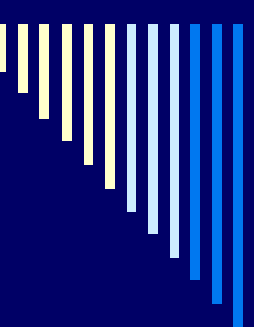


Drivers and Action Plans for Sustainable Promotion of Nuclear Energy

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Present Status of Nuclear Power in Japan

- 53 operating units produce about one-third of electricity generated in Japan
- Contribute to 16% increase in Japan's degree of self-sufficiency in primary energy supply
- Contribute to the reduction of CO₂ emission /GDP
- Three units under construction and seven units in preparation for construction



Policy for Sustainability

- Sharing the vision that safe, economical, and reliable nuclear energy technology will contribute as a mainstay electricity and heat generation technology to fostering economic growth, providing security and fuel diversity, and enhancing environmental quality in many parts of the world.
- Recommends actions across three different time frames; short-term, mid-term and long-term.



Short-term Actions

- ❑ The existing nuclear power plants are recognized as a safe, reliable and competitive power source in many countries.
- ❑ Their performance should be improved to maintain high levels of public, investor and regulatory confidence in the nuclear energy supply sector.
- ❑ The actions for this purpose should be promoted with toughness, resolution, and the consideration to details.
- ❑ Government should support the R&D of generic nature to ensure that a broad range of technologies are developed and applied.



Short-Term Actions Taken

- ❑ Develop and apply advanced technologies for increased output and longer-term operation.
- ❑ Develop and implement technologies for high burn-up fuel.
- ❑ Implement effective and efficient measures to economically maintain a high level of safety.
- ❑ Promote the closed fuel cycle to separate high-level radioactive waste from valuable nuclear material and recycling the latter into fuels.



Mid-term Actions

- The competitive operation of current design units and facilities by no means guarantees the adoption of the same type of plants and facilities for replacement of retiring units or for addition of the capacity, as deregulation of electricity market has sharply altered the financial landscape for utilities, who are no longer guaranteed a fixed return on investment.
- Nuclear power plant suppliers should pursue the improvement of the performance of current designs incessantly for 20-40 years so as to win new orders of construction in tomorrow's market.



Mid-term Actions Taken

- Reduce capital cost by standardization of design and developing modular cost-effective construction technologies
- Improve robustness in maintaining safety and reliability by adopting passive safety features, and enhance easiness of inspection
- minimize environmental impact by reducing volume of radioactive waste from operation and decommissioning of the plants
- Improve human consciousness of the design by pursuing low occupational exposure, low work load, and low man power need



Mid-term Actions: the Role of Government

- These mid-term R&D activities should primarily be sponsored by private sector as in the case of near-term actions.
- However, it is important for government to fund for the development and transfer of relevant generic technology platforms in a timely fashion.
- Government should identify and characterize good elements of the technology platforms related with various improvements through constant collaborative planning.



Long-term Actions

- Over the long-term, radical new energy technologies will appear and address effectively the challenges of air pollution, climate change and energy supply insecurity while expanding energy service availability to all on the globe.
- Explore, through R&D, innovative nuclear energy system concepts which can compete with new and radical non-nuclear energy technologies in the long run with a view to making nuclear energy system sustainable in terms of social acceptability as well as safety, economy and environmental protection.



Long-term Actions Taken

- Develop nuclear energy systems which can provide
 - manageable nuclear waste, effective fuel utilization, and increased environmental benefits, consistent with such national goal of pursuing zero emission society through reducing, reusing and recycling of wastes.
 - competitive economics,
 - enhanced safety and reliability performance consistent with the requirement of neighbor friendless
 - sufficient security in terms of proliferation resistance and physical protection.



Long-term Actions; the Role of Government

- Government should carry out long-term R&D activities aiming at developing these systems desirably with international partners with similar vision as to the use of nuclear energy for sustainable development of the world as in the case of the GIF framework, which is quite beneficial since we can enjoy the benefits derived from such economies of scale and of specialization as the joint use of test facilities, sharing of information and results, and the pooling of resource, efforts and experience.



End Note

- There are two primary gateways to control the development and flow of technology from either a push or pull standpoint.
- The growing universality of technology now makes successful innovation much more frequently driven by the pull of technology which is basically the pull of the basic human needs structured by Maslow in the ladder form.
- We should make the process of R&D transparent to the public and get its feedback on the R&D design so as to maintain and strengthen the public acceptance of our products.