

Changes to Projections in the “IEEJ Outlook”

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“IEEJ Outlook,” the global energy demand and supply outlook published by the Institute of Energy Economics, Japan, has been updated almost every year since 2006.¹ The Outlook presents projections for two scenarios: the “Reference Scenario” based on the continuation of trends such as technological trends, and the “Advanced Technologies Scenario,” which projects the maximum adoption of low-carbon technologies. Readers often raise the question, “Which scenario is more likely to happen?” However, it is impossible to say objectively how likely it is that each scenario becomes reality.

Nevertheless, the definitions of the concepts behind each scenario have remained unchanged so far. For this reason, it is possible to see, to a certain degree, which scenario the actual values have trended closer to, by tracking the projections that have been drawn up in the past. The figure below compares the projected values and actual values of energy-related CO₂ emissions in both scenarios from the 2009 edition and after.² Until the early 2010s, actual emissions have trended within the range of past projected values in the “Reference Scenario.” Although the actual values later moved closer to the projected values in the “Advanced Technologies Scenario,” they generally hover close to the boundary line between the two scenarios. So far, it does not appear as if either scenario had been accurate.

While the definitions of the scenarios have not been changed, the future projections are changing every year. The “Reference Scenario” is based on the extension of past trends. Although the projections under this scenario had continuously been revised upward until the 2012 edition, they were revised downward every year thereafter as the growth rate of actual emissions began to slow down. Similarly, in the “Advanced Technologies Scenario,” projections have been revised downward every year after peaking in the 2012 edition, as a result of factors such as the advancement of low-carbon technology and the strengthening of environmental policies. However, until the 2016 edition, emissions were not projected to fall significantly even in the “Advanced Technologies Scenario” but were projected to remain generally at the same level until 2040. From the 2018 edition, the outlook has changed, with projections of a significant fall in emissions until 2050. This is due to the incorporation of CCS into the technology assumptions. While keeping an eye on the development trends of new low-carbon technologies, we constantly consider the possibility of their popularization, as reflected in the

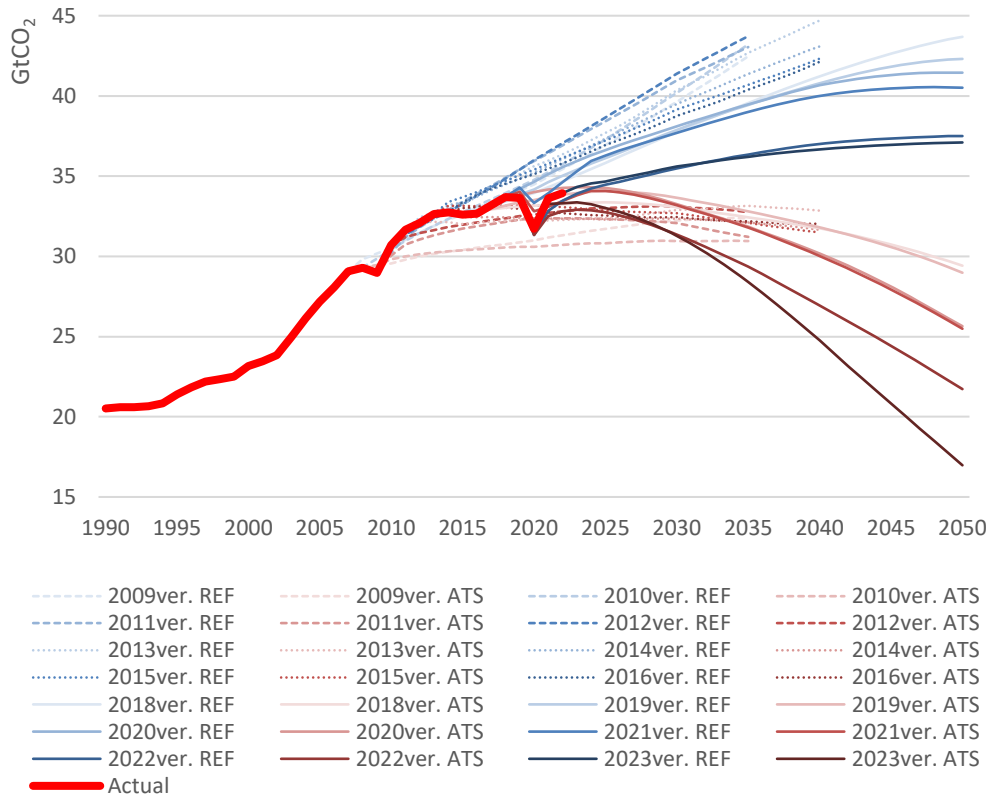
¹ “Asia/World Energy Outlook” at the time of the 2006 edition. The title was changed from the 2018 edition.

² Before the 2008 edition, the “Advanced Technologies Scenario” was formulated only for the Asian region.

incorporation of the popularization of hydrogen technology in the 2023 edition.

Therefore, by looking at changes in past projections in this way, we can get a clear understanding of the direction that the world is moving toward. In particular, the “Advanced Technologies Scenario” assumes the adoption of low-carbon technologies to the maximum degree that can be accepted, economically and socially. The maximum degree of adoption can change significantly as a result of the economic, social, political, and technological conditions of the time. In recent years, many countries have been issuing declarations of carbon neutrality, reflecting a growing momentum toward CO₂ emissions reduction even in developing economies. The development and popularization of low-carbon technologies has also been picking up speed. In a sense, changing the projections means that such trends had not been taken into consideration beforehand, or in other words, that projections published in the past had not been accurate. However, the Outlook is not an accurate prediction of the future to begin with. Rather, it examines how the future energy demand and supply structure could look like based on the hypothetical scenarios. If unfavorable global conditions are predicted, it is then possible to consider how such situations can be avoided. For example, if the outcome of the prediction is insufficient CO₂ emissions reduction, this offers us clues for countermeasures that can be taken, such as the need to accelerate the development and adoption of low-carbon technologies in certain regions or sectors. As a result of such countermeasures, we are likely to take a different path from the initial projections. Therefore, we can say that the nature of the Outlook is to provide information that contributes to behavioral changes in the future, and consequently, that its future projections will not be accurate. The IEEJ Outlook 2024 is currently in the works and is scheduled to be published on October 20.

Figure Changes in the Projected and Actual Values of Global Energy-related CO2 Emissions



Source: IEEJ, “Asia/World Energy Outlook,” “IEEJ Outlook” editions of each year (no 2017 edition)

Note: REF: Reference Scenario, ATS: Advanced Technologies Scenario. The starting points for past projections have been corrected in line with retroactive revisions to the actual values. Actual values for 2022 were calculated with a 0.9% increase from the previous year based on IEA reports.

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