This is a translation of the Introduction (pp.4-18) of the 113-page report of the Citizens' Commission on Nuclear Energy (CCNE), ***Our Path to a Nuclear-Free Japan: an Interim Report*** (original in Japanese; October 2013). The report has four chapters following the Introduction. An executive summary in English (12 pages), covering the main points of all the chapters, is separately available from the CCNE website: www.ccnejapan.com. (The English page button is on the top right.)

*Our path to a nuclear-free Japan*

# Introduction

The Citizens' Commission on Nuclear Energy (CCNE) aims to nourish and reshape public opinion on the critical issue of nuclear power generation. The following document—*Our Path to a Nuclear-Free Japan*—is an interim report providing a 'first-cut' at key questions to be more fully examined in a final report—*Policy Outlines for a Nuclear Phaseout*—scheduled for publication in March 2014. While the final report will aim for a comprehensive account of all of the issues involved in phasing out nuclear power in Japan, the interim report summarizes the key issues and the results of discussion and research up to the present. Although shorter in length, we are confident that the following provides a powerful statement on the direction in which the CCNE aims to push nuclear energy policy.

We expect this report to mark a milestone in the advancement of our work and serve as a catalyst for generating opinions and comments from experts and concerned citizens within Japan and abroad. We kindly ask all readers of this document to freely and unreservedly provide feedback and opinions on the issues discussed. In addition, since we provide ample opportunities for open dialogue and interactive discussion, we kindly ask for your participation. Your feedback on this interim report, and active participation in the discussion it generates, are essential to both the successful completion of the final report and the achievement of the goals contained therein.

## 0.1 The severity of the Fukushima disaster: ten characteristics of the Fukushima nuclear accident.

When the Great East Japan Earthquake struck at 2:46 p.m. on March 11, 2011 the nuclear power plants along Japan's northeastern coastline were swept into crisis. At Fukushima

Daiichi, reactor units 1, 2 and 3 released large amounts of radioactivity from their reactor cores, while the structure housing reactor unit 4 was severely damaged.

This accident has been evaluated at Level 7, a 'severe accident', on the International Nuclear Event Scale (INES). Large amounts of radioactivity were released across not only Fukushima Prefecture but a much wider region. Hundreds of thousands of individuals were exposed to high concentrations of radioactivity and risk of radiation exposure. Yet even today, two and a half years after the initial event and the subsiding of fission reactions, the reactors continue to emit radioactivity into the atmosphere and sea.

The Fukushima nuclear accident has caused tremendous damage. Yet not only are the harmful impacts of this accident continuing, they can be expected to continue into the foreseeable future. The damage and harmful impacts of the Fukushima nuclear accident are summarized below as ten points that each captures a defining characteristic of the event and its aftermath. These ten points describe not only the specific characteristics of the damage inflicted by this accident, but also the causes and processes that served to bring about the unprecedented damage of this nuclear disaster.

(1) Seismic-nuclear disaster – a complex disaster became a reality.

(2) Multiple reactor unit explosions resulted in widespread and severe radioactive contamination.

(3) Many nuclear accident-related deaths occurred.

(4) A large number of people are exposed to radiation and burdened with health risks.

(5) Inland areas suffer serious radioactive contamination.

(6) The marine environment suffers serious and expanding radioactive contamination.

(7) Stabilisation of the reactor heat and radioactive emission is not on the horizon.

(8) Stabilisation of the accident requires a large number of workers who are inevitably exposed to radiation.

(9) Financial losses alone are totalling hundreds of billions of dollars.

(10) Various forms of social conflict and division have arisen.

### *0.1.1 Seismic-nuclear disaster – a complex disaster became a reality*

The first defining characteristic of the Fukushima nuclear accident is that an interlinked seismo-nuclear event led to a complex disaster. That is, the initial earthquake and

subsequent tsunami were quickly followed by, and overlapped with, the emission of radioactivity from the reactors at Daiichi and these intertwined events created a synergistic disaster that devastated Fukushima and the Pacific coast of Japan. Resultantly, many among those able to survive the earthquake and tsunami lost their lives while enduring the hardships of evacuation and refugee life, or were stricken with added misery by the nuclear accident that followed the initial seismic event. For example, efforts to rescue victims of the tsunami along the Ukedo coast in Namie Town were rendered impossible by the nuclear accident and individuals unable to evacuate on their own are thought to have been left to die as a result. At the same time, damage to the facilities of the nuclear power plant and the infrastructure of the region caused by the earthquake and tsunami resulted in serious roadblocks for efforts to stabilize the nuclear disaster.

Around 10% of all earthquakes in the world occur in Japan and an earthquake of magnitude 7 can potentially strike at any spot on this tectonically unstable island chain. All of the nuclear power plants in Japan have been constructed in coastal areas and this uneven spatial distribution places nearly all of them in the path of potential tsunamis. It is thus fair to say that no nuclear power plant in Japan is safe from a seismic-nuclear disaster.

### *0.1.2 Multiple reactor explosions resulted in widespread radioactive contamination*

The second defining characteristic of the Fukushima nuclear disaster is that multiple explosions at reactor units resulted in widespread and serious radioactive contamination. Indeed, it has now become widely accepted that, in the worst-case scenario, there was a serious possibility of being forced to evacuate all of northeastern Honshu.

In the case of the Fukushima nuclear accident, multiple nuclear reactors were incapacitated at the same time. These accidents were not isolated but rather completely and complexly intertwined. For example, reactor number 2 was brought into a state of crisis because efforts to shut down the reactor were slowed as a result of damage to the lines for injecting core cooling water and those for containment vents caused by explosions at reactor units 1 and 3. As a result of these accidents at multiple reactors, plant technicians could not focus their efforts on any single reactor and crisis management was rendered nearly impossible. What the Fukushima nuclear accident thoroughly exposed was the extreme difficulty of dealing with multiple simultaneous nuclear reactor accidents.

In addition, a second nuclear power plant is located only 12 kilometers from the Fukushima Daiichi nuclear power plant and there was grave potential for the accident at

Daiichi to spread like a chain reaction to this second reactor site. Thus the Fukushima nuclear accident has also brought to light the serious risks involved with placing nuclear power plants in close proximity.

Finally, the Fukushima accident made it plainly evident that coolant loss accidents at spent nuclear fuel pools could certainly occur and that placing these pools above reactors presents serious risk.

The habitable land area of Japan is limited and human settlement is dense and highly concentrated. The Fukushima nuclear accident established that, in comparison with more sparsely populated regions, a nuclear accident in densely populated areas would be catastrophic.

### *0.1.3 Many nuclear accident-related deaths occurred*

The third defining characteristic of this disaster is that it has claimed numerous lives. While direct deaths by acute radiation exposure have not been documented, the multiple nuclear accidents at Fukushima Daiichi have resulted in indirect nuclear accident-related deaths. Although these nuclear accident-related deaths have not drawn as much attention as at Chernobyl, they must become an issue of top priority for nuclear accident disaster prevention in the future.

Most distressing is the case of Futaba Hospital and the attached elderly care facility of Deauville Futaba in Okuma Town. Here many patients and residents were abandoned due to exhaustion and over 50 individuals eventually lost their lives due to exhaustion suffered during their confinement.

It has also been reported that residents who lost their home or livelihood have committed suicide and there are instances in which these untimely deaths have been followed by compensation claims against TEPCO by the families of the deceased. When these deaths are added to the total number of individuals indirectly killed in Fukushima Prefecture by disaster related events, the toll rises to 1,648, and it is clear that a substantial portion of these deaths can be attributed to the nuclear accident.

In addition, plant workers struggling to deal with the aftermath of the nuclear accident must wear cumbersome protective clothing and full-face masks while working long hours under harsh conditions and cases of heart failure and heat stroke leading to deaths at the plant have been reported.

### *0.1.4 Many individuals are being exposed to radiation and experiencing health effects*

The fourth defining characteristic of this disaster is that a large number of individuals have been exposed to radiation and are now at greater risk of health complications. The radioactivity emitted from the reactors gave many people a dose of radiation. Regardless of the specific amount of radioactive exposure, this is a harmful act and the perpetrators must, first, take responsibility for derailing the lives of their victims and, second, take adequate measures to ensure that victims lives are returned to the conditions they desire.

Among the many victims of this tragedy, there is a particular need to attend to the residents of the areas around the nuclear plant who have suffered serious health complications. However, there is no reliable data concerning the degree of radiation exposure actually received by local residents. In particular, data for the period immediately after the accident, the time when the greatest number of exposure occured, is extremely limited. Late onset disorders caused by trace amounts of radiation such as cancer and leukemia are expected to increase. Already as of August 2013 a health survey conducted in Fukushima Prefecture reported 43 cases of thyroid cancer. It cannot be proven that these cases are unrelated to the Fukushima nuclear accident, and the possibility of increases in various other diseases cannot be excluded. While it is not known whether radioactive exposure can directly affect the health of the heart, it is likely that indirect effects on this vital organ are even greater. The harmful and overlapping impacts of the earthquake, tsunami and nuclear accident—for example losing one's family to the tsunami and also losing one's home and livelihood to the nuclear accident—is obviously an enormous psychological blow.

### *0.1.5 Inland areas suffer serious radioactive contamination*

The fifth defining characteristic of this disaster is that radioactivity was emitted across a wide area that has become unsuitable for long term residence and, including voluntary refugees, there are now hundreds of thousands forced into long term residence at evacuation shelters under refugee conditions. Indeed we are faced with a situation where many people will never see the day when they can safely return home. Many families have been forced to live apart from one another. Along with losing the lives they built for themselves, evacuees are now unable to realize their long cherished goals and dreams. More than a few of the towns and villages around the Fukushima Daiichi nuclear plant have been forced to move their municipal facilities to other locations.

Not only are people who have chosen to remain in these areas faced with potential radioactivity, but they are also faced with far from ideal living, work and educational opportunities. Since the land, river and marine environments of the area have been radioactively contaminated, agriculture, forestry and fishing industries have been decimated.

In addition to people, animals—cattle, pets, wild flora and fauna—of the disaster area have also been severely impacted. Not only have the agricultural, forest and livestock resources of the area been contaminated, but also the very fields, forests and grasslands that nurture these resources have been lost to radioactive contamination. Former agricultural lands are gradually reverting to wilderness and the ecology of the area is undergoing an unprecedented transformation.

### *0.1.6 The marine environment suffers serious and expanding radioactive contamination*

The sixth defining characteristic of the Fukushima nuclear accident is that radioactive contamination has not only affected the land but also the marine environment of the area. This was not true of the Chernobyl nuclear accident. Beginning with the detonation of hydrogen bombs by the American military near the Marshall Islands, radioactive contamination of the oceans for military purposes has frequently occurred. However, radioactive contamination of the oceans from civil sources is rare. Due to seasonal weather patterns, most of the radioactivity from the Fukushima accident was transported over the Pacific Ocean resulting in marine pollution. Moreover, contaminated water released from the bottom of the melted-through reactor has flowed into the Pacific to further pollute the marine environment, and these flows are expected to continue. Finally, in July of 2013, contaminated water, which leaked from the reactor into the groundwater, flowed to the sea. Even worse is the fact that tanks of contaminated water within the nuclear power plant site are leaking. This discovery had a major impact on people both in Japan and around the world. Yet a reliable method for stopping the flow of this contaminated water into the sea is yet to be found.

### *0.1.7 Stabilisation of the situation is not on the horizon*

The seventh defining characteristic of the Fukushima disaster is that even now, two and a half years after the initial event, stabilization of the situation is not on the horizon. A nuclear disaster entails large amounts of radioactivity being emitted as heat and radiation over a long period. Said differently, “nuclear fire” is a fire that cannot be easily extinguished. Accordingly, if the nuclear facilities and reactors that caused the accident are not continually cooled, then there is a possibility of re-criticality. Even if radioactivity

leakages from the reactor can be stopped, there remains a long-term risk of repeated radioactivity releases from the reactor facilities to the surrounding environment. Thus a nuclear disaster, when compared with other disasters, has characteristics that make it unique. The accident cannot be said to have been resolved when the risk of re-criticality has become negligible, but only when the risk of further release of radioactivity from the reactor facilities has been eradicated.

### *0.1.8 Stabilisation of the accident requires a large number of workers who are inevitably exposed to radiation*

The eighth defining characteristic of the Fukushima nuclear disaster is that workers at the Daiichi plant and disaster management personnel have been exposed to large doses of radiation and this situation continues unabated today. The Fukushima nuclear accident was early on declared an 'exceptional case' and protective standards for workers dealing with stabilising the plant were relaxed. Immediately following the accident the dose limit for workers was raised to 250 millisievert. After November 2011, when the dose regulation was normalised, workers engaging in "emergency operations" are allowed a maximum dose of 100 millisievert. However, even under these permissive dose regulations, incidents occurring on the ground suggest that these standards are not being observed properly.

Moreover, in the case of the emergency management period immediately after the incident, it was not only the threat of radiation exposure, but also the special protective clothing and full-face masks worn for long hours, particularly in the summer heat, that resulted in grueling and dangerous labor for the workers. Considering the extremely demanding and dangerous labor these workers endured, it is clear that they should, first, have the right to voluntarily decide whether to engage in this work and, second, be guaranteed adequate treatment and health care. Yet these rights and services have not been afforded. What is of critical importance is that we be vigilant in demanding that the many workers engaged in stabilising the plant over the following decades are adequately protected.

### *0.1.9 Financial losses alone are totaling hundreds of billions of dollars*

The ninth defining characteristic of the Fukushima nuclear accident is that it has resulted in the loss of hundreds of billions of dollars. When compared with forecasts of the largest hypothetical nuclear disasters (i.e. an event in which most of the nuclear material at a plant is explosively emitted) Fukushima was clearly a much smaller event. Indeed, while

compared with the Chernobyl accident of 1986 the Fukushima accident only released a fraction of the radioactivity, the costs of the Fukushima accident have been astronomical.

The majority of expenses related to the accident are for repairs and damages. However, since it is impossible for TEPCO to cover these costs, the taxpayers of Japan are to be burdened with these costs for the very long term. The majority of these expenses will be inherited by today's youth and generations of not yet born.

However, even if trillions of yen are paid for reparations and damages, this will only cover a portion of the total damages. It appears probable that, rather than being dismantled and disposed of, the Fukushima reactors will be sealed off as best as possible. However, this means that decontamination of the affected areas is likely to be insufficient. Moreover, it must be noted that there is a possibility that, amidst the government's financial crisis and subsequent cost cutting measures, funding for repairs and damages will be cut off at an insufficient and halfway level. The passive stance of the government towards victims (see 1.2.1, 1.6) represents a foreshadowing of the above scenario.

### *0.1.10 Various forms of social conflicts and divisions have arisen*

The tenth defining characteristic of the Fukushima disaster is that radioactive contamination has caused various social conflicts and divisions. Immediately after the disaster, families were forced to decide whether or not to evacuate. That is, they were faced with deciding whether to prioritize family or livelihood, leading to serious conflict and internal tensions within families. In addition, individuals, neighbors and different generations held very different views of evacuation, leading to a worsening of interpersonal relations. Since mothers with young children often sought to evacuate, families have frequently been divided. While local government officials have struggled with handling the disaster, they have also been faced with the dissatisfaction of local residents and significant tensions have formed between residents and local government. While many evacuees received a warm reception upon arrival in other prefectures, there have been cases of discrimination towards evacuees. This creates new anguishes and anxieties. While some people continue to live in the affected areas, many young people fear future stigmatization. During the chaotic period after the initial accident, distribution channels for agricultural and industrial products from Fukushima were shut off and even now these channels have not been fully restored.

The central government and local administrative bodies are encouraging residents to remain in the affected areas. Moreover, in areas that were deemed uninhabitable after the initial accident due to radioactive contamination, the government is encouraging

residents to wait until radiation levels have lowered and then return home. As planning for reconstruction of the affected areas continues, various conflicts have arisen among residents and between residents and government officials over various issues, such as decontamination and disposal, returning or not returning to affected areas and the amount of damages to be paid. Not only the local government, but the very local community itself appears to be on the verge of collapse. Although it is known from other cases that strained social relations amplify the impacts of a disaster, in the case of a nuclear disaster divisions are created between the local people and the very local place itself.

As the above amply demonstrates, this seismic-nuclear disaster is wide-ranging and complex. Chapter one of this interim report deals with the question of what is necessary to restore the daily life of the people in the affected areas.

## 0.2 The case for a nuclear-free society

### *0.2.1 The drawbacks of nuclear energy*

Nuclear energy was introduced into Japan under the assumption that the state would both provide support for this fledgling industry and intensely scrutinize it to ensure safety. For power companies this was a golden opportunity to receive state support while pursuing private gain. However, as outlined below, from both an economic and an operations perspective such a system has crucial shortcomings.

1) In the case of a severe nuclear accident it is impossible for a private power company, or even a wealthy sovereign state, to cover the astronomical costs of cleanup and compensation.
2) Treatment and disposal of nuclear waste is highly problematic and the actual costs of the nuclear fuel cycle, dismantling reactors, and removal and decontamination are unknown and dramatically underestimated.
3) Nuclear power is highly vulnerable to natural disasters and potential terrorist attacks.
4) When plant and equipment costs are included in normal operating costs, nuclear power is more costly than either gas or coal fired thermal power generation. Moreover, investments in nuclear power plant and equipment are high risk.
5) Power companies must respect the demands of multiple stakeholders and their business management practices are thus severely constrained.

Following its initial development in the 1950s nuclear power generation came to be seen as having high potential for the future. Individuals and organizations promoted nuclear power as a sure bet for producing an abundant energy supply at extremely low costs and the industry began to draw in considerable capital investment. By the 1980s nuclear power had become an essential source of energy generation. It cannot be denied that the development of nuclear energy played an important role in the continued socio-economic development of Japan after the culmination of its high growth period in the early 1970s.

When considering the context in which nuclear power generation expanded in Japan it is clear that political motivations such as securing diplomatic prestige and security were important. For advanced industrial countries nuclear energy became a techno-economic fetish that both fueled and symbolized modern progress. For Japan, a country that lacks its own arsenal of nuclear weapons, the endorsement of its domestic nuclear energy program (even including the sensitive technologies of uranium enrichment, reprocessing and fast breeder-reactors) by the US and the international community was a privilege that symbolized the nation's re-arrival on the international scene. Thus there was a very strong political motivation for closely promoting and protecting nuclear energy.

As noted above, however, nuclear power was a high-risk venture for power companies and the state. Finally, with the passage of time, it became clear that the future hopes and dreams pinned on nuclear power had been far in excess of its real potential. Yet since vested interests—the so-called 'nuclear village'—became more and more entrenched, it became increasingly and paradoxically difficult to choose any alternative.

The Fukushima nuclear disaster represents the culmination of an energy pathway forged over many years. It is this event that must serve as the occasion for shifting toward an alternative path, one leading to a nuclear-free society.

### *0.2.2 Policy formation based on comprehensive comparative evaluation of policy options*

The policy formation method of evaluating and comparing policy options has not been adopted as a tool for decision-making regarding Japanese nuclear energy policy. This methodology uses various evaluation criteria—including supply stability, economic efficiency, safety, environmental conservation etc—to comprehensively evaluate each policy option before finally formulating a preferred policy.

In the case of nuclear power policy, options include 1) adhering to existing safety and support policies 2) elimination of protection and support policies and 3) and abolishment of nuclear power through legislation.

When taking into consideration the serious drawbacks of nuclear power discussed earlier in this chapter, and the fact that the Fukushima nuclear disaster has decisively proved that the alleged economic efficiency, environmental protection and stable supply merits of nuclear power relative to other energy sources were not based on reality, it is clear that Japanese society must choose the third option, the abolishment of nuclear power through legislation. While it seems possible that the second option—elimination of protection and support policies—may be aggressively pushed through in tandem with other neoliberal reforms, it is important to remember that this policy option would encounter stiff opposition from the many stakeholders dependent on government support for nuclear power. In contrast to the confusion that would follow such a neoliberal policy shift, it is clear that an orderly withdrawal from nuclear power is necessary for avoiding social conflict. Abolishing nuclear power in the short term may also benefit power companies, releasing them from the exorbitantly high risks of nuclear power generation, but only if the costs of early phaseout are somehow subsidised or compensated.

### *0.2.3 The need to evaluate the electricity supply and demand pressures*

Selecting abolishment as the preferred policy option for nuclear power entails examining whether this option would create a less robust and higher-risk power supply. This is a question of whether or not the abolishment of nuclear power would result in power shortages and energy crisis. To answer this question we must consider an array of factors, including expected changes in future energy demand, the potential for energy saving measures by consumers to lessen demand, the degree to which thermal power generation can be increased and, finally, how all of these changes would affect power companies and society at large. Answering these questions requires ample data and lengthy analysis.

### *0.2.4 Increased cost due to early decommissioning*

It is also extremely important to evaluate the potential effect of each alternative on energy prices. The defining characteristic of nuclear power generation is that the upfront costs of construction are high and fuel costs are low. After paying the high costs of initial construction, and as long as plant and equipment are running smoothly, reactors will provide power companies with an abundant supply of power for minimal running costs: a blueprint for profitability. Accordingly, power companies aim to keep reactors in service as long as possible.

As of spring 2012, nearly all of Japan's nuclear reactors were out of commission and thermal power generation was increased to cover energy shortages. How much did prices

increase during this period? Did they indeed increase? On the other hand, did cost savings result from the shutting down of the costly nuclear fuel cycle? Looking ahead, how much will it cost to implement adequate policies for ensuring the safe restart of currently out of commission reactors? How much will energy saving measures, increased use of renewable energy and the natural decline of energy use in this ageing and post-industrial society allow thermal power production to be steadily decreased? And, finally, what will be the overall costs of abolishing nuclear power? In order to achieve either immediate or early abolition of nuclear power, it is imperative to first consider any burdens that such action would have on the public. Then, if the public remains committed to pursuing abolishment, there is a need for political action in line with their wishes and demands.

### *0.2.5 A nuclear-free society is possible*

In the late 2000s nuclear energy accounted for around 10% of Japan's total supply of primary energy and this significantly decreased after the Fukushima nuclear accident. Considering the small percentage of total energy needs derived from nuclear energy, it is clear that the abolishment of nuclear power will not be overly challenging.

It is expected that energy consumption in Japan will decline in the future. There are several factors behind this expected decrease, including population decline, the decline of manufacturing and energy intensive industries, decreased consumption due to rising fossil fuel prices, and decreased household income (not national income). It can be expected that within decades the decrease in total energy consumption due to the above causes will be equal to the total amount of power presently derived from nuclear energy. In the late 1960s, many Japanese began to criticize the long postwar economic boom and slogans such as "Down with GNP" could even be seen on the pages of the nation's newspapers. Such criticism of the high growth economy of the postwar period remains a central pillar in the ecology movement. Yet, although such thinking was revolutionary and remains important, Japan is now entering a brave new world, an era in which energy consumption is expected to decline without protest. Certainly this calls for rethinking our approach to energy production.

### *0.2.6 Towards energy democracy*

There is also considerable potential for expanding both energy efficiency and renewable energy, and both are of extreme importance for Japanese society. Pursuing energy efficiency and renewable energy will not only quicken the abolishment of nuclear power, but simultaneously lessen our use of, and dependency on, fossil fuels. When looking at the advancement of energy efficiency and the expansion of renewable energy from a civic-

democratic perspective, it is clear that such trends will foster a sense of empowerment and self-determination by placing energy production and consumption decisions within the grasp of the citizenry. This will not only have ramifications for local energy policy, but also increase citizen's sense of ownership over state energy policy. The increasingly popular slogan of 'from large scale concentrated to small scale decentralized' is not about technological tweaking or the silver bullet of a technological fix. It is about transforming the citizen's role in decision-making on energy issues. It is about democratizing energy.

Faced with the results of nuclear power generation, and in particular the severity of the damage caused by the Fukushima seismic-nuclear accident, it is clearly necessary to advance towards a nuclear-free future. Yet it remains necessary to deal appropriately with the various complex problems related to radioactive waste and decommissioning. These problems and their resolutions will be examined in chapter 2. That chapter also questions how to resolve issues such as securing alternative energy and the economic issues of energy conversion. Chapter 3 examines how to deal with the various issues entailed with that process.

In contrast to the views presented here, there will be people and organizations committed to the continuing operation of nuclear power plants. These organizations and individuals assert that strengthening regulations will allow for Japan to safely rely on nuclear energy in the future. However, it must be questioned whether the continued operation of nuclear power plants can actually be safe and, in particular, whether the new principles laid out in June 2013 are actually adequate and appropriate. These questions concerning regulation will be examined in chapter 4.

## 0.3 Creating the political conditions for a nuclear phaseout

### *0.3.1 The Political conditions required for advancing a nuclear phaseout*

To realize a nuclear-free society—a society in which every nuclear plant has been decommissioned and the burdensome legacy of nuclear energy is wisely managed—it is only the voice of the people that can bring about real change. This document is merely a report compiled by concerned citizens. It goes without saying that it does not have the power to single-handedly effect changes in national nuclear energy policy. Yet this document can serve as both a foundational statement on the perils of nuclear power and as a roadmap for advancing towards its abolishment. We are firmly convinced that the majority of the Japanese people are already in favor of a nuclear-free society. However, the joining together of this silent majority and the construction of consensus on concrete

nuclear phaseout policies is still a work in progress. To transform national policies on nuclear energy, we must be committed to producing proposals that will best serve the people of Japan and the world. In this regard, we can learn from the experience of Germany, where one pathway to a nuclear-free society has already been forged.

The last of Germany's nuclear power plants began operations in 1989. In the year 2000, the coalition government of the Social Democrats and Green Party enacted the 'Nuclear Exit Law' which placed a cap on the future energy generation of all nuclear power plants with the goal of phasing out nuclear power by 2020. Although the government of Prime Minister Merkel enacted a law extending the life span of the country's nuclear power plants, these plans were quickly reversed after the Fukushima disaster. Following on the recommendations of a report by the Ethics Commission on a Safe Energy Supply, the Merkel administration made a cabinet decision to decommission all nuclear reactors by 2022 and this was immediately enacted. This action gave tremendous hope to people around the globe seeking a nuclear-free world. While we continue to draw lessons from Germany's efforts to move towards a non-nuclear future, it is imperative that we develop our own original proposals for a nuclear-free Japan.

In Japan the key political conditions for achieving nuclear phaseout are: 1) the formation of a political regime determined to seek a nuclear-free future, 2) the formation by that regime of a majority in both houses of the Diet, 3) the holding of power for consecutive terms and 4) tenacious adherence to nuclear phaseout oriented policies.

The coalition government of the Democratic Party finally began to express an anti-nuclear energy stance near the end of its time in power, but it turned over the reigns of government to the Liberal Democratic Party without having laid out any concrete policies for achieving a nuclear phaseout. Now the regime of the Liberal Democratic Party under Prime Minister Shinzo Abe is treating the 'Innovative Strategy for Energy and the Environment', issued by the Democratic Party administration, as if it did not exist and, moreover, is showing a highly favorable attitude to the reopening of existing plants and the export of nuclear power plants.

Faced with these bleak political prospects, unfortunate though it be, perhaps our nuclear phaseout policy proposals will be ignored, and only policies acceptable to the current administration will be taken up and, even then, only in a piecemeal fashion. However, we are not pessimistic about the future. A nuclear phaseout cannot be achieved in a short period. In Germany, it took 11 years with much toing and froing. Similar progress will be unavoidable in Japan. A nuclear power phaseout will inevitably cause some pain. Even after we agree to abolish nuclear facilities, we will still have to continue to pay for

redressing the negative legacy of nuclear power for a very long time. Nevertheless, by initiating a path towards a nuclear phaseout, we will be able to hand over a better future to our descendants.

### *0.3.2 The three key political obstacles to achieving a nuclear phaseout*

Any future regime aiming to phaseout nuclear power will need to neutralize and overcome the following three key political obstacles.

First is the resistance of special interest groups fully entrenched in the political and administrative structures governing nuclear power in Japan. In particular, the domestic administrative bodies (centered on the Ministry of Economy, Trade and Industry) charged with overseeing the nuclear industrial complex put up strong resistance to change. Even during the time of the Democratic Party of Japan government, although they hesitated for a while under former Prime Minister Naoto Kan who showed firm determination to keep all nuclear plants shut down, they eventually managed to drive him to resign. Then under the administration of Yoshihiko Noda the re-starting of existing reactors and the export of nuclear power plants were promoted, and these policies have only accelerated under the leadership of Prime Minister Abe and the Liberal Democratic Party. For the pro-nuclear forces, the most unfortunate and fearful moment came when the Energy and Environment Council took control of energy policy-making initiatives. Yet this also did not last for long.

The second obstacle to the phasing out of nuclear power is the alliance between Japan and the United States. The United States is keen to see Japan continue to rely on nuclear power for the following reasons. First, nuclear power is big industry in the United States and its powerful backers are very much reliant on the continuing cooperation of Japanese manufacturers. For international expansion in particular the cooperation of the Japanese government is indispensible. Yet nuclear power is not a simple commodity to be merely bought and sold, but also a crucial bargaining chip that affords power to the players able to control its international development. Second, in order for the United States to continue to control international nuclear cooperation in the Asian region, it needs the continuing support of Japan, its ever-faithful diplomatic partner. Another possible reason why the United States does not want Japan to abandon nuclear power is that key people judge that for Japan to maintain the industrial and technological capability to make nuclear weapons is in the United States' security interests in the northeast Asia region.

The third obstacle to the transformation of nuclear energy policies in Japan is resistance from the local governments that host nuclear power plants and nuclear processing

facilities. Since local governments in Japan have an effective right of veto over nuclear plants and nuclear related facilities, these facilities must first acquire local consent before locating in the community. In many cases this local right of veto also allows these communities to refuse decommissioning of nuclear facilities.

#### *0.3.3 The role of Japan in the international community*

Any future political bloc seeking to phaseout nuclear power must confront and overcome the three obstacles outlined above. Overcoming these obstacles is a daunting task, but one made more achievable by the fact that the Fukushima nuclear disaster has impressed upon the people of Japan the severity of a nuclear disaster. Against that background, the people of this country refused the restarting of all existing reactors for over one year, from May 2012 to September 2013. This is an accomplishment that the citizens of Japan can be proud to hold up as an example for other countries. The Japanese government and nuclear operators are quietly attempting to return to the pre-Fukushima status quo. By blocking that attempt and moving toward a nuclear-free future the Japanese people can give courage to the people of the world.

In the long run it can be expected that international civil society will choose to be free from the perils of nuclear energy. As renewable energy technology advances and the disadvantages and ethical compromises of nuclear energy become more widely recognised, the number of countries ceasing to introduce nuclear power will increase. That transformation will usher in a human civilization that is fair, sustainable and not dependent on nuclear power. Along with several European countries, Japan has the potential to lead the world toward a nuclear-free future. That is Japan's political role in the international community.

## 0.4 *Policy Outlines for a Nuclear Phaseout* – process from here to the Final Report

#### *0.4.1 Drafting process*

Since nuclear power generation has tremendous impacts on individuals and society, nuclear power related decisions must be conducted in a way that reflects the consensus and good judgement of the people.

However, decisions on nuclear power policy in Japan have been overwhelmingly influenced by the individuals and organizations directly involved with nuclear power

generation. That is to say, key actors—individual power companies and the Federation of Electric Power Companies of Japan, nuclear reactor and associated equipment manufacturers, construction companies and civil engineers, and the politicians, ministries and academic associations they support—have drawn on their massive economic, political and media capacities to construct the legal framework for nuclear power generation and have championed this cause. In addition the judiciary has also supported nuclear power by refusing to issue court injunctions against the construction of nuclear power plants. However these individuals and organizations directly involved in nuclear power are biased in favor of overestimating the benefits of nuclear power while underestimating its risks and costs. Resultantly, public concern over the risk of accidents, radiation exposure and environmental pollution has been pushed aside in favor of the construction and continued operation of nuclear power plants.

The Fukushima seismic-nuclear disaster clearly illustrates the defects in nuclear policy decision making up till now. It also challenges us to reflect on the structure of nuclear policy decision-making and the way in which public opinion has not been incorporated into policy. For example, two and a half years after the disaster, have the restoration of victim's lives, the management of the health in the contaminated areas, and the compensation of victims been appropriate or adequate? Could the effort to stabilize the Daiichi plant, and in particular the repeated leaks and spills of toxic water, and plans for decommissioning the plant have been improved? For the reform and transformation of energy policies, what type of forums to discuss and debate these issues are necessary? What should be done to move to a nuclear-free future and what should be done about nuclear energy regulations?

In order to more appropriately reflect the consensus and insights of the public and to create more effective structures for addressing problems such as these, the basic requirement is to provide abundant opportunities for discussion of public issues and to stimulate the active formation of public opinion. The central government and the Diet should adopt and enact policies that respect and reflect public opinion formed through deliberation.

After publication of this interim report, the Citizen's Commission on Nuclear Energy will make significant efforts during the coming months to create numerous opportunities to exchange views, promote the formation of public opinion and to ensure that the final report—*Policy Outlines for a Nuclear Phaseout*—will adequately reflect these public discussions.

### *0.4.2 Comprehensive approach*

In order to produce *Policy Outlines for a Nuclear Phaseout* which reflect the consensus and insights of the public, it is necessary for the policy forming process to be comprehensive.

To achieve comprehensiveness it is most important that the constellation of actors for dealing with the nuclear energy issues should be reformed. This means that the views of power companies and the central government should not dominate discussion, but that the views of citizens coming from various standpoints, local government views, and technical standpoints should have equal standing. The views of citizens coming from various standpoints means not only residents of places which enjoy the benefits of nuclear power, but also people from places that have had to bear all sorts of burdens associated with hosting nuclear power plants, from regions which have accepted radioactive waste and, particularly, people suffering as a result of the Fukushima nuclear accident.

Second, it is imperative that each academic discipline aims for comprehensiveness. Not only science and technology, but also the knowledges of humanities and social sciences should be utilized. The use of nuclear power has tremendous impacts and complexities for society and people's lives. For that reason it is without question that we must seek a comprehensive examination based on various disciplines and forms of knowledge. However, the examination of nuclear policy in Japan has prioritized the views of science and technology and the various considerations of nuclear power for society have not been adequately taken into account.

### *0.4.3 Ensuring the autonomy of scientific inquiry*

In constructing an adequate constellation of actors, an indispensable pillar is the proper handling of scientific knowledge. In formulating policies for moving away from nuclear power, it is imperative that policy proposals are supported by analysis based on scientifically accurate assessments and evaluation criteria that are persuasive. For that to happen science must not become the exclusive property of a limited closed circle of experts. Furthermore, the contents of the scientific knowledge presented by experts, as well as their data and rationale, should not be manipulated or distorted by special interests.

In order to create policies based on accurate scientific knowledge, it is important to hold 'science forums' that average citizens can attend. It is also necessary to maintain an awareness of the limits of science. However, within nuclear policy making in Japan, the autonomy of science has been compromised by special interests, the limits of science have

gone unheeded and the safety and dangers of nuclear power have been carelessly and irresponsibly theorized. To formulate appropriate nuclear energy policies, it is imperative to first distinguish between questions science can answer and those that cannot be answered with science alone but must instead be left to public opinion. This requires forums for conducting scientific investigation that ensure autonomy and guard against distortion.

It also requires a number of essential conditions, including establishing forums where researchers from various fields can come together to share and debate, full disclosure of information, citizen based groups to watchdog scientific controversies, and scientists willing to respond to the questions and concerns of citizens.

### *0.4.4 The importance of an ethical perspective in policy making*

Technological and economic rationality have been the main criteria of debate on nuclear policy. However, constructing a comprehensive policy for phasing out nuclear power in the future demands that the following policy evaluation criteria are deemed essential.

1) Safety

When evaluating nuclear power policy, avoiding the health impacts of radiation and environmental pollution should be the top criterion. That is, for all aspects of nuclear power—from construction and operation, to dealing with accidents and decommissioning and managing nuclear waste—the top priority for evaluating policy should be protecting citizens and workers from radiation exposure and protecting the local environment from pollution.

2) Equality

From an ethical point of view, it is desirable for benefits and burdens to be evenly distributed both spatially and temporally across generations. However, in Japan, nuclear power plants and nuclear waste related facilities are located such that the burdens of nuclear power are externalized outside the areas that reap its benefits, thus furthering the uneven distribution of benefits and burdens across time and space. This creates a social structure prone to downplaying the negative consequences of nuclear power and overestimating its safety and benefits. It is imperative to ensure that scientific techniques are not introduced, expanded or continued that force one group of people to shoulder a disproportionate share of risk. In order to achieve equality in the distribution of environmental burdens, we must operate on the principle that those establishing and operating, as well as those benefitting from, nuclear power must bear its costs and risks.

3) Fairness

Fairness means that all stakeholders have opportunities to voice their opinions and the right to influence decision making during the policy formation process, and that information on which decisions are made is fully and transparently disclosed. In addition, it means not over-emphasizing safety from a specific standpoint with public relations campaigns. To ensure the above, it is important to establish various organizations that allow for public discourse to be promoted and for the people's voice to be reflected in policy making decisions. In particular, it is imperative that people who have suffered, or who might suffer, from the negative consequences of nuclear power are afforded adequate rights to voice their views and to influence decisions. To achieve the fair disclosure and sharing of information and fair decision-making procedures, it is essential to ensure safety, equal distribution of benefits and burdens and avoidance of distress.

4) Sustainability

A system of production and consumption that recognizes a finite planet requires moderation and does not permit us to pass the accumulation of pollutants and resource depletion on to future generations. The continued use of a technology such as nuclear power involves tremendous risks that last for thousands of years and put a heavy burden on future generations. It is not acceptable to jeopardize the ability of future generations to pursue life, livelihood and happiness either in Japan or anywhere on this planet. In evaluating the pollution, risk potential and radioactive waste that comes with the use of nuclear power it is imperative to consider the above point.

All of the four criteria above are important from an ethical perspective and, together, these make up what can be referred to as "social reasonability".

From the perspective of social reasonability, we must regard the Fukushima seismic-nuclear disaster as extremely serious. When a severe nuclear accident occurs, there is no upper limit to the negative impacts. As the late Jinzaburo Takagi, renowned nuclear chemist who warned us of the danger and the unethical nature of nuclear power, once put it in his book, *The Era of Giant Accidents* (1989):

> "I refer to these total destruction events that leave life barren as annihilation, but I think that we absolutely cannot let these accidents occur. If I use the concept of probability, we must make the possibility of large disasters sufficiently low, but we must make the possibility of absolute destruction absolutely zero. That is, technologies that leave some of the possibility of annihilation remaining are part of a 'culture of death' and such an option is no option at all."

When considering the dangers of nuclear power, wise judgment is of tremendous importance to achieve safety and sustainability. The meaning of the Fukushima seismic-nuclear disaster is that, despite the efforts of the pro-nuclear supporters to ensure its safety, it has brought annihilation. For a Japanese society that has experienced the pain of not being able to control the dangers of nuclear technology, the prerequisite for securing safety and prosperity in the future must be to choose the path to a nuclear-free society.

*translated by Jay Bolthouse; revised and edited by Philip White and Komei Hosokawa.*