



Referendum Shifts Japan's Nuclear Policy

Kazuyuki Takemoto Society of Opposing to Nuclear Power Plants for Protecting Kariwa Village

Introduction

My hometown Kariwa village is the site of the world biggest nuclear power station. Tokyo Electric Power Company (TEPCO) operates seven nuclear reactors with a total output of 8212 MW, at Kashiwazaki-Kariwa nuclear power station. The Kashiwazaki-Kariwa station is located on the boundary of Kashiwazaki city, with 90,000 residents, and Kariwa village, with 5000 residents.

I was born in a peasant family three kilometers from the nuclear power station. I have been opposing nuclear power since the project was first announced in 1969.

Today, I would like to report on the result of Kariwa village's referendum of May 27 last year, regarding the Plutothermal project, MOX fuel use in light water reactors, and its impact on the project for the entire nation, and the current situation in regard to the Plutothermal project and nuclear power plants. In today's speech, on behalf of my comrades, I would like to express our gratitude to organizers of this conference who gave us a chance to think together about the world situation as regards nuclear power plants.

It is often the case that an accident happens and the plant is shut down at a place like Kashiwazaki-Kariwa, where seven nuclear power reactors are located at one place. If we take the average, a Japanese nuclear reactor unexpectedly stops its operation 0.5 times a year. On March 5, 2002, the reactor 1 at Kashiwazaki-Kariwa had an accident in its recirculation pump, and it was manually stopped. In last year alone, there were 15 accidents at Kashiwazaki-Kariwa.

There are many accidents caused by aging of reactors, operators' errors, and the negative influences of cost-effectiveness-first policy. Whenever an accident is reported, distrust and anxiety among the residents in the surrounding area is mounting.

Currently, the police are on guard 24 hours in front of the nuclear power station's gate. Patrol boats remain on the surrounding sea, and helicopters brought by the boats are flying overhead. The security has been like this since September 11, which brought even more anxiety to the residents.

In the referendum on the introduction of the Plutothermal project, the opposition won the majority, and the plan is now suspended. However, neither the Japanese government nor TEPCO has given up the plan yet. The other day, there was an announcement saying COGEMA had started the fabrication for the next batch.

Current situation of Japanese nuclear power plants and Plutothermal project

Japan has been planning to use plutonium in a Fast Breeder Reactor (FBR), and constructed Monju, a prototype FBR. However, on December 8, 1995, sodium leaked from the ruptured protection pipe of a thermometer placed in a coolant piping and this caused a fire. The operation of Monju has been suspended since the fire, and there is no prospect of resumption of its operation. Because of this, huge amount of plutonium, which is convertible to nuclear weapons, has been accumulated.

In order to consume this excess plutonium, the Japanese government planned to fabricate MOX fuel by mixing with uranium to be burned in light water reactors. In the original plan, Kansai Electric Power Company (KEPCO) planned to burn MOX at Takahama 4 in Fukui prefecture, and Tokyo Electric Power Company (TEPCO) at Fukushima I-3 in 1999, KEPCO at Takahama 3 and TEPCO at Kashiwazaki-Kariwa 3. By 2010, the Plutothermal plan was going to be implemented by each utility company at a total of 18 to 20 light water reactors.



In the midst of the uproar caused by the JCO accident, MOX fuel was being shipped from the UK and France to Fukui and Fukushima. However, the fuel planned to be loaded into Takahama 4 is going to be returned to the UK in summer this year, due to the inspection data falsification scandal. In addition, COGEMA's fuel assemblies for the next use, which were in the process of fabrication, have to be disposed of because of failures in the procedures.

In Fukushima, nobody knows when the MOX will be loaded since the prefectural governor's Energy Policy Review Committee is still underway.

At the third candidate site, also in Kashiwazaki-Kariwa, there is no knowing when the plan could actually be implemented. The governor stated, "As long as the residents' decision does not change, we cannot go on," referring to the result of the referendum showing that the majority of Kariwa villagers opposed the plan.

There is no prospect at all regarding the loading of MOX into a reactor in Hamaoka operated by Chubu Electric, because of the accidents involving a pipe rupture and water leak from the Hamaoka 1 reactor vessel.

Here, we can say that electric companies themselves may not want to go ahead with the Plutothermal plan, since it will suppress the liberation of the electric market and will lead to higher costs.

Nuclear power plants in Japan

The Japanese population of 125 million lives in an area of 378,000 kilo-square meters. In Japan, 10 electric companies that have divided up the whole nation between them are providing electricity to each area under regional monopolies.

Nine electric companies as well as the Japan Atomic Power Co. are operating 53 nuclear power plants with a total capacity of 46GW. The types of reactors are, 29 Boiling Water Reactors (BWRs), 23 Pressurized Water Reactors (PWRs), and one Advanced Thermal Reactor (ATR) which is planned to be decommissioned next year.

As of the end of 2000, the world total is 430 plants with a total capacity of 363GW, of which Japan's share is one eighth, as regards the number of plants and the capacity. The first Japanese nuclear reactor was a gas-cooled reactor imported from the UK, which began its construction in 1960, and operated for 32 years from 1966 to 1998, and is now being decommissioned. After that, from 1969 to 1997, on average, two US type reactors, both BWRs and PWRs, have been constructed each year.

Between 1997, when Kashiwazaki-Kariwa reactor 7 and Genkai 4 began operating, and January 2002, when Onagawa 3 commenced its operation, no new reactors had been started up. Currently, only three reactors are being constructed. In this way, even in Japan, the construction of nuclear power plants has slowed down.

Nuclear power plants were constructed with the emphasis on need, economy, and safety.

Necessity: Japan's energy consumption expands each year. Japan has scarce sources of energy, and oil will soon be depleted. Nuclear energy is an infinite source of energy, and thus, we need nuclear energy.

Economic aspect: Nuclear energy is more economical compared to fossil energy such as oil, coal, natural gas, etc. And also to hydro energy.

Safety: We do not have to worry about the catastrophic consequences of Hiroshima and Nagasaki, etc. There is no health risk incurred by low level radiation. Nuclear energy, when under control, is safe.



When the nuclear energy era arrived, those who rejected nuclear energy were called as those who deny the progress of society. Such slogan were widely spread, while all the nuclear power plants were constructed in agricultural or fishing villages far away from the consumers' locations. In regions with nuclear power plants, people were persuaded that their town would become rich through tax cuts and other financial rewards for their support of nuclear facilities.

The first reactor was made by the UK, and all the others were BWRs and PWRs that were copied from the US and built by Japanese companies. In the end, Japan has become the third biggest nuclear energy country, following the 103 reactors with a total output of 101GW in the US, and 57 reactors with 63GW in France.

Country	Number	Output MW	Population (million)		Area (1000km ²)	Population ratio
kW/person	Area ratio kW/km ²					
US	103	101'171	226	9'364	0.38	11
France	57	62'920	58	552	1.08	114
Japan	52	45'082	125	378	0.36	119
Germany	19	22'365	82	357	0.27	63
Russia	29	21'556	148	17'075	0.15	1
Korea	16	13'716	45	99	0.30	139
UK	33	13'531	59	244	0.23	55
Ukraine	13	11'818	51	604	0.23	20
Canada	14	10'615	29	9'971	0.37	1
Sweden	11	9'822	9	450	1.09	22
Spain	9	7'798	39	506	0.20	15
Belgium	7	5'995	10	31	0.60	193
Taiwan	6	5'144	22	36	0.23	143
Bulgaria	6	3'760	8	111	0.47	34
Switzerland	5	3'352	7	41	0.48	82
Others	50	24'698	4'810	95'822		
Total	430	363'343	5'768	135'641		

Table 1 Nuclear Power Plants in the world

Three consecutive victories of anti-nuke referenda-democracy shifts nuclear policy

When many candidate sites for nuclear power plants were revealed, the anti-nuclear power plant movements started. Responding to this, the government and the electric companies conducted promotional activities and bought up the land and surrounding seas at exorbitant prices. As a result, the constructions were forcibly carried out.

Yet, there are still some places where the purchase of land and sea could not be secured due to long-sustained movements and finally the plans were given up. Yet, even now, in some places, electric companies cannot give up their plans while anti-nuclear citizens' movements are going on.

All the Japanese nuclear power plants are built on the coasts far away from the cities. After World War II, urbanization progressed rapidly, causing overpopulation in cities and depopulation in agricultural villages. The electric companies proclaimed that local economies would be boosted if they accepted nuclear power plants; people could enjoy prosperous lives just like in cities.

In Japan, lands are privately owned and fishing rights are rendered to fishermen's unions. Meanwhile, assembly men elected in their regions are able to decide their regional policies. In order to build a nuclear power plant, the purchase of the construction site, the renunciation of fishing right on the area to be affected by hot waste water, and the agreement of the mayor and the assembly will be needed.

The electric companies are able to construct and operate a nuclear power plant, once they secure the land and the sea, and obtain the agreement from municipalities. Under the slogan of "Nuclear power is a state policy, so you should be cooperative," the lands and the seas were sold at dozens of times higher than regular prices.

Municipality officials were made to agree, after being persuaded that the region would be enriched by the government's incentives for building nuclear power plants. In fact, compared to regions without nuclear power plants, enormous amount of subsidies and



donations were allocated, public buildings were constructed, and roads and ports were renovated.

Mayors and assembly men are elected by the voters. Elections are carried out over many issues of policy decisions, nuclear policy is just one of them. Mayors and assembly men generally belong to or at least support political parties. This means that most of them are on the side of pro-nuclear and the Pluthermal plan.

As a result, in many cases, the majority of voters' opinions and their mayor or assembly men's intention conflict with each other over the issues of siting of nuclear power plants and the implementation of the Pluthermal plan.

In villages with nuclear power plants, citizens' anxiety or outright opposition was not reflected in important decision-making processes.

During the 1960s, when the atomic energy plan was initially announced, Japanese democracy was not mature. Women were given the right to vote for the first time only in 1946, and people did not insist on their own rights so much.

As one way of overcoming such a situation, referenda, in which voters can express their own will, have been proposed and implemented. The first referendum held in Japan was on the approval of the construction of a nuclear power plant in Maki town, Niigata prefecture on August 4, 1996. Since then, there have been a number of referenda here and there over the issues of industrial waste disposal site, a military base and so forth.

According to Japanese laws, establishment of an ordinance can be proposed with one fiftieth of the voters' direct claim, but without the motion of the assembly, that ordinance cannot be passed.

The direct proposal for a referendum on the Pluthermal plan in Kariwa village was submitted for the first time by Kariwa and Kashiwazaki to the assembly in January 1999. However, the claim was dismissed on March 23. After that, the JCO criticality accident took place, followed by the exposure of the data falsification of MOX fuel for the Takahama nuclear power plant owned by KEPCO, and the scandal concerning slush spending on Rapika built with the government subsidies for promoting areas adjacent to nuclear power plants. Due to this series of incidents, the referenda were finally undertaken.

Both in Maki and Kariwa, promoters of nuclear energy expressed their opposition to referenda, insisting that referenda were unnecessary. There were indescribable difficulties on the way to the implementation of the referenda both in Maki and Kariwa.

On the other hand, the referendum for the approval of siting a nuclear power plant in Miyama town in Mie prefecture was planned and implemented by the promoters. Promoters in Maki and Kariwa used to insist, "Nuclear energy is a state policy, which does not go along with referenda," "Referenda deny the parliamentary democracy." But after the referendum in Miyama, which was implemented by nuclear promoters, now, they can no longer criticize referenda using this logic. In addition, I believe nobody no longer can deny the assertion, "People should decide by direct voting for important issues such as the building of nuclear power plants."

The voter turnout for the referenda was almost 90% in the three municipalities. This high turnout shows the willingness of the citizens, who want to participate in important decision-making processes of their regions. In addition, all the results showed opposition to the construction of a nuclear power plant or the loading MOX fuel, which has led to a freeze, suspension, or cancellation of the respective target plants.



In Miyama town, the siting plan of a nuclear power plant had already been underway. In Maki, most of the land for constructing a nuclear power plant had already been purchased. In Kariwa, one fourth of the village's households are dependent on the salary from the nuclear power station. Yet, it was proven in Japan that we can stop the promotion of nuclear energy if we resort to referenda, a form of democratic procedures.

	Date	Population	No. of voters	No. of votes	Turnout	Opposition (%)	Support
Maki	04.08.1996	30,011	23'222	20,503	88.29%	12,478 (60.9)	7,904
Kariwa	27.05.2001	5,027	4'090	3,605	88.14%	1,925 (53.4)	1,533
Miyama	17.11.2001	10,400	8'748	7,754	88.64%	5,215 (67.3)	2,512

Table 2: The result of referendum on nuclear policy

The referenda were proven to be an effective democratic procedure in which residents can recapture control of their own government and administrative matters for themselves.

The first referendum held in Maki on the issue of disapproval of the constructing a nuclear power plant helped the spread of referenda nationwide. At the same time, at present in Japan, the central government gave its instruction to promote merging small sized municipalities into bigger ones to simplify administrative work. It is expected that more referenda will take place as a form for decision-making on this issue as well. Accordingly, referenda will become a more common practice, which will become an advantage for the anti-nuke referendum movement. There will be a day in the future when it is said that the people of Japan have successfully achieved a shift from the nuclear energy policy by referenda.

Joint movements by citizens nationwide for new regional societies

After the Kariwa referendum, citizens from organizations against nuclear power plants in Kariwa village and Niigata prefecture were invited by various places to report about the referendum and they also gave gratitude for those who supported their action. People who live in the candidate areas for siting facilities such as nuclear power generation, interim storage site for spent fuel, reprocessing plants, geological disposal site for high level waste, were pleased with the result as if it was their own victory. People who have been supporting anti-war and anti-nuke weapons movements also joined their celebration.

They have also made a renewed pledge for establishing a nuclear-free society. Among these, Miyama town in Mie prefecture had its own referendum on the issue of constructing a new nuclear power plant after the referendum in Kariwa village. The victory went to the anti-nuclear citizens' side. If we, the Kariwa villagers, had indeed made some contribution to the result of the Miyama town referendum, by telling them the situation in pro-nuclear town Kaswhiwazaki-Kariwa, we believe that it was the best return gift to all the people who supported us nationwide.

In Kariwa village, the "Society for Talk about Kariwa in the Future" was established. The Society was established for having a discussion on lives of local people who have been forced to accept the existence of nuclear power plants. The meeting are also for talks with pro-nuclear people.

Efforts by the government and electric companies to undermine the result of the referendum

On March 8, 2002, ignoring the result of the referendum of Kariwa villagers, TEPCO announced that it had placed an order for the next MOX fuel to COGEMA, and that the fabrication is already underway.

Behind the scenes of this development of the nuclear promotion plans, we can assume that electric companies are trying to execute the contract agreed in the old days, and that the nuclear industries are trying to reinvigorate their industry on its death-row.

After the referendum, the government and electric companies are expanding nuclear



promotion activities, including pronuclear energy education from an early age, excursions to nuclear power plants, exchange programs between the regions that produce electricity and consume electricity, and increased regional subsidies.

Right after the referendum, the government established “Inter-Ministerial Coordination Committee for Promoting Pluthermal.” The Atomic Energy Commission has also been trying to conciliate local people by holding a meeting with citizens in Kariwa village, saying, “We have listened to the voices of people who are against nuclear power.”

Even the pronuclear people in Kariwa were discontent, saying, “We are not getting visible support from the government.” Responding to this, the government dispatched some personnel who would listen to the voices of the residents in Kariwa. Yet, what the pronuclear people really think was represented by the statements from the governor of Tokyo saying, “Tax-payers money from cities paved the roads on which only bears would cross at night.” In addition, the director of Inter-Ministerial Coordination Committee for Promoting Pluthermal said, “Kariwa should be thankful to nuclear power plants which brought prosperity to the village.”

Electric companies have been continuously conducting the campaign for promoting the Pluthermal plan. With “Seeing is Believing” as their own slogan, they initiated a campaign called, “Let One Million People Visit Nuclear Power Plants,” the size of which is three times bigger than the previous campaign. In addition, they are using TV and newspaper advertisement.

For the first time in over 30 years, since the announcement of the construction of a nuclear power plant in Kariwa village, TEPCO carried out visits to all the local households. In addition, they try to regain trust by sending applications to join Japanese cricket clubs mainly consisting of senior citizens, and providing donations to local festivals.

The promotional activities by the government and the electric companies remind us of a furtive stalker trying to undermine the endeavors of the residents who have already decided to reject the Pluthermal plan. It is not an acceptable practice for a single private company to interfere in a local community to this extent.

Liberalization of electricity market, decentralized small scale generation and future perspectives

The Japanese utility fee is quite expensive compared to other advanced countries- approximately 2.5 times the US and 2 times European nations.

Countries	Industrial	Domestic
Australia	5.6	8.0
United States	4.4	8.5
Sweden	3.4	10.1
UK	6.5	12.5
France	4.9	13.4
Italy	9.4	15.9
Germany	7.2	16.1
Japan	14.6	20.7

Table 3 Comparison of electricity fees by country (1997) US cent/kWh

This is a result of regional monopoly and the comprehensive cost system, in which the profit can be decided in accordance with the electricity cost, and thus is a convenient system for the Japanese electric companies. Currently, liberalization of electricity is being promoted.

All over the world, nuclear energy is becoming less and less popular. Nuclear energy needs enormous amount of capital investment, and no future prospect is yet to be seen regarding disposal of the waste even without accident. Moreover, an irreversible catastrophe could occur if a severe accident happened.



Some European countries have chosen to withdraw from their nuclear policy based on their rational thinking. Due to economic reason, the US has also stopped siting a new nuclear power plant since 1980. On the other hand, Japan has been promoting nuclear power. But now, electric companies are in deep trouble, saying, "Without the government's incentives, we cannot maintain our cooperation with nuclear policy." Until today, the pro-nuclear government and the electric companies have stood "shoulder to shoulder," but now, disagreements are seen on both sides.

The result of the referendum made this kind of contradiction even clearer. In the future, we assume that 2001 would be noted as the year when a shift from nuclear policy was made for the first time.

The future perspective

After the industrial revolution, urbanization progressed all over the world. In the case of Japan, it started since 1867, the year of the Meiji Restoration, and the move became all the more rampant after WW II. Urbanization brought overpopulation in big cities, and depopulation in agricultural and fishing villages, which made both cities and villages run-down. In Japan, population in primary industry, such as agriculture, forestry, and fishing diminished, and shifted to the second and tertiary industries. We can say that since that time, urbanization has been a worldwide trend which has promoted the division of labor to achieve higher efficiency.

In the old days, large-scale electricity generation systems and long-distant distant transmission were considered effective and thus they were promoted. The typical example of this was nuclear power stations. The efficiency of nuclear energy (conversion of heat energy to electric energy) is only one third. The loss of electricity through long distant transmission is almost 10%. Thus, the energy that can actually be used at consumers' locations is only 30% of the initial amount at source.

On the other hand, decentralized small-scale generating systems, such as fuel cells or micro gas turbines, generate electricity at consumers' locations and provide hot water along with electricity. Thus, the efficiency of these energy forms is said to be between 70 and 80%. It is quite obvious that, regardless of this social system, more efficient systems will be selected in the future.

In addition, small-scale decentralized system will not only affect the electricity generation system, but also the social system as a whole. It will realize the society where diverse culture and values are recognized to each other while maintaining the self-sufficiency of many regions, independent from other regions. I consider this kind of society should be the framework for the 21st century.

The referendum in Kariwa village, with only 5000 people, became the turning point in Japan's nuclear policy. Even the state can no longer ignore the will of the villagers. In this regard, the meaning of the referendum was more than we had expected.

It was at the end of 19 century, approximately 100 years ago, when the principle of atomic energy was found. It has been half a century since atomic bombs were dropped on Hiroshima and Nagasaki. Currently, atomic energy has spread all over the world, with the issues of waste disposal and control remaining unsolved. I consider that the choice of nuclear energy as an industry was a wrong decision by human beings in the 20th century. The nuclear industry is a negative legacy, which burdens us with worries about catastrophic accidents, occupational exposure and genetic damage during the whole process of the nuclear fuel cycle from uranium mining to disposal of high-level waste which will have to be overseen for many centuries to come. I believe that in a future history book, nuclear energy will be noted as a foolish technology chosen by the people living in advanced societies in the latter half of the 20th century.



Postscript: Earthquakes and nuclear power plants

80% of the world earthquake energy is concentrated on the Circum-Pacific Earthquake Belt, and 20% on the Himaraya Mediterranean Earthquake Belt. 15% of the world earthquake energy is released under the Japanese archipelago, whose land and surrounding are less than 0.1% of the world's entire area. The seismic activities in and around the Japanese archipelago have been going through alternate active and inactive periods. But since the Great Hanshin Earthquake in 1995, it is said that Japan has now entered a seismically active period. Currently, there are 53 operating nuclear power plants in Japan.

There has never been a case in the world in which a gigantic earthquake has hit a nuclear power plant.

Even without any terrorist attacks, a catastrophic disaster caused by destruction of a nuclear power plant in a great earthquake is highly probable. The whole world has to think seriously about the nuclear plants built on seismically active belts.

In March, a lawsuit was filed seeking an injunction on the operation of the Hamaoka nuclear power plants, which are located directly in the area where the Great Tokai Earthquake is expected to occur.

History of Nuclear Technologies

- 1895 Roentgen discovered X-rays
- 1898 Madam Curie discovered radium
- 1903 Rutherford established the theory of decaying radioactive elements
- 1905 Einstein established the Special Theory of Relativity
- 1938 Hahn and Strassman discovered uranium nuclear fission
- 1942 Fermi created a nuclear fission chain reaction
- 1945 A-bomb were dropped on Hiroshima and Nagasaki
- 1953 US President Eisenhower advocated "Atoms for Peace" at the United Nations
- 1966 Tokai nuclear power plant (GCR 166MW) commenced operation
- 1969 Tokyo Electric announced its plan for Kashiwazaki-Kariwa nuclear power plants
- 1970 Tsuruga nuclear power plant (357 MW) commenced operation
- 1979 Accident at US Three-Mile Island nuclear power plant 2
- 1985 Tokyo Electric commenced the operation of Kashiwazaki-Kariwa 1.
- 1986 Accident at Chernobyl nuclear power plant 4 in former Soviet Union
- 1995 Sodium fire accident at Monju
- 1996 Maki town in Nigata had a referendum on siting nuclear power plant
- 1997 Tokyo electric commenced its operation of Kashiwazaki-Kariwa 7
- 1999 JCO criticality accident in Tokaimura
- 2001 Referenda took place in Kariwa on the Pluthermal plan and in Miyama on the siting of a nuclear power plant

Claims for referenda in Japan

A result of a referendum regarding nuclear policy is not legally binding. Yet, the mayors of the municipality should take the result into consideration. The following are the results of claims submitted to municipalities, seeking an ordinance for implementing a referendum related to nuclear policy.



Rethinking Nuclear Energy and Democracy after 09/11
April 26/27 2002
A symposium organized by PSR/IPPNW/Switzerland



Date of claim	Municipalities	Issues	Result	Date of Referendum
May 85	Aomori prefecture	Siting of a nuclear fuel cycle facility	Dismissed	
June 85	Kisei town(Mie)	Advance environmental assessment for siting Ashihama nuclear power plant	Dismissed	
May 86	Togi town(Ishikawa)	Siting of Shika nuclear power plant	Dismissed	
Sep. 90	Tomioka town(Fukushima)	Resumption of Fukushima II-3's operation	Dismissed	
Feb. 93	Nanto town(Mie)	Siting of nuclear power plant(Revised on 95.3)	Passed	
Oct. 93	Kushima city(Miyazaki)	Siting of a nuclear power plant(Revised on 95.9)	Passed	
Dec. 93	Tsuruga(Fukui)	Construction of a new nuclear power plant	Dismissed	
Dec. 93	Rokkasho(Aomori)	Receiving high level waste	Dismissed	
March 95	Nanto town(Mie)	Advance environmental assessment for siting a nuclear power plant	Passed	
June 95	Maki toen(Niigata)	Siting of a nuclear power plant(Revised on 95.10)	Passed	08/96
Dec. 95	Kisei town(Mie)	Siting of a nuclear power plant	Passed	
Dec. 99	Takahama town(Fukui)	Loading of MOX	Dismissed	
March. 01	Kariwa village(Niigata)	Loading of MOX	Passed	05/01
Aug. 01	Miyama town(Mie)	Siting of a nuclear power plant	Passed	11/01