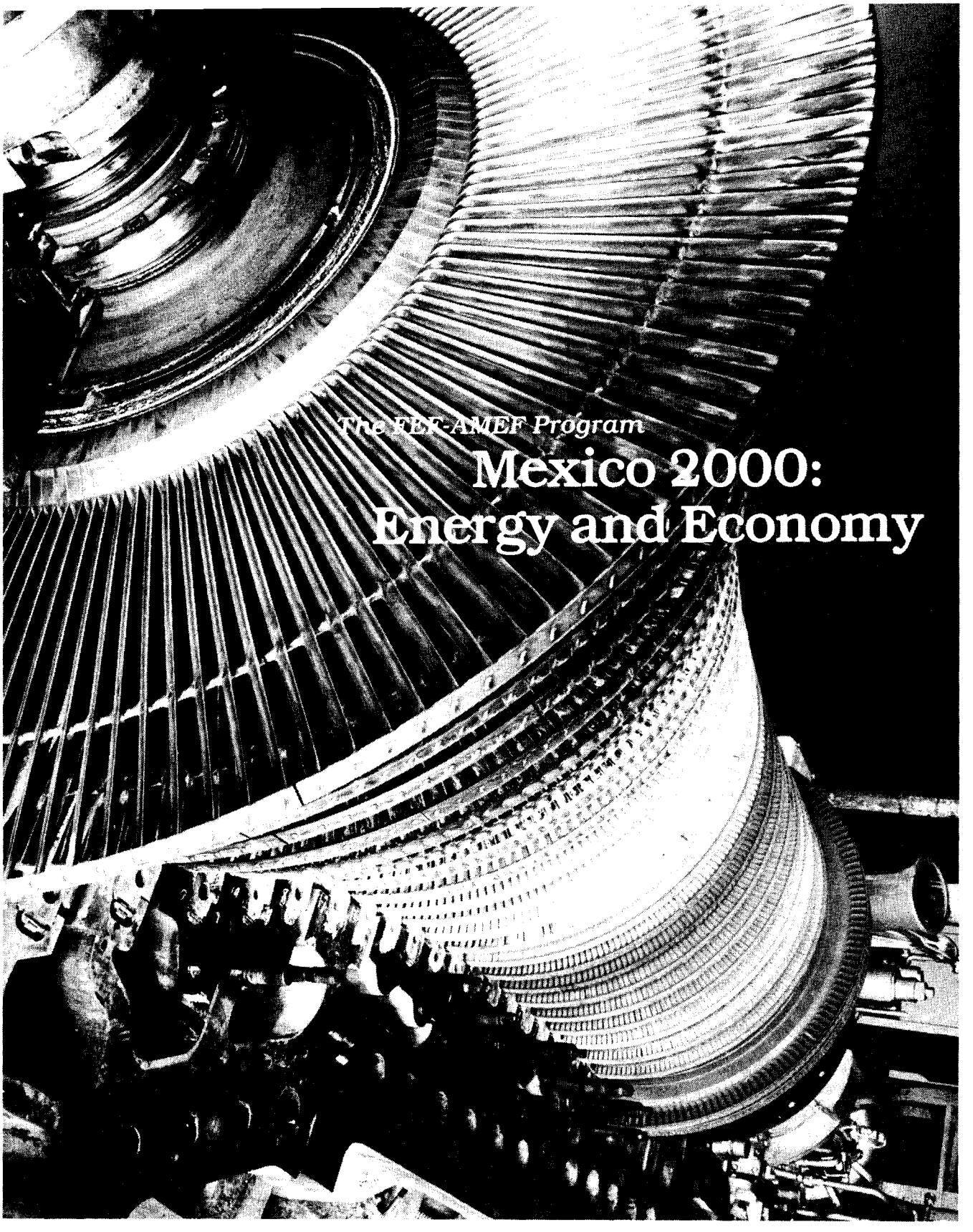

The FEF-AMEF Program

Mexico 2000: Energy and Economy

EIR *presents here the introduction to the "Mexico 2000: Energy and Economy" development program by Dr. Uwe Parpart, director of research for the Fusion Energy Foundation. The development program, formulated by the Fusion Energy Foundation and the Mexican Association for Fusion Energy (AMEF), was presented at a Feb. 19-20 conference sponsored by both organizations in Mexico City. Among the 150 participants were representatives of eight Mexican government ministries, leading private firms, and engineering, research, and educational institutions.*

For its Mexico development projections, the FEF-AMEF team employed the LaRouche-Riemann computer model, the only such econometric tool to have successfully predicted recent trends in the world economy.

The motion of this aggressive approach to Mexican developmment received added impetus with Democratic Party leader Lyndon LaRouche's call in Houston, Texas recently for an "oil-for-technology" package between Mexico and the U.S. as the keystone measure to free the Reagan administration from the Volcker "no-growth" stranglehold.

The discovery, starting in the mid-1970s, that Mexico possesses much larger petroleum reserves (certainly in the 200 billion barrel range) than had been previously realized, affords it a unique opportunity among the larger Third World sector countries to substantially reduce by four to five years the time that would "normally"—even with an ambitious development program—be necessary to become a modern industrial nation.

Our analysis demonstrates that by no later than the year 2000, the great majority of 115 to 120 million Mexicans should be able to enjoy a standard of living comparable to that of the average inhabitant of the Western European nations in the year 1980. Key to the success of a rapid development effort leading to such a result are extensive oil-for-technology deals between Mexico and several advanced sector countries, which could become a model for beneficial North-South relations in general, and are essential to overcoming critical capital goods shortages.

By 1990, oil revenues representing production for export of 3.5 million barrels per day of a total daily production of 10.5 million should be allocated to finance capital goods imports, to optimize the tempo of industrial development. At such a coupled oil export/capital goods import level, the Mexican economy can operate at a substantial growth rate in industry of 12 percent per year, powered by annual productivity increases whose lower boundary will at no point dip below 5 percent.

Why rapid growth?

A "go slow" attitude in the exploitation of petroleum reserves represents the greatest threat to Mexico's future. The rapid conquest of underdevelopment must be squarely based on—for its tempo depends upon—continuation of the aggressive oil exploitation program of the past several years. At an early point in the 1990s, reaching production levels of 10 million barrels per day would be desirable and guarantee Mexico the rates of capital formation in the economy which, in the course of the 1980s, will make the country less and less dependent on raw materials extraction.

It must be understood that these growth rates are not arbitrary, representing targets that would be "nice" to achieve. They are variables that depend on detailed time-phase investment decisions, estimates of when plant, equipment, and elements of infrastructure representing such investments will come on line, and how this will affect production and growth rates. They conform, on the other hand, to an absolutely essential structural requirement for the Mexican economy, without which large-scale social dislocations and the dreaded "Iranization" of the country may in fact become consequences of insufficient development.

Mexico, because of its anomalous population structure and oppressive rates of unemployment and underemployment, must between now and the year 2000 sustain annual rates of job creation and industry of 6 to 7 percent. It is the uniform evidence from both advanced and underdeveloped countries that underwent successful development since the end of World War II, and also analytically provable, that the combination of 12 percent industrial and 5 percent productivity growth rates is the minimum at which such rates of job creation are possible without hyperinflationary consequences.

The oil-for-technology strategy should be seen as the basis on which the principal existing bottlenecks can be eliminated. During the two-decade period ahead, Mexico must begin to make provisions for its energy future beyond the oil era. The 1985-1990 phase will be a crucial transition period in which a first series of nuclear power plants can come on line.

By the year 2000, more than 60 gigawatts of power must come from nuclear sources. This signifies more than simply a transition to a new mode of energy; it means a transition to a mode of functioning as a modern industrial economy as a whole, and is simultaneously one of the greatest challenges to Mexico's manpower development, if the country is to achieve the status of a truly independent republic.

To say that Mexico's economists—including those who operate the Diemex/Wharton Mexican econometric model at the Wharton School of the University of Pennsylvania in Philadelphia—are the principal obstacle to the country's successful economic development would clearly be to overstate the case. However, there can be little question that incessant talk of the dangers of "petrolization," association of the near 30 percent

rate of inflation with the oil boom, lobbying for oil production ceilings to preserve the national patrimony, and so on, have gone quite a way in injecting doubt and uncertainty into government policy. It is necessary, in particular, to put to rest the "oil carries inflation" argument in order to permit an unobstructed view of the true dynamics of development.

The 'oil-inflation' fraud

There is much controversy over the extent to which imported inflation contributes to the overall Mexican inflation rate. We shall not attempt to settle this matter here, except to say that we regard that contribution as significant. The domestic inflation component is said to be due to excess demand—an excess of the oil revenues running up against limited productive capacity, production and distribution bottlenecks, and so forth.

Well, why not concentrate on rapid expansion of production capacities, instead of the omnipresent clamor for "cooling off" measures and currency devaluation? The very argument presented to demonstrate that the oil boom causes rising rates of inflation reveals that the true cause of the problem lies elsewhere: in certain profound structural weaknesses of the Mexican economy which can only be cured through an aggressive investment policy in the sectors in question.

Nor is there any difficulty in identifying the weak and inefficient sectors and structural imbalances in the economy which cause the inflationary drag on the economy as a whole. Before making that identification, let us concede: there is no question that even the best thought-out investment policy does not produce miracles overnight. And there will undoubtedly be a certain inflationary lag between today's spending and tomorrow's production capacity. However, such a shortage-causing time-lag can be covered by a judicious import policy. It is the more profound structural problems and the political roadblocks to their elimination which cause all the trouble. To these problems we can now turn.

Subsistence farming

By far the largest problem for the Mexican economy is the tremendous inefficiency of the agricultural sector. While a clear distinction must be made between the significant, modern, import-oriented farm sector and the bulk of the agricultural sector, which consists of subsistence farming, the overall performance of the sector is so poor that in 1979 and in 1980 large quantities of food had to be imported. Oil revenues diverted for this purpose, of course, contributed nothing to economic development and became a pure source of inflation.

It is the 18 million rural poor which largely earn Mexico the title of underdeveloped nation. Only a program aiming for the most rapid total elimination of subsistence farming will be able to secure for Mexico a solid economic future. We are fully cognizant that implementation of an agricultural development program on the U.S. side is not merely a technical problem, but is meeting and will continue to meet major political problems.

Skilled labor shortage

The second major problem in the Mexican economy is more difficult to pinpoint, and at present principally shows up in the initially seemingly unrelated problems of crucial weaknesses in the capital goods sector and extraordinary manpower shortages, principally in the highest skill categories.

The difficulty is as follows: while Mexico has experienced impressive annual economic growth rates averaging close to 6 percent during the entire 1955 to 1980 period, this economic growth has been entirely lopsided, favoring consumer goods industry to the almost total neglect of basic heavy industry. Until the recent period, the preferred areas for development were the easy profit, high-turnover, low-risk, low-technology areas. Under these circumstances, of course, there is no need to train a highly skilled labor force supported by a well-developed engineering and scientific manpower pool.

Past sins of omission have now turned into major bottlenecks, and the continued almost total lack of output of graduates with advanced degrees in the natural sciences, physics, and mathematics in particular, has reached the dimensions of a national scandal.

Transportation

The third major bottleneck in the Mexican economy is the transportation system. Transportation functions as a central determinant of productivity in any economy—to the extent that goods are reliably and rapidly transported. The economy has a "conveyor belt" that speeds up production. Without that ability, productivity decreases and hence, inflation increases. Goods pile up at the border of Mexico; rail cars are used as warehouses while awaiting shipment; trucks are used for long-haul bulk shipments, etc. These problems impede the rate of production and the rate of absorption of investment—they cause inflation.

But these problems can be solved with investment in highly developed technologies. Mexico must put the sort of priority on investment in transport that the Koreans did in the early part of their economic "miracle." Almost half of the investment made in Korea in the early 1960s was in the development of a transport system, which paid off many times over in the 1970s. Extensive rail systems must be built which are electrified, rectified, and double tracked. A modern highway system must be built. Large ports must be constructed. In all these areas, technologies exist for rapid massive construction of transport facilities. Mexico has private sector companies internationally famous for their abili-

ties in the sort of crash construction programs used by military forces. Mexico needs several Cam Rahn bays!

Oil for technology

All three of these problems can be solved with a forceful application of investment paid for by oil revenues. The potential exists in Mexico's oil reserves to solve the dependence on those reserves. Like any endowment, this oil will have been successfully used, if, at the end of a generation, it is no longer needed. The FEF program provides a strategy for the transformation of Mexico from a raw material producing country to a capital goods-producing country.

The role of these oil exports is most dramatically shown in the way that they purchase the critical capital goods for Mexico. In 1982, we project that Mexico would use approximately 20 percent of its oil revenue for purchase of capital goods. This import of capital goods would represent about 75 percent of the capital goods needed in Mexico. However, by 1990, about 50 percent of the oil revenue would be used to purchase less than 60 percent of Mexico's capital goods needs—the other 40 percent would be produced domestically. By 1995, Mexico would be producing more than half of its capital goods requirements. And by the year 2000, Mexico would be producing 75 percent of its capital goods requirements.

LaRouche-Riemann model

The FEF program presented here is a "proof of principle" experiment—we have shown that Mexico can become an industrialized country by the mid-1990s. The FEF program is *not* a prediction of how that development will happen; nor is it a statement of how this industrial development must happen. But, it is a demonstration that Mexico need settle for nothing less than rates of growth of national product of 12 percent per year, and the transition to a modern, industrialized country in the lifetimes of most Mexican citizens today. Any claim of the impossibility of these goals is scientifically false.

As has been described in more detail in several publications, the LaRouche-Riemann model reproduces in numerical form the dominant cause-and-effect relations of an economy. This model shows how investments are generated, how their disposition affects future production. It gives the economic planner, industrial manager, or governmental economist, the ability to derive impact evaluations for a given investment strategy. We have used the model to devise a specific investment strategy which shows without a doubt that Mexico can industrialize, and lays bare the principal causal features of the process of development.

The motor for the Mexican economy, as for any economy, is the gross profit in tangible terms which it produces. Every economy which is growing does so first

The urgency of a full education drive

From Part VII of the Fusion Energy Foundation's draft program for Mexico, headed "Education and Science: The Key to Mexico's Future."

The task of education in Mexico is twofold: to bring into existence a world-class scientific elite, and to imbue the population at large with elementary scientific literacy and an understanding of how science is the key to national sovereignty and development.

The problems we face in reaching these goals are also dual. First, the objective skill-level profile of the Mexican population; and second, the political or ideological antiscientific prejudices prevailing in much of Mexico's education system. The domination of education in Mexico by the enemies of industrial progess must be addressed. . . .

Despite almost 40 years of fairly steady economic growth, Mexico is practically a nullity in scientific achievement and number and quality of scientists, outside the field of petroleum. The list of annual Ph.D.s awarded in Mexico is a disgrace. In ongoing basic research and development, Mexico has a pitiful 5,896 scientists actively engaged, one of the lowest in absolute numbers of significant countries in the world. . . .

Part of the problem is the cancerous expansion of "socially relevant" curricula at the expense of natural sciences. Compare Mexico to [South] Korea, a country that began less than 20 years ago as a very backward, nonindustrial nation, and that has now achieved a development level at least on a par with Mexico. Mexico had 112,942 students enrolled in the social sciences in 1975, compared to Korea's 37,247—while Korea, with half the total population of Mexico, had 17,022 students in natural science to Mexico's 14,042. And Korea had a far higher completion rate.

Mexico's enrollment in secondary education is also very insufficient. In 1976, Korea, with half the potential student body of Mexico, and enrolled 2,675,000 in secondary education, compared wth Mexico's 2,142,800. In elementary education, while Mexico reports nearly universal attendance for three to six years of schooling, this has been achieved only with very large class sizes of 40 to 50 pupils, too large for efficient primary education.

Courtesy of the United Nations

Pupils in a rural school.

because it produces more tangible output than would be required to replace the inputs to the previous cycle of production. The difference between the total tangible output and the requirements for production at the same level is the gross tangible profit. This real surplus product is the source of monetary profit and is the driving force of an economy.

But, it is not enough merely to have produced this tangible profit; some portion of it must be reinvested in expanding the scale or quality of production if an economy is to progress. This portion of gross profit, called S′ in our model, provides the fund for new capital investment, expansion of the labor force, and expansion of circulating capital inputs like energy and raw materials. These two aspects of real economic systems lead to the formulation of two corresponding parameters which quantify the most essential aspects of successful economics;

Productivity = gross profit divided by wages (in tangible terms). This ratio measures the effectiveness and efficiency of deployment of any economy's reason for existence—its population.

"Free Energy Ratio" = S′ divided by equilibrium costs. This ratio measures the rate of directed investment in an economy and can be mathematically shown to give the instantaneous growth rate of the total tangible product.

Mexico's development depends on implementing a set of investments which increase these ratios as much as possible!

Agro-industrial cities

The essential ingredient in any successful investment strategy for Mexico is a solution to the agricultural problem. Agriculture today in Mexico functions overall as a drag on the economy. Its productivity is about 65 percent of the average in the economy. That means that the sector contributes less than its share to the total pool of tangible profit; it consumes 21 percent of total wages but produces only 11 percent of the profit.

But, more importantly, there is a part of agriculture, a subsector of subsistence agriculture, which is a net drain on the economy. In this subsistence sector, the productivity is lower than the rate of consumption of nonproductive items (services, etc.) so that every peso invested in subsistence agriculture actually *decreases* the economy's ability to expand. There is a clear solution to the agricultural situation in Mexico—the subsistence fraction must be eliminated as quickly as possible, and the remaining fraction must have its productivity increased as rapidly as possible.

Our program accomplishes the first goal within ten years—after 1990 the subsistence sector of agriculture has decreased to less than 1 percent of the total economy. To raise productivity in agriculture requires massive investments *in industry,* most of all, and then a means of transferring those industrial products into agriculture.

We have formulated a unique strategy of "concentrated investment" in the construction of up to ten agro-industrial complexes and ports—new cities based around advanced energy production and integrated industrial production, irrigation, and fertilizer production facilities. These new cities are the conveyor belt which moves the knowledge and capital to the countryside required to raise agricultural productivity.

Education and urbanization

The second essential ingredient in a successful investment program is an aggressive education and urbanization program. Again, we have not proposed a broad-based, mass literacy campaign to train the labor force Mexico needs. Such a program may create a level of mediocre education suitable for the World Bank's "ruralism," but a different approach is demanded for industrial development.

Rather, a top-down attack on the problem is necessary. Because of such a strategy, India is today favorably positioned for its own development. During the 1950s, every large regional center was equipped with a center for teaching and research. What more profound remembrance could be left of a national leader than that of Nehru's—almost all these institutions have above their entrance, "Established by Jawaharlal Nehru."

To raise productivity at 5 percent per year, to expand the industrial labor force at the rate of 8 percent per year, to urbanize Mexico with construction of ten new cities, requires an initiating cadre force of engineers and scientists who can transmit their knowledge to expanding layers of the population, in the manner that the Ecole Polytechnique did in France in the early 1800s.

Mexico can use the construction of agro-industrial complexes to generate not only energy, food and man-

ufactured goods, but even more importantly, to educate "on the job" the citizenry of a modern industrial country.

Radiating out from these new urban centers will be engineering and scientific know-how, the tools of culture and the world view of a modern country, and the human side of the resolution of the problem of subsistence agriculture. Here are the jobs at high-skill levels and wages needed to build and maintain an urban labor force. With these new cities, the large economically inactive population of Mexico can be employed, the tragic underemployment of the labor force reversed, and educational and cultural resources built.

Finally, the Mexican economy must actually produce the industrial output required for its survival and growth. This can only be done by rapid and large-scale investment in industrial steel, cement, capital goods, and electricity. All must grow at rates in excess of 13 percent per year. Mexico is uniquely positioned to accomplish this goal using its oil revenues. South Korea, on the other hand, used labor-intensive investment in textiles to generate the surplus required for industrialization. Mexico can be spared this step with aggressive exploitation of its oil.

Our model shows that the revenues from this oil can more than adequately provide the margin of surplus needed to purchase capital goods in the critical first 12 to 15 years of industrialization. With a petroleum output growing at an average rate of 8 percent per year over the next two decades, and with the export of approximately 3 to 4 million barrels per day, Mexico can provide itself with the capacity for rapid industrial growth.

Mexico initially depends, in our program, on heavy investment in petroleum. But by 1988, only 24 percent of total investment goes to petroleum. The economy changes qualitatively, with larger and larger investments in industrial and capital goods sectors. By the end of our program, the capital goods sector itself is receiving 8 percent of the total investment per year and growing at an accelerating rate.

This strategy passes the acid test of our program—it transforms the Mexican economy from a raw materials producer, which it will continue to be for 8 to 10 years, into a capital goods-producing country. The ratio of imported capital goods to domestically produced capital goods under our program begins at roughly 2.0 in 1980, but decreases by 1995 to less than 1.0. That is, Mexico is rapidly approaching the capability to produce its own requirements for continued industrialization.

At that point, which our study proves can be achieved in the early to mid-1990s, Mexico realizes its potential as a modern nation-state. The true source of national sovereignty will be within the grasp of the Mexican republic. There is no other path to true national independence.

Proposed location of some agro-industrial nuclear complexes (Nuplexes), by the year 2000 in the Mexican development program

Large agro-industrial complexes based on advanced energy sources are essential for Mexico's overall development, states the Fusion Energy Foundation program. Nuclear reactors—optimally, high-temperature gas reactors—and magnetohydrodynamic power generators will provide the base for chemical fertilizer plants, steel plants, desalination plants, and electricity grids. Three of these complexes are discussed in the program.

Northern plateau: Half a million acres in the hot, arid, and thinly populated area are to become an agro-industrial center permitting the development of natural gas and mineral ores. Near Torreon, two high methane gas-fueled 1000-MWe magnetohydrodynamic generators coupled with steam turbines would be installed, providing energy for irrigation via subsurface pumping and for fertilizer production.

Sonora region: Near the extreme northwestern cities of Mexicali and Tiajuana, 3 million acres can be developed, based on nuclear energy for copper refining, fertilizer, and desalination.

Central plains: 3 million acres in the Guadalajara vicinity could be farmed, triple the present extent, with nuclear energy to expand irrigation and construction of reservoirs.

Centered in areas of Mexico that most need manpower, infrastructure, and energy, the advantage of the "nuplexes" is to serve as central points of outward waves of education, urbanization, and industrialization, states the program.