

An Interview with Hiroshi Komiyama, Chairman of Mitsubishi Research Institute Inc.

“The Platinum Society” of Energy Self-Sufficiency Is Approaching in Japan

By Japan SPOTLIGHT Editorial Section

What Is “The Platinum Society”?

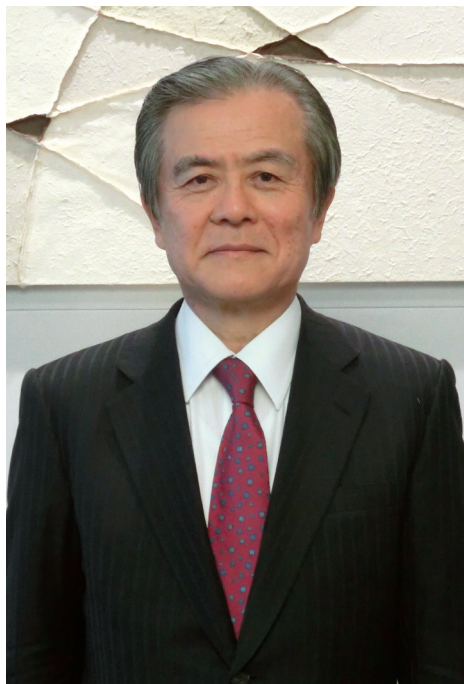
JS: Innovation will be key to enhancing our growth potential, the most important policy goal of “Abenomics”, and “The Platinum Society” you propose in your books and lectures is certainly an innovative idea, especially regarding energy and the environment. Could you introduce this idea from a long-term perspective?

Komiyama: In “The Platinum Society” any nation, including one like Japan whose economy has been heavily dependent on imported energy resources, could achieve self-sufficiency in natural resources and energy. By 2050, the age of manufacturing using imported energy and mineral resources will be over and self-sufficiency in energy and natural resources will be realized. This sounds utopian but I believe it could be realized naturally as time goes by.

On energy consumption, industries account for around 40% of the total and the remaining 60% is used by households, business facilities and transportation, including automobiles. Today our new houses are fully equipped with insulating materials and thus energy efficiency is being greatly improved, and with solar panels now on most housing provided by major constructors in Japan, the energy they produce would exceed the energy they consume.

As for business facilities, a new rule on heat insulation has been adopted for newly built offices in Japan which has resulted in drastic energy savings. For example, our Mitsubishi Research Institute’s new office built a few years ago has realized a 45% reduction in energy consumption compared with our old one built more than 30 years ago.

I assume that if a Building Energy Management System (BEMS) is introduced in the future, the energy consumption of office buildings



Hiroshi Komiyama, Chairman of Mitsubishi Research Institute Inc.

would be around 20% of the present one. For example, the Imperial Hotel, an old-type building without heat insulation and LED lighting, could spend 80% less on energy than now if it had these two new technologies.

Regarding transport, automobile sales in Japan have already reached saturation point, where the number of cars has been unchanged for a decade, that is 58 million. This means new cars are only replacing the scrapped ones. Assuming that 12 years is the average life of a car, you can compare your car’s fuel costs now with those of 12 years ago, and then work out how much would be saved in total fuel costs among all cars. In the case of my old car, its fuel efficiency was 8 kilometers per liter 12 years ago, while my new one is 22.8 kpl. So its fuel cost has fallen to around one-third during this decade. In 2050, with more electric cars and fuel cell cars, the energy consumption of such

transport would decrease by 80%.

As for industries, the largest user of energy is the steel industry, and in this industry iron and steel scrap are increasing worldwide. The world steel industry now produces 1.5 billion tons of steel each year and half of this is made in China where scrap is not yet produced since it is still in the midst of industrialization. But among other maturing economies, scrap accounts for half their steel production, and among developed nations steel production from iron ore by blast furnaces is decreasing even now. As scrap increases further in the future, market mechanisms will encourage producers to use scrap rather than iron ore, since they could save energy costs by doing so. Iron ore is oxidized in the air and they would need more energy to eliminate it than in producing steel from steel scrap, which would use only one-third of the energy consumed in the iron ore process. This cheaper method would soon become dominant. The same can be applied to other materials such as aluminum and rare earths. Therefore, I believe industrial energy consumption will also

decline to around one-third of the current level around 2050, even with the production of steel and other materials unchanged in Japan.

JS: Will this decline in energy consumption be possible without any technological developments?

Komiyama: Obviously we need technological developments, such as those that might enhance heat insulation or improve the quality of LEDs. But I think we would not need any breakthrough technology to achieve this, only continuous innovation.

Assuming that renewable energy sources could meet around 30% of the current energy consumption in Japan, we could achieve self-sufficiency in energy in 2050 with only renewable energy, since our energy consumption could be reduced to at least one-third of the current level, as I mentioned. Perhaps, in the second half of the 21st century, energy prices will further decline and I believe we could then have electric airplanes by using clean and cheap energy sources.

As I have said, recycling technology to utilize scraps will become dominant among developed nations. In the 21st century, the BRICS and other developing nations with large populations are engaged in manufacturing — a significant contrast to the 20th century when only developed nations with about 10% of the world's population were engaged in manufacturing. The global manufacturing industry is reaching saturation point under these circumstances, since the BRICS and other developing nations do not really need to import steel anymore from developed nations. With saturated demand for manufactured goods, recycling technology would be a key to achieving economic success. I believe Japan could make a good contribution in this regard.

So this is what we call “The Platinum Society”.

Social System Innovation Is Key

JS: Will we need to transfer such recycling technology to the BRICS or other emerging economies in order to achieve global prosperity?

Komiyama: Yes. One of the difficulties of recycling technology is that with alloys, such as bronze, which mixes copper and tin, both materials have to be used, and this is not as easy as recycling a pure material. We should develop product designs in advance so that tin and copper do not need to be mingled.

Another key point in promoting the recycling of resources would be developing a waste recycling system in society. In Japan we already have such a device, namely “The Basic Law for Establishing a Recycling-based Society” to tackle crucial questions such as how waste can be reused.

From an overall perspective covering industrial technology for separating useful materials from waste, product designs and social system designs, I believe Japan is one of the most advanced nations

in recycling and this could create a new competitive edge for the Japanese economy.

JS: In such a recycling-based society, what would drive economic growth in an economy whose growth potential is declining?

Komiyama: We are living in a society where our demand for goods is saturated. Developed nations have already reached a demand saturation point and developing nations will reach that point soon. We cannot realize economic growth from such material demand. Instead, we should pursue “quality of life”. Recycling waste and renewable energy sources, I believe, would result in a better quality of life.

Human beings' lifespan is getting longer today and it does seem to be reaching saturation as well. With a longer lifespan, we should pursue a longer life with a high quality of life. We would be much happier if we could manage to go to a restroom by ourselves up until the end of our life, even with the aid of a caregiver robot.

Such a demand for better quality of life, which could be referred to as creative demand, could be a new engine for growth.

For example, in 1964 on the occasion of the Tokyo Olympics, we produced the Shinkansen bullet trains, a symbol of social infrastructure for a developing economy. In 2020, in responding to meet what we call creative demand in an aging society, we should show the world our new invention — the Hybrid Assistive Limb (HAL), a robot-powered suit that can help elderly or handicapped people move around smoothly. How about having a 100-year-old runner wearing this suit and carrying the Olympic Flame?

When a person thinks about moving, electric pulses come to move the body through neurons. HAL can detect such human intentions by measuring the leakage of electricity flow on the surface of the body with its sensors and can help a person walk or move with its motors. This is a highly sophisticated fusion of brain science and robotics technology. A 100-year-old runner wearing HAL and carrying the Olympic Flame — that would be a symbol of the 21st century.

JS: Do you think Japan has great potential for innovation to meet what you call creative demand?

Komiyama: Yes. I believe we have great potential with our technology. What matters will be how we can modify regulatory barriers in our market which could be an impediment to expansive application of such new technologies. In the case of HAL, Germany has accepted its practical application, whereas Japan has not yet. We must understand the true meaning of innovation. It does not mean a simple technological breakthrough but a change in the whole paradigm in society, sometimes triggered by a technological revolution or initiated by a change in regulations or financial systems. As the changes in existing conceptions or social or

scientific frameworks pile up, the paradigm will shift. This is innovation.

But although we have good technologies and potential demand, we will also need a new social system to enable us to take full advantage of these technologies and maximize their benefits to meet the demand. In other words, we will need a mature civil society with democratic politics that can choose the best regulatory framework in the interests of the people.

I believe that the industrial economic development that we have experienced during the 20th century truly suited a national government-led modernization process, because this process was best realized by governmental policy guidance in determining how much steel or other industrial products were to be produced to meet potential demand and where. And this was because the industrial process in the 20th century had been pursuing only quantitative growth that everybody could share as a common goal, and not quality of life. But whereas quantitative goals can be determined by a national government, quality of life, the new national goal in the 21st century, in my view cannot be decided by national governments but only by citizens themselves, since it is personal and diversified.

Role of Universities & NGOs in the 21st Century

JS: What should be the role and mission of universities in such a civil society aimed at achieving better quality of life?

Komiyama: The role of the universities will be important. For example, Kashiwa City has now been transformed into a model of how this quality of life can be realized in the future. There are two well-known national universities — the University of Tokyo and the University of Chiba — that have campuses in Kashiwa and their

neighborhoods have been transformed into districts with smart grids, solar power and underground storage space for the electricity generated by them, and also a vegetable factory where elderly people can work and feel revitalized.

We also have such model towns in other regions, such as Toyama City and Ama-cho in Okinoshima, which is far from Tokyo. They are, I believe, wonderful examples of the balance between quality of life and material growth that can also assure residents of job opportunities.

JS: Do we need to promote decentralization to realize better quality of life in such local towns?

Komiyama: Yes. I believe that decentralization would be the right direction to realize such model communities in local places. However, it would be very costly and time consuming, since we would need to revise thousands of laws to change the job allocations between the central government and local ones. Therefore, I believe it would be far more productive if regional governments with a strong interest and commitment to decentralization alone volunteered to start expanding their jurisdiction, and not all of the 1,700 regional administrations in the whole country. Some 130 regional governments with such strong commitment have currently joined our initiative to realize “The Platinum Society”.

JS: NGO activity in Japan seems to have grown since the Great East Japan Earthquake in 2011, in terms of the increase in volunteer activities to help residents in the Tohoku region, which was most seriously hit. Do you think this trend would contribute positively to “The Platinum Society”?

Komiyama: Certainly it would be a very positive development. NGO support for the disaster-hit areas has created some social system innovation, in the sense that civil society can directly work to improve the quality of life of the residents in a local community.

JS: Current university education seems to fail to develop the human resources needed to achieve such social system innovation. The majority of university graduates seem to be happy to work for large corporations instead of as volunteers for NGOs. They are also clearly differentiated by the subjects they studied at university. Most students studying natural sciences do not care about social or economic issues, while most of those specializing in social science pay little attention to the effects on society of developments in the natural sciences. Will it be difficult to expect any synergy between such diversified expertise?



Komiyama: It will be difficult to develop such innovative human resources in Japan. However, since we are living in the age of globalization, Japanese students do not have to stay in Japan all the time. They can go anywhere in the world to improve their creativity. Assuming that Silicon Valley is a truly authentic place for innovation, they should go to California. But it would be wrong just to transplant the Californian mentality in Japan. Japanese students should go there and learn how to be innovative. In a country with a long history like Japan, it would be difficult to make all people innovative. Only a small number of people would learn how to be innovative in Silicon Valley and after returning to Japan they could stimulate Japanese innovation.

JS: Would it be difficult for such people to make a significant contribution to Japanese innovation after they come back?

Komiyama: It may be difficult. However, today many people who have studied in Silicon Valley have come back to Japan and many of them are interested in joining “The Platinum Society” initiative, considering it to be a very innovative idea. A few of them have two houses, one in Tokyo and the other in California. We currently have around 8.2 million vacant houses in Japan, so there would be more than enough facilities for such people to have two houses, one in Japan and the other overseas. Some of our friends working on our initiative in Toyama Prefecture also have two houses, one in Tokyo and the other in Toyama, since many of them find Toyama a good place to raise children despite working in Tokyo. Transportation between the two may cost money, but this could also help raise our gross national product at the same time.

Human beings have been working in agriculture or hunting, namely to get food for their survival, throughout their history. However, over the past couple of centuries many of them have been getting out of this development stage where they need to care so much about providing food, housing, clothing, transport and other material items. Today, many of them have acquired the means of getting any information they want through the Internet and enjoy long lifespans. Their ultimate goal should be self-esteem by achieving a better quality of life. We can say that they are now free to pursue such a high-level goal and we should create businesses responding to this need. That would be innovation.

Science Diplomacy

JS: As we are living in an age of globalization, we should exchange views on innovation internationally too. In particular, in light of the increasing impact of advanced technology such as robots or bio technology on people’s daily lives and also their global impact, we would need to have such an



international exchange of views on the interaction between innovation and society.

This is what we call science diplomacy. For these discussions, the OECD and other international conferences are increasingly engaged in long-term forecasts on innovation and social systems.

Komiyama: Yes. I think this is natural, since social system innovation is an issue that will need to be discussed and resolved urgently. As I have said, our key term in thinking about a new social system is “quality of life” in our age of material saturation in the 21st century.

There is a book titled *Abundance* (2012) by Peter Diamandis and Steven Kotler that has recently been translated into Japanese. Its subtitle is “The Future Is Better Than You Think”. Diamandis is one of the founders of Singularity University, an unaccredited teaching organization in Silicon Valley established in 2008 whose stated aim is to “educate, inspire and empower leaders to apply exponential technologies to address humanity’s grand challenges”. The book is an introduction to the research outcomes of Singularity University.

The authors say that all the challenges human beings face, such as water shortages or food shortages, will be resolved by exponentially advancing technologies such as brain science or information and communication technology (ICT). I share their optimistic views on technology. We should promote through science diplomacy the idea that “pessimism is nature and optimism is will” and that we can change the world by technology on our own.

JS