

# Capability Statement

**Owners & Lenders  
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 over 3GW of Australian renewable energy and 150MWh of energy storage projects through all stages of the project lifecycle. After 10 years, Clean Technology Partners is now a respected company in the sector with over 25 passionate staff. We pride ourselves on our responsiveness, client commitment and ability to find solutions to difficult problems.

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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Clean Technology Partners has a long and proud history of working for the Owners and Lenders of large-scale renewable projects. In these roles, we have been called upon to provide a wide range of expert advice and project management leadership to bring projects to a successful close.

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/>



## Owner's Engineer

To help illustrate CTP's capability to support Owners and Lenders, we have selected a number of de-identified short examples from various engagements to illustrate our approach and achievements.

### EPC Contract Negotiation

On a major solar project, CTP was a key part of the Owner's negotiating team to close construction contracts. We were able to

- Write the Owner's Technical Requirements document to clearly specify the objectives and performance standards for the EPC contractor
- Clearly identify roles & responsibilities, particularly during the R1/R2 commissioning process
- Identify key risks to the Owner and address them through the technical schedules
- Identify and fix gaps between the technical schedules and contract terms, streamlining the design and contract execution to reduce costs for all parties.

### Construction

- For a project in Queensland, the inverter supplier provided inverters where the internal switchboard clearances, while compliant with EU standards, did not meet Australian Standard AS3000 and others. We held firm against several entreaties from the contractor and inverter manufacturer to ensure an acceptable solution.
- We were brought in mid-way through a project to support the Owner during escalating disputes. The contractor began construction but then sought to improve margins by aggressively claiming variations at every opportunity. CTP was able to methodically work through the claims and provide solid technical and commercial support to the Owner and Lender. We were able to reject or reduce most of the claims while supporting reasonable payments for those that were valid.
- On a hot and windy day, a fire broke out in the hardstand store and around 15% of the solar PV panels were destroyed. No direct replacement panels were available at short notice. We were able to work closely with the contractor to identify alternative products that were electrically compatible with the design and available in Australia. The project suffered no delay and upon commissioning demonstrated only minor (as expected) performance differences to the original panels.

### R1 Registration

- Our client was responsible for providing a complete R1 package and achievement of registration. CTP provided extensive project management to coordinate the activities of the grid modelling consultant, metering data agent and EPC contractor. We had to navigate considerable uncertainty through this process due to parallel construction of a competing solar farm (model integration and wide-area network modelling) and low grid strength while satisfying the requirements of AEMO and the NSP due diligence process. Our responsibilities included GPS negotiation, Power System Design Setting Data Sheet (PSDSDS) lodgement and coordination of all documentation and issues trackers.

## R2 Commissioning

- When a construction contractor, new to the Australian electricity market, was unable to formulate an acceptable R2 plan, we stepped in to pull the plan together to meet the needs of the DNSP, AEMO and the Owner. We negotiated a reduction in the number of hold points to shorten the test period and aligned the export limits to match inverter hot commissioning. We assumed a leadership role during the hold point report issues resolution process and assisted the Owner to negotiate non-compliance notices with AEMO to avoid unbudgeted expenses on harmonic filters.
- A construction contractor, responsible for achieving R2 commissioning, subcontracted the model validation and report generation element of this work package to an under-performing subcontractor. To reduce the time and cost of review by AEMO and the NSP, we provided report reviews, extensive comments and improvements while each of the hold point reports were created.
- A solar farm in a weak network exhibited voltage oscillations similar to that recently encountered in northern Victoria. CTP supported the Owner through difficult technical discussions with AEMO, NSP and nearby interacting generators to investigate the root causes and negotiate a simultaneous testing program (mid-way through hold point testing). We separately liaised with the contractor to build and test an oscillation detection and control logic system to comply with plant GPS requirements – understood to be the first on the NEM.

## Payments & Variation Claims

On every project, CTP has provided expert technical and commercial advice to Owners to assess milestone claims and payment progress. We assess the value of works completed and compare against payments made and variation claims to ensure the interests of the Owner and Lender are protected.

- A contractor found that the mounting piles were not able to be driven to the required depth and were frequently damaged in the attempt. They lodged a claim under the contract Latent Conditions clause, despite possessing all soil test reports and after conducting several pile pull-out and lateral load tests prior to executing the EPC agreement. We worked closely with our subcontractor geo-technical engineers to methodically work through the merits of the claim and supported the client in their negotiations with the contractor. We assessed and approved an alternative pile insertion method to enable construction to proceed without delay.
- A contractor used existing stockpiled soil from site to spread out over the internal roads, without knowledge or approval from the Owner. Unfortunately, the soil was contaminated with asbestos and the site had to be shut down for six weeks for decontamination. We provided support to our client and their legal team to determine the limit of liability for our client and for them to reach a negotiated settlement without further project delays.
- A contractor, responsible for R2 testing and report submission, was exposed to significant time and cost delays due to errors in commissioning and mismanagement of the test process. The contractor, liable for significant liquidated damages, lodged a series of counter-claims against the Owner. We were able to:
  - Work methodically through more than 50 different claims
  - Maintain professional working relationships with the contractor during sometimes heated discussions
  - Provide extensive support to the Owner as a sounding board for charting a path forward

## Technical Advisor to the Owner

- On a major project in Queensland, the state government introduced a new regulation that only qualified electricians were able to handle solar PV panels – which would have added significant unbudgeted costs to the Owner. We
  - Provided technical input to the legal argument around safety and applicability of relevant standards
  - Evaluated Contractor cost variation estimates
- After vigorous defence, the regulation was deemed invalid, enabling the project to proceed as planned.

## Lenders Engineer

The following provides some examples of the services we have provided to Lenders on renewables projects. CTP's Lenders Engineering engagements have included the following institutions;

- Clean Energy Finance Corporation (CEFC)
- Infradebt
- Victorian Funds Management Corporation (VFMC)
- Realside Capital

## Cost-To-Complete Notices

We form an independent view of the cost to complete the project. For each Notice (6 assumed) this includes:

- An estimate of value of works completed, compared to the project budget
  - Towards the end of construction, we will focus more on the value of uncompleted work, as we find this a better method to safeguard the interests of the Lender
- Obtaining the value of
  - Variation claims lodged by Contractor (both approved and not approved)
  - Undrawn commitments under the construction facility
  - any unspent Equity
  - amounts standing to the credit of the construction account / liquidated damages account / proceeds / insurance account to the extent available to pay project costs
  - any input tax credits which will be reasonably assumed to meet project costs prior to Conversion
  - any compensation payable under the Project Documents to Project Co

## Certificate to Financier re milestone achievement and Cost-To-Complete test

We provide a Letter of Reliance to the Lender, summarising our review of the Cost To Complete and status of the project in respect of milestones achieved.

If the contract requires the certificate to be in a specific format, we provide our advice in that format.

## Verification of construction progress reports

Following each monthly site visit, we:

- verify that the milestone claim lodged by the Contractor has been achieved, in terms of delivery of materials to site or construction works completed
- provide a written report

If the milestone is not achieved, or is not delivered to a satisfactory standard, then we report (at a high level) on the deficiencies.

## Certify Practical Completion

In our role as Lender's Engineer, we form an independent view of Practical Completion to safeguard the interests of the Lender. Key questions and activities we undertake include:

- Review of documentation provided by the Contractor, and the Owner's Engineer
  - As-built and red-line drawings
  - site ITP documents
  - commissioning records by the Contractor and suppliers (eg inverters)
  - certificates of electrical safety, HV audit and similar
  - operating manuals
  - records and analysis of electrical output during the Performance Guarantee evaluation
- Extensive site visit to verify completion of construction (2 engineers x 3 days)
  - Use the mounting system installation manual to determine the critical tolerances for construction
  - Test random fastenings for correct torque
  - Measure alignment of mounting system to manufacturer's tolerances
  - Inspect actions undertaken to fix non-compliant or emergent issues
  - Compare the installation with the For Construction drawings to verify whether the site has been installed in accordance with them
  - Visual inspection at multiple random locations to assess quality of installation and alignment with Australian Standards and good industry practice (for example, cable management & securement, conduit protection & routing, sunshades on non-metal control or combiner box cabinets)
  - Verification of defect punchlist, and provide independent estimate of rectification value of items
- Review grid connection status
  - Hold Point reports (typically four), but with most attention to the final (100% output) report
  - Issues Registers, noting what issues have been raised by the NSP and AEMO, and the steps to close out
  - Non-Conformance Reports lodged with AEMO and associated agreed plan to address them
- Write a detailed report to summarise our methodology and provide our independent opinion on Practical Completion

## Relevant Project Experience

A selection of example projects below illustrates relevant work that has been completed by Clean Technology Partners, showcasing experience in Power System studies, R1 registration and R2 testing. **Please note this information is confidential and not to be shared with a third party.**

### 1. Glenrowan West Solar Farm (149 MWp PV), VIC (Ausnet)

Client: **Signal Energy Australia**

Scope of Works: Responsible for all commissioning activities including management of internal resources as well as client and external stakeholder liaison. Support all phases of commissioning – PCU & DC circuit energisation, prepare commissioning plan, R2 Hold Point Testing and coordinate with multiple different parties including NSP, owner, key subcontractors and AEMO. Key member of R2 commissioning team, directing onsite testing activities and with key responsibility for timeliness and accuracy of data from site and troubleshooting of site issues such as intermittent PPC crashing / reboot, compliance to new AEMO comms failure requirements, grid oscillations and SCADA and PPC behaviour under backup battery & genset cutover. Commissioning achieved on schedule.

### 2. Munna Creek Solar Farm (140MWp) – QLD (Ergon Energy)

Client: **REST**

Scope of works: Technical review of grid connection constraints for a number of proposed developments Assist large international developer with grid connection advice and application processes. Tender Design and Detailed design review including DC design and general arrangements, civil & structural design, and construction support.

### 3. Maryrorough Solar Farm (34.5 MWp) – QLD (Ergon Energy)

Client: **Impact Investment Group Pty Ltd** Financiers: **Infradebt, VFMC**

Scope of Works: Technical Due Diligence and Risk Assessment prior to project acquisition, Owners Engineering Services & Project Management, Power System Studies and Management and AEMO Registration, Detailed Design Reviews, Construction Supervision and Inspections, Management of Metering, & Contract Management.



### 4. Kelsey Creek Solar Farm Proserpine (60.5 MWp) – QLD (Ergon Energy)

Client: **KCSF Consortium**

Scope of works: Feasibility Study, Concept Design, Project Development Support, Grid Connection Application

**5. Chinchilla Baking Board Solar Farm (19.9MWp) – QLD (Ergon Energy)**

Client: **Impact Investment Group** Financiers: **Infradebt, VFMC**

Scope of Works: Technical Due Diligence and Risk Assessment prior to project acquisition, Owners Engineering Services & Project Management, Power System Studies and Management and AEMO Registration, Detailed Design Reviews, Construction Supervision and Inspections, Management of Metering, & Contract Management.

**6. Williamsdale Solar Farm (11MW) – ACT (ActewAGL/ Evoenergy)**

Client: **Impact Investment Group** Financiers: **CEFC**

Scope of works: Owner's engineering from concept design through to grid connection. Energisation & defects management, EPC and O&M technical contract schedules, Owner's and lender's (CEFC) engineering services, 11 MWp ground mount HV connected to ActewAGL / Evoenergy network



**7. Peterborough & Port Pirie Solar Farms (2 x 5.6 MWp) – SA (SAPN)**

Client: **Renew Power Group Pty Ltd**

Scope of Works: Owner's Engineering Services, EPC and O&M Technical Contract Schedules

**8. Darlington Point Solar Farm (275MW) - VIC (Ausnet Services)**

Client: **Signal Energy Australia**

Scope of Works: PR Performance Testing, Intermediate Acceptance Tests, Final Acceptance Tests

**9. Karratha Airport Solar Farm (1 MWp) – WA (Horizon Power)**

Client: **Impact Investment Group**

Scope of works: Technical Due Diligence and Risk Assessment prior to project acquisition, Owner's engineering, Contract Review, Review As-Built Drawings, Site Inspection, Review System Specification & Commissioning Documentation, Review Testing Schedule

**10. NSW Solar Farm (107 MWp PV), NSW (Essential Energy)**

Status: **R0 Complete (5.3.4a letter received)**

Scope of Works: Concept Design & Model set-up, Steady-State Studies to Essential Energy Requirements (Thermal Studies, Steady-State Voltage Studies & Voltage Fluctuation Studies), GPS System Studies and Grid Connection Application documentation resulting in AEMO acceptance of performance standards and AEMO Issue of the 5.3.4A Letter.



### 11. Solar and Battery Park in South-East Melbourne (115MW) - VIC (United Energy)

Status: **R0 studies underway**

Scope of works: Concept Design (Site Plan, HV, AC, SLD, Protection, Battery System Concept Design). Steady State studies, Grid Connection Study Package (PSSE and PSCAD Dynamic Modelling (NEM/SMIB), Power Quality, Model Acceptance Testing and Benchmarking)

### 12. VIC Wind Farm (45MW), VIC (Powercor)

Status: **R0 studies underway**

Scope of works: Steady State Studies, Grid Connection Study Package (PSSE and PSCAD Dynamic Modelling (NEM/SMIB), Power Quality, Model Acceptance Testing and Benchmarking), AEMO/NSP Negotiations, Troubleshooting with the OEM.



### 13. Ferguson Wind Farm (7.4MW), VIC (Powercor)

Client: **BayWa R.E.**

Scope of works: Steady State Studies, Grid Connection Study Package (PSSE and PSCAD Dynamic Modelling (NEM/SMIB), Power Quality, Model Acceptance Testing and Benchmarking), AEMO/NSP Negotiations, Troubleshooting with the OEM. On submission of the connection application package, the project received a formal AEMO registration exemption. CTP performed further studies including resubmission and approval of R0 package post detailed design (exempt equivalent R1), GPS validation testing (exempt equivalent R2).

### 14. 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 CAS and PMA checklist.