

# Setting the Tone

## “Three-tiered framework to make Global Innovation a reality”



### Speaker

**Itaru Yasui**

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### Summary

#### **Itaru Yasui:**

The chart I have shown you is a representation of GIES. We arrived at this in September 2006 in Kyoto. Originally, our main target of the output side was profit and the growth of industries, companies and economies. In the final version we have also included welfare, quality of life and sustainability. I have also expanded basic chart into a three-dimensional representation. We already have a concept for the national level, but there is also the multilateral and bilateral relationship between countries and the global ecosystem. We must increase the number of layers to express the situation of each country. In the case of ODA, for example, we might need to discuss things separately depending on whether the other party is an advanced country, a country in transition or a developing or least developed country. If a company or product generates profit, some of it can be used for ODA, and how this is administered will depend about the situation of the recipient country. We can utilize knowledge on the input side, and we generally use English as the language

to communicate this. But that is not the only true knowledge. There is other knowledge that can also be used for advancement, perhaps written in other languages or indigenous knowledge. We need to increase the scope of knowledge also. The interaction fields will play the role of exchanging people and information and also will provide for the exchange of knowledge and concepts, cultures and written in different languages.

We looked at the case of the iPod as an example of innovation. In the iPod case, it is probably not necessary to use the three-dimensional concept because this is an integrated, global market already. The concept can be uniform. In the case of the iPod, we would only need the space to express the location. For example, the US, Taiwan and Japan are all involved. We did another trial for the GigaBeat, which is made by Toshiba and is not so common in the global market. Here again, Windows Mobile is used in the OS and there is no real need to use a three-dimensional representation. Therefore, I chose energy to study.

Japan's Prime Minister Abe made an announcement saying that we need to launch the "Cool Earth 50" program that will reduce greenhouse gases by 50% by

2050. He will probably propose this to the G-8 next year. I decided to look at whether it was really possible to reduce the emission of greenhouse gases this much by the year 2050. It is probably impossible for any country to make significant reductions right now, but we need to prepare something. We will need the technologies that will make a reduction at the end. We know that it is possible to increase pollutants and missions as economies advance. When economies are not advanced, there is little pollution, but as it develops pollution peaks and then goes down again as a more advanced age is developed, this is known as the Kuznets Curve that measures GDP per capita versus SOx concentration. Likewise, we can measure energy consumption per capita and CO2 emissions per capita and see that there are different situations in different countries. Iceland is the extreme example because it uses hydropower to generate more than 90% of its electricity. It uses large amount of energy but in its very few pollutants. They also make use of geothermal energy for home heating. This chart plots the advancement of energy consumption versus GDP per capita for Japan. When we try to increase GDP per capita it seems necessary for us to increase energy consumption. India and Brazil look like they may follow the same curve as Japan. China looks like it may have a tendency to consume large amounts of energy. We can classify countries into separate categories according to these measurements. At the top are the oil-producing countries like Kuwait and UAE, followed by the second group of larger countries like Canada USA, the Northern countries and others. In the case of Japan, it is quite natural to reduce energy consumption and reduce emissions. By the year 2050 we should be able to do this and also increase per capita GDP. But is it really possible to obtain this?

I use a four or five stage theory to explain the curve. We start from the 0 level, which is nothing. When we enter stage 1, we have two overcome pollution issues that are created by industry and others, for example traffic. Then in stage 2 will be decreased landfill and improved

waste management. That brings us to stage 3, casualties by disaster, and then stage 4 where we introduce CO2 emissions. Studies show that there is the potential to reduce greenhouse gases at a cost per ton of 20 dollars. There is also great potential for reduction in emissions from buildings. Perhaps the first stage is to concentrate on the improvement of buildings. This might require increasing the price of CO2 to the level of 50 dollars per ton. After the oil crisis of the 70s, Japan made great strides in improving energy efficiency. There were significant savings the energy consumed by television sets, air-conditioners and refrigerators. However, after 1983 or so there was not much improvement. In the 90s, it had introduced the concept of "top runners." And air-conditioners, depending upon the type and use, are separated into 32 categories and given targets for coefficient of performance. If a product exceeds a target, they can use a label that says they have fulfilled the target by, for example, 130%. It is good for promotion. It is a very simple scheme, but it has been very successful. The coefficient of performance has increased to 6. Now we have self-cleaning air-conditioners on the market and they look like they will make even further improvements.

Japanese steel makers claim that Japan's steelmaking is the most efficient of the world. Certainly, it uses less energy than other countries such as Korea, EU, China, USA and Russia. There are three basic technologies that work: coke dry quenching, pressure recovery turbines and basic oxygen converter gas recovery processes. In Japan they have achieved widespread use, while not so much in Korea, USA, UK or Germany. The reason is that the price of electricity for industry is much higher in Japan than for other countries. What we are doing is trying to save costs rather than making drastic changes. I think it is necessary for us to overcome this barrier. To do this, we need to take several approaches. Regulation can put usage caps in place. Economic incentives can come in the form of trade and environmental taxation. There are also ethical decisions and responsibilities for future generations. We must

change the mindset of people. Over time, we might be able to achieve a natural reduction in CO<sub>2</sub>.

My conclusion is that it is necessary for us to develop "Echo Tech 2.0," an improvement in efficiency by a factor of 2. In Japan, we have two types: heat pump technology and hybrid vehicles. We need a next group of candidates. Pure electric vehicles, LED lights, organic EL and laser TVs. We need some discussion in this symposium on the structure that is required and the efforts required to achieve this. In advanced countries, we need to examine social values. For countries in transition, it is necessary to compete using a common framework even if the framework is not exactly the same. For developing countries, it is all right for the framework to be different and will depend on the natural resources available. We need more discussion of what the common framework is or should be. Is it really possible to attain this? I have tried to plot energy intensity, which is the oil equivalent of energy divided by GDP. In Japan, our value is 0.2 kg for each dollar GDP. In China, they started to decrease their energy intensity in the 1970s and now are almost close to the levels of Japan. This means that China adopted new technology by itself to improve its efficiency. Perhaps the path that can be taken by China will be one of which Japan reduces its energy consumption while China is able to bypass the wastrel period that Japan went through.

**Toshiaki Ikoma (JST):**

We have seen how to extend our schematic to the three-dimensional range looking at products like the iPod and GigaBeat. We also looked at the social issues of energy and environment and again so much data. Japan has very advanced technology for civilian energy and the question is how to apply this to countries like India and China.

**Floor:**

I would like to see the names of countries that have higher electricity charges than Japan. Barbados, Granada, Italy, Jamaica, Nicaragua and Japan. Why Japan? The public should be outraged

**Itaru Yasui:**

This is the reason why steelmaking industries improved

their efficiency.

**Floor:**

Companies can move their factories offshore. So they are charging us.

**Floor:**

This is becoming a political issue.

**Toshiaki Ikoma (JST):**

Deregulation in the United States caused serious problems.

**Floor:**

It is a monopoly right now and I think there must be some answer.

**Floor:**

The Japanese price is almost 30 or 40% tax, which is high compared to other countries.

**Floor:**

I cannot understand the curve in China for energy intensity. This is a very sharp decline. Is this really true? That means that there is a very high increase in energy productivity. Is that true? I think that is a problem in the data in China's energy use.

**Itaru Yasui:**

We used data from the World Bank.

**Floor:**

It is not only technology but also economic efficiency. If you combine those, you see that curve. (Chinese speaker)

**Floor:**

We would also need to look at the gross output, not just per capita.

**Itaru Yasui:**

The energy intensity chart is not per capita based.

**Floor:**

Getting back to the global innovation ecosystem, if you look at Microsoft, the way they do it is that they set their platform standards for whatever new product and people from all over the world start developing things onto that in a very classic ecosystem model. That is been going on for

a long time. I really do not understand what to do about this and why we are looking at iPod, which is not a good example compared to something like Windows.

**Toshiaki Ikoma:**

At the corporate level they are already adopting this. It is called "open innovation" in management schools.