

Advanced R&D Platform for Decarbonized Power Grid with Inverter-based Distributed Energy Resources

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In order to make variable power sources from renewable energy sources the main power source in the power system, it is essential that inverters have advanced functionality. By realizing the potential of inverters, they can play a role in ensuring a stable supply of power in the power system. For example, it can help ensure the quality of electric power, such as voltage and frequency. Inverters with communication capabilities can be profitable by timing the transfer of power in and out of the power market.

Since each inverter is so small compared to a conventional generator (thermal, hydro, etc.), a very large number of inverters need to operate in unison as an aggregated unit. It is also necessary for the inverters, as newcomers to the system, to operate in proper coordination with the conventional power system. AIST has been operating an inverter R&D and testing facility since 2016, and has supported about 200 joint research and certification tests on inverters. Next year, the facility will have a major update to accommodate large inverters in the 5 MW class. In addition, by strengthening DX support such as automatic test methods and HIL technology, R&D and certification testing related to smart inverters, virtual inertia inverters, and the grid connections of battery electric vehicle will be accelerated.