in their market area has severe limitations. It is necessary to redefine the role of RE, that of the government and improve the institutions to promote RE and serve as a conduit for subsidized funds.

Reform transition implies equity trade offs. Reformers need to be aware of the social equity issues involved in the reform transition and make the right trade offs. A slow reform favors existing users who benefit from subsidies at the expense of non-users who are “rationed out” of energy and other services. Many of those who expect to lose from the reform also expect compensation and handling these expectations raises equity issues: legal commitments to investors have created stranded costs which deserve compensation, but if it is paid by consumers, it will not be seen as fair unless it secures a quid pro quo of commensurate and tangible benefits for them—e.g. tariff drops-- in a near future.

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Abstracts of Selected Papers

“Rural and Energy Development: Improving Energy Supplies for two Billion People” Report Sept 1996. The World Bank. A review of the status of rural electrification and a rich synthesis for rural energy specialists: Retraces the status of rural energy in developing countries; emphasizing the role of the World Bank, the emerging practices and the policies implemented to offer alternatives to the consumers for sources of energy - provision and eliminate deficient subsidies- addresses the issues of market failures, high start up costs and risks, external costs and benefits, subsidies versus price liberalization, inefficiencies from subsidies, the importance of a sustainable supply and use of cooking fuels for improving access to Kerosene and Gas. Refer to Tables pp11, 25, and 42 on access and use patterns of rural inhabitants.

Barnes Doug, Dowd Jeffrey, Qian Liu, Krutilla Kerry, Hyde William: The Urban Energy Transition: Energy, Poverty, and the Environment in the Developing World .The World Bank. The paper examines whether reliable conclusions or models could be constructed for interfuel substitution and the energy transition for the developing world, the study covered patterns of urban interfuel substitution over 12 countries including 45 cities, with a variety of local resource conditions and under a variety of energy policy regimes. The authors conclude with recommendations for better policies to ensure an effective transition, stressing on the necessity to include choice.

Chisari Omar, Estache Antonio, Romero Carlos 1997: Winners and Losers from Utility Privatization in Argentina: Lessons from a General Equilibrium Model: WPS 1824 The World Bank. The main purpose in this paper is to assess both the macroeconomic and distributional impact of privatization in electricity, gas, water and sanitation, and telecommunications services. This is done comparing the economy in 1995 and 1993 during which all major privatizations have taken place.

Delucia Russel Feb 1994: A selected discussion of poverty and infrastructure: Linkages, Issues, and Questions. A background paper for the World Bank, World Development Report 1994. It covers (1) pricing and access to infrastructure: the type of infrastructure to be included, the impacts direct or indirect on poverty, the pricing access related policies; (2) technical and institutional models for infrastructure development: demand willingness and ability to pay examples; (3) infrastructure development and development paradigms”

Delucia Russel March 1994: Alternative Paradigms For Rural Energy Development: A Selected Review of Bank and Non Bank Experience. The paper raises a series of questions. Part I introduces the multitude of supply options potentially applicable to meet energy service needs. Part III is an overview discussion of World Bank and other experience with rural energy projects; Part IV examines alternative paradigms--technical, institutional, and financial-- that might facilitate the transformations of rural energy. The author concludes with suggestions for a new World Bank strategy for rural energy development.

Irwin Timothy Feb 1997 Price Structures, Cross-Subsidies, and Competition in Infrastructure. Private Sector note no 107: “ A summary of the most efficient price structure that would allow an equal treatment of consumers. It raises issues about the efficiency of existing subsidies mainly cross subsidies and analyzes alternative options in unbundled and competitive sectors: preserving the old price structure, funding price subsidies out of general tax revenue, or relying on social safety nets.

Kosmo Mark 1987. Money to Burn? The High Costs of Energy Subsidies. World Resource Institute. The paper evaluates the cost of commercial energy subsidies and energy pricing policies in over 30 countries. Energy subsidies are still widespread: electricity, natural gas and coal are heavily subsidized. The author suggests that by removing energy subsidies governments encourage energy efficiency, cut the costs of producing and using energy, reduce costly energy imports, minimize environmental damages and risks and reduce their own fiscal burdens.



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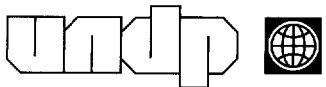
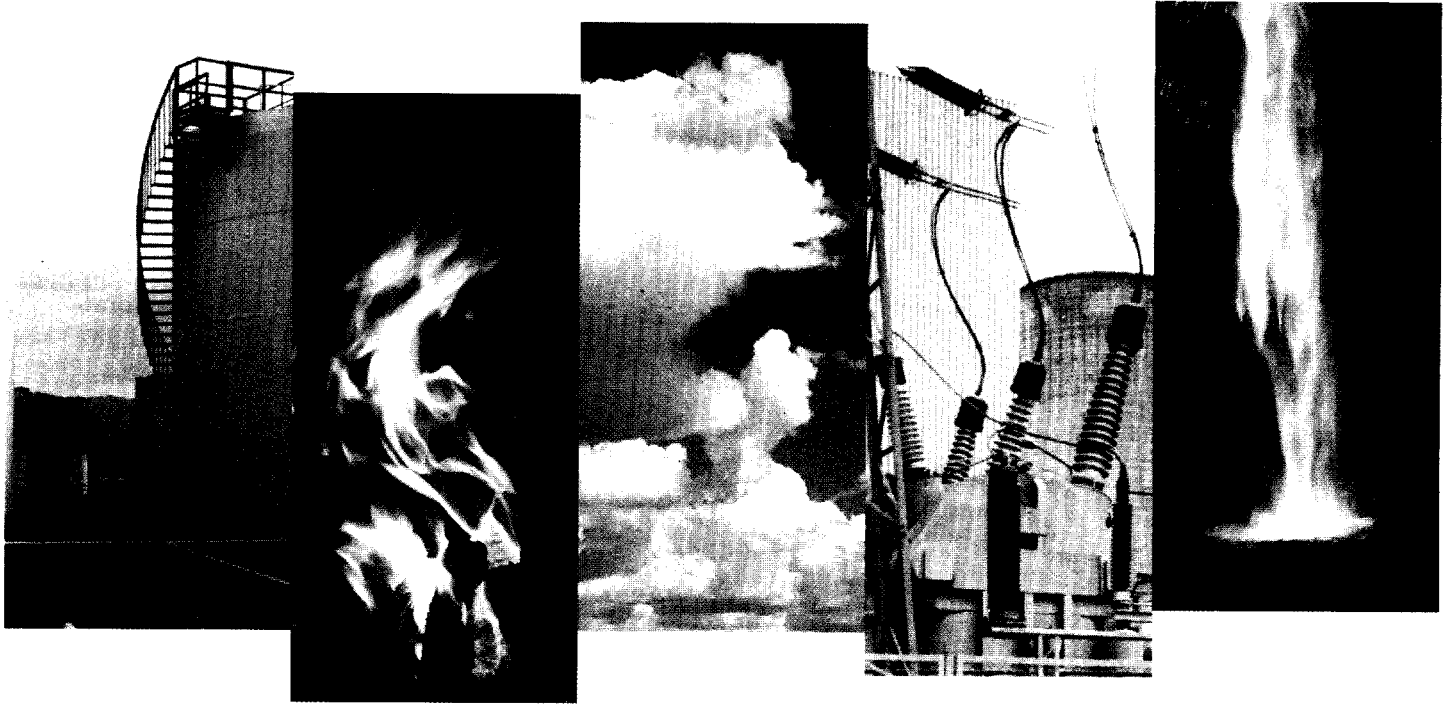
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