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evitalization for Japan

Pursuing Realization of “Platinum Society”



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By Hiroshi KOMIYAMA

(from a speech at a meeting of the Japanese National Association of the Club of Rome, a worldwide NGO engaged in saving the global environment)

Japan Should Play Key Role in Club of Rome

The activities of the Club of Rome are very important for saving the global environment. We should do our best to further raise the presence of Japan in this important endeavor. Most importantly, we should create a key concept to be put at the center of the stream of thought on the global environment. That is, there is now a saturation of artificial products and this should be considered the most important key concept in the 21st century.

I believe that we should determine a new key concept of the Club of Rome to be established at the center of their entire activities, going beyond their old concept of “limits of growth” announced in 1972, and that should be, in my terminology, realization of a “platinum society” where there is a saturation of artificial products.

Japan has been a country with a pioneering spirit in resolving many challenges such as environmental pollution, energy provision constraints, etc., and will continue to be actively engaged in resolving new challenges, though, among the nations of the world, Japan is one of the most vulnerable to challenges like the possible further rise in energy costs and environmental constraints, as well as the rapid progress of the aging society, and faces the most urgent need to resolve them.

The solution to be provided by Japan to these global challenges, prior to anybody else, would be a vision for all human beings in the world and thus a proposal to the Club of Rome.

Age of Saturation Will Come in 2050

I believe that the developed nations are now coming into an era of saturation of domestic demand. Their artificially made products reached a point of saturation in the 20th century. This is the background of saturation of their domestic demand. We cannot see any new product any more now such as the fertilizers, cement, sugar, refrigerators, washing machines, TV sets, automobiles, air conditioners and so on of the past high-growth era.

This is a fundamental reason behind the developed nations' stagnant economies; meanwhile, the developing countries are growing much faster than the developed ones since their catching up towards such a saturation point of the developed ones creates higher growth.

Around 2050, artificially made products will reach a saturation point on a global basis, since nearly all the developing countries will accomplish their economic development by then. After that, how can all of us survive? This is a critical question for all human beings. The 21st century cannot be a copy of the 20th century.

On the question of energy, most arguments have been so far concentrated on its supply side, not its demand side. However, I

believe that in the 21st century, we should try to decrease energy consumption by rationalization of all economic activity as much as possible and thus enhance the prosperity of industries. This is what we call “green growth.”

Saturation of artificially made products is good news for humankind. For example, in the case of automobiles, in the developed nations, every second person owns a car, and that is a saturation point. In this situation, we do not have to exploit iron ore any more to produce cars. In order to produce new cars, we can use the old ones by melting them. You can also extract 250 grams of gold from 1t of used mobiles, though you can get only 5-10 grams of gold from 1t of rocks in a gold mine.

You do not have to develop any rare earth in a mine. You can get enough from used cars. This is an enormous benefit of a “recycling society.”

Housing has also reached saturation. We have around a 14% vacancy rate of housing in Japan.

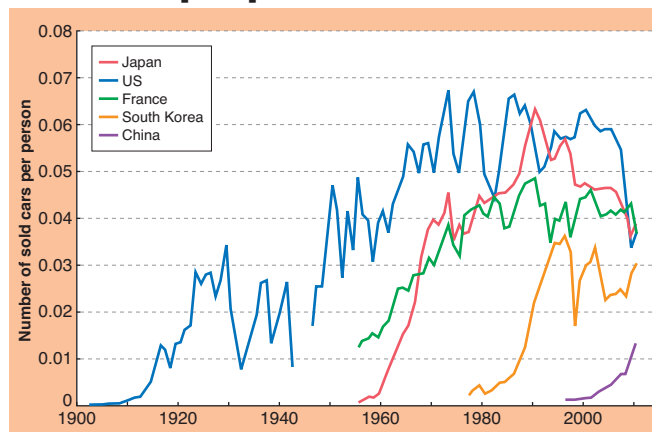
We are curious as to when the Chinese economy will reach such a saturation point. As [Chart 1](#) shows, the average number of cars sold per person in China will reach the number in the developed nations in 5-10 years, if its sales growth continues at the same speed as now.

Beyond Saturation Point

Beyond such a saturation point, what kind of society will be created? Nobody knows the answer. As Steve Jobs said, human beings do not know what they truly want. We must create a concept of

CHART 1

Change in the number of cars sold per person



Source: “Handbook of automobile industry,” US Automobile Production Figures from Wikipedia; UNSD Demographic Statistics, etc.

our new society beyond saturation, just like Steve Jobs did with iPod.

We will eventually reach a saturation point in television, super-express trains, and nuclear power stations, all of which are currently targets for consumption in particular in the emerging countries, as well as housing and cars, as we saw.

After saturation of these products, what we will most likely see is “green growth,” to be achieved by the growing need for environmental protection and energy-saving, which many of us are already aware of. However, we should be aware of another possibility of the industrial revolution provoked by the progress of the aging society. There will be enormous business opportunities brought to us by the aging society and they could create new industries, some led by manufacturing innovation and some by social system innovations.

We need a long-term vision and actions in accordance with this vision and, most importantly, we should promote action and, based on these actions, our vision should be revised further. We Japanese should introduce such a system in responding to the abovementioned two most likely, crucial scenarios of socio-economic development in the 21st century, “green growth” and “innovation for the aging society.”

Energy Efficiency & Recycling – Key Concepts in Age of Saturation

Since even China, now in the midst of economic and industrial development, will reach a saturation point of artificially made products soon, as we have seen, the whole world will reach saturation of these products, a key concept of the 21st century, soon.

In this process, energy consumption is very important in the sense that energy efficiency could be a new engine for economic growth after the saturation of material growth. In other words, “green growth” is to be considered “the most energy-efficient economic growth.” Whatever the source of energy, energy efficiency should be considered most important. What kind of energy sources should be chosen, including the question of nuclear power, is a very important question for the Japanese people. However, I guess there will be very little room for choice on this question and the principal energy sources to be used in the future will be unexpectedly limited.

I participated in an international forum in Russia. A Russian expert told us that the Russian government will be engaged in creating a law for implementing energy conservation. With their efforts, they will be able to earn 400 billion dollars, which is equivalent to the amount of Japan’s total imports of raw materials.

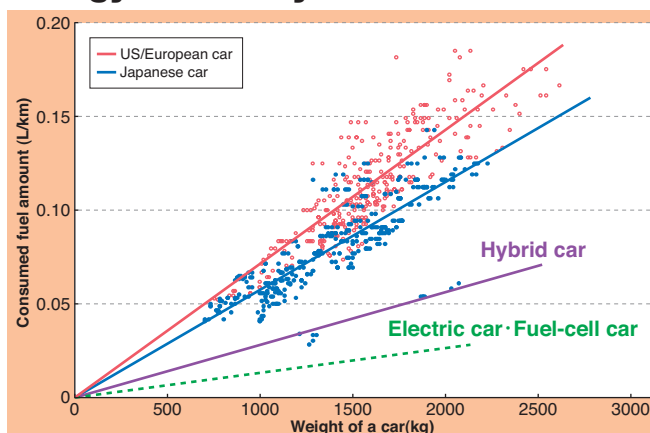
Chart 2 shows that this is the correct approach in our age. This figure shows us that there is a positive correlation between the weight of a car and its fuel consumption.

In other words, assuming the same technology adopted by each car, as its weight is doubled, it will consume twice as much gasoline as the lighter one. As is shown in *Chart 2*, Japanese cars’ gasoline consumption is 20% less than that of US or European cars, in the category of the same weight. This tells us an advantage of Japanese technology. In comparison in terms of size rather than weight, Japanese cars’ gasoline consumption is 30% less than that of US or European cars, since they are lighter. In the case of hybrid cars, their gas consumption would be half of the ordinary Japanese cars’ fuel consumption.

Further, by 2050, all cars will be either electric or fuel-cell ones. Then the cars’ fuel consumption will be half of that of hybrid cars. In

CHART 2

Energy efficiency of automobiles



Source: Yahoo! Autos

short, a car with the same weight as a current car will consume only one-fifth of the fuel that is consumed now.

In the coming years, lighter materials will be used for automobile production and then a car of the same size as the one we use now will be half as heavy as the current one in the future. Taking this into consideration as well, the car in 2050 will consume only 10% of the fuel consumed by the car today.

In 2050, the world population will reach nine billion and assuming that most of the countries worldwide will be developed nations, on average, every two persons will own one car. Therefore, we will see 4-4.5 billion cars in the world in 2050, meaning that four times as many as the cars in use now in the world will emerge in 2050. Thanks to technology for saving fuel and energy, we will be able to afford such an increase in cars in practice, since a car’s fuel consumption will be 10-20% of that of the current car. Japanese technology for saving energy in cars has been leading the world in this domain and it should continue to do so in the future.

Consumption of cement will not decline so much. More importantly, recycling of resources will be instrumental in decreasing energy consumption in 2050 when, as we assumed, a saturation of artificially made products occurs globally.

Melting scrapped metals such as iron or aluminum would create 27 times as much energy as that created by melting iron ore and 83 times as much as energy produced by melting bauxite. As a matter of fact, a factory smelting bauxite consumes 30 times as much electricity as one melting aluminum, though its theoretical value is 83 times as much energy as that produced. In my calculation, including energy-consuming products such as automobiles, air conditioners, lighting, etc., on the basis of a discussion with the experts on the big energy-consuming process to be achieved by material industries such as steel, cement, glass, and pulp, such metal recycling would eventually lead to three times higher energy efficiency in 2050 than the present one, on average. This is to be considered a target to be achieved in 2050.

If we assume that such energy efficiency will be realized in 2050, we can achieve a sustainable economy and society. Currently, 80% of total energy consumption in Japan is fossil fuels, whereas non-fossil fuels occupies 20%. We assume that in 2050 the weight of non-fossil fuels will be doubled. No matter what energy source such as nuclear power, solar fuel or whatever may emerge to fill this 40% of the total energy consumption in 2050, energy efficiency should be more important than the question of the supply side. We have an infinite amount of solar energy and geothermal energy on the supply side.

Japan Can Further Reduce CO₂ Emissions through its “Growth Strategy”

It is completely wrong to say that Japan has already exhausted ways and means to reduce CO₂ emissions. Some 57% of the total energy consumption in Japan is from homes, offices and transportation. We have much room for reducing energy consumption in these sectors. Japan should lead global manufacturing with its most energy-efficient technology, as it has been doing, and also reduce energy consumption in daily life. That should be a Japanese model to be introduced worldwide as Japan's “green growth” strategy.

I have already shown how much energy we can save in the transportation sector with my argument on automobiles.

How much can we reduce energy consumption in homes and offices?

Air conditioning is the largest source of energy consumption in those sectors.

In northern Japan, they generally spend 2000L (liters) or 3000L of petroleum per winter for heating houses. However, if we improve thermal insulation a little more, we will not have to spend more than one-third of the current petroleum consumption, namely 800L.

Heating rooms that are already warm is wasteful and results only in pushing the heat out of the rooms. On the question of cooling rooms, it is possible as well to reduce the energy consumption for that. I assume that energy consumption for heating and cooling can be reduced to almost zero in the long run in Japan.

More realistically, it is technically very easy to raise thermal insulation by three times as high as it is now in Japan. Low thermal insulation is Japanese architecture's weakness and thus we have much room for improvement.

Hot water supply is another opportunity for the reduction of energy consumption. EcoCute, a new heat pump made by electricity companies, can produce hot water using only a small amount of electricity. A fuel cell water supply called Ene Farm produces hot water by excess electricity produced by power generation of fuel cells at homes, which would have been wasted in the form of extra

heat flowing into the air or the sea in the case of a thermal power station. Both EcoCute and Ene Farm are highly effective in achieving energy-saving in hot water supply in homes.

Therefore, I guess both will soon become very popular in the global market. In my calculation, their market size will be about a quarter of the market of automobiles.

It is to be noted here that serious competition among Japanese companies in the Japanese domestic market only could end up in producing high-quality but highly expensive products that will not be competitive in the global market any more after those products are produced by other countries in a few years after the birth of a product. Therefore, in this globalised world, it is always necessary to pay proper attention to the global market as well as the domestic market even at the moment of creation of a product. “Green growth” means growth supported by exports of these products to be created by Japanese high-level technology to the global market.

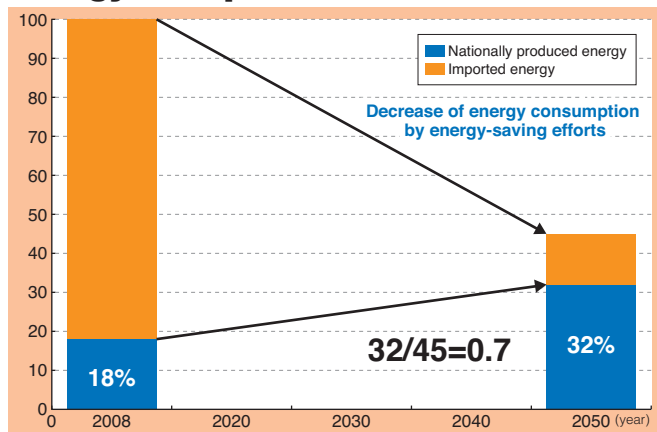
Another important point to be noted about energy-saving is that investment for energy-saving should be reimbursed completely after a certain period, since the cost of electricity consumption would be dramatically reduced by using a new energy-saving technology. We should not hesitate to spend much money for energy-saving.

I built my own residence as a model of full energy-saving. My home shows how you could save energy consumption in your own home. The hot water supply provided by a heat pump and higher thermal insulation for the housing, hybrid car, and solar fuel cells achieved an 81% decrease in energy consumption. And the cost of investment for these energy-saving facilities will be reimbursed by a decline in the cost of electricity consumption over 12 years.

As [Chart 3](#) shows, with such energy-saving efforts, Japan can be successful in achieving a 55% reduction of the total energy consumption, in my calculation, in 2050. Then our total energy consumption in 2050 will be 45% of the current one. Today, in Japan 18% of the total energy consumption comes from our national energy sources, of which around half is nuclear power, and 82% comes from the imported energy sources. We would be able to increase the supply of our national energy sources to 32% of the

CHART 3

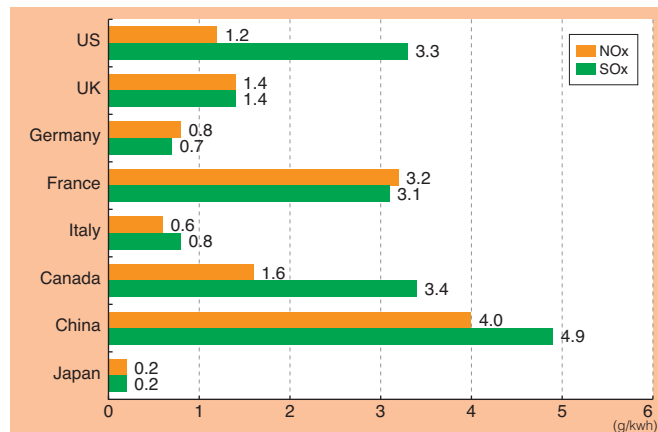
Self-sufficiency rate of energy in Japan



Source: Compiled by author

CHART 4

Comparison of SO_x & NO_x issued from electricity generation among the major countries (g/kWh)



Source: Compiled by author

total energy consumption in 2050 with our efforts to develop five non-nuclear power energy sources: solar fuel, wind power, geothermal power, biomass energy, and hydroelectricity.

This is how we can provide 70% of the total energy in Japan by our own national energy sources (32% divided by 45% is around 70%).

Forestry can be fully restored in Japan by clearcutting of forests, which will raise our self-sufficiency rate of forestry resources from the current 24% to 100% in 2050. With clearcutting, we will have an enormous amount of biomass energy, which could be used for energy consumption in the future.

Japan Will Be Pioneer in Achieving “Platinum Society”

Thus, we can remodel Japan from a natural resource-importing country into a model country less vulnerable to a possible rise in energy costs and an ideal one in terms of energy and environment. As a matter of fact, Japan has been a pioneer country in resolving many serious challenges so far.

The two sets of Photos (*Photos 1 & 2*) show that Japan was fully successful in abating air and water pollution in the last century. *Chart 4* shows us how successful Japan is in environmental protection, among the major industrial countries. In the first half of the 1990s, 3,200 desulfurization plants were in Japan, among the 4,000 plants in total in the world. But the resulting potential pollution was resolved by strict emission regulations on the manufacturing industry in Japan.

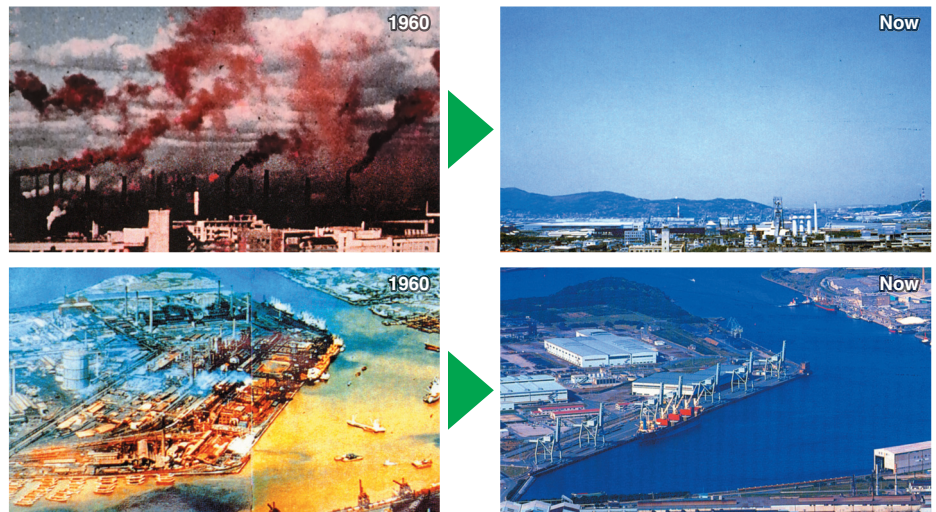
Another great achievement realized by Japan is that we created one of the most competitive industries by raising energy efficiency, though Japan is one of the nations most vulnerable to rising energy costs. We should bear in mind these great achievements of Japan in world history and try to work harder to remodel our country towards 2050, as mentioned above, and create a new ideal of economic development for the rest of the world.

At the same time, we should not be too pessimistic about the coming aging society in Japan. There will be new business opportunities such as nursing robots to care for elderly people and housing with higher thermal insulation, which would be more comfortable for old people. Above all, it is to be noted that older people would be much happier to work rather than go to hospital.

In summing up, I would propose to the Club of Rome a new Japanese socio-economic model of prosperity called the “platinum society,” where we do not have to worry about ecology or energy,

PHOTO 1

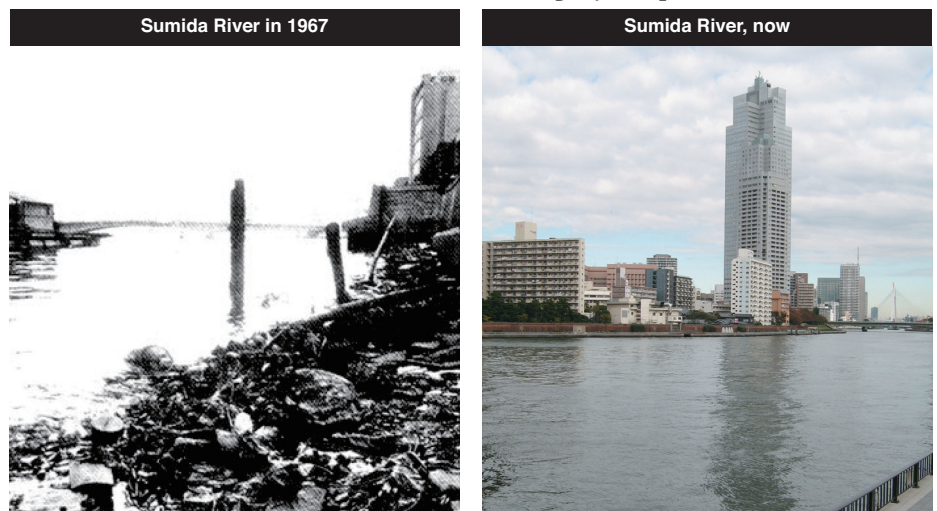
Recovered sky & sea in Kitakyusyu, Japan



Source: Kitakyusyu, Japan

PHOTO 2

Recovered Sumida River in Tokyo, Japan



Source: Annual Report on the Environment in Japan 1981

aged people can participate in work, human beings can grow, and jobs are available for anybody. This is to be achieved by 2050.

Finally, I would like to point out the importance of a change in the way to build a nation in Japan. In our old model, the government has always lead a blueprint of nation-building and taken the initiative in achieving it. However, in our remodeling of Japan, each individual should take the initiative in doing so, since we are all living in a saturation of artificially made products and in this situation, economic growth and innovation is in the hands of each individual's efforts to improve their own standard of living. It should be people's efforts rather than government policy that leads our nation to revolutionize a model of economic development.

Bearing this in mind, I have created a network among regional organizations, universities and people. I hope this network can create new initiatives and ideas to lead the country. **JS**

Hiroshi Komiya is chairman of the Mitsubishi Research Institute, Inc and president emeritus, the University of Tokyo.