

October 12, 2022

To all members of the press

Ministry of Economy, Trade and Industry  
New Energy and Industrial Technology Development Organization

## Conference report of “Innovation for Cool Earth Forum 9<sup>th</sup> Annual Meeting (ICEF2022)”

**15 sessions held and about 1,600 people participated**

**from 87 countries/regions**

**Two Roadmaps, “Low-Carbon Ammonia” & “Blue Carbon”,  
had been created**

Ministry of Economy, Trade and Industry (METI) and New Energy and Industrial Technology Development Organization (NEDO) hosted “Innovation for Cool Earth Forum 9th Annual Meeting (ICEF2022)” as part of “TOKYO GX WEEK” which holds 10 international conferences in the field of energy and environment.

ICEF2022 is the international conference which brings experts of industry, academia and governments from the world together to discuss “innovation” as the key to solving global warming. A total of 15 sessions were held, attended by about 1,600 people from governments, international organizations, companies, and academia in 87 countries/regions.



【Opening Remarks from Mr. TANAKA Nobuo  
(Chair of ICEF Steering Committee)】



【Conversation between ICEF Steering Committees  
and Youth experts】

The Keynotes included dialogue and speeches on the status of energy security, the importance and necessity of innovation to address it, and the innovation that are attracting attention while having various barriers for achieving carbon neutrality.

- Keynote1: Pre-recorded Dialogue between Dr. Fatih Birol, Executive Director of International Energy Agency (IEA) and Mr. TANAKA Nobuo, Chair of ICEF Steering Committee
- Keynote2: Video Message from Mr. Gerd Müller, Director General of the United Nations Industrial Development Organization (UNIDO)
- Keynote3: Pre-recorded Dialogue between Mr. Francesco La Camera, Director-General of International Renewable Energy Agency (IRENA) and Mr. TANAKA Nobuo, Chair of ICEF Steering Committee
- Keynote4: In person Speech by Mr. Rahm Emanuel, Ambassador Extraordinary and Plenipotentiary of the United States of America to Japan



【H.E. Rahm Emanuel (Ambassador Extraordinary and Plenipotentiary of the United States of America to Japan) and Mr. TANAKA Nobuo (Chair of ICEF Steering Committee) in the session of Sustainable Nuclear Systems】

In each session, under the theme of "Low-Carbon Innovation in a Time of Crises," lively discussions were developed about policy innovation, CDR (Carbon Dioxide Removal technology), sustainable nuclear systems, a sustainable value chain in the age of resilience: Critical Metals and Minerals, and more. As the result, ICEF2022 issued a statement based on these series of discussions.

Each session is distributed on-demand on ICEF's YouTube channel.

<https://www.youtube.com/channel/UC7ouNL9NbvDomDTfiubi8iw>

Moreover, the roadmaps for "Low-Carbon Ammonia" and "Blue Carbon" were released. ICEF will give presentation for these roadmaps in COP27 (the 27th Conference of the Parties of the UNFCCC) held in Egypt and in BNEF held in Shanghai in November 2022.

## **[Statement]**

Under the ICEF2022 main theme of "Low -Carbon Innovation in a Time of Crisis", the statement addresses the crises we face, the opportunities under such uncertainties and risks, and the importance of diversified approaches to materialize opportunities. Focusing on the need for accelerated action by 2030 and action-oriented innovation, it emphasizes innovation in policy making and innovation for transitions. As a technology innovation, a wide range of technological

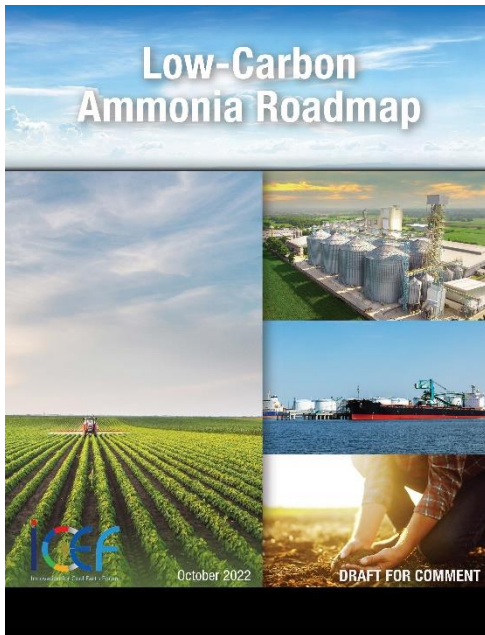
options for both the supply-side such as carbon dioxide removal and utilization, nuclear, hydrogen and synthetic fuels in heat and transport sector, and critical minerals and enhancing energy efficiency and utilizing renewables in all sectors on demand-side are emphasized.

The full text of statement is at the bottom of this release.

## [Roadmap]

ICEF publishes innovation roadmaps for carbon dioxide utilization, Direct Air Capture (DAC), Industrial Heat Decarbonization, Biomass Carbon Removal and Storage (BiCRS) and Carbon Mineralization with the potential to contribute significantly to long-term Net Zero Emissions. This year's Low-Carbon Ammonia roadmap is the 10th anniversary ICEF roadmap. A booklet is also published to commemorate the 10th roadmap.

### 1. ICEF2022 Roadmap : Low-Carbon Ammonia (Draft)



ICEF Low-Carbon Ammonia Roadmap explores a topic that Ammonia (NH<sub>3</sub>) being one of the building blocks of modern society. Low-carbon ammonia is produced by the methods such as capturing the CO<sub>2</sub> emitted in production processes and storing that CO<sub>2</sub> underground or in long-lived products, or by separating hydrogen from water using electricity from a zero-carbon power source. Low-carbon ammonia could then be used to substitute for carbon-intensive fuels or as a store of surplus renewable power, providing significant additional emissions reductions. The roadmap examines the global ammonia industry today, strategies for reducing the cost of low-carbon ammonia production, infrastructure needs for scaling up low-carbon ammonia, different ways that

low-carbon ammonia could be used to reduce emissions in the years ahead, the safety and local environmental impacts of expanding ammonia production and use, R&D needs and policy options.

### 2. ICEF2022 Roadmap : Blue Carbon (Outline)

This ICEF Blue Carbon Roadmap summarizes the potential of blue carbon as one of the negative emission technologies to achieve net-zero emissions. In the roadmap, blue carbon is defined as the CO<sub>2</sub> captured and stored by mangroves, tidal marshes, seagrass beds, and natural macroalgae beds as well as macroalgal farming such as kelp and sargassum. The mitigation potential of blue carbon globally is estimated at 0.5-1.5 GtCO<sub>2</sub>e/year by the year 2050. The roadmap summarizes the scientific knowledge currently available, areas of research and development expected in the future, and institutional, policy, and environmental considerations that may arise in the future. It then presents pathways to increase blue carbon absorption and reduce emissions from the loss of the

ecosystems.

A draft of the ICEF Low-Carbon Ammonia Roadmap and an outline of ICEF Blue Carbon Roadmap were released at ICEF2022. In addition to the discussion at ICEF2022, public comments are welcomed. After reflecting the comments, the official Low Carbon Ammonia Roadmap and a draft Blue Carbon Roadmap will be released at COP27. For more information, please visit our website.

[https://www.icef.go.jp/roadmap/?utm\\_source=media&utm\\_medium=cjfp&utm\\_campaign=rm](https://www.icef.go.jp/roadmap/?utm_source=media&utm_medium=cjfp&utm_campaign=rm)

Comments should be sent by Saturday, October 15(JST) to:

- Low-Carbon Ammonia : [icefroadmap22@gmail.com](mailto:icefroadmap22@gmail.com)
- Blue Carbon : [ICEFRoadmap2022-bc@convention.co.jp](mailto:ICEFRoadmap2022-bc@convention.co.jp)

## [About ICEF2022]

- Innovation for Cool Earth Forum 9th Annual Meeting (ICEF2022)
- Website:  
[https://www.icef.go.jp/?utm\\_source=media&utm\\_medium=cjfp&utm\\_campaign=tp2](https://www.icef.go.jp/?utm_source=media&utm_medium=cjfp&utm_campaign=tp2)
- The number of sessions: 15 sessions
- The number of participants: about 1,600 people from 87 countries/regions
- YouTube Channel: <https://www.youtube.com/channel/UC7ouNL9NbvDomDTfiubi8iw>
- Host: Ministry of Economy, Trade and Industry/ New Energy and Industrial Technology Development Organization
- Co-hosts: Ministry of Foreign Affairs/ Ministry of Education, Culture, Sports, Science and Technology/ Ministry of Agriculture, Forestry and Fisheries/ Ministry of the Environment
- Sponsors: International Energy Agency/ BloombergNEF/ United Nations Industrial Development Organization
- Dates: 8:30~18:35, Wednesday, October 5/ 9:00~17:05, Thursday, October 6 (JST)
- Venue: Hotel Chinzanso Tokyo (Address: 2-10-8 Sekiguchi, Bunkyo-ku Tokyo) and On-line

[For inquiries from media members]

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## [The Full Text of Statement]

Under the main theme of “Low-Carbon Innovation in a Time of Crises”, the ninth annual meeting of the Innovation for Cool Earth Forum (ICEF 2022) was held in a hybrid format on October 5 and 6, 2022 as an initiative of "Tokyo GX Week", a series of 10 conferences that discussed on a wide range of energy and environmental issues. More than 1,600 people from governments, international organizations, industry, and academia participated in this event, representing 87 countries and regions. At the conclusion of ICEF 2022, the Steering Committee is releasing the following statement based on a series of discussions.

### 1. Crises we face

- This year people in many parts of the world experienced record high temperatures, as well as devastating wildfires, floods and droughts, threatening human lives and nature. The Sixth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC AR6) pointed out that we are not on track to limit warming to 1.5° C. Unless there are immediate and deep emissions reductions across all sectors, 1.5° C is beyond reach, increasing the danger of exceeding more tipping points. Even 2° C has become increasingly challenging.
- In addition, the COVID-19 and the war in Ukraine have not only shocked but also dramatically disrupted our energy and food systems. The war has impacted various energy markets and threatened energy security of many economies.
- As a result, both the use of coal and emissions are rising. We also face the imminent issue of inflation, in particular energy and food price hikes, and supply-chain disruptions.
- All these crises revealed weakness of international and national institutions to address global issues.
- Furthermore, social unrest and political violence in some parts of the world have been rising, due to the public’s dissatisfaction and anger in the difficult socio-economic situation.

### 2. Opportunities we have: diversified approaches

- Since its start in 2014, ICEF has promoted innovations as a solution to climate change. Innovation becomes even more significant and crucial under these uncertainties and cascading challenges. The current rapid cost declines and massive deployment of renewables demonstrated that transformational change is possible. Now we need to transform other areas and sectors. Momentum for public and private R&D incentives and investment in clean energy technologies is now higher than ever before. Countries’

pivotal measures away from dependence on fossil fuels can accelerate clean and secure energy transition in the medium and long term.

- Diversification in approaches is essential to materialize opportunities. Diversified approaches will create sound competition among different technologies, and therefore constitute an origin of innovation and contribute to their deployment.
- Diversification is also an important principle of resilience that helps enhance capability to grapple with risks and uncertainties. It is thus indispensable for tackling energy security issues and moving towards the post-COVID-19 era, which are now transforming our society.
- ICEF embodies diversification and inclusiveness. We not only facilitate discussions and debates among countries and regions with different pathways, various technological areas, sectors of industry, academia and government, and many other stakeholders, but also ensure cross-generational representation and gender diversity.

### 3. Need for accelerated action before 2030

- While the number of countries and regions pledging carbon neutrality and with climate legislation is increasing, CO<sub>2</sub> emissions in 2021 rebounded at the highest level after a temporary decrease in 2020 with the COVID pandemic lockdown. The short-term emissions unfortunately continue to increase. In the meantime, the IPCC AR6 assessed that the remaining carbon budget from 2020 onwards is 500 Gt CO<sub>2</sub> to have a 50% chance of limiting warming to 1.5° C, while existing fossil fuel infrastructure is expected to emit cumulatively 610 GtCO<sub>2</sub> from 2018 until the end of its lifetime. We simply cannot keep this pace forward and must reverse the trend as soon as possible.
- It becomes crystal clear that this decade up to 2030 is critical in order to deliver carbon neutrality by mid-century, and that we need to accelerate innovation and deployment.

### 4. Action-oriented innovation

- In the midst of surging discussions on energy security and geopolitics, at ICEF 2022, leading experts discussed (1) how innovation can contribute to delivering both carbon neutrality and energy security, and (2) what practical action-oriented approaches are required to accelerate transition leading up to 2030.
- Policymaking shall also adopt innovation. When energy geopolitics is so much heightened, energy security and energy transition must be pursued in a more balanced and rational manner. Fair market conditions and mechanisms for decarbonization need to be established. A new industrial policy for deployment is needed.
- Transition must take into consideration of socio-economic impacts and ensure to leave no one behind. Thus, how innovation contributes to increasing compatibility between

economic development and carbon neutrality shall be addressed. As many countries still depend on fossil fuels for economic growth, we seek answers to how to pursue wise use of fossil fuels in the challenging energy transition.

- Technology innovation offers perspective and options to choose. In ICEF, we dive deep into a wide range of technological options for both the supply-side and demand-side. On the supply-side, carbon dioxide removal and utilization, nuclear, hydrogen and synthetic fuels in heat and transport sector, and critical minerals are examined in depth; and on the demand-side, enhancing energy efficiency and utilizing renewables in all sectors are emphasized.
- Given that carbon neutrality requires all sorts of carbon dioxide removal technologies, we discussed how to ensure the environmental integrity of those technologies, in particular around increasing R&D and good governance.

## 5. In closing

- ICEF has diversity and inclusiveness in its DNA by design. We always embrace and celebrate the participation of speakers who represent and embody diversity. This year we have paid particular attention to increasing the representation and voices of younger generation who will lead and define a sustainable, resilient and inclusive society of 2050. We at ICEF remain firmly committed to engaging diverse stakeholders and thereby creating stronger momentum for technological and social innovation for carbon neutrality.

