EM-Power Europe

Munich, May 7–9, 2025

TREND PAPER: FLEXIBLE GRID CONNECTION CONTRACTS – MORE RENEWABLES, LESS GRID CONGESTION?

Munich/Pforzheim, February 2025 – In many places, the energy transition is being held up by a key problem: the lack of grid capacity. While renewable power plants are being deployed at a rapid pace, grid expansion often lags behind, so that valuable energy has to be curtailed as a result. Flexible grid connection contracts could alleviate this bottleneck because they allow a more efficient use of grid connection points, so that more systems can be connected without having to wait for the time-consuming expansion of the grid. This trend paper shows the regulatory innovations that will pave the way for this practice in Germany, the opportunities and challenges connected to this, and discusses if the model can be a true game-changer.

In many countries, grid connection points for power plants are designed for each system to be able to feed in 100 percent at any time. This means that when new installations are planned, grid operators have to carry out a grid compatibility check as soon as they receive a grid connection request. This has the purpose of establishing whether the grid has the physical capacity to handle the incoming electricity. The check is based on the system's installed capacity, in other words the active electrical power that the system is theoretically able to generate. However, the wind doesn't always blow and the sun doesn't always shine, and there are various other reasons why renewable energy systems don't usually feed in their full active power. Hence the capacity utilization at the grid connection point is often low, and the remaining grid connection capacity is not being used. It is possible to "overbuild" renewable capacity, i.e. for the system behind the grid connection point to be permitted to have a higher output than that which the grid connection point is able to transmit.

What's new in the EEG and EnWG?

The EU has triggered various changes: With the updated Directive on common rules for the internal market for electricity, the Member States have to create options for flexible grid connection contracts in areas with low, or no, grid capacity. The German parliament has implemented the Directive with the EEG/EnWG reform, which came into force in January 2025 and paved the way for overbuilding renewable capacity in Germany. In the future, renewable energy project developers will be allowed to come to more flexible agreements about grid connection and usage with grid operators. This means that grid operators may curtail the electricity being fed in from power plants and the consumption of grid electricity to a specific value for a specific time. This gives project developers the opportunity to connect systems to the grid much sooner – and to a more favorable connection point –, if they accept a lower connection capacity before the required grid expansion is completed.

What should a flexible grid connection contract cover?

For a flexible grid connection contract to be realized, it has to cover at least the following aspects:

- the extent and duration of the limited maximum active power feed-in
- the permanent or temporary limitation of feed-in or output (dynamic or static limitation)

- the liability of the plant operator in the case of the feed-in/output limit being exceeded.

"We expect with the introduction of flexible grid connection contracts, the frequency of disputes about grid connection points will drop – and that's great news for renewable energy plants and storage systems," comments Robert Busch of the German Association of Energy Market Innovators (bne).

In Germany, flexible grid connection contracts were introduced both with the Renewable Energy Sources Act (EEG) and the Energy Industry Act (EnWG). The provisions of Section 17 EnWG also comprise consumers and flexibility options, as well as large standalone battery storage systems, while Section 8a EEG provides for cases where a renewable energy system is included, for example photovoltaic installations with or without storage, or cases where photovoltaic installations are used to overbuild the capacity of wind power on grid connection points. These contracts could cover the priority for connecting renewable energy systems to the grid. Furthermore, grid operators are obliged to provide digital processes for managing connection requests and sharing information.

No complete protection against arbitrary decisions

The new regulation has a weak point: Grid operators can impose requirements on grid usage that could severely impede financial optimization. Time will tell whether grid operators will be reasonable when setting requirements, especially when it comes to grid connection usage. If those requesting a connection and grid operators work together constructively and negotiate contracts that ensure good grid usage, but no over usage, everybody wins.

Potential game-changers?

An essential goal of the energy transition is to use power rather than curtail it. If in the future, storage systems and other flexibility options can be built and connected faster and more easily, flexible grid connection contracts could turn into real game-changers for the energy industry. They offer a number of benefits that could improve the integration of renewable energies, grid stability and cost efficiency at the same time. This should make it easier in Germany to obtain grid connections for solar farms, large rooftop PV installations or photovoltaic systems combined with large battery storage systems.

EM-Power Europe, and the parallel events Intersolar Europe, ees Europe and Power2Drive Europe, will take place from May 7–9, 2025 as part of The smarter E Europe, Europe's largest alliance of exhibitions for the energy industry, at Messe München.

Further information on this topic can be found at the following events:

EM-Power Europe / Power2Drive / Intersolar Conference

Developing the Future Distribution Grid
Tuesday, May 6, 2025, 11:30am – 01:00pm
ICM München, Room 13A

Smart Electrification of Demand
Tuesday, May 6, 2025, 2:30pm – 04:00pm
ICM München, Room 13A

V1X and V2X Business Models Integrating Grids and Electric Vehicles
Tuesday, May 6, 2025, 4:30pm – 06:00pm
ICM München, Room 13A

Tackling Transmission and High-Capacity Connection Challenges
Wednesday, May 7, 2025, 9:00am – 10:30pm
ICM München, Room 13A

High-Power Application - How Far Can MCS Go?
Wednesday, May 7, 2025, 9:00am – 10:30pm
ICM München, Room 13B

Hybrid PV Power Plants I: Enhancing Grid Flexibility with PV, Wind & Battery Storage
Wednesday, May 7, 2025, 11:00am – 12:30pm
ICM München, Room 14B

The smarter E Forum

Intelligent Distribution Grids for tomorrow's demands
Wednesday, May 7, 2025, 10:30am – 11:30am
Messe München, Hall B5, Booth B5.550

Optimising Grids Through Demand-Side Flexibility
Thursday, May 8, 2025, 01:00pm – 02:00pm
Messe München, Hall B5, Booth B5.550

HEMS and their pivotal role in modern energy management and grid stability
Friday, May 9, 2025, 1:30pm – 02:30pm
Messe München, Hall B5, Booth B5.550

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