

# A NEW WAY FOR ENERGY -- EFFICIENCY IMPROVEMENTS, RENEWABLE ENERGY AND “CLEANER” CENTRALIZED ENERGY<sup>1</sup>

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As the 21<sup>st</sup> Century approaches, energy systems continue to be in a crisis<sup>3</sup> of many dimensions. There is the crisis of capital -- the demands for capital are outstripping the traditional sources of capital. There is the crisis of inequity -- the distribution of the benefits of energy is highly skewed and large sections of the population of developing countries (particularly the poor, women and rural areas) are deprived of access. There is the crisis of self-reliance – there is limited popular participation and empowerment in the planning, management and control over energy systems. And there is the environmental crisis – locally, with impossible levels of pollution, regionally, with deforestation and desertification of vast areas and globally, with discernible changes in the global atmosphere carrying the threat of climate change.

Despite this situation, energy does not get the attention it deserves. This is perhaps because decision-makers feel that there are other more important issues – poverty, gender disparity, population, under-nutrition and food scarcity, health, acidification, climate change, land degradation, investment requirements, foreign exchange impacts, national security, nuclear weapons proliferation. Unfortunately, energy cannot be given lesser importance because current energy patterns aggravate major global issues. Alternative energy approaches are required to tackle these issues.

The crisis of energy systems can be traced to the prevalence of the conventional paradigm for energy. According to this paradigm, the goal is economic growth to achieve which energy consumption, and therefore energy supply, has to be continuously increased. Energy efficiency, renewable sources and environmental protection are after-thoughts and add-ons; they are not integrated into the process of supply expansion. All this is the “bad news”.

Fortunately, there is also “good news”. A *new energy paradigm* is emerging. Here, energy is not an end in itself -- it is an instrument for the achievement of the socio-economic goal of *Sudevelopment*<sup>4</sup>. This goal of sudevelopment implies several criteria. In particular, it implies

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<sup>3</sup> The word *crisis* refers to a situation that does not permit continuation of old patterns of behavior.

<sup>4</sup> In the ancient Indian language Sanskrit, the prefix "su" stands for "good"; hence, “sudevelopment” means "good development".

- economic efficiency,
- equity/access (particularly for the poor, women and rural areas),
- empowerment/self-reliance,
- environmental soundness and
- peace.

Against this background, current discussions of energy systems tend to follow two distinct trends. Either, the goal is greenhouse gas abatement and prevention/minimisation of climate change. Accordingly, there is an emphasis on energy technologies, particularly renewable energy technologies (RETs) and efficiency improvements (EIs). Maximisation of (centralised and decentralised) renewable energy technologies (RETs) and/or efficiency improvements (EIs) becomes the objective function. RETs and EIs become ends in themselves. The proponents become RET and/or EI energy fundamentalists. They even demand that the playing field has to be distorted to favour these technologies. Or, the goal is sudevelopment. If sudevelopment is pursued as the goal, climate change becomes a vital but *subsidiary* concern. By and large, climate change is a preoccupation of the industrialised countries, and sudevelopment a priority of the developing countries. Here, the discussion will be based on sudevelopment as the goal.

Energy technologies, however, are only instruments to achieve socio-economic goals. Like all instruments, they must be appropriately designed and effectively wielded. If particular energy technologies advance the goal of sudevelopment, then these technologies are elevated to the status of *sustainable energy technologies* (SETs). SETs include “cleaner” conventional energy technologies (for example, the next generation of fossil-fuel-using technologies including “clean” coal technologies), centralised and decentralised renewable energy technologies (RETs), and efficiency improvements (EIs).

Every RET and every EI does not *ipso facto* ensure sudevelopment and become a SET. If, for instance, a RET or an EI is economically unviable, restricts equity/access (particularly for the poor, women and rural areas), and disempowers people, it may have a beneficial impact on the climate, but it impedes sudevelopment. Thus, RETs and EIs must qualify as SETs by finding a rightful place in national energy policies that are compatible with the goal of sudevelopment.

The remainder of this paper is devoted to describing how energy technologies qualify for inclusion in the set of national energy policies and become SETs.

Sudevelopment is not pursued in a vacuum. The achievement of sudevelopment must take into account important (global and national) trends and constraints. The main trends are

- globalisation,
- marketisation,
- democratisation,
- corporatisation (of utilities) and
- changes in external funding (both with respect to the magnitude and sources of this funding).

The crucial constraints are

- the declining availability of capital (internally from governments and externally from Official Development Assistance) and
- the cutbacks in government spending.

These trends and constraints lead to a set of considerations that sustainable energy strategies must take into account. In fact, they define the *new energy paradigm* that is emerging:

- a focus on *energy services* (rather than mere energy consumption) particularly for the satisfaction of basic needs;
- ensuring access to *modern energy services for all* (implying an obligation to serve);
- the establishment and maintenance of *a level playing field* (elimination of permanent subsidies and reflection of external (social and environmental) costs in pricing);
- utilising a *rationally derived mix of SETs* or "cleaner" centralised sources (not only the conventional sources but also the next generation of fossil-fuel-using technologies), centralised and decentralised renewable sources, and efficiency improvements.
- the promotion and safeguarding of *competition* within the mix;
- *indigenous capacity building* (with full use of information technology);
- a role for the *private sector*;
- a role for *stake-holders outside the private sector* (environmentalists, current and potential consumers, etc.); and
- utilisation of *measures that are low-cost or no-cost to the treasury* (including technological advances and innovative financing).

In addition, it must be recognised that, unlike conventional centralised energy sources, most RETs and EIs have not yet matured. And, since their costs are declining because of technological advances and organisational learning, they must not be compared on the basis of their current costs. Their place in the mix must be determined on the basis of their future costs after technological advances and organisational learning. It follows that special policies for RETs and EIs must be put into place and implemented

- to ensure that the future costs of RETs and EIs are taken into account when they are compared with conventional energy technologies, and
- to promote technological advances and organisational learning. If subsidies are used as a policy instrument for this promotion, they must be time-bound (and not a

permanent crutch) and they must be justified on the basis that they are promoting technological advances and organisational learning.

However well crafted the generic energy strategies, they will not succeed unless the **barriers** that they face are identified and specific policies designed to overcome them. In general, there are barriers to SETs (particularly RETs and EIs) earning a rightful place in national energy policies -- barriers to least-cost mixes, barriers to future costing, barriers to technological development and organisational learning.

In particular, there is a **market** sub-set of barriers to new SETs:

- **subsidies** (open and hidden) to conventional energy particularly to fossil fuels;
- **market prices that do not reflect environmental costs and damage** (air pollution affecting human health, land degradation, acidification of soils and waters, and climate change) and mask the striking environmental advantages of the new and cleaner energy options;
- **limited access to information**;
- **first-cost sensitivity** (where decisions are based on initial, rather than life-cycle, costs);
- **split incentives** or the common "landlord-tenant" problem (whereby the landlord has no incentive to invest in energy efficiency because it is the tenant who pays the fuel bills);
- **indifference to energy costs** (because they are often a small fraction of total costs) leading to limited attention to alternative energy options.

Another sub-set of barriers consists of **non-market** barriers including

- the **supply-biased energy paradigm**;
- **vested interests** (in the private and public sector, which benefit from business-as-usual approaches and practices and, therefore, resist change); and
- **institutional obstacles** (include the monopoly position of utilities and the lack of appropriate fora and rules for interaction between relevant organisations).

Within an appropriate framework, energy companies, investors, consumers, and civil society can all take on contributing and mutually reinforcing roles to meet the goals of sustainable development through a public-sector-led reorientation to make energy an instrument of sudevelopment.

Thus, the integration of sudevelopment into national energy policies involves a conceptual scheme presented in Figure 1.

The future may be difficult, but the present cannot be sustained. In fact, every "crisis" presents an "opportunity"<sup>5</sup>, and the 21<sup>st</sup> Century offers a grand opportunity for energy systems to be in the vanguard for sudevelopment.

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<sup>5</sup> The Chinese character (ideogram) for "opportunity" is the same as that for "crisis".

Figure 1: Scheme for integrating sustainable energy technologies (SETs) and sustainable development

