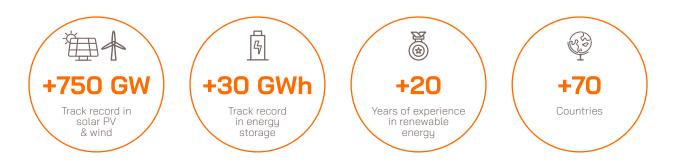


# GLOBAL FULL-RANGE TECHNICAL PARTNER FOR RENEWABLE AND ENERGY STORAGE PROJECTS

Applus+ provides independent, highly-specialized technical advisory, engineering, testing and inspection services for renewable energy and energy storage projects all around the world. We support our clients to minimize their risks across all stages of their projects, from feasibility and development, to construction and operations, covering all required specialties.



# A TRUSTED GLOBAL TECHNICAL PARTNER

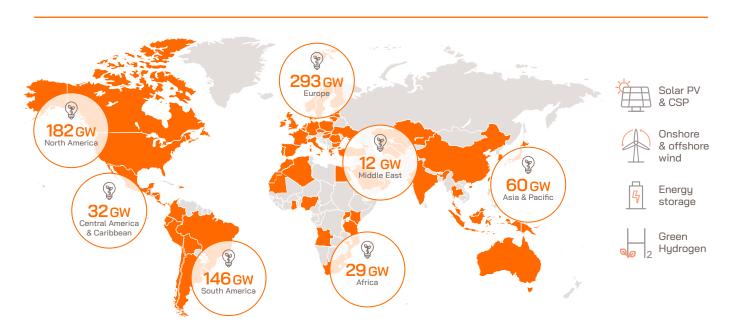
With over 20 years of experience in the renewable energy sector, Applus+ is positioned as a trusted, independent technical partner globally. We have permanent offices on five continents and a team of highly specialized consultants and engineers with extensive knowledge of the solar PV, wind, energy storage and hydrogen technologies.

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Arplus<sup>®</sup>

Our specialised brands for technical advisory services for renewable energy and BESS projects:





# **TECHNICAL ADVISORY SERVICES**

### **TESTING AND INSPECTION SERVICES**



Solar PV & CSP



Onshore & Offshore Wind



Energy Storage



Green Hydrogen



### QA/QC Supply Chain

- Technical Advisory during Negotiations with PV, BESS, and other Equipment Suppliers
- Supply Chain Traceability
- Supplier Due Diligence & Factory Audits
- Accredited Manufacturing Supervision & Testing
- Vendor Surveillance Service\*



### Consulting

- Red Flag Analysis
- Energy Resource Studies & Yield Assessments
- Technical Due Diligence for Vendors, M&A Transactions and Lenders
- Construction Monitoring and Supervision during Operation
- Contract Negotiation Support for Main Project Contractors
- Wind Power Curve Performance Test



# **Specialized Testing**

- Development stage: Albedo On-Site Measurement, Wind Measurement Campaigns & Micrositing
- Post-shipment Inspections of PV, BESS Containers, Main Wind Components, and any Key Equipment
- Post-installation Stage: Electroluminescence (EL) to Installed PV Modules (Including Massive EL and Dautime EL)
- Commissioning Stage: Visual Inspection, Solar PV I-V Curve, IR Inspection, Inverter Efficiency Measurement, WTG Verifications, Power Performance Test and any other LV & MV Tests
- Operation Stage: Solar PV I-V Curve, IR Inspection, Maximum Power Measurement, Massive EL, Pyranometer Calibration, etc.
- WTG Technical Inspection. Advanced Drone-Based Blade Inspections



### Engineering

- Technical Assistance during EPC/BoP Tender. Review and Evaluation of Proposals
- Owner's Engineering: Contracting Support & RfP Management for Main Equipment for EPC, BoP and TSA. Construction and Commissioning Supervision and Project Management
- Basic and Detailed Engineering\* for BoP, Substations and Power Evacuation Lines
- Technical / Economic Feasibility Analysis of Renewable Energy Projects and Hybridisation of Solar PV & Wind & BESS Technologies







<sup>\*</sup> Services Available For Green Hydrogen Projects



Solar PV & CSP



Onshore & Offshore Wind



Energy Storage



**TESTING AND INSPECTION SERVICES** 

Green Hydrogen



# **Environmental**

- Consultancy and Engineering: Environmental Impact Studies, including Marine, Landscape Integration, Risk Analysis, Waste Management
- Studies & Surveillances. Vegetation & Fauna Inventory
- Inspections and Analysis (labs): Air Quality, Soil, Water, Waste and Noise
- Sustainability Consulting and Corporate **ESG Services**



### **Electrical**

- Substation & Protections Systems Commissioning and Testing
- Power Lines Aerial Inspection Drones & LiDAR Technologies
- Electrical Testing & Condition Assessments: Transformers, Cables (overhead & buried), Generators, Motors, Switchgears...



### Civil

- Technical Studies: Access Design, Topographic, Geotechnical, Hydrology...
- Material Testing Lab: Concrete, Steel, Soils, Aggregates & Chemical Analysis
- Supervision Services
- Structural Asset Integrity



### Mechanical

- Manufacturing Quality Control Services: Wind Towers, Jackets, Transitions pieces, Monopiles, ...
- Supervision Services
- NDT Services, Conventional & Advanced: Phase Array, ToFD, Eddy Current, Digital Radiography, RAZAR, IWEX, ...



### H&S

- External Prevention Service and Consultancy
- H&S Coordination and Technical Assistance
- Serious Accidents and Process Safety



# Statutory Inspections

- Evaluation of Compliance with the Maintenance Plan
- Initial and Periodic Regulatory Inspections



### **Telecommunications**

- Mobile Network Coverage Measurements both before and after Construction/ Commissioning
- Reflectometry Measurements of PE Fibre





# SOME OF OUR CLIENTS

We provide our best-in-class and cutting-edge services to owners, developers, IPPs, OEM companies, financial institutions, and equity investors across all the stages of their renewable energy and BESS projects.

Our clients include:

+ 100 Power Utilities & Developers globally + 10 OEMs
7 in the Top 10
per WTG installed

+ 100 Banks & Financial Institutions globally

