Act last year, liquid fuel from biomass, or gasohol, has enjoyed a 4 cent per gallon federal tax exemption. On April 5, the President recommended that the exemption be extended beyond the Oct. 1, 1984 cut-off in the act. On July 16, he proposed that this exemption be permanent and that tax money be used to subsidize gasohol production to the tune of $16.80 per barrel. The optimistic production estimates for gasohol, set as the national goal, is 120,000 barrels by 1990. This will cost the taxpayer about **$200 million**.

Though virtually no one takes the stated goal of producing 20 percent of U.S. energy consumption from solar as a serious proposal, the DOE FY80 budget request to Congress plans on spending over **$800 million** in R&D money and tax credits and loans for passive solar heating, research into direct electricity conversion from the sun, industrial process heat from solar, and various other possibilities. None will or can be implemented without massive subsidies to residential consumers and other end users.

The President also proposes to replace about 2.5 billion barrels of oil per day with various "backstop" technologies by 1990. This includes: about 400,000 barrels per day from oil shale, using a **$1 billion** tax credit; 500,000 from unconventional gas with another **$1 billion** tax credit; 100,000 from biomass, and 1.5 million from coal liquids and gas. This coal synthetics program would require mining at least an additional *150 million tons* of coal each year. This synthetics program would soak up most of the $88 billion in the Energy Security Corporation, between now and 1990.

Leaving aside for a moment the physical effects such a program would have on labor productivity and plant and equipment, just consider what we would be getting for *our* money.

Schlesinger's second National Energy Plan estimates that the replacement of 1 million barrels per day oil equivalent with synthetics entails building 20 synthetics conversion plants at a cost of about **$32 billion**. The fuel that will be produced will sell for at least **$40 a barrel** of oil equivalent. This means that the price of energy "independence" which is supposed to lower our oil bill and the cost of energy throughout the economy will double as "domestic" synthetic oil is substituted for the oil being sold to the U.S. by OPEC.

The Schlesinger plan, written three months ago, concludes, therefore, that coal synthetics should be brought on line in the 1990's only as the world price of oil makes them competitive. Carter has since decided that regardless of the cost to the economy, the 1990 goal of 1.5 million barrels per day will be met.

How the alternate

The following report of a computer-generated analysis of alternative energy scenarios for the United States is drawn from a larger body of work in preparation under the direction of 1980 presidential candidate Lyndon H. LaRouche, Jr., a contributing editor of *Executive Intelligence Review*. Reproduced below are the graphic analyses of two energy scenarios: first, a crash commitment to synthetic fuels production as proposed by the Carter administration, and second, a crash commitment to nuclear power at the rate sufficient to generate an additional 7 percent of capacity per year.

As the graphs indicate, the *EIR*'s Riemannian economic model, as programmed by the journal's economics staff, shows that the proposed synthetic fuels scenario would produce a form of economic breakdown by late in the 1980's, while the commitment to nuclear energy production would produce an economic growth rate exceeding—after 10 years—any previous postwar growth rate.

The data employed for the comparison are detailed exhaustively in the following section. In brief, the Riemannian model was programmed according to these specifications:

For each scenario, the capital costs of construction of new energy-producing facilities were added to the basic capital costs of the economy. The change in the price of energy produced was added or deducted from this incremental capital cost.

The cost of the two scenarios was then compared, and the difference—a massive difference in the case of the synthetic fuels production plan—was treated as a nonproductive expenditure in the final modeling.

In addition, for the synthetic fuels scenario, the productivity ratio was held constant through the entire period of the projection. In the case of the nuclear scenario, productivity was held constant for the first three years, and then increased by 5 percent per year for the remaining years of the projection. The basis for the different treatment of productivity under the two scenarios was a linear correlation of the change in energy prices with the annual change in productivity in manufacturing industries for the U.S. economy during the postwar period. There is a precise correlation between lower energy prices, measured in kilowatt-hours per dollar, and the rise in manufacturing productivity, measured in output per manhour, over the period examined, within any five-year period.

energy policies stack up

The conclusion to be drawn from this correlation, a common conclusion, is that under conditions of energy price reduction, business tends to invest in more energy-intensive technology, which increases labor productivity. For example, the slow growth of productivity of the U.S. economy since 1973 is frequently traced to higher energy prices and the reduction of new investment in energy-intensive technologies.

Since the nuclear scenario involves a projected saving of over $15 billion by 1987 in the cost of generated electricity in postwar history, it was decided to assign an annual rate of productivity increase at the upper range of the postwar characteristic level, with a three-year lag reflecting the time required for business to realize new investment decisions based on the expectation of cheaper electrical energy.

Given the extreme increase in the cost of all forms of energy projected under the Carter program, the assignment of a steady, rather than falling, level of manufacturing productivity probably represented an overly generous concession to proponents of the President's program.

The cost of synthetic fuels

The largest single component of the increased cost of energy projected under the administration's scenario is the assumed rise in the price of oil to the level required to make the synthetic fuels program feasible, or $42 per barrel of oil. The assumption of a general level of $42 per barrel for oil runs contrary to the established assumptions of the administration program, which treats the enormous cost of synthetics as a special case, to be brought down to the otherwise-prevailing cost of oil through special government subsidies. However, we do not believe that the administration's assumptions accurately reflect the real-world consequences of the synthetic fuels program.

Apart from the $88 billion projected construction cost of 25 synthetic fuels plants, and the $18 billion annual subsidy required to hold the price of 2.5 million barrels per day of synthetic fuels down to market prices, the costs of the program will be enormous. They include:

1. Environmental costs: Coal hydrogenation on the scale projected by the administration requires gigantic amounts of water. In a 1977 study for the Department of Energy on the subject of synthetic fuels, the Hudson Institute concluded that virtually the entire available water supply of North Dakota, South Dakota, and Wyoming would be used in such production (presuming that the synthetic fuels plants were located virtually at the mouth of coal mines in those states), wiping out agriculture in those states.

2. Predictable cost overruns: The capital equipment capacity, especially in the steel industry, does not presently exist to provide the vast amount of steel tubing required to build these plants. Therefore, the relative price of capital goods involved in the production of synthetic fuels—capital goods already affected by capacity bottlenecks—would have to rise spectacularly, throwing all current cost estimates up the chimney.

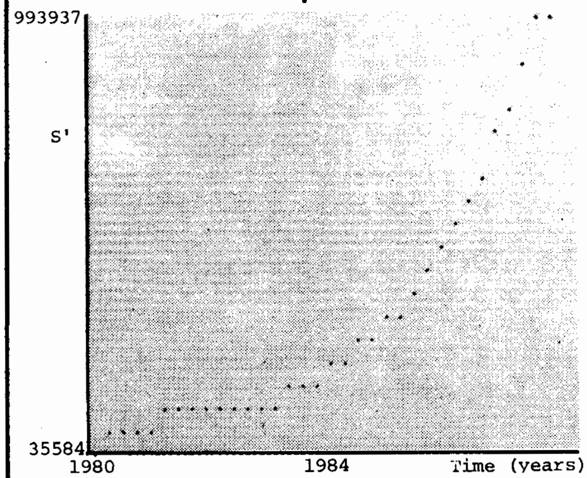
3. Damage to other capital goods sectors: The capital costs of coal mining development, synthetic fuels plants construction, soil-to-coal reconversion, and so forth would adsorb virtually the entire stock of several categories of capital goods. The physical goods would simply not be available for investment in other areas, crippling the capital goods sector of the economy.

Therefore, the assumption that the special costs of synthetic fuels can by "contained" within the administration's current, admittedly large, price estimates, is entirely insupportable. The secondary and tertiary costs would probably be several times in excess of the primary costs.

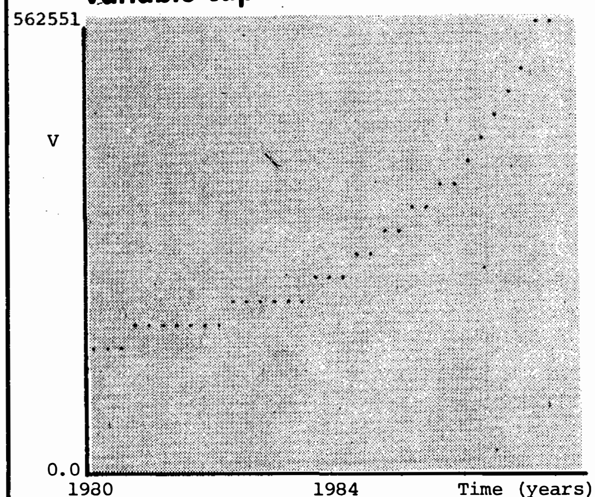
There are several ways to estimate these costs, but the simplest and most direct involves application of classical economics ground rent theory. What Carter has proposed is a strictly Ricardian ground rent case study, in which the resource in question, oil, is limited in availability by a federal import quota. All the marginal production of oil in this case is expected to come from synthetics, under the assumption that domestic oil production will not rise substantially. In this case the cost of the entire resource is determined by the marginal cost, i.e. the cost of synthetic fuels. In other words, even if the nominal cost of part of oil consumption is articially held down below the level of synthetic fuels production, the total economic effect will be equivalent to a general $42 per barrel oil price. This assumption follows the thinking of the Hudson Institute's current scenario—which formed part of the basis for the administration's proposals. Hudson simply assumes that the cost of synthetic fuels will have to become generalized.

The LaRouche nuclear development program

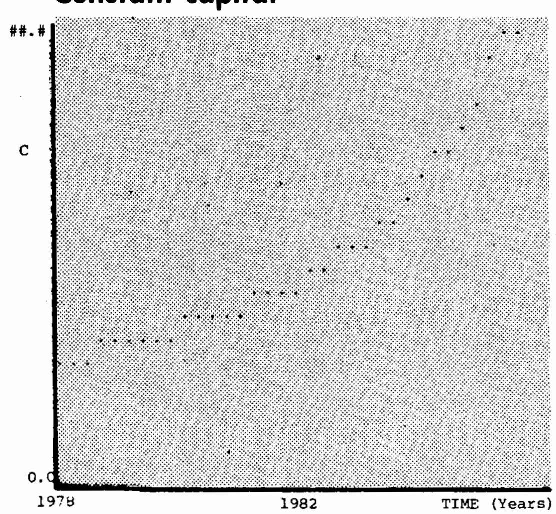
Reinvestible surplus



Variable capital



Constant capital



Therefore, for purposes of programming, the increase in the price of $42 per barrel was programmed into the computer, ranging from $22.65 billion in 1980 to $177 billion in 1988. This price figure, calculated as a nonproductive expenditure, contains embedded within it the costs mentioned above.

How the model works

These contraints are analyzed by the computer program in the following way. The Riemannian model starts with a data base which divides the economy (or an economic subsector) into four categories, measured in constant-dollar sales of tangible output. The categories are variable capital (V), or the tangible consumption of the goods-producing labor force; constant capital (C), or the total raw materials and machinery costs of production; "d," or all expenditures that are not returned to the production cycle, including consumption of non-goods-producing workers and production of goods not used in the production cycle, like office buildings and tanks; and reinvestible surplus ("S′"), or the margin of production available for reinvestment back into the production cycle.

The program then calculates ratios for the change in these categories, showing the composition of the reinvested capital, or V/V+C; the rate of nonproductive spending, or d/S; and the rate of productivity, or S/V. The program then solves three simultaneous differential equations (or multiples of three for a multi-sector model) showing the rates of change in these measures.

Changes in the absolute values of C, V, d, or S′ are used by the program to calculate further changes in the above ratios. The final printout shows the new absolute values for the basic categories within the economy's tangible output.

At the outset of 1979, the ratios for the U.S. economy stood as follows: V/V+C= .19; S/V = 5.11; d/V = 4.5. In other words, variable capital was a small proportion of constant capital; the rate of surplus was over five times the rate of variable capital; and nonproductive expenditures were 4.5 times variable capital.

Adjusted for the changes in absolute values for both programs, and with the productivity assumptions noted earlier, the model produced the graphs displayed here.

The first set of graphs show, respectively, the level of reinvestible surplus production for the nuclear scenario, the level of variable capital production for the nuclear scenario, and the level of constant capital production for the nuclear scenario.

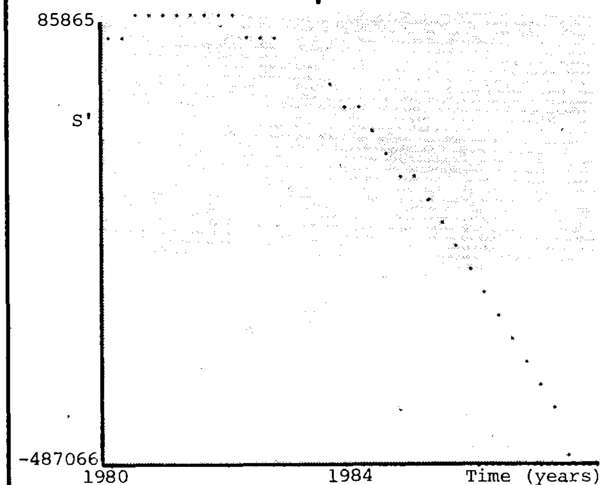
The second set of graphs show the reinvestible surplus, variable capital, and constant capital for the Carter administration's scenario.

One aspect of the first set of graphs must be set in the proper context, namely, the exceptionally high growth rates projected. By the final year projected, the model shows the U.S. economy to have reached an annual growth rate of 20 percent—in excess of any growth rate since the height of the World War II war mobilization. To be more precise, the model shows that there are no *physical* constraints to the achievements of such a growth rate. It is not at all likely, however, that such a growth rate could be achieved without major changes in the way the economy is organized. The model shows that the physical volume of production will exist for such a growth rate, with the assumption that the technology and skilled workforce exist to transform a 7 percent rate of growth of cheapening electrical energy into the production process. The technologies certainly exist off-the-shelf. However, relative to the rate of growth projected, there is currently nowhere near the required levels of either skilled manufacturing workers or engineering personnel. To realize the physical possibilities shown by the model, the United States would have to undertake a tremendous training and educational effort, returning to the levels of graduating physics PhD's and associated measures of the population's capacity to absorb technology of the early 1960's.

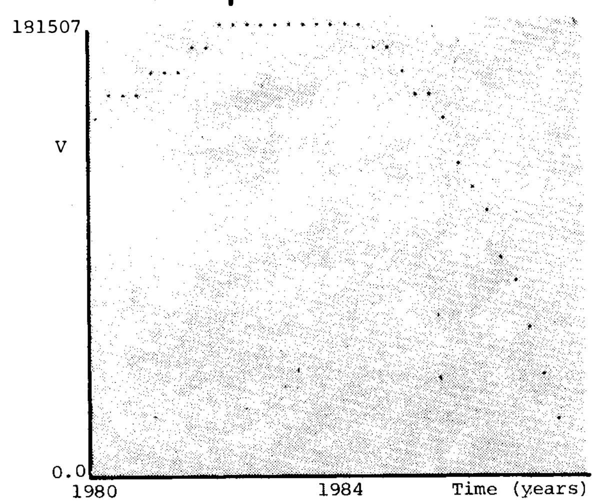
In regard to the second set of graphs, which show the virtual disappearance of economic activity by the late 1980's, a different type of explanation is required. At a certain point, the consequences of the synthetic fuels program makes it impossible for the economy to exist in the mode reflected in the 1979 ratios cited above. A basic change in state must occur, possibly a drastic and permanent lowering of living standards. What the vertical drop in the parameters shows is a coupling of the differential equations, reflecting a "singularity," or discontinuity, in the economic trend. What the model shows is that the economy cannot function with the Carter program after several years. Short of a dictatorship enforcing lower living standards, or some comparable transformation, the program is *impossible*.

The Carter energy program

Reinvestible surplus



Variable capital



Constant capital