

Tokyo Zero-emission Innovation Bay

[https://unit.aist.go.jp/gzr/zero\\_emission\\_bay/en/index.html](https://unit.aist.go.jp/gzr/zero_emission_bay/en/index.html)

< **Opening Remarks** >

Professor KASHIWAGI Takao

President of Zero-emission Bay,

Distinguished Professor and Emeritus Professor, Tokyo Institute of Technology

---

Thank you for the introduction. I am KASHIWAGI Takao from Tokyo Institute of Technology. I was assigned by Dr. YOSHINO, Director of GZR, to serve as the President of Tokyo Zero-emission Innovation Bay. I wish to extend our warmest thanks in particular to Mr. HOSODA, State Ministry of Economy, Trade and Industry for attending this Symposium.

Looking back on the history of carbon neutrality, the Paris Agreement first set targets to keep average global temperature increases well below 2°C above pre-industrial levels. If advanced countries could reduce greenhouse gas emission by 80%, we would achieve the reduction target by 2050.

The target had been reviewed on various occasions including by the IPCC, to add to the agreement to continue efforts to limit temperature rise even further to 1.5°C. Led by the EU, it was argued that advanced countries should prepare to meet this target boldly to avoid irreparable damage. This was the context of the 1.5°C target toward carbon neutrality and the Paris Agreement clearly spelled out the target. 196 parties including developing and advanced countries signed the agreement. Each country had reviewed the agreement and it came into effect in 2016.

Since 2016, the Japanese government has been working intensively on the long-discussed carbon neutrality. Under interministerial collaboration, with the Industrial Science and Technology Policy and Environment Bureau of METI's taking the lead, on January 26th, 2020, "Environment Innovation Strategy" was formulated, in which 16 challenges with 39 themes in five areas were selected. If we continue to pursue the strategy, we will surely reach carbon neutrality by 2050.

I thought that Mr. ABE, the Prime Minister at that time, would announce it, but, he resigned and Mr. SUGA, the former Prime Minister, made a commitment to achieving carbon neutrality in his policy speech on October 26th, 2020.

Under such circumstances, Japan declared that we would overcome climate change through technological solutions and human activities. While climate change involves average temperature increase with volatility, Prime Minister Suga made a major decision in line with countries around the world calling for the

temperature rise to be capped at 1.5°C. The other day, I met Mr. IZUMI, the former Special Advisor to the Prime Minister, when he came to us for a guest presenter, I asked him if he had been aware that the president would announce his big decision, Mr. IZUMI said that he did not know. I am not sure if it was true or not, but it must be true because he told me in public. He said that Mr. SUGA self-determined the commitment to carbon neutrality for his policy speech. It showed the intensity of his passion for engagement.

Later, the government declared the “Green Growth Strategy Through Carbon Neutrality in 2050” to boost Japan’s development. The strategy should not lead to negative growth. “Environment Innovation Strategy” was reviewed over and over again to be shaped into fourteen challenges as “Green Growth Strategy Through Carbon Neutrality in 2050”. New strategy was announced only in a few months after Mr. SUGA’s policy speech. In METI at that time, each challenge had a manager assigned to it, who worked day and night to formulate the strategy. It must have been disaster, I guess. Finally, fourteen challenges were selected. The Challenges differ in characteristics, and led to the establishment of a two trillion yen GI Fund over a ten-year period.

It is a large and unique fund for Japan. The ten-year fund was unique because Japan adheres to the budget principle for a single fiscal year. I think they made every effort to make it a ten-year fund because the green growth was not going to happen in a short period of time.

About a year ago in April, Mr. BIDEN, the President of the United States, visited Japan. Mr. BIDEN advised Japan to raise the 26% CO<sub>2</sub> emissions target to announce at the Leaders Summit on Climate scheduled for April 22nd and 23rd. According to Mr. BIDEN, the 26% emissions target could not drive Japan to reach zero emissions by 2050. We could not ignore Mr. BIDEN’s word as we have the US-Japan alliance.

Mr. SUGA started to revise the goal through “the Sixth Strategic Energy Plan”, which I served as a member of the Advisory Committee, The target time was shortened from 2050 to 2030. 2050 became just the time to make carbon neutrality a reality. The plan contained no further details about 2050 nor nuclear energy that I would have mentioned since the election was also coming up. Consequently, Mr. SUGA declared that Japan will reduce emissions by 46% in 2030.

It is extremely difficult to reach the target. We must complete the task in eight years through the energy system, starting with energy conservation. Energy conservation is the simplest system of all, and its impact should be visible in a short time. Primary and secondary energy come after energy conservation.

This is how carbon neutrality makes progress. When we set clear goals, zero-emission innovation hub was planned to establish. There are many hubs in the world like Silicon Valley and Singapore. However, they all have something to do with IT or IOT. Zero-emission itself is involved in a wide area, and therefore

it will never be easy to successfully establish the hub in a short time. A good combination of industrial factors would lead to the achievement of carbon neutrality or zero emissions.

The challenges toward carbon neutrality usually fall under three key points. Firstly, energy conservation is the easiest thing to begin with. Secondly, it is electrification. Electrification means electrification of vehicles. Since the CO<sub>2</sub> emitted by vehicles accounts for seventeen percent of all emissions, replacing that seventeen percent with electricity would contribute to carbon neutrality. Electricity could be generated by nuclear energy and renewable energies. As you can see, the road to electrification is very clear. Thirdly, it is hydrogenation. Hydrogenation would solve heat issues. The fact that hydrocarbon is decomposed to carbon and hydrogen would be used to produce hydrogen, which would be the heat source.

We hope to realize zero emissions through the three keywords I have shown. The main challenges can be roughly categorized into these three points. If we could successfully produce zero emission hydrogen, we would find a path to e-fuel and SAF such as Sustainable Aviation Fuel for aircrafts. SAF is synthetic kerosene. Since SAF and kerosene are different only in form, SAF is as familiar as kerosene. Therefore, hydrogen plays an important role. Hydrogen can produce e-fuel, synthetic fuel, or whatever.

If Japan creates system of systems through the zero-emission innovation hub in an execution process, and we operate the hub effectively, Japan, the country with almost no fossil fuels, would become an exporting country of fuels, electricity, and secondary energy such as hydrogen. If we could create a good combination of green hydrogen, brown coal hydrogen, and CCUS, while processing them and implementing an international supply chain, ideally Japan would turn into an exporting country for industrial fuels, unlike we used to do to export industrial products like vehicles.

Under the government's leadership, Tokyo Zero-emission Innovation Bay was founded 2 years ago to realize zero emissions in Tokyo Bay, which would make a big impact to the world because of its popularity. I believe the world's first zero-emission innovation hub has been effective so far.

We hope that this symposium will deliver beneficial outcomes toward progress of the growth strategy, through sharing information among experts.

Thank you very much for your attention.