

## Chapter 4

### Findings on Public Acceptance Improvement

#### 4-1. Findings

Why is nuclear power important? Currently, the primary source of energy that global markets demand is fossil fuels (Figure 5-1). Growth in the fossil fuel use is expected to continue in developing countries, giving rise to problems such as air pollution, climate change, and energy crises in countries that do not possess natural resources. On the other hand, the use of nuclear energy offers benefits such as the reduction of greenhouse gas emissions; energy security (OECD, 2007); and economic benefits such as the creation of new businesses, employment, and human resources development (IAEA, 2014a). Hence, nuclear power generation has moved beyond being a means of supplying energy and now fulfils various other

##### 1) Current situation

Those who are opposed to nuclear power assert that it is dangerous, generates radioactive waste, and can be substituted with other forms of energy. In truth, however, the adverse health impacts of nuclear power are comparatively small, and it could be described as the safest means of generating power with low environmental burdens. Nuclear power supplies energy to people in many countries in a stable and economic manner. While the risks related to nuclear power generation should be recognised and managed, the true risks lie not in the use of nuclear power, but in the environmental issues such as air pollution caused by the utilisation of fossil fuels.

important roles.

Figure 5-1: Demand for Oil and Liquids, Natural Gas, and Coal around the World

	2025	2030	2040
<b>Current Policies</b>			
<b>Oil and liquids demand (mb/d)</b>			
North America	22.5	21.8	20.5
Central & South America	6.4	6.7	7.6
Europe	11.8	11.2	10.4
Africa	4.7	5.4	7.0
Middle East	8.8	9.5	11.9
Eurasia	4.3	4.5	4.8
Asia Pacific	36.2	39.5	44.0
OECD	39.9	38.3	35.6
Non-OECD	54.8	60.4	70.5
Bunkers	9.4	10.4	12.8
<b>World oil demand</b>	<b>104.1</b>	<b>109.1</b>	<b>118.8</b>
<b>World biofuels</b>	<b>2.2</b>	<b>2.5</b>	<b>3.2</b>
<b>World liquids demand</b>	<b>106.3</b>	<b>111.7</b>	<b>122.1</b>
<b>Natural gas demand (bcm)</b>			
North America	1 075	1 116	1 229
Central & South America	190	219	303
Europe	635	679	740
Africa	180	221	323
Middle East	586	691	886
Eurasia	596	616	685
Asia Pacific	998	1 161	1 501
OECD	1 826	1 911	2 098
Non-OECD	2 434	2 792	3 568
Bunkers	10	17	38
<b>World</b>	<b>4 270</b>	<b>4 720</b>	<b>5 704</b>
<b>Coal demand (Mtce)</b>			
North America	520	512	501
Central & South America	57	62	70
Europe	430	391	348
Africa	169	189	255
Middle East	7	8	9
Eurasia	229	234	238
Asia Pacific	4 539	4 979	5 786
OECD	1 200	1 152	1 094
Non-OECD	4 751	5 224	6 114
<b>World</b>	<b>5 950</b>	<b>6 375</b>	<b>7 208</b>

bcm = billion cubic meters, mb/d = million barrels per day, Mtoe = million tonnes of oil equivalent, OECD = Organisation for Economic Co-operation and Development.

Source: International Energy Agency, *World Energy Outlook 2017*. Paris: IEA.

## 2) Successful and unsuccessful cases

### 4-2. Factors for success

- The factors for success within a local government body include: increase in employment opportunities for residents, business opportunities for local companies, tax revenue to the local government from employees and workers, and economic contribution to both residents and the local government.
- Factors contributing to successful radioactive waste management as seen in Finland include clarification of accountability for the waste materials by the nuclear power operators, long-term and consistent policies for the management of radioactive waste, stringent safety regulations, and reliable independent safety regulatory authorities (IAEA, 2018).
- With regard to the degree of trust that local residents place in regulatory agencies, in the US, the Nuclear Regulatory Commission conducts public meetings and puts effort into communicating with the local residents (USNRC, 2017). The local residents, in turn, trust the Nuclear Regulatory Commission.
- The situation in the UK is similar to that in the US. Safety reviews for nuclear power are carried out in two phases: design reviews and environmental reviews. During the review phase, regulatory authorities listen to the views of the residents (Government of the UK, 2014).
- In Finland, the citizens place their trust in the high level of expertise of the regulatory agencies.

### Unsuccessful cases

- There is a low level of trust in the Nuclear Regulatory Authority in Japan. There have been cases of prefectures conducting their own safety reviews based on their own set of criteria after approval by the Nuclear Regulatory Authority.
- In India, two factors are key to building trust between the citizens and the government: how efficiently communication is carried out, and how involved citizens are in the policymaking process. In both these areas, the building of trust in India has been inadequate.
- In Japan, the radiation levels that were used as criteria for evacuation in the Fukushima accident were far too conservative. The radiation levels for evacuation criteria in Finland are set higher (less stringent) than in Japan. In the UK, the standard is determined separately for each site, and there is no national standard. It is necessary to consider a diverse range of elements in deciding evacuation zones.

- The US issued an evacuation order during the Three Mile Island accident. This represents a case of failure in the technical sense, as evacuation was carried out even though the radiation levels were lower than the established standard for evacuation. As demonstrated by the cases of Japan and the US, when the government panics and takes a wrong step, the residents will become even more panicked, which in turn strengthens their negative responses to nuclear power.

### 3) Possible countermeasures

- It is vital to recognise that an information asymmetry exists, and to ensure that anyone who wishes to obtain information can obtain it accurately.
- Some facts are revealed for the first time during an accident, and these should be spread worldwide and the countermeasures feedbacked to mitigate risks. Since the accidents at Chernobyl and Three Mile Island, the safety of nuclear power plants has improved through the implementation of various measures, making it less likely that the mistakes will be repeated. In the US, the Institute of Nuclear Power Operations shares information and carries out benchmarking activities, while the power plants co-operate with each other to improve safety. Such information and efforts should be disseminated not only within each country but also internationally. Use of accident databases to show such activity is helpful for enhancing transparency toward the public.
- In Japan, construction costs are rising as the industry reflects on its experience of severe accidents. Although Japan has taken measures against risks since the Fukushima accident, such as strengthening the probabilistic risk assessment system by studying its use in the US, it is not possible to reduce the level of risk to zero. The Government of Japan aims to improve safety as far as possible and achieve the highest level of safety in the world, but it faces difficulties in doing so because of the financial implications. It is necessary to explain the need to optimise the balance between safety measures and cost.
- Nuclear power plant safety levels must improve continuously and constantly. To convey this attitude to the public, relationships of trust must be built. It is of course important for nuclear power plants to be safe, but this is not enough. Misunderstandings and scepticism may rise amongst residents if communication begins with the pre-concluded arguments and technological theories. Communication in the field of nuclear power is extremely difficult and continuous efforts are needed to improve it.
- For consensus building at different levels, trust in the regulatory authorities and the local

government leadership is important. The political considerations that tend to infiltrate key messages must be eliminated to gain the residents' trust and to disseminate a message that conforms to realistic and practical needs.

- The perspective of cost should be incorporated in discussions. When purchasing power from a power producer, consumers can choose from various options including nuclear power and renewable energy. It should be explained that charges are lower when electricity is generated from nuclear power.
- In the US, schools offer lessons to give students a factual understanding of radioactivity and an explanation of emergency plans. It is important to strike a balance between these two aspects when delivering education on nuclear power.
- When describing the safety culture of nuclear power plants, it is important to take responsibility for ensuring the transparency and accuracy of the content delivered.

#### 4) Challenges

- While residents stand to benefit from nuclear power, how should we explain to the public that other areas that do not receive direct benefits may face a degree of risk? The direct benefits of nuclear power reach only as far as the local community. It is not realistic to provide sufficient compensation to all assumed risk. It is important to considerate the dimensions of the estimated risks.
- In Fukushima, people are still unable to leave temporary homes and return to their hometowns. This could risk the collapse of the communities that the people originally belonged to.

### **3-1. Policy recommendations**

#### 1) Points to note about communication

Currently, communication about nuclear power often focuses on the technological aspects. To gain trust, communication must have integrity, competence, and benevolence. To improve communication, take note of the following points:

- Do not talk only about technological theories.
- Talk about the need for nuclear power.
- Discuss matters that the other party is concerned about, such as health, air quality, nature, and the

economy.

- Involve diverse groups of stakeholders and focus on the values that these groups can share.
- Talk about personal experiences and be open and honest.
- Acknowledge mistakes and apologise when necessary.
- Replace technical jargon with words that are easy to understand.

## 2) Role of the government

- Take clear and firm responsibility for projects.
- Explain the benefits of nuclear power to the public: economy, jobs, infrastructure, and human resource development.
- Rethink the role of the central government concerning risk communication. Debates about how the burden should be shared between the central government and other actors should be carried out in Japan, the central government attempts to control all the information. However, residents do not trust information released by the government.

## 3) Involvement of local stakeholders

- All stakeholders, including industry, research institutions, government, and educators, should be involved and should have a clear vision and common understanding. It is necessary to communicate directly with them through local liaison groups and public relations magazines. Relationships should also be strengthened with local schools and universities. It should be conveyed to them that nuclear power provides job opportunities and enhanced regional security.
- The government and the private sector should promote business and investment opportunities. Lasting economic benefits are assured through the implementation of projects. The kinds of projects are not limited to nuclear industry. It is important to think comprehensively about existing, developing, and future projects and assets taking local circumstances into consideration, and to deliver explanations consistently.
- To ensure the key messages are communicated effectively, local employers who are well acquainted with the local community should become key persons in soliciting the involvement of local stakeholders.

#### 4) Role of the media

Many people utilise various kinds of media to collect information or make their own opinions known. Media are clearly becoming increasingly important in our lives. On the other hand, in the field of policymaking or governance, the role of media and communication in development is rarely prioritised by researchers or think tanks, and there is substantial divergence amongst actors about what the media, in governance terms, is expected to deliver to support development (Deane, 2015). This is also the case with nuclear energy policies. We should be considering the role of the media. Deane (2015: 267) cites the following four reasons why development actors invest in media support or believe support for media is important:

1. To build an independent media sector as an intrinsic good in and of itself, essential to the functioning of a democratic society and a key platform for freedom of expression (democratic and human rights objectives).
2. To enhance the accountability of governments to citizens, often in order to improve service delivery and state responsiveness, improve state-citizen relations, support more informed democratic/electoral decision-making, or shift social norms to decrease public tolerance of corruption or poor governance (accountability objectives).
3. To improve debate, dialogue and tolerance especially in fragile or conflicted societies, increase the availability of balanced, reliable and trustworthy information, reduce the likelihood of hate speech or inflammatory media likely to exacerbate conflict, enhance social cohesion or build the legitimacy of weak governments in fragile contexts (conflict and stability objectives).
4. To create demand for services (such as health or agricultural services) and use the media as an instrument to achieve development objectives including working to shift behaviours (e.g. improving uptake of immunisation) or changing the social norms that prevent such uptake, such as distrust of vaccinations (communication for development objectives).

These four points not only underline the importance of providing people with information about nuclear energy policy or what is happening in nuclear power plants, but also highlight the need to collect the opinions of various kinds of social actors and facilitate fruitful discussions, eliminating violent discourse if necessary. If the policymakers were to utilise such an approach in the decision-making process, they could achieve a more acceptable mode of nuclear energy governance.

From such a viewpoint as mentioned above, we should analyse the function of the social media in promoting open policy discussion and consider how to better use it to gain public acceptance. Although its use in this field is still at an exploratory phase, social media is believed to offer a potentially effective means of advancing the understanding of nuclear power. For example, Mothers for Nuclear uses social media; and while there are some negative comments amongst the posts, the moderators respond to them courteously and carefully. The traditional media, such as TV, newspapers, and radio, might find it difficult to play such an interactive role.