

etap GridCode™

Integrated, Unified Digital Twin Solution for Renewable Energy Systems

Optimize Design and Performance

Grid Code Compliance
Sustainability
Resilience and Reliability
Safety and Security

Life Is On

Schneider
Electric

ETAP GridCode™

Design, validate, control, and audit

ETAP GridCode is a comprehensive software and hardware solution for renewable energy power plant network analysis, system planning, and operations on a progressive digital twin platform, empowering engineers and operators to maintain local grid code compliance, increase safety, maximize reliability and energy efficiency.

End-to-end power solution to optimize the LCOE of renewable farms

Traditionally, electric power flowed from bulk generation, via transmission networks, to distribution networks and then to end-customers. This allowed Distribution Operators to design their networks based on a set of rules considering only the most critical scenarios to accommodate loads at large. This approach allows for very limited short-term decisions (days to hours vs real-time) on distribution level and upgrading the network requires long planning cycles. Grid modernization and sustainability efforts drove large investments into renewable energy power plants that requires control, routine maintenance, and continuous insight to keep it running efficiently, safely, and profitably. In today's dynamic energy generation environment, power plant owners, therefore, require sophisticated & integrated solutions to meet a variety of operational compliance and interconnection standards.

Design and Build phase	Operate and Maintain phase
<p>ETAP help to reduce projects' time to market & cost with optimized and best in class electrical engineering, compliant to grid codes and standards.</p> <p>Model</p> <ul style="list-style-type: none"> • Field data collection & intelligent modeling • Cloud-based collaboration • Verified and Validated brand-agnostic libraries <p>Simulate and Analyze</p> <ul style="list-style-type: none"> • From LV, MV to HV systems • Unified AC and DC calculations • Design tool and optimization • Grid code compliance • Co-engineering & simulation 	<p>ETAP help to maximize revenue and optimizes operations with a focus on people's & assets' safety, system reliability and operational efficiency.</p> <p>Monitor</p> <ul style="list-style-type: none"> • Grid code compliance – dynamic system monitoring <p>Control</p> <ul style="list-style-type: none"> • Power Plant Controller <p>Operate</p> <ul style="list-style-type: none"> • Predictive Simulation • Operator Training Simulator • Protection and Asset Management
Full data continuity → one tool, one model, from design to operate	

Value Proposition



Design and Optimization



The ETAP Electrical Digital Twin empowers engineers to efficiently design, analyze, and optimize renewable energy power plants.

Grid Code Compliance

Modules	Supported Country Codes
<ul style="list-style-type: none"> • Grid Code Analysis • Time-Domain Load Flow • Quasi-Dynamic Load Flow • DC Load Flow • PQ Capability • Harmonic Analysis • Transient Stability • Voltage Ride-Through • Frequency Ride-Through • User-Defined Dynamic Models • Power Plant Controller • Electromagnetic Transients • EMTCoSim 	<ul style="list-style-type: none"> • ENA EREC G99 2021 – United Kingdom • ENA EREC G5/5 2020 – United Kingdom • IEEE 1547 2018 • PRC-024-2 – North America • Enedis-PRO-RES_64 2020 – France • RTE_DTR 2020 – France • Guida Tecnica - Allegato A.68 - Rev.03 12/2019 – Italy • Guida Tecnica - Allegato A.17 - Rev.02 12/2019 – Italy
Rulebooks	
Automatically evaluate grid code compliance regulations based on country-specific standards and guidelines.	

Analysis and Maintenance

Maximize safety and reliability from Point of Connection (POC) to Balance of Plant (BoP).

 <h3>Safety & Security</h3> <ul style="list-style-type: none"> • Arc Flash, Arc Fault • Short Circuit • Protection & Coordination • Ground Grid • Cable Derating • Asset Management 	 <h3>Resiliency & Reliability</h3> <ul style="list-style-type: none"> • Optimal Power Flow • Reliability Assessment • Contingency Analysis • Feeder Hosting • Short and Long Term Forecasting • Demand Response
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Operate, Monitor and Audit

Maximize yields and meet TSO stability & power quality requirements at POI with ETAP Grid Compliance solution, including model-driven eSCADA platform, ePPC™ Power Plant Controller, and eTESLA™ Dynamic System Monitoring Recorder.

ePPC power plant controller

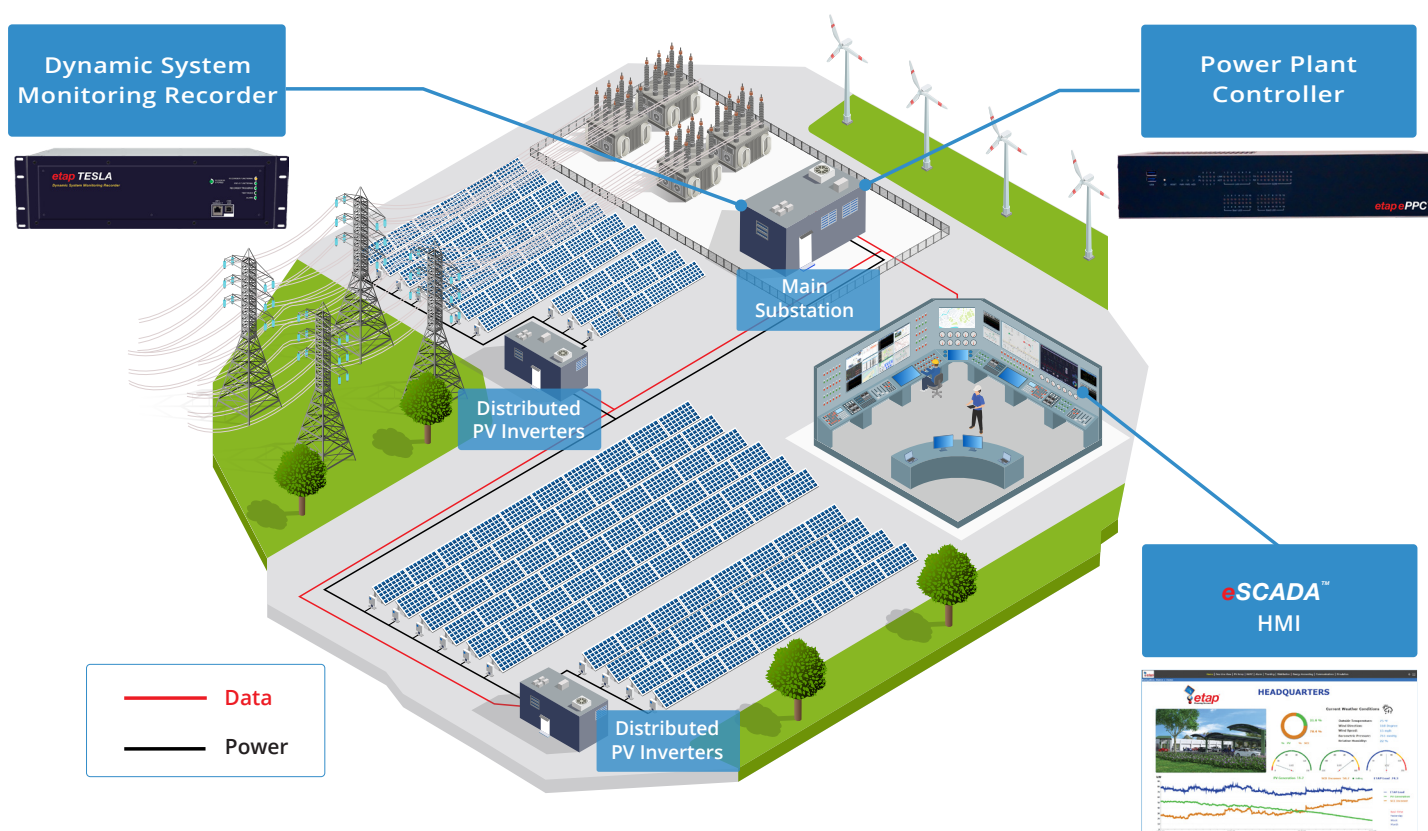
Intelligent and secure controller hardware ensures compliance with local grid code and standards. ePPC leverages a model-driven electrical digital twin for visualization, predictive calculations, optimization and management of renewable power plants.

Integrated Power Plant Controller & SCADA: Gain insight into asset health and perform preventive maintenance based on present and anticipated conditions by combining PPC and SCADA with dedicated HMIs and predictive analysis applications.











eTESLA™ dynamic system monitoring recorder

Continuous monitoring of steady-state and dynamic plant response to tune the electrical model, identify generator / AVR / governor and control parameters, and confirm PPC response under actual operating conditions.

Grid Compliance Monitoring & Reporting: TESLA hardware and software solution performs assessment and continuous audit of actual operation versus expected response. System operating condition is compared with established grid code rules for compliance reporting and evaluation.



etap GridCode™

	Ensure resiliency and reliability of power supply		Maximize long term sustainability
	Conform to grid requirements		Meet investor expectations of energy yield
	Reduce risk throughout planning and operations		Accurate forecast of yield and transfer capability
	Full dynamic control for enhanced stability		Operation, maintenance and compliance auditing
	Power conditioning and improved power quality		Greater transparency and investment security

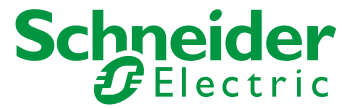
Intelligent design and engineering

Perform automated steady-state and transient studies, design and simulate power plant controller logic to simulate optimal grid performance under all possible situations.

Performance testing and validation

Test and validate power plant controller logic with ETAP SIL technology to ensure smooth commissioning and approval procedure when connecting to the grid. Reduce downtime via direct deployment or hot-swap of logic to Power Plant Controller.

Life Is On



Discover more:

etap.com/solutions/gridcode



SE Blog

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