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Ch. 18 - The Need for a Broader View

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CHAPTER XVIII - THE NEED FOR A BROADER VIEW

1. As mentioned in Chapter I and abundantly illustrated in the individual company reviews, the Bank has given pride of place in its power work to company financial matters and little or no place to broader economic considerations. Whatever economic work has been done has been almost totally confined to economic comparison between hydro-electric and thermal plants -- a type of work which is undoubtedly important but might better be called engineering cost minimization than economics. This heavy concentration on finance, sometimes supplemented by simple cost-minimization analyses, has resulted in eight out of the ten companies reviewed improving financial performance or at least remaining reasonably viable financially; and most of them have been able to sell most of the power they could produce. But it is not clear that these companies have contributed as much as they might have done to development in their countries. Nor is it clear that the philosophy which has infused the Bank's operations in this sector and which the Bank has to some extent imparted to the companies has been particularly well oriented to achieving development, the perennial underlying purpose of the Bank.

2. Since the late 1950s when the Bank moved beyond a purely short-term financial view of its operations with power utilities, the approach which has prevailed may perhaps best be characterized as one of adopting a certain projection into the future of peak demand for power and then trying to find the financially most efficient way to meet the projected

growth. This approach closely parallels that developed by American engineering consultant firms for serving U.S. utilities, under legal obligation to meet all the demand for electricity which presents itself in their service areas and protected by a regulatory regime which has been concerned to allow them, on whatever investment they made, a rate of return sufficient to maintain their ability to raise funds in the capital market. Among the means of minimizing financial requirements to meet the projected load growth the Bank has emphasized international competitive bidding, contracting of loans on long terms, selection of the cheapest alternative among system expansion projects prepared, maintenance of cash flow to prevent delays in project works, and efficient construction and construction supervision. In some cases the Bank has, with considerable engineering foresight and diplomacy, helped to bring about changes in the organizational structure of the electricity supply industry which would also contribute importantly to minimizing financial requirements for meeting the projected load growth.

3. This approach bypasses most of the basic questions of development and of the role that electric power can play in development. In order to deal with them, and hence to orient the Bank's operations in electric power more effectively for development, a much broader view has to be taken both of investment decisions in the sector and of the utility companies themselves. The purpose of the present chapter is to define the main lines of this broader view, and to illustrate the need for it, by reference to the experience reviewed.

4. In most of the developing countries, unlike in the more developed and industrialized countries, there is extreme unevenness in the quantity and quality of supply of electricity, as of other services, in different regions and areas and in different zones of a city. For instance, even in the relatively rich developing countries which form the bulk of those studied here, electrification presently touches no more than about 50% of the population, and, as pointed out earlier, availability of electric power outside the cities and towns is quite limited. At the same time, electric power is a service so expensive in terms of capital and import requirements that, even with the best administration, it is not possible to overcome this unevenness in short order -- at least not without unduly biasing development in favor of electricity and neglecting other services and sectors. Consequently the critical problem is how to allocate effort and funds in such a way as to maximize contribution to development and, following from this, how much in total to devote to electric power as against other services.

5. To apply a requirements approach in these circumstances and to concentrate all attention on minimizing the financial burden involved in meeting these power requirements tends to mean that consideration goes principally to meeting what is sometimes called 'established demand', meaning the demand of those who are already connected or who come to live and work in areas where there is already a relatively strong and well-established power entity. National power organizations are of course confronted with the problem of how much priority to give to such 'established demand' as against potential demand in other areas, and even

urban and regional entities face dilemmas as to how much effort to devote to extension of the distribution system into marginal zones of their often rapidly growing cities or into neighboring rural areas. Most of the entities studied in this report have accomplished a small amount of such extensions, which have contributed to the large increases in the proportion of population electrified, although immigration of people into the existing service area has accounted for the bulk of new connections in most cases. Some entities are lagging more than others in distribution extension; clearly serious lags exist with EPM and SEGBA.

6. Sometimes the Bank has directly assisted in extension of service areas, including small amounts in its loans for such purposes, most importantly and continuously in the case of CFE but also to a much smaller extent in various other cases, including EELPA and on certain occasions CVC/CHIDRAL and EEEB. In Ghana it recently made a loan to ECG mainly for this purpose. And sometimes it has been directly concerned about problems resulting from failure to extend service areas -- as, for instance, the extensive stealing of energy in Medellin and resultant slower than expected growth of sales and revenues. But it has barely contributed at all to helping to resolve the basic question of how much effort should be put into this type of system extension. It has not helped the companies to develop tools for analyzing the economics of system extension or encouraged them to look out for opportunities of promoting development -- for instance, increased efficiency on the part of small industry or agriculture or better educational and study opportunities among poor families -- by distribution system extension. It has

left them to respond to political pressures, or not to respond. As regards its own financing, it has often been initially reluctant to accept extension of public lighting (marginal zones) or electrification of neighboring rural areas, having no policy on the matter, and has apparently eventually agreed to contribute small amounts to such work mainly on the criterion that the work proposed was within the limits of what the company could manage with its prospective cash flow. In the case of Medellin, where the problem was mainly one of refusal by the municipal authorities to include within city limits the areas from which power was being stolen, the Bank seems never to have taken the time to follow up the matter with the authorities as an important municipal planning problem.

7. With no major effort by the Bank over twenty years of heavy involvement in the electric power sector to develop an approach for analyzing the economics of distribution system extension under different conditions, it is not possible to say whether even the extensions which it did directly finance were particularly worthwhile investments or not.

8. Profitability of service, whether within an existing service area or beyond it, can be one important indicator of economic validity provided that it is based on a calculation with proper attribution of social marginal costs. But the Bank has never until recently, and then only very little, gone beyond inspecting the financial profitability of a power entity as a whole, being more concerned with cash flow to permit expansion than actual demonstration of validity of investments. And because power companies are monopolies and have some consumers, or many,

with demand relatively inelastic to price, these financial statements show nothing about the validity of investments. The case which has been studied in this report from the point of view of its tariff structure (Bogota) shows such large distortions between social marginal costs and prices and such heavy subsidies to residential consumers of all classes that it is doubtful whether all the investment carried out there in power has been worthwhile (as discussed in Chapter XVI).

9. Profitability is not a necessary condition of economic validity. In some circumstances it will be worth subsidizing electricity, at least temporarily, to promote greater consumption than would otherwise occur. Such subsidies would need to be specifically justified in terms of developmental effects, or cost savings to society, that would not otherwise be obtained because those affected could not or would not pay full cost. No such justification would seem to exist for heavily subsidizing, as now, electricity consumption of the wealthier classes of residential consumer in Bogota; it may exist for poorer consumers, although that too is questionable, chiefly because of the distorting effects that this seems to have on consumption patterns, at least in Colombia. What may be required is a better organization of self-help schemes for mobilizing efforts to install local distribution lines jointly with the power company -- as is done successfully in the water supply and sewerage field in Colombia. Among the companies studied SEGBA appears to be the one with the best program of this sort, though execution of works is lagging much behind demand.

10. On the other hand, electric power supply may have a significant fiscal potential, which needs consideration in a development context. Many developing countries have considerable difficulty raising tax-revenues. If electric power consumption of wealthier residential consumers and most industries is as inelastic to the average level of prices charged (as opposed to the structure of these prices: use of peak demand charge, off-peak rates, etc.) as often supposed, then it may be a very effective and inexpensive means of taxation, hard to evade. Several of the countries covered in this review levy direct taxes on power companies or indirect taxes on power consumption, while others charge neither. This is an area where the Bank should be able to offer useful advice.

11. Whether it is established demand for power that is being met or new potential that is being generated, but particularly in the case of the former, which will normally account for the bulk of investment, it would seem essential in analysis of electric power projects to give explicit attention to the validity of the reliability standards being provided. This seems never to have received serious attention in the Bank's appraisal reports for the projects covered in this review, although provision of reserve capacity to guarantee a certain level of reliability is expensive in power, and savings on this would enable more expansion of the service to new areas. The Bank has almost invariably accepted the load forecasts of its borrowers or their consultants as well as their proposed provisions for reserve generating capacity -- generally ostensibly based on some simple reserve criterion such as use of

lowest recorded flow year in hydroelectric capacity planning, largest single unit out, or 10-15% of peak demand, but sometimes more conservative. The review suggests that reserve allowances have actually often been padded by allowing for low load factors in the future (sometimes with a decline from present levels) or for more rapid growth of demand than actually materialized -- although the impact of this has sometimes been offset by delays in plant completion. But the cases show no study by the Bank of what would be appropriate reserves for the specific circumstances, including the cost of capital and foreign exchange in the country, the reliability of the load forecasts, the shape and composition of aggregate system demand and the economic requirement of major consumer classes for greater or lesser certainty of supply. In practice it seems that excessive generating capacity has been provided, partly due to neglect of this aspect, in Singapore, Ethiopia and Malaysia currently and in Mexico in the past.

12. Distribution usually accounts for a larger proportion of utility investment than generation -- often about 50% -- and review of reliability standards in this part of the system may be even more important. Due to the complexity of this field and the fact that it has accounted for a relatively small proportion of direct expenditure out of Bank loan funds, on which principal attention had to be concentrated, it has not been possible to go into detail on distribution in this report. However there are some signs of overinvestment in distribution, by overdimensioning of underground networks in Singapore and by provision of

three-phase (four-wire) distribution throughout the city of Bogota, two cases in which the Bank has been directly involved. In Bogota no studies have been undertaken to determine optimum design standards under local conditions of cost of capital, foreign exchange, climate, maintenance requirements, etc. A related problem arises there from the manner of land development in the city. Because of the inflationary situation and tradition, considerable savings are channelled into house lots, which are developed with infrastructure facilities (mainly in order to make them more readily saleable) but then left unoccupied for many years; such 'plotted' but unoccupied house lots were recently estimated at some 40,000 or about 20% of the estimated 200,000 occupied lots in the city -- considerable building ahead of demand, which also requires the distribution lines which are used to be longer (to reach the new lots that are occupied) than would otherwise be necessary. Not all of this investment is financed by the power company, much of it in Colombia being the responsibility of urban land developers. Nevertheless it is a significant cost to the resources of the country. As illustrated earlier in a different manner with the problem that has arisen in Medellin, it would seem necessary for the Bank, seeking development impact, to look at power projects in an urban context and at the least to check that conditions are such that a reasonably efficient use of resources will result.

13. Neglect of these factors -- appropriate tariff structures and reliability standards, in particular -- can lead to a severely distorted

pattern of investment and imbalances in the supply of services. It may be that these are part of the reason for the odd situation prevailing in Bogota, discussed in Chapter XVI, whereby electricity, despite its capital intensity and heavy reliance on imports, seems to be in considerably more ample supply than other services and facilities much more dependent on factors and resources more readily available in the country. Equally in Colombia there are severe imbalances between the quantity and quality of electricity supply in the largest cities, where it is generally quite good, and most of the smaller towns, where it has remained poor. There is some evidence that this may be promoting a particularly expensive pattern of urbanization, in which people migrate to the largest cities, in small part because residential electrical connections are relatively easy to obtain and the cost of electricity is low (a fraction of that in neighboring small towns), while industry goes more than it otherwise would to the largest cities because public power supply remains so relatively unreliable in the smaller towns. It is possible that such a pattern is economic and well oriented for development because of the external economies of large cities and the possibility of using social facilities more intensively there, but this is far from clear and needs demonstration, particularly to justify promoting such a pattern by special subsidies and concentration of investment.

14. To some extent these imbalances may be the result of the strong internal cash generation which the Bank has so strongly and successfully promoted, as seen in previous Chapters. Certainly in Bogota part of the

reason for the more ample availability of electricity than of other services and facilities seems to be the ability of the power company to generate internally a large proportion of its own investment funds in a situation where the fiscal and capital market mechanisms, on which many other services and facilities -- public health and housing, to take two important examples -- are mainly dependent, are weak. In an approach which focusses solely on efficient means to meet projected power demand there is no question about the desirability of strong internal self-financing. Equally it may be argued, and in some circumstances correctly, that increased self-financing reduces the call on Government budget resources for financing the power investments, leaving more for other sectors or for weaker entities in the power field and rural electrification. Yet internal self-financing can become similar in effect to an earmarked tax and channel excessive resources into a particular sector -- or a particular region, especially where the entity with the strong ability to fund investment is responsible only for power supply in a limited area such as a city or urban region. With the large self-financing abilities developed by most of the companies reviewed it is likely to be increasingly important to look at questions of intersectoral balance of investment, economics of electrical network extension and reliability standards, in order to ensure that investment in power is not becoming excessive; taxes on power companies may need to be increased.

15. The Bank seems never to have used its involvement in a country's power sector as a means to help promote the development of the local capital market, although the weakness of such markets in many developing countries is a serious obstacle to development and to an effective pattern of investment. In some cases the Bank has helped to work out a financing plan for an expansion program, including the local currency portion, but, among the cases reviewed, there seem to be none where it has systematically encouraged the power entities to raise resources by bond issues, etc. with a view to helping to overcome the more fundamental problem, of capital market weakness. The closest is the case of SEGBA where the Bank did strongly encourage sale of stock to the Argentine public, but not with a view to capital market development; the purpose was rather to insulate the company against Government interference, and the effort did not succeed.

16. Relying principally on internal cash generation to provide funds to cover the local currency portion of investment, with this strong cash generation guaranteed, generally fairly effectively, by a covenant or similar arrangement providing for the power company to earn a certain minimum rate of return on average net fixed assets, the Bank seems to have given inadequate attention to the effect this may have on company efficiency. In the case of SEGBA, with its very high costs and prices, the Bank did become concerned about several aspects of company efficiency in the middle 1960s and it took specific steps to help deal with the situation. But this seems to have been more the exception

than the rule, and it came quite late, after five or six years of prior involvement in which relatively little attention seems to have been given to means of reducing costs -- as opposed to raising tariffs. The present review has shown rising unit costs in Furnas and stable unit costs in EELPA (since 1964) and in the three Colombian companies since the 1950s despite the substantial scale economies that these companies should have developed with the multiplication of sales that they have enjoyed. In Medellin it was found that the average wage (plus fringe benefits) of the Electricity Department of EPM lies within the top 5% income bracket of Colombia and is substantially above the other Colombian power companies for which comparable data is available. It would seem that use of the minimum rate of return covenant must be complemented with greater attention to company efficiency.

17. Another matter which seems to have received insufficient consideration in the general emphasis on meeting projected load growth at minimum financial costs is the potential for inducing growth of efficient local electrical equipment manufacturing industry. Utilities in the developing countries appear frequently to have a preference for imported equipment, a preference reinforced, when the Bank has been prepared to finance only foreign exchange costs, by the difficulties of borrowing funds on the domestic capital market, a problem referred to earlier. Another contributing factor in several countries is irrational import tariff policy: no tariffs on equipment imports by power companies but full tariffs on the raw materials and parts imported by domestic

industries which can produce such equipment. Cognizant of these problems, the Bank seems nevertheless to have been unprepared to try to resolve them except to some extent in a few instances, principally SEGBA among those studied. If the Bank were to seek maximum development impact from its power projects, rather than merely to try to minimize the visible financial costs of meeting projected demand, then identifying opportunities for development of viable industries in production of electrical equipment and promoting exploitation of these opportunities through its own lending would be an important area of attention.

18. In some of the cases reviewed -- particularly Argentina, Brazil and Mexico -- the Bank has tended to adopt, for various reasons, a rather flexible attitude in adjusting its standard procurement rules to local conditions, including covering substantial amounts of local procurement out of loan proceeds. In other cases, such as Colombia, it has adopted a more rigid attitude. These differences seem to have resulted more from differences in the amount of pressure applied by the countries than from careful analyses of the potential contribution that the Bank could make to local industrial development in each case. With the increasing importance that transmission and distribution projects seem to be assuming in Bank power lending, partly because of the improving possibilities of financing generating equipment through supplier credits, a more systematic approach will be more necessary in the future.

19. Questions of local procurement need to be analyzed with more attention to the real scarcity value of foreign exchange to a country

than in the past. In 1961/62 the Bank convinced the Bogota Power Company to replace the Canoas hydroelectric project in its expansion program with a thermal plant mainly because the latter had a much lower local cost component which it was thought the company would have difficulty in covering because of the inadequacy of the local capital market. Economic analyses at the time showed that Canoas was preferable except from this purely financial point of view, and a revised analysis in this report showed that the actual economic advantage was probably even greater than thought at the time, especially if adequate account is taken of the scarcity value of foreign exchange. Even though this was a time when the Bank was particularly concerned about the overvaluation of the Colombian Peso there is no evidence that this was ever allowed to affect the decision on this project.

20. Points have been made earlier about the need to orient power companies borrowing from the Bank in a more dynamic way, to seek out opportunities for achieving development benefits from power expansion, and about the positive contribution the Bank should make to this by helping to develop appropriate analytical techniques. Also the dangers of excessive emphasis on financial rates of return in judging company performance have been discussed. But there is another institutional aspect where the viewpoint of the Bank in the electric power field seems to need broadening. This survey has shown that the Bank has sought to make its borrowers responsible for power only and has not been adept at dealing with multi-purpose institutions. Its emphasis on

setting up the Bogota Power Company in 1959 as an independent organization, without relation to other municipal utilities (particularly the Water Company), seems in retrospect to have been quite unfortunate. In another case, that of CVC, which the Bank had helped to set up with multipurpose responsibilities, it also showed no ability to help cope with anything more than power among these responsibilities. In the more modern case of VRA in Ghana, the Bank neglected the non-power aspects of the Volta Project in the early 1960s and seems to have given them inadequate attention in pressing VRA to shed its non-power responsibilities and amalgamate with ECG. Such amalgamation may be the right solution, but the Bank might have made more progress in convincing the Ghanaian authorities of this had it been able to make more positive suggestions about how the existing non-power responsibilities of VRA might better be handled. Performance here is another example of the dominance of the narrow approach of merely minimizing costs and difficulties in meeting some given power demand projection.

21. That the Bank is able to take a much broader approach than it has typically done in the past is shown by some notable exceptions to the normal pattern -- as, for instance, in accepting a program approach to CFE in Mexico, in pressing for the creation of the Colombian Public Utility Tariffs Board, affecting all utilities in the country, or in encouraging and assisting Furnas to provide training not only for its own personnel but for staff of other utilities in Brazil in addition -- but these exceptions are far too rare. It is quite evident that country specialists will have to play a much more thorough part in

determining Bank policies towards power and that a much greater effort will have to be made to strengthen the economic capabilities of the Public Utilities Department if the Bank is to realize more fully the potential of its power lending for contributing to development.