WANTED IMMEDIATELY: AN ENERGY STRATEGY FOR INDIA (I) DEFENDUS Energy Strategy offers hope

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Introduction

A senior bureaucrat recently declared at one of the energy seminars: "There is nothing new at these meetings the same policies are being repeated over and over again! "This statement highlights the single most important characteristic of the Indian energy scene there is an abundance of policies but a total lack of energy goals and strategies. Even the meanings of the terms: goals, strategies and policies do not seem to be clear.

A goal is an ”objective to be attained or a destination to be reached; a strategy is a ”broad plan to achieve the goal(s) or a path to reach the destination; and a policy is a ”specific course of action to implement a strategy. Goals must be state able in a couple of paragraphs, and a strategy in a couple of pages, but policies can be described in lengthy documents of even 3050 pages.

Goals provide a focus for a strategy. A strategy coordinates and integrates policies and prevents inconsistencies between them. Thus, a strategy is to policies what a conductor is to an orchestra policies without a strategy tend to produce chaos just as musicians without a conductor would produce cacophony. Without a strategy, policies have no coherence, and without goals, a strategy has no focus.

It is alarming, therefore, that official approach papers and perspectives pertaining to our energy system do not seem to have either a simple statement of goals nor a brief formulation of strategy. Why? Perhaps because of institutional problems. Energy spans several ministries and departments; hence, it is not easy for "empires" and "emperors" to subordinate their narrow interests and privileges to overall national interests. But, whatever the reason, the result is that, in the absence of an integrating energy strategy, the country does not have a coherent and synergistic set of energy policies. In fact, many policies conflict. For example, the electricity sector encourages industries to set up diesel-based captive generation sets and the oil sector tries to reduce diesel consumption. Obviously, the Indian energy sector urgently requires goals as well as a strategy for reaching those goals.

”DEFENDUS Energy Goals

The Indian energy system is a sub-system of the larger socio-economic system. So, the goals for energy must be compatible with and contribute to the goal of the economy. The goal of the Indian socio-economic system is ”development, i.e., a need-oriented, self-reliant and environmentally sustainable process of growth. The energy subsystem should, therefore, be an instrument of development.

This development focus means that the goal of the energy sub-system is ”the advancement of development. The energy sub-system should contribute to the satisfaction of basic needs, starting from the needs of the neediest. It should strengthen self-reliance at the local, state and national levels.

It should be in harmony with the environment to ensure long term sustainability of the development process. And, needless to add, it has to be economically efficient so that it results in economic growth.

Unfortunately, development in the energy sector is usually measured in terms of (per capita) energy consumption. As a result, energy has become an end-in-itself. However, what human beings need is not energy ”per se (e.g., kilowatt hours) but the services (e.g., light) that energy provides through end use devices (e.g., lamps) that perform tasks and satisfy needs. Why is this distinction between services and consumption important? Because energy services (measured by the useful energy produced by the end use device) depend, not only on the magnitude of energy input, but also on the efficiency of the end use device. As a result, energy services can be increased not only by increases in the supply of energy but also by improvements in the improvements of efficiency. Compared to a 40 watt incandescent bulb producing 410 lumens of light, an increased illumination of 710 lumens can be obtained either by using a 60 watt bulb with 50% ”more electrical energy or a modern 15 watt compact fluorescent lamp using about 60% ”less energy. Such opportunities for efficiency improvements can only be identified if there is an end-use orientation and a scrutiny of the demand side of the energy subsystem.

This enduse orientation and service basis means ”the provision of an increasing level of energy services. For, it is this level of energy services (rather than the magnitude of energy consumption) that is the true indicator of development. Thus, the Indian energy system requires development focussed end use oriented service based (DEFENDUS) goals. These goals consist of the use of energy as an instrument for (and a means to) development via the provision of energy services through end use devices.

An DEFENDUS Energy Strategy for India

In order to achieve the DEFENDUS energy goals (of advancing development and providing increasing levels of energy services), a DEFENDUS energy strategy must be formulated. Following from the dimensions of development, such a strategy must have four thrusts: equity, self reliance, environmental soundness and economic efficiency. To acquire operational value, these general thrusts must be elaborated this has been done here by formulating a DEFENDUS strategy consisting of nine components of equal priority.

Equity components: The first component of the DEFENDUS strategy consists of ensuring supplies of energy for basic needs. This necessarily means priority for the following enduses of energy: (1) lifting and/or pumping of drinking water to convenient points near or inside homes; (2) cooking with clean and efficient cooking stoves and/or fuels this may require transitional solutions based on liquid fuels (alcohol and kerosene) and solid fuels (biomass), and wickstoves and biomass chulas, as well as long-term solutions taking advantage of gaseous fuels (LPG and biogas) and biogas/LPG stoves; (3) electrical illumination in all ”homes to improve dramatically the quality of life and to save kerosene bearing in mind that village electrification has not necessarily resulted in the electrification of all homes; (4) energy (electricity/fuels) for employment-generating agricultural operations -- water-lifting/ pumping, mechanized ploughing, etc. and (5) energy (electricity/ fuels) for employment-generating industries, particularly in rural areas.

Self-reliance components: The second component of a DEFENDUS energy strategy should be a ”reduction (and ultimately elimination) of dependence on oil. Such a reduction which strengthens national self reliance requires a number of crucial measures. These include (a) a massive shift away from truck to rail for long-distance freight traffic; (b) an optimal inter-modal mix for intra-city and inter-city/town passenger traffic with an emphasis on public transportation (buses, trains, etc.) rather than personal vehicles (two wheelers and cars); (c) the reduction of oil consumption through the efficient use of oil in fuel-efficient vehicles and furnaces; (d) moratorium on further increases of indigenous oil production -- the country should "stockpile" its onshore and offshore oil in the earth for future sales by the next generation at sky-high prices.

Along with the move away from oil, the third component of the strategy should be a major ”thrust towards ”alternative non oil fuels. Such a programme should involve (a) full utilization of the natural gas now being flared, (b) greater natural gas consumption without increasing oil production, (c) an increase of biomass supplies through centralized production from forests and decentralized production from wood-lots and wayside trees; (d) a massive programme of biomass-based liquid-fuels for vehicles (perhaps methanol because of scarcity of land for ethanol).

The fourth strategy component should be a ”transition towards renewable sources. This would involve in the short- and medium term an emphasis on micro-hydel, biomass (via new technologies), producer gas, biogas, wind and solar energy, and in the long-term, a reliance on photo-voltaics.

In view of the importance of village and local self- reliance, the fifth component of a DEFENDUS strategy is an ”emphasis on decentralized sources of energy. In particular, there should be a massive programme of rural energy centres based on biomass sources (animal waste and energy forests) and solar energy.

Environmental-soundness components: The sixth strategy component should be the deliberate reduction of environmental impacts. All the large scale centralized technologies bring in their wake major environmental impacts. Coal based thermal plants produce, apart from other pollutants, emissions of the greenhouse house gas, carbon dioxide. Large scale hydroelectric plants often involve submergence of forests and displacement of populations. Nuclear power plants do not produce greenhouse gases, but they produce low and medium level radiation which has an impact on the physical environment. In addition, they produce high level wastes which have serious consequences for the social environment because social institutions must prevent these wastes from causing radiation damage and being used for manufacturing nuclear weapons (e.g., by terrorists).

It appears, therefore, that an environmentally sound strategy should avoid new installations of these centralized technologies. However, large scale industry and urban concentrations require large inputs of energy. So, the centralized supply sources available today must be stretched to the limit with efficiency improvements including process and device modernization. Despite such improvements, demand supply gaps may still remain. When the deployment of centralized technologies becomes inescapable in this way, the most environmentally benign centralized technologies should be deployed as technologies of the last resort.

Current development environment conflicts cannot be resolved within the framework

of unchecked and unrestrained resource use driven by the obsession that the magnitude of consumption of energy (and other resources) is the index of development. Rational resource use is the key to environmental soundness. Greater exploitation of efficiency improvements and other conservation measures must therefore be the seventh component of the DEFENDUS energy strategy.

Efficiency improvements and other conservation measures are the basis of environmental soundness. This is because they produce the same levels of energy services with smaller amounts of energy inputs and therefore smaller environmental impacts. By reducing the demand for energy, efficiency improvements provide an additional bonus the lower the demand, the less the necessity to invoke the harsh and environmentally malign technologies, and the greater the scope for (and the role of) renewable sources of energy. In fact, an indepth scrutiny of official demand projections suggests that they are often boosted in order to justify the environmentally hazardous technologies on the grounds of "there is no alternative to these technologies!

Economic efficiency components: Energy efficiency improvements should not be invoked merely as retrofits to inefficient devices. That was the case in the industrialized countries they built up massive stocks of inefficient devices before the energy crisis, and then had to go through the painful process of modernization. India need not repeat that process of first making the mistake of energy inefficiency and then correcting that mistake with efficiency improvements. Energy efficiency improvements can become a mechanism of technological leapfrogging over the advanced countries. In the case of industry, for instance, why cannot India have by the year 2000 the most energy efficient industries now available in the world steel, cement, aluminium, paper, etc., with the lower energy consumption norms than the current average in the industrialized countries? Motors for conveyors, drives, compressors, etc., consume about two thirds of the electricity used in industry why not install the advanced energy efficient motors that have been developed?

Such an emphasis on energy efficiency is in fact economically efficient. It is invariably for the country to save energy than to generate it and also quicker and environmentally more benign. Consumers also benefit if the initial investments on efficiency improvements are financed through loans because the total expenditures on energy can be reduced even if they repay the loans along with decreased energy bills.

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