INTEGRATED ENERGY PLANNING – A MANUAL

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Background

During 1982—84, the Asian and Pacific Development Centre (APDC) carried out a research project in the area of energy planning. The project was based upon a number of basic premises :

— national energy planning in the Asian and Pacific region has continued to follow traditional, subsectorally disaggregated approaches which have inherent shortcomings :

— the tools and techniques used in the planning process are often not well understood, with the result that many countries find themselves saddled with energy plans which are criticised as being unrealistic despite the elegance of computational inputs into these; and

— increasing reliance has been placed upon external consultants due to lack of adequately trained personnel within developing countries; and this has brought about problems of varied nature, including the lack of continuity in planning efforts.

The primary objective of the project was to pool together available knowledge on major energy planning concepts and methods and set these within an integrated framework so that national energy planning teams could have access to these at one place. The aim was to facilitate " best suited " rather than " better known " choices where analytical tools and techniques were concerned.

The project has culminated in a three-volume publication entitled " Integrated Energy Planning: A Manual ". Given the policy directional focus of the project, policy interests rather than technical concerns have been stressed in the Manual. The Manual is not intended to be a set of operating instructions for constructing an ideal energy plan. It is more like a compendium of knowledge on a range of available methodologies out of which many possible choices can be made by those directly involved in national energy planning. Although many of the methods contained in it have universal application, conceptually the Manual is addressed to developing countries of the Asian and Pacific region. Hence, as far as possible, it attempts to emphasize issues and problems of relevance to the region.

The Manual has been developed with four types of audience in mind:

— energy and economic planners and policy makers in national governments, that is, persons responsible for formulating national policies for economic development at large as well as in major sectors like Energy, Industry. Transport, Agriculture, Commerce and so on:

— senior and middle level, government officials whose task is to implement approved national energy/economic plan within given policy constraints:

— senior and middle level managers of public utilities, government regulatory agencies and private sector corporations engaged in energy supply and energy demand management: and

— researchers and trainers in the energy and economic policy areas.

Apart from its utility as a reference document in the hands of national energy planning and management teams, the Manual constitutes an important contribution to training efforts within the region. Notwithstanding the proliferation of literature on energy planning, contemporary training exercises in this area have generally felt the absence of a uniform curriculum structure. The Manual, it is hoped, will help fill this gap by providing a unifying framework under the broad theme of Integrated Energy Planning (IEP). Such a framework can help to anchor training programmes to a descriptive rather than prescriptive theme and sequence, while allowing for concepts and methods available outside the Manual's scope and coverage to be added on in keeping with (a) the need to strengthen the basic curriculum and (b) the necessity for matching individual curricula to specific priorities of countries/sub-regions.

STRUCTURE

The IEP concept, as advocated in the Manual, has two major characteristics. Firstly, it marks a significant point of departure from conventional planning by energy subsectors. Secondly, it focuses mainly on the planning process rather than on the eventual outcomes by way of plans of varying nomenclature.

The disadvantages of disaggregate energy planning have been realized by many countries of the region, as evidenced by the growing number of large-scale

energy plans. Of illustrative importance in justifying IEP are the following shortcomings of such approaches:

— inability to deal with inter-sectoral conflicts of objectives (for example, rural electrification versus biomass promotion):

— inadequate mechanisms to minimize intersectoral sub-optimisation (preponderance of oil in electricity generation in some countries despite access to coal, for instance);

— Lack of balanced resource development (late development of the coal sector in some countries due to concentration on oil);

— diffusion of conservation efforts (due, among other factors, to absence of co-ordinated policies by demand groupings); and

— insufficient perspective to cope with larger interface issues (the energy-environment interface, for one, and the energy-economy nexus, for another).

The focus on the planning process in IEP arises from the awareness that plans themselves vary widely from country to country in terms of objectives, detail, time horizon and linkage with economic plans. This, naturally, renders any strict definition of a plan virtually impossible. On the other hand, regardless of what shape an energy plan finally assumes, there are a number of fundamental steps in the planning process which can be set out to a certain extent in more formal terms. In the Manual, IEP has been defined to consist of four elements:

— setting up an, *energy data base;*

— analysing current and projecting future *energy demand;*

— assessing *energy supply* resources and evaluating related technologies: and

— *integrating demand and supply options* through a policy simulation framework to identify an optimal supply-demand configuration.

The Manual sets out each of the above IEP elements in the form of a Division, each Division exploring the concerned stage of IEP through a number of Chapters, the order of these Divisions is: Data-Demand-Supply-Policy. Though this does indicate a broad sequence of events, there is an enormous amount of iteration in IEP that belies attempts to establish any rigid chronology. For example, the notion of demand analysis preceding supply analysis is debatable since the two are interdependent and are usually undertaken simultaneously. Therefore, IEP is more a checklist of basic energy planning steps—and a frame of reference—rather than being a prescriptive chronology.

With iteration a constant thread running through IEP, three levels of integration have been considered important in the Manual;

— integration of the economic plan/perspective with the energy plan;

— integration of different energy sub-sector plans: and

— integration of individual components of energy sub-sector plans.

The actual mechanics of the planning process have been divided into the following steps;

(1) establishing the energy date base
(2) building economic growth scenarios
(3) making energy demand projections
(4) assessing energy resources
(5) evaluating supply technologies
(6) supply-demand balancing
(7) carrying out economic and environmental impact analyses
(8) developing investment and other financial plans
(9) framing supply and demand management strategies

CONCEPTUAL QUESTIONS

Three important conceptual questions have been evoked in relation to IEP, namely:

— is IEP possible only in countries which subscribe to economic planning?

— if so, is IEP a part of central planning ideology, therefore not applicable to countries following other forms of politico-economic belief—notably free market oriented?

—is IEP any different from energy master plans?

To the first question, the answer is no. The existence of an economic plan, though certainly helpful as a starting point, is not in itself a major input to IEP. Economic plans, because of their limited time perspective, usually fall short of the requirements of long-range energy plans. The forecasting and analytical methods used in economic planning are also often inappropriate for energy sector planning, The need

for close interrelationship between an energy plan and an existing economic plan is not denied (in fact, it is actively sought), but where economic planning does not exist, energy planners can form their own perspectives of the economy, as usually has been the case.

To the second question on ideology, the answer is that IEP is a process rather than an end result. It neither specifies the final shape of its outcome, nor the level of detail. All it provides is a framework containing essential steps that will lead to any desired energy plan, given whatever politico-economic belief. Admittedly, this explanation only removes the notion of "central" but not "planning" itself as opposed to free market ideology. However, the Manual is addressed to developing countries of the region which, for the most part, practice planning to varying extents.

The third question arises, perhaps, from misconception that integrated energy planning lea to an integrated energy plan, which is the same as energy master plan. Unlike energy master pla IEP does not signify an attempt to capture all in intensive onetime exercise by small groups of ene "specialists" (or "consultants"). On the contra it is very much a continuing effort, one that is und taken essentially by a national energy planning te and involving substantial inputs from various sect of the economy. It may well come out with integrated energy plan and, again, it may not merely produce a series of modular outputs—depend upon the decision needs at policy levels. Tho other explanations can be offered to further elabo this point, indigenisation of effort and continuity time must stand out as the distinguishing feature IEP where comparisons with energy master plans attempted.

(Acknowledgement — APENPLAN NEWS)

THE 100th ISSUE

Our congratulations to "ENERGY MANAGEMENT" a monthly published by the Department of Energy (U.K.). which brought out its 100th issue in January, 1986.

STOP PRESS

A Seminar/Exhibition on Energy Management for decision makers in the Hotel Industry organised by the Ministry of Power and Energy in association with Sri Lanka Energy Managers Association was held on 2nd August, 1986 and was hosted by Lanka Oberoi. The Inaugural address was delivered by Dr. Ananda Tissa de Alwis, Hon. Minister of State, while the Guest Speaker was Prof. Mohan Munasinghe, Head Energy Policy Department Group: The World Bank, President Emeritus, SLEMA. Prof. K. K. Y. W. Perera welcoming the guests and participants stated that the Seminar on Energy Management in the Hotel Industry was timely and stressed the need for energy conservation and substitution. Mr. P. Dayaratne, Deputy Minister, Power & Energy and Vice Patron SLEMA, enumerated the activities undertaken by the Ministry of Power and Energy in regard to Energy Conservation. M/S. E. N. Wijemanne, D. Chandrasekera, D. B. J. Ranatunge, Dr. Nalin Walpita, Vijitha Perera, and Mr. B. P. Sepalage, Directors of SLEMA were the principal speakers. Mr. S. C. Manicavasagar, Addl. Secretary, Ministry of Power and Energy summarised the proceedings at the end.

THE WORRY ABOUT COOKIN FUEL

"There is an old African proverb: It co much to heat the pot as to fill it. Never ha been more true. Despite the difficulty of quan the traditional energy use, it is becoming ap that its cost can be alarmingly dear. Whe ditional fuels enter into commerce, as in most and, increasingly in smaller towns and village cost is approaching, or even exceeding the c the food it is to cook. In Mali, a full third typical urban laborer's income may be neec purchase cooking fuel for his family."

"The worry about cooking fuel is comm many areas of the developing world. The in the central Chinese province of Hunan saying very similar to the African one: 'I what's in the pot, but what is under it, that you."

"Energy in the Developing World", Knowland, Oxford University Press, 1980.