

POWER TRANSFORMER SERVICE OVERVIEW

CEA'S Services are Designed to Mitigate Risk

As one of the most critical and costly elements of any renewable energy project, the Main Power Transformer (MPT) is critical to plant reliability and predictable long term performance. As a highly engineered, long lead item, monitoring the manufacturing process is critical to ensuring performance requirements and milestones are met. CEA provides a host of services that support the supplier selection, procurement, contract management, manufacturing, shipment and delivery of power transformers used in renewable energy projects.



Procurement Support

- Safe Harbor / ITC Services
- Supplier Selection
- Contract Reviews
- Warranty T&C Review
- Performance Guarantees
- RFP Support
- Contract Negotiation



Contract Support

- Lead Kick-off Meetings & Supplier Communications
- Milestone Verification
- Contract Performance Monitoring
- Logistics Verification Delivery
- Verification



Technical Services

- Supplier Technical Diligence
- Design Reviews
- Factory Acceptance Testing †
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Quality Assurance

- Supplier Factory Audits In-
- Process Monitoring:
 - Manufacturing Milestone Verification
 - Performance Test Verification Factory
 - Acceptance Testing
- Pre-Shipment Inspection:
 - Packaging & Loading Verification




PROJECTS

- Over 7.3 GW's of power transformer projects completed
- Global capability - services performed in the U.S., Asia, Mexico & India
- Over 10 years of medium and high voltage transformer experience

Market: **Utility Scale**
Location: *U.S. & India (2019)*
Type: **Commercial Support**
Service: *Safe Harbor / ITC Services*

CEA Value Added: Verified medium voltage transformers being manufactured for a U.S. project that utilized them for ITC/Safe Harbor. Inventory verification, checked serial numbers and ensured proper long-term storage procedures were in place.




Market: **Utility Scale**
Location: *U.S. & China (2019)*
Type: **Quality Assurance**
Service: *Factory Audit, In-Process Monitoring, PSI and FAT*

CEA Value Added: Performed full Factory Audit on potential supplier of medium voltage transformers for a solar project in the U.S. Upon Client approval, performed IPM during manufacturing of the transformers along with Factory Acceptance Testing.




Market: **Utility Scale**
Location: *U.S. & China (2019)*
Type: **Commercial Support**
Service: *Technical Services*

CEA Value Added: Provided Factory Acceptance Testing (FAT) oversight at the manufacturing facility. Oversight for full functional and performance testing prior to shipment, verified results and released the unit for shipment.



Market: **C&I**
Location: *U.S. & China (2019)*
Type: **QA, Technical Services**
Service: *Factory Audit, IPM, PSI and FAT*

CEA Value Added: Full quality assurance services for a manufacturer of medium voltage, pad mount, transformers for a solar project in the U.S. Performed Factory Audit, IPM and PSI plus Factory Acceptance Testing of limited units prior to release for shipment.



Clean Energy Associates (CEA), a solar and storage technical advisory firm, provides quality assurance and independent engineering solutions worldwide. We serve financial institutions, project developers, EPCs, IPPs, and power plant owners. From our base in China, CEA's quality control engineers travel worldwide to conduct upstream in-factory technical evaluations, including factory audits, production monitoring and pre-shipment product inspections. Our US-based product management and engineering (IE/OE) teams provide support throughout the project life cycle, from upstream supply chain management and supplier benchmarking, to downstream system design, construction, commissioning, performance assessment, re-power and optimization as well as warranty support. We serve the solar and storage industries through our expertise in PV modules, racking, inverters and energy storage systems. Since 2008, CEA has reduced buyers' risks and improved returns on investments via quality assurance, technical and financial due diligence and engineering services.

As technical advisors, we provide procurement and investment confidence through risk mitigation to key stakeholders in solar and storage projects worldwide.

