

Report of the Joint UNESCO-UNITAR Ethics of Energy Technologies in Asia and the Pacific Dialogues: Workshop on the Ethics of Nuclear Energy Technologies

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Background

This conference was held in the context of Working Group 12: **Nuclear Dialogues and Nuclear Energy Technologies**, in the Ethics of Energy Technologies in Asia and the Pacific (EETAP) project. This was the first meeting of Working Group 12. Working Group 12 was formed after the launch conference of UNESCO's Regional Unit for Social and Human Science in the Asia-Pacific (RUSHSAP) 'Ethics of Energy Technologies in Asia and the Pacific' Conference held in Bangkok, 26 to 28 September 2007.

The EETAP project is coordinated by the Regional Unit in Social and Human Sciences in Asia and the Pacific (RUSHSAP) at UNESCO Bangkok, and is linked to several key activities of UNESCO Social and Human Sciences sector, including the ethics of science and technology, environmental ethics, philosophical dialogues, linking research with policy-making and promoting the culture of peace. The work will also feed into considerations of the ethics of climate change that are being made by the World Commission on the Ethics of Scientific Knowledge and Technology (COMEST).

The interim chair of working group 12 is UNITAR. The objectives of the working group meeting and the Conference were to discuss ethical issues related to the use of nuclear energy technologies from a holistic perspective, and to set the agenda for the Working Group. The objectives of the conference included:

- Providing a forum for exchanging views on diverse perspectives on ethical issues;
- Framing the debate in an ethical framework by identifying and clarifying the values at stake and providing ethical reasons for alternative choices; and
- Identifying areas for further research and consideration and different policy options.

As the global region with the fastest annual growth in energy demand, countries face increasing pressure to articulate their energy policies. There are many countries in the region that are considering adopting nuclear energy, including Australia, Bangladesh, Indonesia, Iran, Kazakhstan, Malaysia, Thailand, and Vietnam. And there are other countries in the region already using nuclear energy, including China, DPR Korea, India, Japan, Pakistan and Republic of Korea. As the international focus on climate change intensifies, the environmental and social ethics of all energy choices need be considered holistically. This meeting and project is not intended to duplicate the numerous meetings being held on energy and environment, but to open up ethical and value questions that have often been neglected, and to depoliticize discussions on environmental ethics to produce substantive cross-cultural outputs that will be relevant for long-term policy making within each nation.

Summary

This was the first meeting of the EETAP Working Group 12: Nuclear Dialogues, jointly hosted by the Regional Unit for Social and Human Sciences (RUSHSAP) of UNESCO Bangkok and the UNITAR Hiroshima Office. The working group had extensive interactive discussion on the particular sensitivities of the nuclear debate from an ethical perspective. In

the conference sessions on 27 July, presenters were asked to give 15 minute talks, followed by questions and discussion. The presentations will be made available on the EETAP website (<http://www.unescobkk.org/index.php?id=energyethics>). The working group session was jointly chaired by the Chair of EETAP Working Group 12, Nassrine Azimi, UNITAR and Darryl Macer, UNESCO, EETAP project coordinator. The papers used will be used to shape the outline of the report of the working group, and feed into the body of knowledge produced by the EETAP project.

There were approximately twenty-five meeting participants in the working group session from Australia, Canada, France, India, Italy, Ivory Coast, Japan, Jordan, Korea, Morocco, New Zealand, and Switzerland. Participants attended in their individual capacity and came from several backgrounds, including engineering, education, civil society organizations, and academia. The disciplines amongst academics ranged from engineering, philosophy, political science and international relations, ethics, environmental science and environmental studies, law, medicine, and anthropology. There were forty participants at the workshop.

Meeting Report

After a welcome address from Ms. Nassrine Azimi, director of UNITAR Hiroshima, there were excursions to the Hiroshima Peace Memorial Museum, with an introductory lecture by the Assistant Director and a chance to visit the Museum and Hiroshima Peace Park. Following self-introductions, Dr. Darryl Macer, Regional Advisor in Social and Human Sciences for Asia and the Pacific, UNESCO, Bangkok, and meeting co-chair, gave an overview of the Ethics of Energy Technologies. In his presentation Dr. Macer introduced the concepts of ethics and bioethics and provided a framework in regard to the origins of ethics and the international standards for bioethics. He noted that there was also a Conference being held on the Role of Philosophers in War and Peace at the same time, with overlapping participation.

Dr. Macer also provided brief descriptions of some closely related working groups in the project, explaining the linkages to the current group. Ms Azimi then began the discussion by noting that there is naturally much opposition to nuclear energy in Hiroshima because of obvious historical reasons. . In other words, the nuclear energy debate cannot be discussed without context or a clear understanding of the historical experiences with the atomic bomb. She asked, can we separate our stance on nuclear weapon proliferation from nuclear energy? This tension presents profound difficulties in the context of clean energy discussions, where nuclear energy is currently being promoted as presumably more productive than solar or wind energy, comprising a disproportionately greater part of the global energy mix. Solar and wind energy are undermined and seen and treated as being less lucrative. It is difficult to invest in meaningful alternative energies in the midst of the climate change crisis and our failed efforts to negotiate workable resolutions. But we cannot ignore the risks of, nuclear energy in the process either.

Dr. Sivanandam Panneerselvam, Professor of Philosophy at the University of Madras in India, remarked that nuclear technology should carry the message of the Hiroshima A-bomb dome as a symbol of both war and peace.

There followed intensive discussion over current energy prices, the future predictions on increased efficiency of different alternatives, and the necessity of nuclear energy. Dr. Ayoub Abu-Dayyeh, an engineer and President of the Society of Energy Conservation and Sustainable Environment in Jordan, raised the issue of energy prices. While nuclear energy has often been quoted as being less expensive than other alternative energy sources, is it truly more economical than wind and solar energy? From his experience, wind energy is almost as

economical as nuclear, and in places where solar intensity is high, such as Jordan and other parts of the Middle East, solar energy may be very economical. He also suggested a 'safety factor' and/or 'ethical factor' needs to be integrated into nuclear energy prices. For instance, earthquakes can destabilize nuclear reactors and contaminate the local water environments. Also, recycled nuclear byproducts, including depleted uranium, are being disposed of in unsuspecting developing countries. However, he cited two reasons why nuclear energy is thought to be less expensive. First, strong investment in nuclear power marketing; this is one possible factor behind 250 new nuclear power stations being planned for the Middle East in the next decade. Second, he suggested that governments may want to control technology and access to energy. Since nuclear technology is complex, requiring much more expertise than solar or wind power, if nuclear power stations are constructed, the political power of the government and technocrats will increase, as it must be centrally controlled by large energy corporations or government.

Dr. Masahira Anesaki, a Medical Doctor and Professor at Kinki Health Welfare University in Japan, asked whether the soaring energy prices for fossil fuels today is the result of financial speculation. Do we really see the true costs of different energy production among alternatives? Dr. Daniel Nesy, professor and head of philosophy at the University of Kerala in India, stated that we need nuclear energy because of its potential for generating large amounts of power. We cannot turn our back on using energy amidst an energy crisis. She noted that in countries like India there is a significant need for large scale energy, and the question of social justice is raised for different groups to access energy is important. Dr. Anesaki noted that we had already opened Pandora's box. Ms Azimi noted that one of the former Greenpeace founders had left the organization and now actively supports nuclear energy because of its carbon-free approach to generating power.

There was some discussion regarding alternative energy. Dr Abu-Dayyeh said that, as a practical engineer who built greenhouses, he thought European countries started focusing on renewable energy in 1973 after the oil embargo. Now, the Europeans will have 20% of their energy mix generated from renewable sources. Wind energy is growing fastest in the United States. Solar heaters in Australia are also gaining in popularity. However, some places, such as Jordan, have no tax on energy-conserving technology and an absence of a strong 'green' lobby because the sale of oil is lucrative and such energy saving technology may render oil less profitable. Dr. Anesaki observed that alternative energy is expensive but some countries, such as Cyprus, have subsidies in the form of loans. Dr. Abu-Dayyeh noted extant photovoltaic subsidies and the successful use of geothermal energy in Canada.

How can we undertake comparisons with other alternative energy sources? Dr. Leary noted that we could study the advantages and disadvantages of clean energy sources. Aspects such as safety, practicality (some of the technology, such as fuel cell cars, was already commercially available), price (there are often substantial subsidies on nuclear plants when it comes to insurance and plant decommissioning), waste (where would nuclear waste products be placed?), and security. Ms. Azimi commented that this issue is perhaps the single most important one in the debate. Mr. Tachiyama said he wanted a greater emphasis on examining energy efficiency issues, and whether our current energy system is geared for production and use or for storage. Dr. Macer noted that inside EETAP, Working Group 9 was looking at different alternative energy technologies, and that this particular working group would focus on nuclear energy. There would be useful overlap to apply similar ethical matrices to the different alternatives.

Another issue raised was the role of ethics in the nuclear dialogues. Dr. Nesy said that it is up to humanity to make a well-informed decision, where both desirable and undesirable uses for science and technology exist. It is up to humanity to decide its course of action. The decision needs to be brought about through consensus between governments, their citizens, and scientists. This requires, among other things, discussing and listening to public opinion. In the midst of all this, ethics helps formulate these decisions, and ethical principles can be used to help govern our energy use choices. Dr. Ali Benmakhlouf, a member of a French bioethics advisory board and Professor of Philosophy at the University of Nice in France, distinguished between ‘federal’ principles (political) and ‘fundamental’ principles (ethical). Both play roles in resolving issues, and science alone cannot adequately resolve the nuclear debate. In politics, facts need to interact with fundamental principles, and the notion of rights can be used in this context. This may occur through international law and its collaboration with national ones. On ethical principles, Dr. Benmakhlouf questioned whether the loose use of the term ‘ethics’ was appropriate. There is an ethics of management, ethics of marketing, and ethics of a great manner of studies. He clarified that ethics means to reflect on singular facts rather than universal frameworks. Mr. Keisuke Tachiyama, an environmental studies graduate student at Kyoto University in Japan, emphasized the dual use nature of nuclear technology, stating that it should be used for energy but not for weapons. The definition of weapons can include political threats linked to nuclear weapons, as seen in the way North Korea, Pakistan, and India have used it. How should the public be convinced of the difference between energy and political threats?

Another issue involved the role of philosophy in the nuclear dialogues. Dr. Anesaki asked whether we need an ‘order’ of contribution from different academic disciplines. He was of the opinion that scientific knowledge is first cemented, and then philosophy and the social sciences arrive later to analyze and handle issues. Dr. Naoshi Yamawaki, Professor of Philosophy at the University of Tokyo in Japan, said the role of philosophy is to mediate the different social science disciplines. Dr. Anesaki said that spiritual and esthetic values are often important. There was discussion of how philosophy should shape our choices rather than just follow what is happening.

Another issue raised by the working group concerned nuclear relations. Dr. Abdessamad Tamouro, Professor of Philosophy at l’AMP Rabat in Morocco, stated that a major problem of nuclear energy use today is related to international relations, and we need to resolve these greater conflicts to limit nuclear proliferation. Dr. Abu-Dayyeh commented that nuclear relations are often dominated by profit considerations. Mr. Kouame Oussou, an international relations graduate student at International Christian University in Japan from Ivory Coast, suggested that powerful states want to restrict technology access by weaker and less developed states, such as Iran and North Korea. Dr. Tamouro noted that nuclear energy can be used as a tool of political power. If large countries begin to develop nuclear energy, smaller states may also begin discussing the development of nuclear reactors. Ms. Azimi observed that the Nuclear Non-proliferation Treaty (NPT) has imploded despite the simple core goal of having the ‘nuclear haves’ in the NPT (who are the same permanent five at the UN Security Council) decrease their nuclear arsenals.

Another issue raised by the working group was the safety and transparency of nuclear technology. Dr. David Leary, a lawyer and a post-doctoral researcher at UNU Institute of Advanced Studies in Japan, noted that there has been discussion about the improved safety of the newer generation nuclear reactors. He suggested examining and comparing the safety of these newer plants with other alternative energy sources. Transparency and a right to information would be important aspects in any study of nuclear plant safety. Dr.

Panneerselvam noted that the government and scientists should not hide facts regarding nuclear plant operation. Dr. Abu-Dayyeh asked how nuclear power station safety information would be guaranteed available to the public. Ms. Azimi noted that understanding the full extent and implications of scientific data is not easy. The Hiroshima Radiation Effects Institute for example has enormous amounts of relevant data, but this cannot always be understood by policymakers. If we were to use such data, it would need to be simplified.

Dr. Nobuo Kazashi, Professor of Philosophy at Kobe University in Japan, noted more safety issues. Residents near nuclear power plants have a greater probability of leukemia. The use of depleted uranium weapons has been linked to significant health problems. Politicians are insensitive to the dangers of depleted uranium weapons because their destructive effects (on targets) appear instantaneous and radiotoxicity information is often covered up. Dr. Yamawaki noted instances of nuclear safety breaches at the Hamaoka plant near Shizuoka (where radiotoxic chemicals leaked) and the Shimoda peninsula incident (where an earthquake caused damage to a nuclear energy station). Dr. Leary commented that the company running those plants has repeatedly covered up its mistakes. There was a call to include in the working group report an analysis of the so-called next generation reactors and the relative safety improvements compared to earlier nuclear energy.

There was also discussion of economics and energy conservation. Dr. Maria-Keiko Yasuoka, a post-doctoral researcher in medical anthropology at Hokkaido University in Japan, asked how energy should be used and saved. For instance, after the Japan G-8 summit in 2008, the public was disappointed because a new building was constructed but destroyed after the summit. Accessibility to such resources appeared to be the exclusive domain of the wealthy. Ms. Azimi noted that despite Japan's energy-frugal society, it would not meet its Kyoto Protocol commitments. This issue includes an economic dimension, as Japan allows the market to determine energy trends. Ms. Kayo Uejima, a primary school teacher and director of the Lablink NGO in Japan, said that changing the economic system is important but suggested lifestyles and values should also be changed because the problem of energy is linked to other systems, such as the social and educational. Living 'close to nature' may aid in energy and environmental issues.

Another issue raised was the level of public debate. Ms. Azimi noted that there is a regrettable nuclear 'myth',— where nuclear energy continues to be presented as the best that science can offer. (for example the United States tried to influence the antinuclear movement after WWII on scientific grounds as well, so as to be able to continue researching nuclear technology). Can we openly challenge such assumptions today and be skeptical about the role of governments? It is a complex debate, and many interests may wish to simply close it off. We need to bring nuclear energy issues into the open despite political resistance. She suggested bringing not just peace activists but business, even military to Hiroshima, and other interests to openly debate nuclear energy in a comprehensive manner. Dr. Kazashi observed that the metaphor of clean energy is being used when speaking about nuclear energy in popular media, but there are significant health hazards noted with the use of nuclear power stations. Dr. Tamouro said that the moral and public 'systems' need to be applied to nuclear technology – e.g. regarding nuclear waste import. Citizens need to be involved in the decisions themselves, rather than having bureaucrats making decisions on their behalf. Public debate and participation can make a difference. For instance, Mauritania refused to accept Israel's nuclear waste after a public discussion resolved opinion in favor of refusing waste.

The group concurred that in some countries the general public appears to be wiser than the ruling political elites, who often repeat mistakes.

This difference may also be due to conflicting factors and interests. There was discussion on the role of the private sector. Mr. Tachiyama thought the corporate sector was a problem, focusing far too much on profits and not enough on developing new environmentally-friendly technology. Dr. Leary did not believe the corporate sector to be evil, as it has often been the driving force behind alternative fuel sources. He gave the example of General Motors looking at fuel efficiency and Honda's hydrogen fuel cell car. In a different context, Ms. Azimi commented that business people should debate, along with other interests such as military, with peace activists regarding nuclear energy.

Dr. Kazashi asked about the concrete objective of the nuclear dialogues working group session, and Dr. Macer replied that the group would provide a summary and objectives for the group work in the future. This meeting was to brain storm and gather ideas. There was also discussion about a report, with Dr. Tamouro stating that a report was required for policymakers. It should have a long-term vision of the future, which includes future generations. An ethical perspective should be used. Dr. Kazashi asked who its authors and audience would be as well as the process by which it would be written. Ms. Azimi noted that a publication should be produced which includes frequently asked questions about nuclear energy. She suggested that UNESCO should discuss or raise the issue of armament prices. Dr. Macer noted that other energy technologies, including solar and wind, are the subject matter of another working group. This working group is to focus on nuclear energy because of its particularly high degree of political sensitivity.

Dr. Kurokawa noted that energy powers human activity. It is a finite critical resource and can be generated and harnessed in many different forms. It also greatly influences economic development and political relations at all levels. Policy makers around the world face a multitude of ethical issues and considerations concerning energy technology, and this pressure is expected to intensify given increasing global demand for energy consumption and the rising oil prices. Nuclear energy now comprises a significant fraction of world energy production and has often been in the global spotlight, influencing international political and economic relations. Discussions concerning nuclear energy have become considerably more complex in recent years and while nuclear dialogues at various levels exist, it remains a highly sensitive subject.

On the 27 July there was a **workshop** to examine the nuclear energy debates from an ethical perspective. How should each country make decisions on the energy strategies to follow, given the variety of potential risks and proposed benefits of different strategies? What are the values and questions that exist inside the region for ethical deliberation over the choices for energy? Dr. Macer outlined that UNESCO's commitment stems from its work with regional Ministries of Science and Technology in implementing the Ministerial "Bangkok Declaration on Ethics in Science and Technology" issued at the conclusion of the 4th Session of the World Commission on the Ethics of Scientific Knowledge and Technology (COMEST) in 2005. Also, as neutral brokers, both UNESCO and UNITAR have the mandate to look at the long-term choices different societies are making over the adoption of different scientific technologies and strategies, and also reflect on the needs for dialogue, education and training that these developments call for.

In the **Introduction**, Dr. Darryl Macer provided an overview of UNESCO Bangkok's role in the Ethics of Energy Technologies in Asia and the Pacific project, and an overview of the project and the Nuclear Dialogues Working Group in particular. In the field of ethics, UNESCO has focused its work on bioethics, where several declarations have been unanimously adopted by member states (in 1997, 2003, and 2005). It is interesting to reflect on the origins of the Human Genome Project which was initiated by the United States Department of Energy because in order to study radiation damage on DNA, scientists needed to have the complete DNA sequence. Then, as a response by the UN to many ethical issues of medical genetics, the Universal Declaration on the Human Genome and Human Rights had been adopted (1997). The three UNESCO Bioethics declarations contain principles that can be applied to different areas of science and technology and which relate also to environmental ethics. In the EETAP some of these internationally accepted principles of ethics were being applied to questions arising from the choices of different technologies that affect energy use and production.

The Nuclear Dialogues Working Group deals with the particular sensitivities of the nuclear debates. Consistent with the above, the objectives of the workshop are to advance international dialogue by:

- Providing a forum for diverse perspectives on the ethics of nuclear energy technologies;
- Exchanging views on nuclear energy ethics;
- Framing the debate in an ethical manner by identifying and clarifying the values at stake and providing ethical reasons for alternative choices; and
- Identifying areas for further research and consideration and different policy options.

Some of the issues already identified include power plant safety, transparency, industrial marketing, security and proliferation, surcharges on nuclear energy prices due to risks, and the issue of nuclear waste. The work is related to the subject matter of other working groups, including that of WG9: State of the Art Review of Alternative Energy Technologies. The latter is focused on discussing the ethical issues of non-nuclear alternative energies.

The first session was **Ethics of Energy Technologies**, and the first presentation in the session was “Energy and Development: Dialogues” by Dr. Daniel Nesy, Professor and Head of Philosophy at the University of Kerala in India. She presented some general remarks about history, energy, and ethics, before providing an Indian perspective on the relationship between energy and development.

Human thought has been dominated by a ‘dichotomous’ system of conflict, competition, and hostility. This has brought great achievements, but also awesome destructive power (e.g. nuclear weapons). Although scientific and technological achievements have provided us with great power, this power can be used for good and evil. Thus, the method of thought involving ‘dichotomies’ is inadequate. Modern energy discussions involve many conflicting scientific and ethical values. However, scientists believe ethics is irrelevant because science is objective, and it produces knowledge and consensus. Yet, scientists are members of society and science is a social activity which takes place in a social context. Thus, they cannot escape ethical issues. Ethical analysis calls for the responsible use of technology, not a banning of it.

India is in the midst of an unprecedented energy crisis, exacerbated by high energy prices. The simple problem is that there are not enough fossil fuels as a foundation of energy. There are about 50 years of production from known reserves. Energy alone will not solve poverty but a lack of resources hinders economic growth, and the unsustainable use of energy may

result in ecological disaster. Uneven, unequal energy distributions will not serve developing countries. Thus, a major question is: how to distribute energy within India? A study by the Indian Energy Research Institute, which was submitted to the government, made many recommendations: provide more investment to the exploration of coal using mining technology; involve the private sector in exploration and production of hydrocarbons, including the use of new licensing policies; improve and enhance possibilities of conservation and substitution using alternative fuels and technologies – enhance public transport, compressed natural gas; reduce coal and petroleum product consumption, particularly in the transportation sector; provide a preference to natural gases which burn cleaner and are easier to handle; research competitive renewable energy and alternative indigenous energy sources. Public opinion has provided momentum for Indian energy security and independence, and Dr. Nesy stated that it needs a missionary drive for large projects with scientific and technological advancement monitored by ethical principles.

Following the presentation, Dr. Mitsuo Okamoto, director of the Hiroshima Center for Non-violence and Peace in Japan, noted many discrepancies regarding the amount of fossil fuels left on the planet. Dr. Nesy replied that natural resources are finite, but scientific knowledge is increasing so the size of reserves keeps increasing. The exact amount is therefore unclear. Dr. Ayoub Abu-Dayyeh, an engineer and president of the Society of Energy Conservation and Sustainable Environment in Jordan, noted that in the last energy conference in Tripoli, Libya (with over 600 participants), the estimate was 45-60 years. The reason the figure keeps increasing is because new reserves are continually found, oil producing nations cut production to keep prices high and make the oil last longer, and competition forces new technology to find novel methods of energy conservation and increased energy efficiency.

Dr. David Leary, a lawyer and a post-doctoral researcher at UNU Institute of Advanced Studies in Japan, asked about the fate of nuclear waste in India. In Australia and Canada, there are debates about whether supplier nations have a moral responsibility to take back the waste. Do such debates exist in India? Dr. Nesy said that it is not currently being discussed because there are only a few nuclear reactors in India.

The next presentation in the session was “New Ethical Conditions” by Dr. Abdessamad Tamouro, Professor of Philosophy at l’AMP Rabat in Morocco. Facing the threat of nuclear disaster, Dr. Tamouro provided several ‘conditions’, which should be a part of ethical principles to be observed. The first is ‘moralization’. We often believe the ‘moralization’ of all ends is achieved through science and technology, as if science and technology are assigned the unique goals of realizing humanity’s fundamental well-being and safeguarding its environment. However, scientists should be governed by moral codes, perhaps in the form of an oath to never participate in activities that may harm humanity or nature. The second is that this moralization must be superior to the state. Many penitent scientists, such as Alfred Nobel and J. Robert Oppenheimer, have offered their efforts to defend values of peace and ethical science. The third is to learn from history. Humanity’s collective historical errors, including nuclear death, should provide the current generation with a moral conscience. The fourth is that every human act should be moral. The fifth is to provide human rights. Human rights, however, need to be realistic, universal, and respect cultural and individual differences. Other conditions include: making ethical values such as dignity, freedom, and rights inseparable from the concept of humanity; participation of scientific communities in ethical debates; regulation of science and scientists; morally sensitizing others through communication; repressing serious immorality; and promoting moral acts. Dr. Tamouro concluded that a new era of ethics should provide consensus-building to build the

fundamentals of morality. However, aspirations need to be realistic by being implemented through legislation. Descriptions of immoral acts should be compared to criminal acts based on their level of harm.

In the discussion, Dr. Takao Takahashi, Professor at Kumamoto University in Japan, asked for clarification on the meaning of ‘harmful activities’ because all technology can be used in such a way. Dr. Tamouro replied that scientists like Oppenheimer reflected and changed their moral views, but we need to have scientists to avoid immoral acts altogether. All acts of science should be ethically regulated, such as through an oath.

The next presentation was “Ethics of Energy Technologies and Query about Happiness” by Dr. Takao Takahashi, Professor at Kumamoto University in Japan. Dr. Takahashi first noted that scientific and technological developments cannot be divorced from their context, including institutional, cultural, and temporal ones. Ethical prescriptions and guidance will need to take note of such contexts. In ethical analyses, many different principles and arguments compete, and it is the job of ethicists to sort them out and prioritize them and to propose paths and reduce contradictions. It is also important for ethicists to inquire about responsibilities toward future generations. He gave five reasons why we should be responsible to future generations: (1) We intuitively feel responsible toward one’s own children’s or grandchildren’s generations; (2) a biological tendency to preserve the species; (3) current generation-centrism; (4) the current situation is due to beneficence of the past and we need to extend that for future generations; (5) beneficence. There is a tendency for liberal advanced nations not to intervene in the content of happiness pursued by individuals. However, we are unable to prescribe our responsibilities to future generations without inquiry into happiness. Beyond mere human survival, two things constitute happiness: (1) human dignity (liberty, autonomy, self actualization, equal treatment, good relationships with each other), and (2) humans respected as living, rather than inanimate machines (Tolerance towards deterioration, mistakes, and aging, awareness of the uncontrollable, awe toward life transcending individual lives) The balance between them should be a moderate one.

This ethical framework should be applied to the specific ethical issues involved in nuclear energy. These include safety (accidents, radiation leakages, health of local residents, health of future generations), environmental preservation, co-existence of nuclear power with local communities, unexpected complications, information transparency, relationships with local industries, and the need for diverse perspectives. Ethical input is required to keep local residents and the environment safe but also to maintain or increase economic efficiency.

In the discussion, Dr. Okamoto asked whether happiness is a subjective feeling, and he suggested that perhaps human rights or welfare are more objective. Dr. Takahashi replied that happiness is related to our subjective feeling, but emphasis is placed more on the objective side.

Ms. Kayo Uejima, a primary school teacher and director of the Lablink NGO in Japan, noted that some destruction of nature, including those possibly caused by electromagnetic frequency radiation, are hidden and not transparent. She believed that enterprises affect the disclosure of such information. Dr. Masahira Anesaki, a Medical Doctor and Professor at Kinki Health Welfare University, noted that the Minamata disease incident, as mentioned by Dr. Takahashi, was another incident where a large corporation destroyed the results of scientific study to cover-up damaging information. We need a thorough analysis of incidents where potential cover-up is a possibility.

Dr. Tamouro commented that the relationship between the current and future generations is not just one of responsibility, but also one of solidarity. Dr. Takahashi said that he used the term responsibility to discuss the relationship between generations, and that solidarity is a feeling between those in the same generation.

The last presentation in the session was “Nuclear energy and sustainable development” by Mr. Kouame Remi Oussou, a graduate student at International Christian University in Japan. Mr. Oussou said that current oil based energy is subject to depletion; energy supplies are political; energy security is an economic issue with high energy prices; and that oil based energy is causing an ozone problem. The main impacts from energy use are inflation, poverty, and widening inequality. So, there is a legitimate search for new energy sources. Wind and solar power are intermittent. Nuclear energy is the best alternative, he argued, because of its availability, reliability, competitiveness, and its carbon free status. However, there can be safety issues, such as the lack of storage and the risk of nuclear proliferation. He argued that discarding nuclear technology because it is thought to be too dangerous will not prevent the risks associated with it. What remains is to foster research about all the risks of nuclear technology. In the meantime, other energy sources, such as solar, wind, and biomass, should be developed. He concluded that nuclear technology should be pursued but its risks should be noted.

In the discussion, Dr. Abu-Dayyeh said that biomass is not a clean energy, nor a sustainable energy source. It is increasingly carbon non-neutral and it emits greenhouse gases. He also thought nuclear energy was not reliable. Furthermore, intermittency of solar energy can be overcome with batteries and capacitors. Dr. Leary said that much of the technology (such as solar and wind) is here already and viable, and industry is investing. Biomass is not sustainable, however, and its popularity stems from the soybean and timber industries which are promoting its use.

The next session was **Contemporary Issues in Ethics of Nuclear Energy Technologies**, and the first presentation was “Ethical Implications of Nuclear Industry Workers” by Dr. Mitsuo Okamoto, Director of the Hiroshima Center for Non-violence and Peace in Japan. It is natural that laborers show loyalty to a company in order to sustain their own life and the family. As long as the company functions normally, there is no problem and the laborers have no responsibility or duty beyond what they are expected to pursue. However, once a laborer comes to know about exceptional injustice such as forged labeling of merchandise, excessive tax evasion, etc., in his/her company, what would be their options? On the one hand, they will face a critical issue as a laborer in the company where they earn the salary to maintain life and on the other they will be haunted by an ethical issue to deal with the problem. Nuclear power plant laborers would understandably be concerned with a possibility of a nuclear power plant accident comparable to the Chernobyl disaster. The thought will annoy them not as a personal problem, but as a problem of the society, the world, and humanity. The primary purpose of laborers is to work for themselves and for their family to sustain their life. Whether conscious or unconscious, the result will benefit not only their family, but contribute to the sustenance of society and the world, eventually the welfare of the whole human being. If they become conscious of their labor as such, it will give them joy, self-confidence, and satisfaction. However, the consciousness of the laborers at a nuclear power plant will not be that simple. Suppose they come to know the following facts about the nuclear power plant in general, what kind of psychological strain or ethical concern they would face or be confronted with? (1) Nuclear power plant is economically not viable; (2) the

potential danger of nuclear power plant is beyond human control; (3) nuclear power plants can very easily be utilized for building nuclear weapons as happened in India and Pakistan; (4) if attacked by an inimical force or terrorists, nuclear power plants could devastate the country almost exactly like nuclear weapons.

Moreover, although nuclear power plants are hailed as the champion to reduce carbon dioxide in the environment, it can hardly be a solution as the operation of nuclear power plants itself requires a considerable amount of fossil energy. Thus, the laborers in the nuclear power plant will be haunted with the ethical question of whether their loyalty is to the company, society, the nation, or all of humanity? The alternatives given to the laborers in the nuclear industry will be to ignore the potential danger of nuclear power plants and continue to work there, or to become conscientious informers to tell the world about such problems as near-misses, obvious mistakes, or small accidents, which are often not informed to the proper agencies or kept secret or even covered up. The informers, the whistle-blowers, would be looked at askance within the workplace and could face dismissal. The economic damage of dismissal will be enormous, particularly for those who have a family. At the same time, however, these whistle-blowers, who are more concerned with the welfare of society, the nation, and the whole human race than their own families are doubtlessly the hope of humanity.

In the discussion, Dr. Abu-Dayyeh asked where the nuclear waste would be placed or stored. Dr. Okamoto replied that the waste from Japan used to be reprocessed in the UK and France, but it is now reprocessed domestically. Dr. Leary commented that ethical dilemmas facing workers are not a phenomenon unique to the nuclear industry. He also noted that Japanese nuclear safety regulators and promoters of nuclear technology export are the same individuals who work at nuclear reactors, which creates dangerous risk.

Dr. Maria Keiko Yasuoka, noted that while technological treatment for radiation is advanced, radiation victims are treated like Hiroshima victims in hospitals. Dr. Okamoto noted that this is true even when dental x-rays are given. Dr. Macer said that these are occupational ethics issues.

The final presentation was “Ethical Issues involved in the Use of Nuclear Energy in the India-US Deal” by Dr. Sivanandam Panneerselvam, Professor of Philosophy at the University of Madras in India. Nuclear energy is playing a role in India’s energy crisis debates, and India now has several nuclear power plants. However, does India really need nuclear energy? Two arguments are given in favor: (1) nuclear power plants will be used extensively; (2) there is no viable alternative energy. Regarding the India-US nuclear deal, it has been argued that India should agree to it because (1) it would otherwise result in a national loss-of-face; (2) it would be a setback to India’s nuclear programme; (3) the deal will not be possible after President Bush leaves office. However, Dr. Panneerselvam noted that India can solve its energy problem because India has plenty of solar and hydropower sources. India should think about more alternative energy and use its renewable natural resources to avoid nuclear power. Nuclear power is not necessary because it involves the potential for dangerous radiation, the government lacks accountability, the country lacks the high technology to handle such power, the high cost, and delicate and dangerous technology (risk of proliferation).

In the discussion, Dr. Rainier Ibana, Professor of Philosophy at Ateneo de Manila University in the Philippines, said that the presentation is useful as philosophy teaching materials because the paper provides a link between democracy and nuclear power. The Filipino

nuclear power station was ordered halted when Ferdinand Marcos, an authoritarian dictator, left political power. The nuclear plant is not functioning but interest is still paid on the money used for construction. When citizens were able to vote on clear ethical dilemmas, they still believed that the nuclear power plant should not be re-activated. Thus, there is a connection between democracy and nuclear energy. Dr. Abu-Dayyeh agreed, and observed a similar situation in Jordan. The decision to utilize nuclear energy was taken at a very high political level, and it was not democratic. Dr. Leary also commented on the link between political power and nuclear energy. During Australia's most recent elections, nuclear policy was an election issue. The opposition distributed leaflets with all potential sites discussed for building nuclear power stations, and it appeared to have an influence on the election result (namely, the opposition won). Dr. Ibana noted that the power of information is very influential, and this played a critical role in the Filipino decision to halt nuclear plant operation (because it was built above an earthquake fault line).

In connection with issues regarding information transparency, Dr. Abu-Dayyeh said that there appeared to be missing information about the after-effects of the Hiroshima nuclear explosion regarding illnesses, diseases, and radiation. Dr. Okamoto replied that there is nothing hidden, and that residual data is available in bookstores and museums.

A **General Discussion** followed. Dr. Macer noted that there were calls for greater information, and useful discussion. He noted that there are still gaps in information (in the context of ethical issues), and he said that while some meeting attendees possessed the information, others, such as engineers and scientists, would be needed to fill in the gaps. He reiterated that the working groups will report or represent policy options and ethical reasons behind them, but they would not be making recommendations.

In response to the Depleted Uranium (DU) Resolution adopted at the United Nations General Assembly on 5 December, 2007, the participants of the Joint UNESCO-UNITAR Asia-Arab Interregional Philosophical Dialogues on the Roles of Philosophy in War and Peace, and this Workshop on Ethics of Nuclear Energy Technologies, noted that they are deeply concerned about the DU issue especially because it is understood that it is children who are most susceptible to toxic radioactive materials. Thus, the participants considered it urgent to:

- (1) Alert the peoples and children living particularly in the DU-affected areas to the dangers caused by DU weapons;
- (2) Give serious consideration to the harmful effects of DU weapons by setting up an expert committee on the DU issue as quickly as possible;
- (3) Place an international moratorium on the use of DU weapons to prevent further DU-caused harms on human health and contamination of the environment.
- (4) To establish a Body to transport DU polluted war machinery and ammunition away from populated areas, and to properly dispose of them in remote and safe locations.