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This is workshop number two, focusing on energy and the environment. I am Nobuo Tanaka, former executive director of the IEA. We have six panelists. You know them. I will not introduce them to you. There is Olivier Appert, Leila Benali, Richard Cooper, Cosmin Ghita, and Tatsuo Masuda. We will talk about climate issues, but this morning, we had a very interesting plenary. Laurent Fabius and Patrick Pouyanné gave a very interesting introduction to us regarding the role of government and state and how ambition must come from leadership. The issue of the future of coal is a very interesting one. How can we use advanced innovation technologies in renewable and nuclear energy? That is the issue.

I will use my presentation and before starting, each of us will make initial remarks for 7-8 minutes. Then we will open up for that discussion. I will outline my contribution to the group Innovation for Cool Earth Forum. This is a forum created by the current Prime Minister Abe five years ago. It consists of energy-related people in the steering committee, and it exchanges views and information and makes international links with experts in technological innovation and sustainability.

We had a meeting a week ago, and about 1,000 people participated from 70 countries. I am chairing this steering committee. I want to say a brief word about what happened there and what the message was. There was the CE group and another two groups which occurred back to back in Tokyo. One was the TCFD summit. TCFD is the Task force for Climate Financial Disclosure. It was started at the G20 by Mark Carney from the UK Central Bank and Michael Bloomberg. It discloses the financial risks of the corporations for the investors.

The Japanese government promoted that substantially in the last year and 199 Japanese corporations signed up. In these financial sectors, pressure is getting very strong. The ICEF, together with this TCFD group, made a contribution and we had a meeting with the Prime minister in the Prime minister's office, reminding him of how we should move. He urged us, calling for much more serious efforts. He said unconventional and discontinuous innovation is necessary. In the sessions, many different technologies are taken up, but the subject of this ICEF was bending the emissions trajectory down through innovation and green finance.

Global CO₂ emissions are increasing at about 2% per year, which is in line with long-term historical trends, since the beginning of the Industrial Revolution. That means that the gap between this trend and the global goal of net zero emissions by 2050 is widening every year, so enormous effort is necessary. ICEF do a lot of things, but how to bend the emission trajectory downwards, with all possible measures including financial or new technology etc. is the critical issue.

ICEF did a lot about the roadmaps, and this year's roadmap was decarbonization in the industrial heat sector. Industrial heat is a very tough area, so it is using more CCUS or hydrogen biomass and electrification. All possible tools are needed to reduce energy from CO₂ emissions from steel making, cement etc. Regarding the top 10 innovations, there are many different kinds of technologies from the commercial scale or from the research and development stage. We picked up several of these innovative technologies, and participants voted on which are the most likely technologies, so I have outlined the top 10 innovations.

There is another message which is interesting. I have outlined the top 10 innovations and the infographics from this meeting. From now, we need an immediate peak and vigorous decline. We used an example of a bobsleigh to show how quickly we have to do it. Another point which I raised is the role of women in climate change mitigation. Climate change is not gender neutral. Women are hit much harder by climate change, especially in African countries, because more women are farmers, and with climate change, much more effort is required to fetch water from more distant places.



On the other hand, women can do a lot to change the policy, by voting, by becoming business leaders and changing business models. Women's role in climate change mitigation could be stressed much more. Gender issues and climate issues should come together. For the financial sector, TCFD is green financing, which means climate lens investment. Gender lens investment is focusing gender friendly corps and these should come together. That is one of the points which this group has discussed and recommended.

I do not want to go too far, but IEA said four revolutions are happening in energy sector. One is the shale revolution in the US. Two, solar power is the cheapest in the future. The third is China's green revolution and the fourth is electrification digitalization. However, an important fifth revolution which I want to add is this demand-driven transformation. Through TCFD, the money goes to more sustainable companies, and in a way, they are users of energy. If these companies try to be more and more sustainable, this may cause the structure of the supply. The IEA and the governments always think from the supply side but the demand-driven transformation may change the structure drastically.

Another example is the RE100, 100 % renewable energy using corporations. This is a list of corporations, including major corporations like Apple, GM and BMW. If they require their suppliers to do the same, and this is the case, maybe those companies who wish to stay in the supply chain of the major global corporations will only use renewables in the future. This may create a huge challenge in the supply structure of energy. Energy transformation could be driven much more by the users than by the supplier, or by the government.

This is one of my points which I want to raise regarding Laurent Fabius' point about the role of the state. The state should prepare the incentives of financial schemes or standards for the disclosures and let corporations and users decide the future. This is one of the messages I want to share with you. Another one is that IEA's energy demand prospects show that it is not easy to see the peak demand of oil happening. However, if the demand-side change happens quickly, maybe peak demand could happen much earlier. That is what Saudi Aramco is concerned about. I told you about this last year.

Peak demand for oil may happen much earlier. I recently talked with Chinese experts and they say peak demand for oil in China may happen before 2025. This is five years from now. A peak emission of CO₂ may even happen in 2022. That is what the Chinese are saying. Their strategy is to use more renewables and reduce oil and gas imports from the Middle East, from Russia and from the United States. This is the geopolitical strategy of China, but at the same time, it is sustainable energy policy. This is very interesting.

One way to help those producers and gas and oil exporters is to use more hydrogen. This is a very common subject in the ICEF and the G20. This is about making green oil and gas with only hydrogen, with CCUS, and it may be exported or used. Hydrogen could still be a costly option, but Japan has been promoting use of hydrogen, but China has taken it up very seriously these days. This is because of the extra generation of solar and wind could be stored as hydrogen. As storage, hydrogen may be used much more substantially in the future. I will stop here in my presentation about these kinds of contributions from the ICEF to you, and let each of the individual panelists to present their case. I will take Olivier Appert first and then Leila will follow.