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Cultivating Energy

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From climate change to volatile oil prices, all signs point to a looming global energy crisis. Confronting the growing challenge means that humanity can no longer afford to ignore the inexhaustible resource found in the organic material that the sun provides each day through photosynthesis. Solar energy enables plants to absorb carbon gas and thereby produce not only oxygen, but also matter that the animal kingdom uses for food – and that our machines can use for energy.

Since the Neolithic (or late Stone Age) period, humans have been cultivating this "biomass" in order to feed itself. Yet, even in today's world, its energy potential is ignored. Beginning with the industrial revolution, humans sought energy from coal, and later from oil and natural gas, but this leads to the exhaustion of non-renewable resources.

Existing alternatives for diversifying energy production are limited. Nuclear energy presents a number of disadvantages, owing to concerns about safety and disposal of radioactive waste. Hydroelectric power is already widely used, while wind and solar energy are structurally sporadic and disparately available.

Biomass, on the other hand, has several advantages. Supplies of it are large and available throughout the world. Moreover, the technology necessary to convert it into energy – including high-yield burning, gas conversion, and liquefaction into synthetic fuel – has long been mastered. Widely used during World War II, this technology has since advanced considerably.

Biomass energy, however, is the victim of unfair competition from fossil fuels. Oil's price reflects its extraction, refining, and distribution costs, but not that of creating the raw material. Millions of years and 200 tons of plant matter are necessary to produce one liter of oil, whereas just 15 kilograms of plant matter are required to make one liter of synthetic fuel.

After the oil glut, with oil below $20 a barrel, interest in developing energy from biomass ebbed, attractive only to "green" militants and those interested in fundamental science. Yet the potential is immense. The planet's biomass – forests, pastureland, savannas, and crops – make up productive capital that generates a 10% "return" every year. Like a battery that runs out and is then recharged by the sun, this supply is renewable indefinitely, as long as it is managed properly. The annual return on this capital is currently estimated at 60 billion tons, yet only two billion tons is consumed for food purposes and 10 billion tons for energy.

Increasing the responsible use of this energy source would contribute to the fight against climate change by reducing the amount of carbon in the atmosphere and diminishing the amount of fossil fuel required to produce energy. Moreover, its abundance in southern countries promises to facilitate their economic development. Considered the "energy of the poor" until today, biomass could become a source of wealth if it is grown and harnessed with the support of the international community.

Thus, "energy crops" could be developed to produce biofuel. Residue from forest, agricultural, and agro-industrial activities could be collected and converted. For example, the six million tons of waste produced annually by Niger could theoretically be used to meet that country's entire energy needs.

However, in many places, energy cropping would certainly compete with food crops. Long-term estimates project that over a 50-year time horizon, most of the planet's arable land would have to be used to feed the world and for forest conservation. Thus, areas dedicated to energy production, particularly biofuel, may not reach the level that societies would wish. But, while such competition would reveal new global scarcities, it would also bring higher prices, thereby encouraging producers to increase yields and productivity.

Thus, while cultivating energy would create new constraints, it would also open new possibilities for many economic actors. The farmer and the forest worker could become more involved in the market, the mine engineer could begin to take an interest in crop fields, the banker in plant shares, etc. But, in order to prepare for a scaling up of energy cropping, new policies must be implemented, both in northern and southern countries, in terms of agriculture, land and water management, protection of biodiversity, fuel taxes, and information and awareness-raising.

The ancient Egyptians and the Incas practiced a religion of the Sun, believing it to be at the beginning of all life on Earth. Science has since proven this to be the case. Nowadays, when it has become more important than ever that we embrace renewable resources, we should use the Sun to cultivate our energy, just as our ancestors used it to cultivate their food.

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