


# Policy Forum 11-32: Creating a Solar Belt in East Japan: The Energy Future

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# Creating a Solar Belt in East Japan: The Energy Future

By Son Masayoshi  
Introduction by Andrew DeWit

September 29, 2011

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Nautilus invites your contributions to this forum, including any responses to this report.

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CONTENTS

[I. Introduction](#)

[II. Article by Son Masayoshi](#)

[III. Nautilus invites your responses](#)

**I. Introduction**

Son Masayoshi, Softbank Chairman and CEO, writes “It is known that land salinized by the tsunami cannot be cultivated for the next decade. How much money would it take to “recover” such farmland and create taller embankments? What future do we see there? Can the government instead take the lead in creating an “East Japan Solar Belt” as an area for producing new energy for the future? Ports of the past could gain new life as ports of solar and wind energy.”

The views expressed in this report are those of the author and do not necessarily reflect the official policy or position of the Nautilus Institute. Readers should note that Nautilus seeks a diversity of views and opinions on significant topics in order to identify common ground.

**II. Article by Son Masayoshi**

- “Creating a Solar Belt in East Japan: The Energy Future”

by Son Masayoshi

*Introduction*

by Andrew DeWit

*This article by Softbank CEO Son Masayoshi outlines the thinking of one of Japan's most innovative capitalists and public-spirited citizens. Having helped create a competitive market in telecommunications, Son is now aimed at liberating and greening Japan's YEN 16 trillion electricity industry. In addition to the efforts he outlines in the article, Son inaugurated his Japan Renewable Energy Foundation on September 12. This Foundation is to be led by Tomas Kaberger, the former Director General of the Swedish Energy Agency. It includes a stellar cast of international experts on renewable energy, associated support policies (especially the feed in tariff), and other aspects of the ongoing energy revolution. Through these initiatives and the plan for a "solar belt," described in this article, Son has been instrumental in defining a new direction for Japan in the wake of Fukushima. Without Son putting renewable energy so squarely and credibly on the public agenda, Japan might have succumbed to the enormous pressure from Keidanren, METI, TEPCO and other elements of the nuclear village to maintain the unsustainable status quo.*



In fact, the fight over Japan's energy options is not at all ended. The nuclear village's effort to portray Fukushima as merely a setback has failed in the face of the facts, of course. Among recent surveys results, we find those that indicate as much as 100,000,000 m<sup>3</sup> of Fukushima's topsoil has been irradiated by the meltdowns, an enormous quantity whose disposal, both its logistics and its cost, simply staggers the mind. In the meantime, the Ministry of Economy Trade and Industry (METI) is in a struggle with the financial institutions that lent trillions of yen to TEPCO and now want the state to ensure that they are completely reimbursed. The nuclear village and its hired guns in the academic and administrative and political sectors have worked together to craft a mechanism through which compensation will almost inevitably be torn out of the public budget as well as the pockets of utility ratepayers. The ricketiness of the scheme suggests it can only hold together if the 10 regional monopolized utilities and their risky nuclear assets are maintained largely as is. It is thus easy to understand why the establishment is furious at Son's effort to apply "creative destruction" to their vested interests in Japan's power markets.

*Softbank's role is of course not the only element that is driving Japan so rapidly towards fulfilling its longstanding commitment to be a green leader. Another is the fact that Tohoku was so heavily devastated by the March 11 earthquake and tsunami. The rebuild gives Japan the opportunity to rebuild smart, which has become common sense within the committees devising the plans for reconstruction. METI recently released the results of one of its own in-house academic studies showing that global renewable energy and associated infrastructure businesses already reached YEN 30 trillion in 2010. The study also projects that the global industry will expand to about ¥80 trillion by 2020. The question of whether Japan plays a leading role in the process remains open.*

*A smart approach to rebuilding the devastated area could serve as a template for restructuring power markets within Japan. This needs to be done, as the International Energy Association argues, because Japan is balkanized into 10 regional and monopolized utilities that have very little interaction among each other as a power market. Son in fact proposed a YEN 2 trillion plan for this kind of "supergid" at the inauguration of his Japan Renewable Energy Foundation.*

*The IEA also points to the opportunity for extending this power market throughout the East Asian region, something Son discussed with South Korean President Lee last May as well as formally proposed during his September 12 talk. In short, initial possibilities now exist for a regionwide energy transformation.*

*A few decades on, when the history of this stressful period in Japanese politics and business is written, Son will rank as a leader with vision and courage. By contrast, the costs of the nuclear village will still be burdening public health and public finance.*

### **Cell phone networks collapsed**

I was shocked by the Great East Japan Earthquake. These days I carry a Geiger counter wherever I go and I was surprised when I went to the Kansai area last week and the device registered double digits like I had seen in Tokyo. Radiation now spreads beyond Tohoku and Kanto to the west as well. One thing that I, as an operator of a cell phone business, was reminded from this earthquake and tsunami is that although cell phones are wireless, stations are wired with optical fiber cables, and when these are broken or power fails, cell phones do not work at all. When we lose electricity and the network is crippled, cell phones are completely out of service.

SoftBank phones also lacked sufficient functioning for receiving earthquake early warnings, so I have decided to equip nearly every phone in the future with this function.

In terms of recovery support, we are currently preparing to establish a foundation to aid and support disaster-hit areas, in hopes of bringing together the goodwill of the entire nation.

While I was wondering if there is anything I could do as an individual citizen in fields that do not necessarily have direct relation with my primary business, I launched a portal site specializing in recovery assistance in an effort to create a system that collaborates with local autonomies and non-profit organizations (NPOs). The site joins forces with volunteers to develop tools to manage insufficient supplies to eliminate the imbalance of accumulated supplies not reaching those who truly need them, or a system that allows individual supporters to support individual evacuees in ways such as a certain volunteer visiting a certain evacuation camp to report on what supplies are needed. The site also provides information on evacuee reception, evacuation camps, NPOs and donations. The site's being accessed two million times a day, or 60 million a month, has made me feel the enormous demand for this service.

The Great Hanshin-Awaji Earthquake occurred in 1995, which was when Yahoo! launched and the Internet was in its early stages. Cell phones had only spread to about 10% of the population and the ability to access the Internet from them was very limited. I had not yet entered the cell phone business and in a sense considered it none of my business. But seeing cell phone networks fail before my very eyes this time around, I was deeply shocked. Lives may have been saved had cell phones worked.

And looking at questionnaires filled out at disaster-hit areas, I found that many people wanted cell phones to work more than they wanted food or anything else. This made me again think of my responsibility and my powerlessness was indescribably frustrating.

So I resolved that SoftBank will offer earthquake orphans free cell phone service until they turn 18 years old, all disaster-hit areas and evacuation camps will be given free public iPads, and I personally will donate 10 billion yen together with my executive pay.

### **How should we counter international misinformation and its effects?**

I personally visited an evacuation camp in Fukushima. A high level of caesium 137 six times that found in evacuated areas around the Chernobyl plant was detected from soil in Iidate Village, and radioactive contamination was going to remain for a long time. Fukushima evacuees are suffering severe anxiety.

I conducted a questionnaire from my Twitter account on the government policy concerning voluntary evacuation within the 20-30 km radius, and 85% responded that the policy is too vague and indecisive regarding what people should do. When left to decide for themselves, and if elderly people living alone or bedridden patients cannot evacuate, those who support them with food, gas and other provisions would have to remain as well, this would increase the number of victims.

Mistaken information about radiation and its effects has spread not only throughout the nation but overseas as well. The trend of avoiding Japanese products is seen not only with vegetables and other food but with industrial goods as well. To eradicate such damage from misinformation, we must announce our figures measured under the Nuclear and Industrial Safety Agency (NISA) standard

together with the global International Atomic Energy Agency (IAEA) standard. No matter how well thought out the Japanese original standard may be the world will not accept it.

For example, the IAEA standard for soil surveys samples a 1 square meter layer of soil 1-3 cm below the surface and measures becquerels per square meter. But the Japanese standard samples soil 5 cm from the surface and measures becquerels per kilogram. Dust and particles carry and spread radioactive elements, which take time to penetrate 5 cm into the soil. Foreign nations, at least, see that the Japanese method would yield lower figures, and doubts spread that Japanese figures might possibly be lower than the actual state.

Something else also concerns me. On April 6, the Ministry of Internal Affairs and Communications issued an official notice requesting “relevant ministries and agencies to collaborate against comments and information on the Internet that violate laws or public order, asking website operators to voluntarily delete them and taking appropriate action against such operators,” which was also posted on its website. This is an extremely dangerous idea that could lead to repression of free speech. We know very well having seen revolutions in Tunisia, Egypt and other Middle Eastern regions how governments that repress free speech on the Internet end up.

I understand that the government has no intention of controlling the Internet, but I sincerely hope it will be extremely careful on this issue. Some foreign nations are already commenting that they hope to see nothing resembling speech repression in advanced and democratic Japan. I offer my strong warning for the sake of Japan’s trust.

### **Nuclear power plant construction peaked in the mid-’80s**

Telecommunications cannot work without electricity, and nuclear power plants are dangerous, but electricity in Japan will not come without nuclear power plants. At least this is what I had thought. I did some research on this and learned quite a few things.

In responding to the nuclear plant incident, Prime Minister Kan has already made his stand clear on three points: We need to reevaluate the conventional safety standards (on existing nuclear power plants); we need to evaluate (plans for building new plants) from scratch and we will pursue safety in nuclear power while we work proactively toward clean energy.” I am in favor of these ideas. I wish to offer some specific suggestions to push them further.

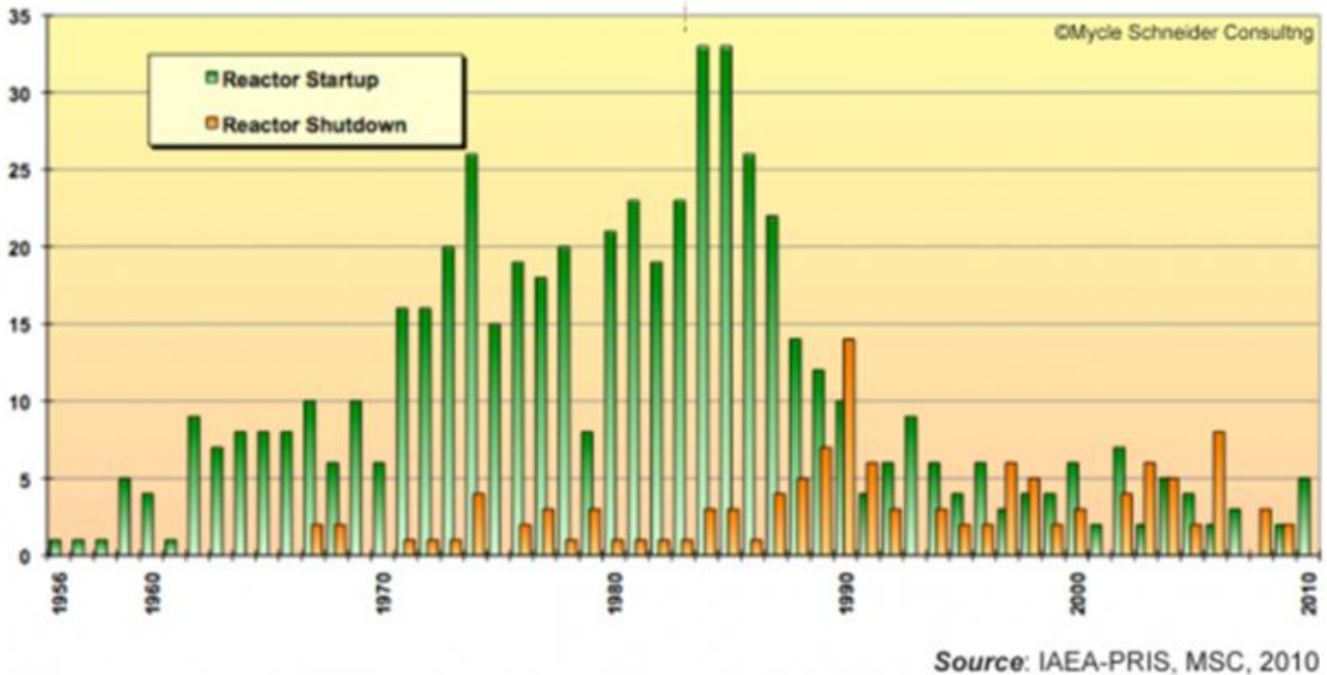
As we are well aware, Japan’s power production is comprised of 30% nuclear energy, 9% hydraulic and other natural energy and 61% thermal energy. People panicked that if we lose nuclear plants we would lack electricity and the Kanto area would have to undergo rolling blackouts. But arguments that began several days ago are saying that we could probably get along without nuclear power by increasing thermal power.

How long does a nuclear power plant last anyway? A reactor pressure vessel deteriorates as neutrons continue bouncing against it, and becomes more fragile against earthquakes and rising temperatures. When we look at the lifespan of nuclear power plants around the world until shutdown, we find that the average is 22 years. I was very surprised that few in the world remain in operation beyond 40 years.

Just because nuclear power plants are dangerous, we realistically cannot stop them today at this very instant. But if we intentionally halted nuclear plants when they reached a 40-year lifespan, the power they produced would naturally decline unless we constructed new ones.

Until a month ago, I had believed that nuclear power was the global trend and that nations around the world are building more nuclear power plants in order to reduce carbon dioxide. But the nuclear power plant boom was actually in the mid-1980s (Figure 1). Hardly any new nuclear plants were built after this period. This amazed me.

Fig. 1: Reactor Startups and shutdowns in the world (in Units, 1956 to Sept. 10, 2010)



If we were to maintain the current level of electrical power provided by nuclear plants, we would have to build so many of them again, as we did in the '80s when production peaked. But having experienced the Fukushima events, would the world welcome a move toward constructing new nuclear power plants when we have so few of them now? I think we the people need to discuss this issue again.

Either way, as the prime minister says, we must raise operation safety standards of existing nuclear power plants. Some of my suggestions are: (1) Principally halt all reactors whose lives have expired, (2) Prohibit exchange of executives/officials among the Ministry of Economy, Trade and Industry (METI), Nuclear Safety Commission, Nuclear Industrial and Safety Agency (NISA) and the power companies, (3) Toughen safety assessments concerning cracks and other abnormalities, (4) Safely disclose information on abnormalities, (5) Release IAEA international standard figures together with Japanese figures and (6) Reevaluate operation of plants in areas of heightened earthquake risk.

#### **Are nuclear power plants actually cheap while natural energy is expensive?**

From the standpoint of practical, economical logic, solar power and natural energy are expensive. I had always believed that nuclear power was the most inexpensive way of producing power, at 5-6 yen per kilowatt-hour; therefore we have to use nuclear power and construct new plants. I am sure that many people thought the same.

But is this really true? According to figures listed on an application for approval of the nuclear power plant installation, its unit cost is 15-20 yen. This is the actual data; the pre-accident cost. So then what happens if we add the cost of the accident? TEPCO obviously should pay this, but any cost beyond its capacity will fall to the government; in other words, tax. If we include the full cost of the accident, nuclear power may in fact be the most expensive form of energy.

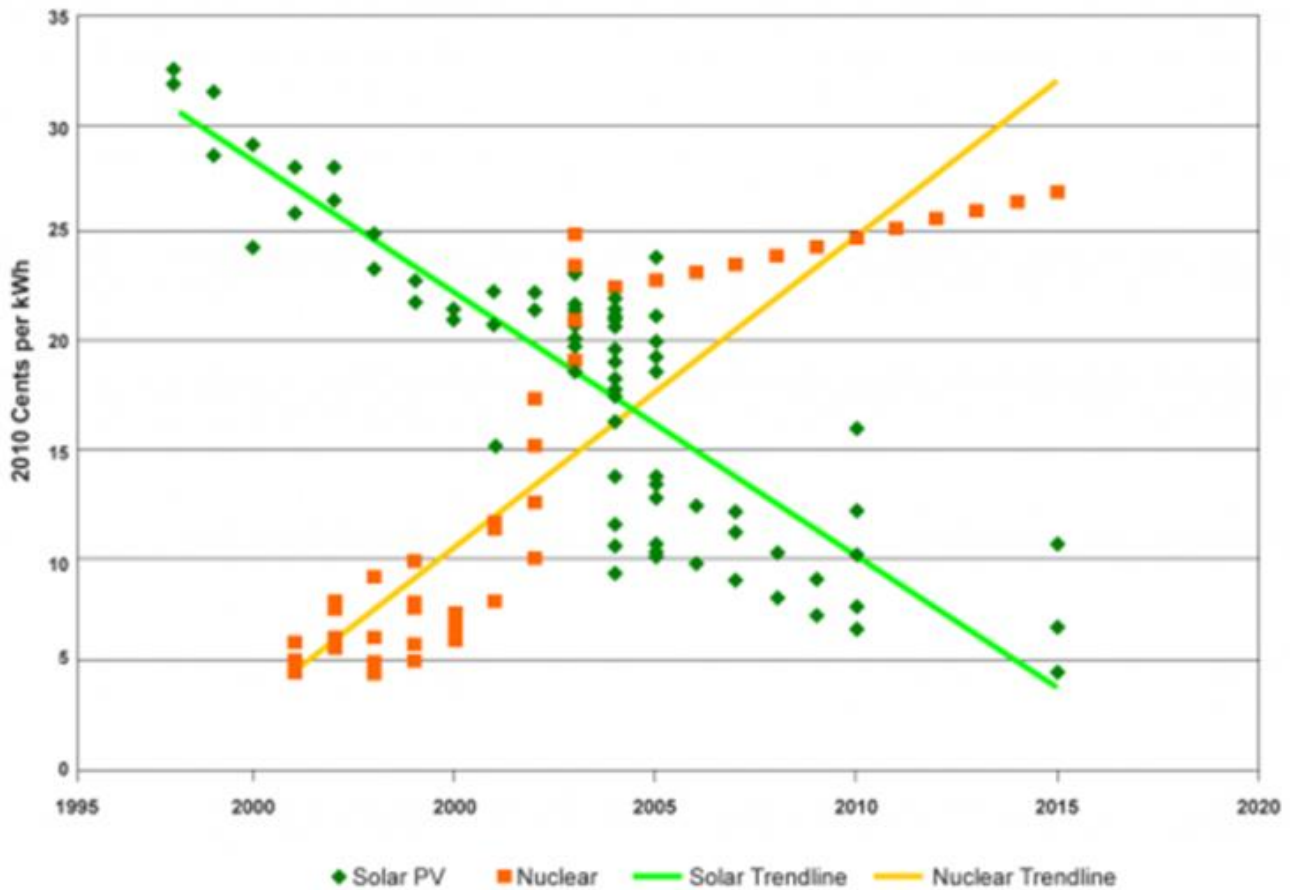
As this example illustrates, the true cost of nuclear power should include local subsidies, nuclear waste processing costs and accident coverage. We need to reevaluate the legitimacy of "5-6 yen," which was the initial hook, but now seems somewhat off.

Moreover, 15 yen was a figure derived from commodity prices 30 years ago, so I wonder what the figure per kilowatt-hour (kWh) would be for a new nuclear power plant today. The number 3 reactor at Olkiluoto Nuclear Power Plant in Finland was slated for an initial construction budget of 350 billion yen, but the work was continually delayed as safety standards continued to rise, and has already cost 1.5 trillion yen despite still having no schedule for completion. Accounting only for

capital investment and without fuel or operating costs, the plant already costs 14 yen/kWh, and fuel and operating costs would add to this. The world no longer makes new nuclear power plants because the truth is, as this case shows, they come at a huge cost.

A graph shows some surprising data. Power production costs for solar and nuclear energy in the U.S. crossed over each other last year, in 2010 (Figure 2). I, like many others, had thought that natural energy was ideal but expensive, that solar power would not work in the rain or at night, and nuclear energy could mass-produce and was inexpensive. But a crossover of the two actually occurred last year, with all the rain and night concerns accounted for and looking only at production cost during operation. Looking at this case makes us think that we must shift our energy policy toward realizing a society in which every citizen can feel safe.

Fig. 2: Solar and Nuclear Costs — The Historic Crossover

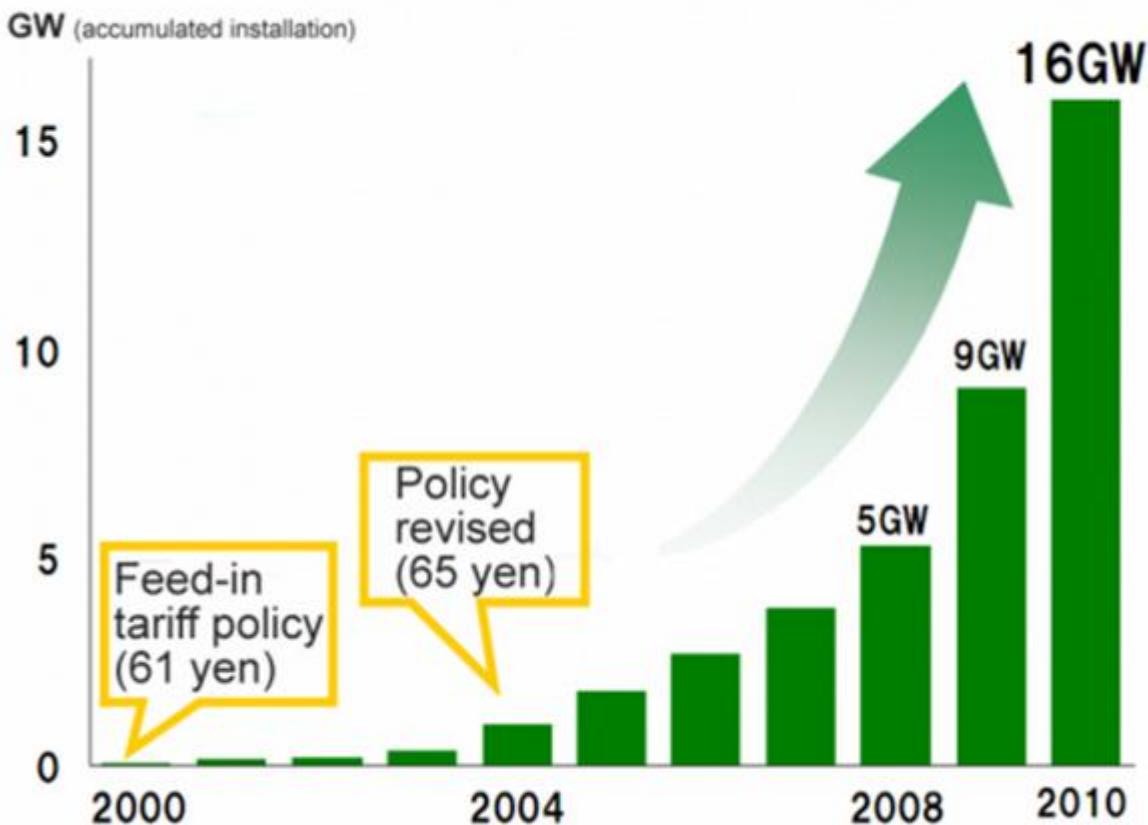


Source: North Carolina Waste Awareness and Reduction Network (<http://www.ncwarn.org>)

### Government policy changes society

Power production using natural energy is currently increasing at a dramatic level in Europe, the United States and China. The key to this increase is government policy. In Germany, the feed-in tariff policy began in 2000, allowing any electricity producer to have its product purchased by power companies at 61 yen/kWh for the next 20-25 years. A 2004 revision of the policy raised the purchase price to 65 yen. The mere act of the government determining such policy sparked competition among private companies and prompted an explosive spread of solar power generation. (Figure 3)

Figure 3: Accumulated Installations of Solar Power Generation (Germany)



Source: Actual figures for 1999-2009, EPIA (May 2010)  
Exchange rate: 1 euro = 120 yen

In Europe, countries like Germany, France and Spain have set a target of supplying 20%-30% of their energy from natural sources by the year 2020, which people now believe could be accomplished faster than anticipated. The latest data confirms that countries such as Germany enforce the purchase of all produced power at 40-60 yen/kWh for 20-25 years. Japan is currently discussing purchase of surplus power for 10 years. I truly believe that we should set figures at the European level or American level of purchasing all produced power at 40 yen/kWh for 20 years to allow private businesses to compete and develop a market. Otherwise, businesses will not think of producing power since the returns will not match their investment.

Looking at trends of the next 10 and 20 years brings an expectation that fossil fuel prices will rise. On the other hand, costs are declining for natural energy, owing to effects of mass production and technological innovation as seen in the U.S. It is time for our government to draw up a grand vision. The average monthly electricity bill of a common household is about 8,000 yen, and if we account for the 40 yen for 20 years purchase price in this, the bill temporarily rises by about 500 yen. But this buys us safety and assurance. Fossil fuel prices will continue to rise, and nuclear power plants will further involve accident costs. There is no need for us to resort to more dangerous and expensive options.

At the same time, we must reduce carbon dioxide. For us to head toward a clean and more inexpensive option over the long term, are we all not capable of facing up to the responsibility and bearing the temporary added burden of 500 yen? The government should be acquiring this consensus from its citizens.

This requires no large-scale financial investments from the government. All the government needs to do is take the solar power purchasing policy it is already discussing one step further and simply add a line, "Purchase of all produced power at 40 yen for 20 years" or shift the policy in that direction.



Recall the U.S. case given above: Is it not sheer nonsense to cling to nuclear power when it will recede in the future instead of taking the path that is already crossing over and which will definitely lead to cost reduction?

Feeling that I should produce action instead of just talk, I established a Natural Energy Foundation to bear my share of responsibility as a citizen and decided to personally input one billion yen. I am hoping that the people of the world gather their wisdom here to present their research findings and give proposals for government policies. It is a dream of mine to see the foundation trigger discussion and play a role in offering practical alternatives to nuclear energy.

### **The sun will rise again**

Solar, solar thermal, wind, geothermal, biomass, oceanic energy and other blessings of nature can be used for thousands of years without contaminating the Earth. These are forms of energy that coexist with nature without destroying it. I have one suggestion to make concerning a vision on recovering from the quake. It is known that land salinized by the tsunami cannot be cultivated for the next decade. How much money would it take to “recover” such farmland and create taller embankments? What future do we see there? Can the government instead take the lead in creating an “East Japan Solar Belt” as an area for producing new energy for the future?

Ports of the past could gain new life as ports of solar and wind energy. Such a recovery project would create huge job opportunities for the region’s people, and Japanese manufacturers already have the number-one solar technology in the world. Instead of exporting it, we should use it domestically to create the world’s largest Solar Belt.

In this way, the sun of 21st century Japan would rise again rather than continuing to set. And with safety and assurance, people could live on this land for many thousands of years. I believe that our nation can come up with such a hopeful vision.

### **III. Nautilus invites your responses**

The Northeast Asia Peace and Security Network invites your responses to this report. Please send responses to: [bscott@nautilus.org](mailto:bscott@nautilus.org). Responses will be considered for redistribution to the network only if they include the author's name, affiliation, and explicit consent.

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