



# Grid Code Compliance Simulation, Testing, Inspection and Certification

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# Streamlined support for power generating units, components and systems.

Renewable power production is growing as the world moves toward decentralized renewable energy production powered by distributed energy resources (DER). Manufacturers find eager markets for these products and systems around the world, but compliance with grid code must be demonstrated before these products can be put into use.



## Typical grid code requirements

- Power vs. frequency
- Active Power control
- Reactive Power capabilities and response
- Voltage and frequency protection (ROCOF, fault-ride-through)

## Expert grid code compliance services

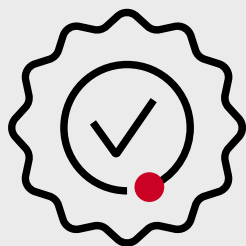
At UL Solutions, we connect manufacturers of energy equipment and developers of power plants with comprehensive grid code compliance services that address a wide range of standards, generating units and systems.

We have supported over 200 renewable installations through our grid code compliance services for energy equipment and power systems, resulting in a growth in installed capacity of over 9GW.

Here's how manufacturers of energy equipment and developers of power plants benefit from working with us:

- Simplify complex projects by working with a single source provider for grid code compliance activities.
- Project speed up interacting with just one supplier for global market access as a one-stop solution.
- Engage with renewable power experts with decades of experience in testing, inspection and certification services.
- Demonstrate compliance for more than 60 grid codes around the world.





## Which products can we test for grid code compliance?

- Photovoltaics inverters
- Wind turbines
- Energy storage power conversion system
- Bi-directional EV charger (V2G)
- Combined heat and power generators
- Mini hydroelectric generators
- Synchronous generators
- Power plant controllers

UL Solutions uses test benches up to 500kW and MW scale for wind turbines and can perform testing in the customer facilities or in field.

## Helping manufacturers of energy equipment demonstrate grid code compliance

UL Solutions is a global leader in safety science, trusted by major players in the energy industry for testing, inspection and certification services. Our team can bundle testing activities for key UL, IEC standards and grid code requirements which leads to significant savings in testing costs and reduces timelines.

Since 2016, European grid codes feature a common requirement based on European Regulation EU 2016/631 – Requirements of Generators. To streamline market access efforts, our team can bundle testing services for a variety of requirements including EU 2016/631, as well as perform preliminary evaluation for grid code compliance for power generating units and components (PGU).

## We help power plant developers connect their plants to the grid

UL Solutions can simulate, certify, and inspect power plants to speed up connection to the electrical power system.

In some countries such as Spain and Germany, utility-scale renewables systems and DER-scaled systems must support the grid just as traditional power stations do. Power generating systems (PGS) must satisfy the local grid codes by demonstrating compliance through diagram analysis and advanced software-based simulations.

UL Solutions offers engineering services to help customers achieve grid code certification, such as:

- Power plant static and dynamic (electromechanical and electromagnetic) modeling
- Low and high voltage ride through simulations and on-field quality assurance inspections where needed
- Power quality investigations
- Short circuiting inquiries
- Protection coordination analysis
- Electrical losses evaluation
- Load flow calculation
- And additional power grid studies on demand

## Global grid compliance services

We work with a variety of power plant developers worldwide, including solar power parks, wind installations, energy storage systems, microgrids and DER systems.

UL Solutions provides grid code compliance services at our facilities in Spain, Germany, the United States, and via local witnessing through accreditations from DAkkS (Germany's national accreditation body), ENAC (Spain's national accreditation body), a2La and OSHA in the United States, and others according to ISO 17065 or ISO 17025.



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Australia

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Chile

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India

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Morocco

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Poland

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Spain

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Austria

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Mexico

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Philippines

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South Africa



# Let's talk

Through our global scale, UL Solutions supports manufacturers and power plant developers to demonstrate grid code compliance and access new markets. Learn more about our complete array of services for the power production industry, from grid code compliance through end-of-life decommissioning.



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