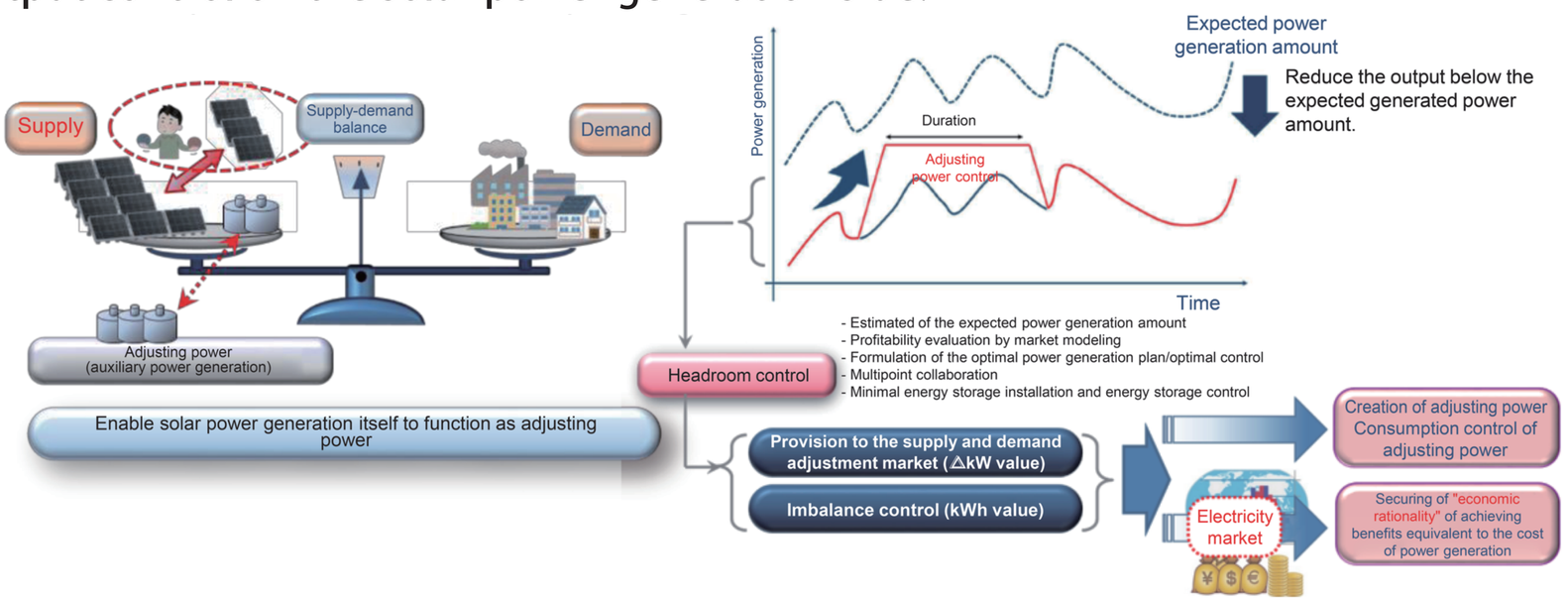
Photovoltaic power generation

Experimental study of technologies to create adjusting power by solar power generation

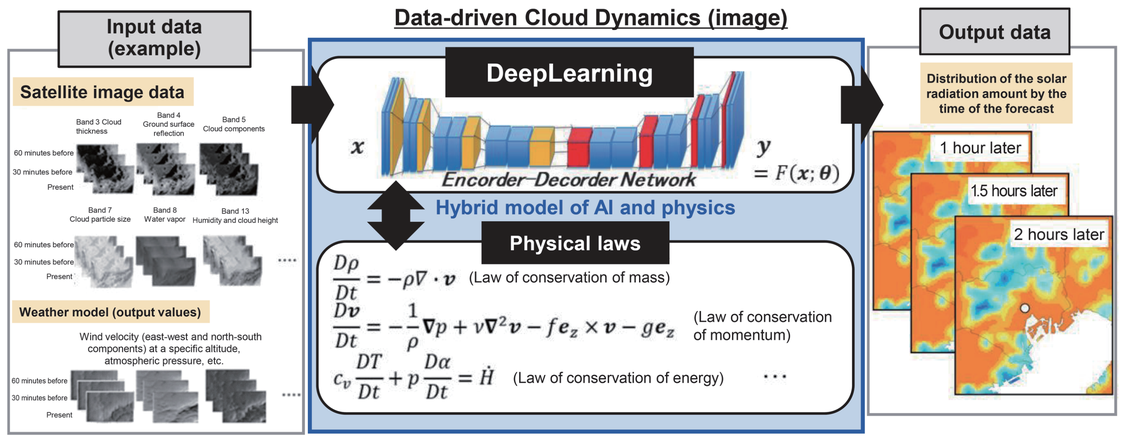
In power system operation, the amount of electricity supplied should be constantly kept equivalent to the demanded amount. There is a concern that if solar power generation systems, whose output fluctuates with the weather conditions, increase significantly in the future and flows into the power system, it will be difficult to adjust the balance of supply and demand, which may hinder a stable supply of electricity.
To address these issues, NEDO is developing technologies to mitigate the impact on the system by providing more flexible output control on the solar power generation side.



Source: Modified from NEDO FY2020 Report "Research on the Feasibility of Technologies to Create Adjusting Power through Power Generation"

Development of solar radiation amount forecast technologies for short-term forecast of the power generation amount

With changes in the market environment surrounding solar power generation, the sophistication of power generation amount forecast technologies is required from the viewpoints of complication of supply and demand operation, stable supply of electricity, etc. Solar power generation is a variable power source subject to weather conditions, and it is important to accurately forecast its generation amount in order to make effective use of the electricity generated. In order to forecast power generation with high accuracy, it is necessary to improve the accuracy of solar radiation amount forecast on the spatial and temporal axes, and NEDO is developing technologies to improve the accuracy of solar radiation amount forecast of a few hours ahead up to the next day and the day after next.



■Developed a method which combines short-time forecast using cloud distribution images from Himawari-8 data and physical forecast using weather models (Data-driven Dynamics method).
Source: Modified based on the basic plan of "Development of Technologies to Promote the Use of Solar Power Generation as Main Power Source" and the FY2020 interim annual report "Development of Solar Radiation Amount Prediction Technology for Short-Term Power Generation Amount Forecast" of NEDO

Development of power generation forecasting technology for new market (in-vehicle) introduction

Use cases have a significant impact on the power generation performance of solar cell-equipped mobile devices and other devices. Estimation of power generation in various use cases considering these influences is important for estimating the effect of solar cell-equipped mobile devices on the market. Therefore, NEDO will establish a technology to estimate the effect of solar power generation, such as power generation on an annual level, and develop a technology that can determine the suitability for the assumed market (vehicle etc.).