Human Cognizance and Utilization of Energy Sources Is Never-Ending

— Refutation of "exhaustion of energy sources"

by Chin Hua

THE essence of energy is motion of matter. The world of matter is never-ending, as are the motion of matter and energy in nature. Therefore, human cognizance and utilization of energy sources also is never-ending. Chairman Mao has said: **"The history of mankind is one of continuous development from the realm of necessity to the realm of freedom. This process is never-ending."** The history of development of the cognizance and utilization of energy sources in nature is also a vivid description of a dialectical process of development.

Of course, transformation of energy sources is carried out under definite conditions; so is energy in nature transformed into energy available to humanity. In class society such conditions are determined by class struggle, the struggle for production and the levels of scientific experiment. The practices of human beings are developing continuously. Therefore, energy sources have been constantly developing. What was not considered energy sources previously have been changed into important energy sources. The process of the struggle in the cognizance and utilization of energy sources is precisely one in which human beings incessantly study the conditions of transformation so as to render more and more energy available for the progress of society.

Theoretically Wrong Views

Views of "energy exhaustion" in human history have been varied. Such views are wrong theoretically, either because they take a metaphysical approach to the problem of energy and deny the infinity of the material world and the indestructibility of the motion of matter, or because they take an isolated and absolute approach to the definite conditions for the transformation of the motion of matter. Politically, such views meet the needs of the declining reactionary classes and are used by them as tools against progress. In China, Ssuma Kuang (1019-1086 A.D.), a disciple of Confucius and Mencius, preached that "material and wealth in nature are finite" at a time when the landlord class was becoming increasingly reactionary. In Europe, when the bourgeoisie was becoming more and more reactionary, the so-called "theory of the death of heat" by Clausius appeared. He maintained that with the continuous dissipation of heat, there would finally be a limited state in which no heat energy could be found which can be transformed into mechanical power, even though the world's total amount of heat energy did not decrease at that time. The universe would then remain in a somewhat inert and rigid condition. His assumption tallied with the needs of the reactionary classes so much so the Pope listed it as one of the "scientific evidences" for proving the existence of God.

Basing himself on the dialectical-materialist principle that motion is indestructible, Engels thoroughly criticized Clausius' theory, pointing out that **"the indestructibility of motion cannot be merely quantitative, it must also be conceived qualitatively."** (Introduction to *Dialectics of Nature.*) The development of the natural sciences has continued to confirm Engels' brilliant thesis.

At present, with the deepening of the imperialist system's crises, the reactionary view of "energy exhaustion" is once again being blared to cover up that system's decline. One U.S. paper exclaimed: "We can see the bottom of the barrel." The Soviet revisionists talk nonsense such as: "Mankind has before it a genuine catastrophe — energy hunger." These reactionary views not only run counter to the materialist-dialectical theory of knowledge, but also to the historical facts of energy development.

History of Energy Development

Known energy deposits are increasing. The view of "energy exhaustion" does not correspond with the objective reality existing in nature. Deposits of petroleum, natural gas and coal, which are the primary energy sources today, have not all been found due to the limitations of social systems, the level of development of production and other reasons. For instance, old China was deemed an "oil-poor" country, but rich petroleum resources have been found in New China. The history of the discovery of energy deposits like petroleum, coal and natural gas in different countries of the world has proved this fully. According to statistics published by the U.S. *World Oil* and *Oil and Gas*

Journal, exploitable oil reserves discovered in the world (excluding China) were estimated at over 6,000 million tons in 1939 and over 90,000 million tons in 1974. New oil fields have been found continuously in the continental shelves. The same is the case with discoveries of natural gas reserves. Nearly 2,000,000 million cubic metres were found in 1939 and 70,000,000 million cubic metres in 1974. All this demonstrates that increasing amounts of global energy deposits like petroleum, natural gas and coal have been steadily discovered. Moreover, there is a long way to go before humanity discovers all the deposits and makes full use of them.

New energy sources which can be utilized by humans are on the increase. With the progress of human society, nature's range of energy sources which can be utilized is always being extended. New energy sources are being discovered. Humans only knew how to burn wood as energy in ancient times. However, several thousand years ago, coal and natural gas were used as energy. In the 20th century, we started utilizing nuclear energy. Viewed from how energy as a motive force was utilized, the earliest sources of energy as power in production was natural mechanical energy like water and wind power which could be used directly. Afterwards, through the use of steam engines, heat energy was transformed into mechanical energy, so that the naturally abundant mineral fuels became power sources for social production. Since the 19th century when the transformation of electric energy and other energies was discovered, electric energy has become the most widely used form of energy. Nuclear fission energy, which is now being used extensively by the power industry, and nuclear fusion energy, whose power is much greater than that of nuclear fission, will become energy sources too. As soon as controlled thermonuclear reaction comes into being, the vast expanse of sea water will become an inexhaustible energy source. It is estimated that the energy stored in deuterium in the world's oceans can be used for 10,000 million years, if the present level of consumption is maintained. In addition, the earth itself is a big thermal energy reservoir. It has an enormous amount of heat along with energy countless times greater than the total energy of deposits of coal, petroleum and natural gas — the present primary energy sources. Utilization of the abundant energy contained in terrestrial heat is only in its infancy. Free from pollution, solar energy has not yet been directly used on a large scale. Besides, with the development of human society, new energy sources will be discovered to serve the people.

Utilization efficiency of energy by human beings is getting higher. The development of energy sources shows that humanity not only is continuously extending the range of energy utilization, but also raising its utilization efficiency. For example, the thermal efficiency of the steam engine attained in its initial stage was only several per cent, but now it goes as high as 30-40 per cent. With the development of industrial production and the raising of technical levels, the utilization efficiency of energy is getting higher and higher. For instance, popularization of steam-power apparatuses with a large capacity and high parameters, promotion of gas input parameters of the gas turbine, application of gas-steam combined cycles and the magneto-hydrodynamic generator and fuel cells now being studied — all these are pioneering the way to higher energy utilization efficiency.

The utilization ratio of uranium in nuclear fission energy sources is being raised time and again. In the thermal neutron reactor generally used for its power nowadays, the rate can only reach 1-2 per cent, but it might be raised to 60 per cent or more by using the fast-neutron breeder reactor.

In short, the history of the development of energy sources fully testifies that **"ideas of stagnation, pessimism, inertia and complacency are all wrong."**

Reflection of the Crisis of Capitalist System

The so-called energy crisis in the capitalist world today is a product of the imperialist system itself and an indication of its aggravating decay. Bragging about her prosperity, the United States boasts that her population constitutes only 6 per cent of the world's population but the energy sources she expends are one-third of the world's total. This is a typical example of waste and destruction of energy sources due to decadent relations of production. Energy sources in the United States are consumed in large quantities for arms expansion and war preparations, 10 per cent of the petroleum and 33 per cent of the industrial electric power are devoted to the production of munitions.

The reactionary and decadent nature of Soviet revisionist social-imperialism is also reflected in the question of energy sources. It wantonly plunders the third world's energy sources for huge profits. In the past few years, its imports of low-priced crude oil from the Middle East have sharply increased: 100,000 tons in 1967, over 7 million tons in 1972, and over 13 million tons in 1973. The Soviet revisionists compelled the Arab countries to pay for their munition debts with cheap petroleum which was resold to European and American countries at a much higher price in order to rake in enormous profits. It is because of the wild exploitation and plunder by the imperialists, especially the two superpowers, that the third world has to use petroleum as a weapon against them.

"Energy exhaustion" and "hunger for energy" uttered by the two superpowers actually mean the crisis of their policy of plunder and hegemonism, showing that they can no longer ravage the third world as they please. Take petroleum again as an example. According to statistics published in the United States, total discovered world petroleum reserves in 1974 was 93,800 million tons, but total world output of petroleum that year was 2,800 million tons only. How can there be "exhaustion" and "hunger"? The fact is that around

80 per cent of the known reserves is in the third world. With the third world steadily awakening and growing in strength, the superpowers can no longer plunder it at will.

The frantic cries of the two hegemonic powers about "energy exhaustion" is but a smokescreen to cover up and create public opinion to facilitate their aggression and plunder. Whenever the U.S. imperialists seized Middle East petroleum in the past, they first of all created public opinion about "energy exhaustion." After World War I, the U.S. propaganda machine was put to work clamouring that "U.S. petroleum resources will soon be exhausted." Soon afterwards, the U.S. State Department clamoured that "open-door" and "equal opportunity" principles should be adopted for the exploitation of Middle East petroleum resources. Thus the U.S. oil monopoly groups made their way into the Middle East. After World War II, these monopoly groups once again raised a hue and cry about "energy exhaustion," howling that all U.S. produced petroleum had been used up and that if they were to maintain their civilization on the basis of petroleum, they should be ready to go into those rich petroleum areas. Soon after this, they managed to control most of the petroleum resources in the Middle East.

The same can be said of the Soviet revisionists. Their "energy hunger" cry is a smokescreen to conceal their outrageous plunder of petroleum wealth so as to wrangle with the U.S. imperialists over Middle East oil. All this illustrates that the so-called energy crisis is a crisis of the imperialist system itself. With the victorious advance of the third world countries and the people of the whole world in their struggle against imperialism, there will soon emerge a new and unprecedented bright era in the history of development of energy sources.