

# Capability Statement

**Detailed Design  
Engineering Services**

## Company Overview

Clean Technology Partners (CTP) is a specialist engineering consultant to the renewables and energy storage industry.

Established in 2011, CTP has provided engineering services for many gigawatts of clean energy and energy storage projects through all stages of the project lifecycle. After 11 years, Clean Technology Partners has built a reputation as a respected company in the sector. We have taken more than one thousand clean energy projects from concept to completion.

We pride ourselves on our client commitment and ability to find solutions to difficult problems. We have a diverse and experienced team of engineers and project managers to consistently deliver great results for our clients. CTP provides engineering services across three main categories.

 <p><b>Power System Studies</b> PSS/E, PSCAD, PSS Sincal, PowerFactory</p>	 <p><b>Technical Advisory</b> Owners &amp; Lenders Engineer, Due Diligence, Feasibility</p>	 <p><b>Detailed Design</b> Electrical, Control, Structural, Civil</p>
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CTP provides broad range of engineering services and can assist your project no matter what stage it is at.

A feature of our work is the ability to draw on the experience of our three core engineering service areas to ensure we can actively manage key risks relating to renewable and energy storage assets including network conditions, completing the AEMO processes to achieve registration and full generation, and a detailed understanding of the design and performance factors of renewable and energy storage assets.

### Corporate Social Responsibility

CTP is a business that seeks to have a positive impact on its stakeholders and the planet.

This led to us becoming a certified B-Corporation in Nov 2019.

Certified B Corporations are businesses that meet the highest standards of verified social and environmental performance, public transparency, and legal accountability to balance profit and purpose. B Corps are accelerating a global culture shift to redefine success in business and build a more inclusive and sustainable economy. <https://bcorporation.net/>



## Detailed Design Engineering Services

Detailed design engineering is one of the core services that CTP offers to Principal Contractors / EPCs / Developers.

Our multi-disciplinary engineering design team can provide conceptual as well as more extensive detailed design drawing packages across a wide range of fields, including electrical (DC, LV and HV), controls, structural, mechanical and civil designs.

We have extensive experience in a wide range of renewable energy technologies and project sizes including various complex C&I and Utility Solar PV, Hybrid BESS, Co-generation & Electric vehicle (EV) projects.

Common design deliverables that we provide for mid-to-large scale renewable projects include:

- Detailed site plans / layouts incorporating, PV arrays, access roads, HV/MV substation and associated facilities / buildings / set down points;
- Detailed electrical design (DC, LV and HV);
- Associated communications, controls and metering design (SCADA);
- Detailed civil-electrical designs, including trenching, general cable management as well as additional mechanical & structural elevations and detailing;
- Load flow studies;
- Protection schematics and studies, including grading reports;
- Earthing system designs, including lightning protection & risk assessments;
- Bill of quantities and material schedules;
- Commissioning test plans for final site acceptance and energisation;
- Detailed energy yield report (PVSyst);

## Relevant Project Experience

To help illustrate CTP's capability to support our clients, we have selected a number of examples from various engagements to illustrate our capabilities and achievements. **Please note this information is confidential and not to be shared with a third party.**

**1. VIC Solar Farm (300MW) - VIC (AEMO)**

Client: **Confidential**

Scope of works: Feasibility (site constraints, concept design, equipment selection, energy yield), Steady State studies.

**2. NSW Solar Farm (120MWp) – NSW (Essential Energy)**

Client: **Confidential**

Scope of works: Concept Design (Site General Arrangement, AC MV Single Line Diagrams, AC MV Cable Schedule)

**3. VIC Solar Farm (33.4MWp) – VIC (Ausnet Services)**

Client: **Confidential**

Scope of works: Harmonics Study, Concept Design, Advisory services on inverter selection, Detailed Design (Plant layout drawings, Electrical, Protection and Control Schematics), Reports (Cable sizing, Protection, Earthing, Safety in Design, PVSyst report) Procurement Specifications (PV Module, inverter, power plant controller, PV tracker, MV Switchgear, DC Combiner Box), Installation Responsibilities & Interfaces.

**4. Winery Solar Farm (9.9 MWp PV) – NSW (Essential Energy)**

Client: **Confidential**

Scope of works: Grid connection with Essential Energy (Steady State Studies, Dynamic Analysis, Power Quality Study), Detailed Design including Electrical layout drawings, Electrical, protection and control schematics, Cable schedules & bill of quantities, Elevation & cable management drawings, Reports and As-built drawings

**5. Melbourne Airport Solar Farm (12.2 MWp) – VIC (Powercor)**

Client: **Beon Energy Solutions**

Scope of Works: Detailed Design of the Solar Farm including: Site Layout and PV Array design, DC design, String layouts, DC cable schedule, DC cable and trench cross sections, Pits and conduit plans, Inverter station general arrangement, MET station general arrangement, Coordination of civil and structural design.

**6. Robinvale Solar Farm (7.5 MWp) – VIC (Powercor)**

Client: **AC Energy**

Scope of Works: High Voltage Design, Protection Study, Earthing and Lightning Study and Design, Supply & Commissioning of CTP's E-Cube Connection Station.



## 7. Dunblane Solar Farm (10.9MWp) - QLD (Ergon Energy)

Client: **Kinelli Pty Ltd.**

Scope of Works: Detailed design of the Solar Farm including: High-Voltage Design, Protection Coordination Study, Earthing Study and Lightning Risk Assessment and Design.



## 8. Kentucky Solar & Battery Farm 4.95 MW Solar + 10 MWh DC Coupled Li-Ion BESS, NSW (Essential Energy)

Client: **Latitude**

Scope of works: Concept & Detailed Design (Electrical & Control – Construction Issue Drawings). Steady State, dynamic and power quality studies to EE standard CEOP8079. Additional EE network studies and documentation for DC coupled BESS, including steady state studies, updates to the PSCAD model, CAS and PMA checklist.

## 9. Kanowna Solar & Battery Farm 4.95MW Solar + 10MWh DC Coupled Li-Ion BESS, NSW (Essential Energy)

Client: **Kinelli**

Scope of Works: Power System Modelling (Response to Voltage Disturbance, Response to Contingency Events, Voltage & Reactive Power Control, Response to Frequency Disturbances Frequency Control, Active Power Control, Impact on Network Capability, Reactive Power Capability, Fault Studies, Power Quality & Continuous Operation, Protection & Control Schemes, Remote Monitoring, Communications Equipment & Power Station Auxiliary Supply). Concept and Detailed Design and Models update. Additional EE network studies and documentation for DC coupled BESS, including steady state studies, updates to the PSCAD model, CAS and PMA checklist.

## 10. SA Solar Farm (6MWp) – SA (SAPN)

Client: **Confidential**

Scope of works: Detailed Design of the 6MWp Ground-Mount Fixed-Tilt Solar Farm including Site General Arrangement, String Layouts, DC Single Line Diagrams, DC Design Report and DC Trench Design, Safety in Design input.

## 11. Dareton Solar Farm (3.7 MWp PV) – NSW (Essential Energy)

Client: **Dareton Solar Park**

Scope of Works: HV Design and Earthing Design, Protection Study, Power System & Essential Energy Connection Studies, Solar Farm Layout, DC Electrical Design, Supply of CTP's E-Cube Connection Station, Project Management including Grid Connection Works.

## 12. Christies Beach Solar Farm (3.5 MWp) for SA Water– SA (SAPN)

Client: **Enerven**

Scope of Works: Detailed Design of the Solar Farm, including: DC Electrical Design, DC cable and trench cross sections, Pits and conduit plans, Inverter Station Cable Management. As well as Engineering Reports & Calculations, and coordination of Civil and Structural Design.

### 13. Utility-scale BESS – AEMO Registered/Scheduled Operation

Client: **Confidential**

Scope of works: **Detailed (IFC) Design Package** Basis of Design, Review of Vendor Drawings, Layout and General Arrangement drawings, Electrical, Protection and Metering Schematics, Communications (SCADA) & Control Design & Schematics, Civil Designs, Electrical & Design reports (DC cable sizing, AC MV & LV cable sizing, Protection study and report, Earthing study and report, Arc Flash Study)

### 14. Grid Capacity and Connection Options for Waste To Energy Project (20MW) - VIC (United Energy)

Client: **Confidential**

Scope of works: Connection Options (Connection Options Assessment, Concept Design (Site General Arrangement), MV Single Line Diagram), Grid Capacity (Review NSP data pack and model set up, Grid capacity modelling and assessment)

### 15. Cannington Mine Microgrid (3MW PV Integration into Existing Diesel / Gas Microgrid) - QLD

Client: **Sunshift**

Scope of works: Protection and Control System Design, HV Design and Earthing Design, Protection Study, Power System Modelling & Connection Studies, Solar Farm Layout, DC Electrical Design.



### 16. Microgrid for University of Adelaide (1.2 MW PV/ 1.5 MWh Battery Energy Storage System (Li-Ion + flow) – SA (SAPN)

Client: **TEC-C**

Scope of works: Detailed LV/HV Electrical Design, Protection, Earthing Design, Interlocking, Arc-Flash Studies, Vendor Reviews. Detailed Civil and Structural Design, Footing Designs, Framework Layouts. Detailed Control System Design, Specifications, Points List, SAPN interface and SCADA.

### 17. Riverland BESS (1 MW / 2 MWh Battery Energy Storage System (Li-Ion) – SA (SAPN)

Client: **Confidential**

Scope of works: Detailed Site / BESS Layouts, LV/HV/Aux Electrical Design, Protection Schematics / Coordination Studies, Earthing Report & Lightning Risk Assessments, Load Flow Studies, Civil and Structural Design, Bill of Quantities, SCADA Control System Integration, Commissioning Test Plans.