

# International Energy Situation And Japan's Energy Policy

By Katsuhiko Suetsugu

Ever since the world was rocked by the first oil crisis in 1973, countries have worked to change their energy supply and consumption patterns. The industrially advanced countries in particular have mobilized manpower and money on a priority basis in both the private and government sectors for research and development work on non-petroleum energy sources.

Petroleum is still considered highly efficient and convenient to use. It continues to boast the highest utility value of all energy sources. At the same time, however, people agree that excessive dependence on petroleum is potentially risky and can even adversely affect the social foundations of an industrial state.

Strategy for increasing the supply of alternative energy sources aims primarily at (1) down-grading petroleum's role in energy price formation and (2) minimizing the instability of oil supplies and the

potential insecurity of overall energy supply that would accompany another oil crisis. Constricting petroleum lies at the heart of any strategy aimed at increasing the supply of alternative energies.

This strategy line has been pursued jointly by Japan, the U.S. and West European countries. Now, however, it is on the verge of collapse due to three major changes in the energy situation.

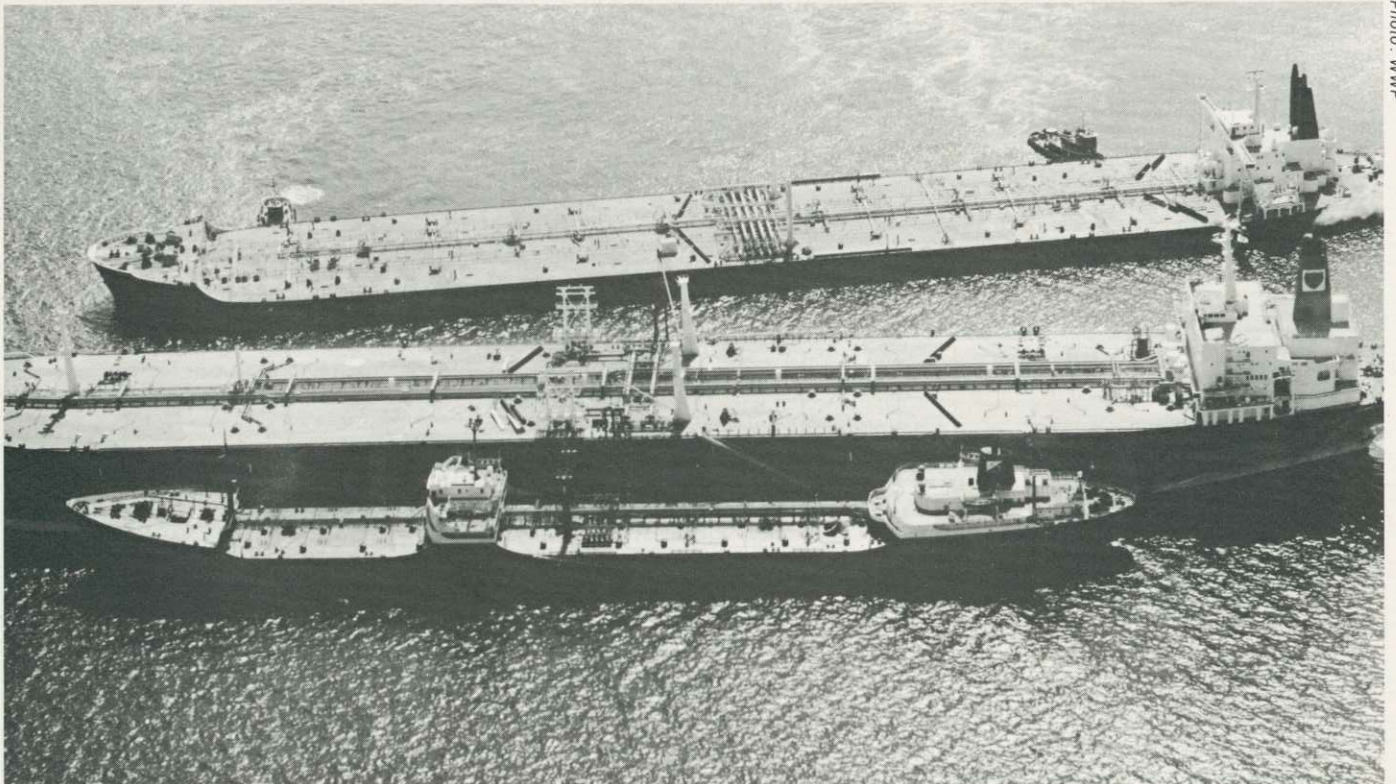
First, with the world in a period of low economic growth that has earned for itself the title of the "global recession of the 1980s," demand for energy has stagnated. This has obstructed the smooth switch to alternative energies, as it is easier to scrap and build new systems in a high-growth period than in a low-growth period.

Secondly, the myth that oil prices would continue to rise collapsed in the face of OPEC's March 1983 decision to lower the benchmark price of crude oil. Marginal

alternative energy projects which would have been competitive given a further rise in petroleum prices instead were suspended one after another. Even more projects will slow down or be scrapped if oil-producing countries agree to sustain stable oil prices long into the future and the industrially advanced nations are convinced they will stand by these agreements.

Thirdly, Japan, the U.S. and the countries of Western Europe are suffering from huge fiscal deficits and rigid finances. Increased military spending as the East-West Cold War heats up, along with the priority given to welfare spending, has made it difficult for governments to increase outlays for alternative energy development.

It was, therefore, a timely decision by the Japanese government to review its energy market forecasts and its energy policy this year, now that the energy market structure has changed so radically.



Washington Trader (foreground), a 44,000-ton tanker, sits alongside supertanker MV British Resolution (center) in the Bay of Parita, about 65 miles from the Panama Canal.

Photo: WWP





Photo: WWP

Saudi Arabian Oil-Minister Ahmed Zaki Yamani with newsmen during the opening session of the OPEC meeting in Helsinki

## Nuclear power emphasized

The purpose of the comprehensive energy policy review was to study how best to cope with the changing energy situation, while taking into account the energy conservation efforts in the advanced industrial nations since the first oil shock and the progress made in converting from petroleum to alternative energies.

The "Long-Term Energy Supply-Demand Outlook and Comprehensive Review of Energy Policy," released in August by the Advisory Committee for Energy, an advisory organ to the Minister of International Trade and Industry, sounds new even from an international viewpoint as an expression of policy efforts to identify the new horizons opening up in the energy field.

The U.S. government, at the initiative of the Department of Energy, is trying to draw up a new "National Energy Policy Plan." The revised energy policy recommended to the Japanese government may offer new directions for other energy-consuming countries as they strive to accommodate the changes in the energy situation.

What especially merit attention in the Japanese government's review are the weight to be given nuclear power generation and the degree to which petroleum dependence will be reduced.

Japan plans to expand nuclear power generation to about 35 million kilowatts by 1990 and 48-50 million kilowatts by 1995. It hopes to raise the share of nuclear power in the total primary energy supply to about 11% in 1990.

According to France's "Energy Plan for 1990," nuclear power in that country is anticipated to reach 66 million kilowatts

by that year, or 26% of its total primary energy supply. The revised Japanese plan calls for reducing oil dependence to about 52% while the French target is 32%.

A comparison of Japanese and French efforts to promote nuclear power generation and reduce dependence on oil shows that France is trying to attain these two policy goals more quickly than Japan.

Ensuring energy supply security while increasing dependence on nuclear power poses a big problem for both countries. Stepped-up international efforts are needed to ensure the safety and reliability of nuclear power plants operating at close to capacity.

Another feature of the report of the Advisory Committee for Energy is the emphasis on re-examining Japan's various alternative energy development projects. The report urged that these projects be trimmed back to include only those with top priority.

Falling into this category are coal liquefaction and gasification, photovoltaic power generation, fuel cells, and oil shale. Three bituminous coal liquefaction processes have been under simultaneous development. Now manpower and money will be concentrated on only one. The focus of Japanese efforts to develop and commercialize new alternative energy technology will narrow in on electric power and city gas generation.

A comparison of Japanese and U.S. priorities in the commercialization of new non-oil power generation systems reveals a striking contrast between the two countries. Whereas top priority in Japan goes to nuclear power generation, America has largely withdrawn from the field.

Next to nuclear power generation, coal gasification and multipurpose utilization

of LNG (liquefied natural gas) constitute the mainstream of alternative energy development in Japan. LNG-fired power generation and fuel cells have the potential of opening up a vast new market for LNG.

But, whereas Japan is trying to utilize fossil fuels other than petroleum, the U.S. is stressing projects to develop relatively small-scale local energy supply systems using renewable energy sources, such as photovoltaic cell, geothermal and wind power. The U.S. is opting for these renewable energies over nuclear power largely because of the strong environmentalist opposition to nuclear power generation. Also, the U.S. has access to abundant natural gas and coal resources both within and immediately neighboring its borders.

## New developments in gas and electricity utilization

Signs of change have appeared in the Japanese energy market, most notably the development of heat pump technology for conserving electric power and the application of gas engine technology with city gas. These new heating and cooling systems are capable of sharply raising the energy efficiency of the electricity and gas they use and of reducing the per-calorie unit cost of energy. The energy efficiency of electricity in a heating system equipped with a heat pump is 3.5 times higher than that of a conventional electric heater, while the cost per 1,000 kilocalories is only ¥11, or one-third the regular cost. These savings make electricity competitive with kerosene as a heating fuel, and lower heat pump installation costs would even give it a substantial price advantage. There is a real possibility electricity could steal the market share from petroleum for heaters and air-conditioners, and make fresh inroads in the energy market itself.

The energy efficiency of city gas in a city gas-fired heating system using both gas engine and heat pump technologies is 55% better than with a conventional gas heating system. Thermal unit (1,000 kilocalories) cost comes down to ¥9, which is 35% cheaper than the cost of gas in conventional systems and is even cheaper than kerosene (¥11.40).

What changes will such innovation in electricity and city gas utilization technology bring about in the present petroleum-centered fuel market? It is important to formulate policy measures which can accommodate these new developments.

In this regard, the energy review concludes that "Basically, consumers should select sources of energy of their own free will in accordance with market mechanisms." It underscores the basic principle that no specific policy initiative should



obstruct or otherwise adversely affect technological innovation relating to energy supply and consumption. This basic principle dictates that policymakers formulate a superior energy policy ensuring stability, efficiency and economic feasibility.

Compared with energy-rich countries like the U.S. and Canada, both of which are, like Japan, industrialized Pacific Basin countries, Japan's international competitiveness is weakened by the high cost of energy, and particularly that of electric power. An important task of the comprehensive review was to work out the best mix of power generation systems to bring down the cost of electricity.

## Petroleum, LNG or coal?

In economic terms it is perfectly reasonable to give top priority to nuclear power generation. But the government is divided as to whether petroleum, LNG, or coal should be designated the fuel of choice for meeting remaining electricity needs.

The principal cause of the split is the fact that price relationships among these three fuels are shifting. The persistent price gap between crude oil and LNG is beginning to narrow because the price of LNG is pegged to the price of petroleum, which has declined as crude oil import prices have fallen (See figure). Imported coal is still very cheap compared with LNG, however, and the revised energy outlook incorporates increased coal

supply and considerably lower volume projections for LNG imports.

The previous energy supply-demand outlook set Japan's LNG imports in 1990 at 43 million tons. The August revision brought this down to 37-39 million tons. Total LNG imports for 1995 have similarly been revised downward, to a conservative maximum of 43 million tons.

These changes will likely have a major impact on international trade in LNG. The government reduced the old LNG import forecast because (1) LNG's price relative to petroleum and coal has risen, and (2) LNG's advantages as a non-polluting clean fuel have been partially nullified by improved pollution-control technology.

The revised outlook envisions additional LNG demand of about 6 million tons in the first half of the 1990s. Several LNG development projects are under consideration to meet this demand, including the Soviet Sakhalin project (3 million tons annually), the Qatar project (6 million tons annually), and the Thai Gulf of Siam project (3 million tons).

Recently, the U.S. government proposed that Japan participate in the new Alaskan North Slope LNG production project. This would increase imports of American LNG in the 1990s and help rectify the imbalance in Japan-U.S. bilateral trade.

For some time, the U.S. has argued that Western countries should reduce their dependence on natural gas imports from the Soviet Union for security reasons. The U.S. insists that the development of

natural gas reserves in Norway, Canada and Alaska should be given top priority as alternatives to Soviet natural gas. The board of directors of the International Energy Agency (IEA) agreed this May that the West should reduce its dependence on Soviet gas. The U.S. government's request that Japan participate in the new Alaskan LNG development project comes in part from these strategic considerations.

Japan is faced with the important question of how to secure LNG in the first half of the 1990s. The choice will be: (1) whether to increase LNG imports from current sources (Indonesia, etc.); (2) whether to suspend LNG development projects to which it has already committed itself; or (3) whether to participate in new projects, such as the one in Alaska.

In this regard, the "Comprehensive Review" makes the following important proposal:

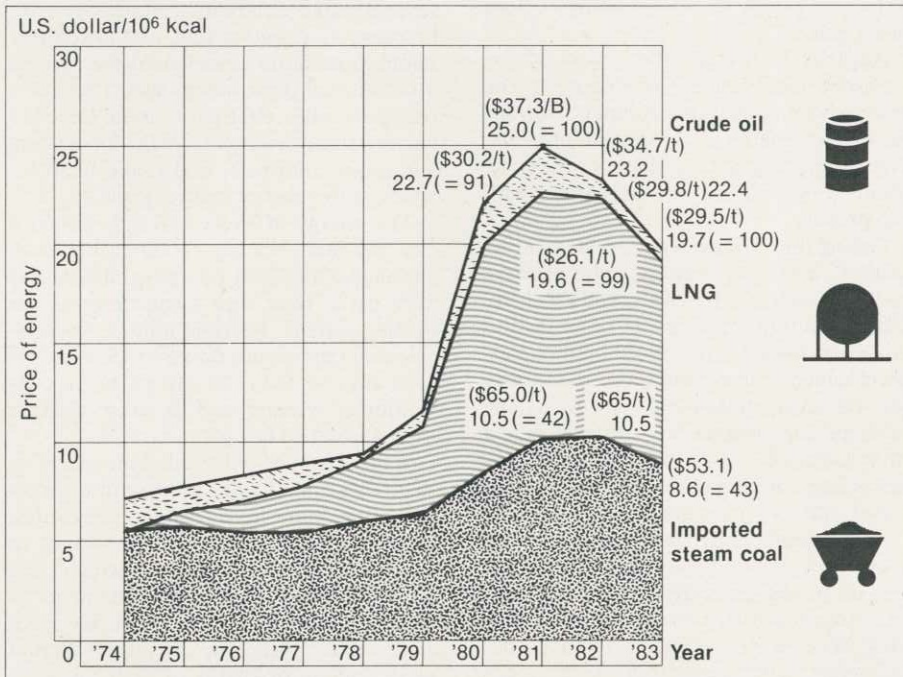
The basic tasks concerning future LNG resources development are to review the current inflexible pricing formula indexed to the price of petroleum and the value of calorie equivalent, and to ease the rigidity of supply conditions (i.e., the Take or Pay Clause)... Unless LNG transaction conditions and economic feasibility are improved, it is not advisable to promote the construction of LNG-fired thermal power plants.

Japan accounts for more than 70% of the world's total LNG imports. Adoption of this stand would greatly influence the global LNG market.

As a major energy-consuming country, Japan naturally wants to work out the best mix of energy consumption patterns in searching for a system that can supply adequate energy at minimum cost. Revision of the LNG pricing system and the easing of rigid LNG supply conditions are an integral part of this effort, a point on which the Comprehensive Review is very clear.

The report states unequivocally that bringing down the cost of energy is an important target for Japan's future energy policy. It is a clear indication that consumer countries are now shifting their energy policy emphasis from securing adequate amounts of energy, to the economic feasibility of the energy they employ. ●

## Price Comparison of Competitive Energy Sources



Notes: 1. Prices of imported energy quoted in CIF prices (annual average). Prices for May 1983 are actuals.  
2. In converting calorie values, crude oil was calculated at 9,400kcal. per liter, LNG at 13,300kcal. per ton, and steam coal at 6,200kcal. per ton.

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