

**POWER
NETWORKS**

Power Systems Engineering

We help clients navigate the evolving challenges of modern power systems to improve performance, reliability and long-term value.

Overview

As the energy transition accelerates, new technologies, changing regulatory requirements and ageing assets are reshaping the way power networks are planned, delivered and operated.

For more than 30 years, PSC has partnered with utilities, renewable energy developers, generators, mining companies and industrial operators to solve complex technical challenges across the energy sector. From connecting new generation and integrating emerging technologies to improving network performance and extending asset life, we provide the technical expertise and practical engineering support needed across the asset lifecycle.



Key capabilities

RENEWABLE & HYBRID SYSTEMS

- Renewable energy integration
- Concept design & feasibility studies
- Dynamic control & stability
- Power management & system restoration
- Harmonics & power quality assessments
- Hardware-in-the-loop (HIL) testing advisory, review & validation support

POWER INFRASTRUCTURE

- T&D substation design review
- Primary plant design & equipment specification
- Earthing & lightning protection design studies
- Insulation coordination studies
- Equipment ratings and compliance assessments
- Testing & commissioning support

PROTECTION SYSTEMS

- Protection coordination & grading studies
- Protection system design & review
- Relay settings & scheme development
- Protection fault analysis & investigations
- Protection philosophy & compliance assessments
- Independent design assurance and commissioning support
- Arc flash protection assessments

ASSET PERFORMANCE & TECHNICAL ADVISORY

- Owner's Engineer services
- FEED studies & technical due diligence
- Tender support & design reviews
- Commissioning oversight & assurance
- Asset condition assessment
- Compliance, safety & risk reviews
- Specialist engineering support & technical advisory

PSC projects

CONFIDENTIAL CLIENT

Virtual Spinning Reserve BESS Project

A major industrial facility sought to replace gas turbine spinning reserve with a 16 MVA grid-forming BESS to improve efficiency, reduce emissions and lower operating costs.

As Owner's Engineer, PSC delivered FEL-2 engineering, procurement support and DIgSILENT PowerFactory studies to assess BESS sizing, integration and dynamic performance. The work established a practical pathway to modernise the power system while preserving network resilience, stability, and operational continuity.

RIO TINTO

Simandou BESS Integration & Owner's Engineer Support

Rio Tinto is integrating a large-scale BESS into the Simandou power network to support reliable operation of critical energy infrastructure.

In its Owner's Engineer role, PSC provides technical assurance, commissioning support and specialist power system expertise to help manage integration risks and support safe, reliable system performance.

TASNETWORKS

Protection & Control Process Review

TasNetworks commissioned an independent review of its Protection and Control governance framework to improve consistency, strengthen settings management and reduce operational risk.

PSC's assessment and prioritised improvement roadmap has been adopted by TasNetworks and is being implemented to support stronger governance and long-term network performance.

VECTOR

Neutral Earthing Reactance Study – EMT and Protection Studies

With increasing earth fault levels across its 11 kV distribution network, Vector required a solution that could maintain network safety and reliability while avoiding unnecessary capital investment.

PSC evaluated the application of Neutral Earthing Reactance (NEX) through detailed electromagnetic transient (EMT) and protection studies, assessing earth fault behaviour, protection performance, temporary overvoltages, and network response under a range of operating conditions.

The study provided Vector with the technical evidence needed to confidently pursue an alternative fault level management strategy, reducing the need for costly network upgrades while maintaining safety, reliability, and resilience. The outcomes supported more informed investment decisions, improved asset utilisation, and enabled a lower-cost pathway for future network growth.

BHP NICKEL WEST

Protection Studies & Arc Flash Assessment

BHP Nickel West sought to improve electrical safety and network reliability across multiple operations. Using DIgSILENT PowerFactory and arc flash calculations in accordance with IEEE 1584-2018, PSC identified and mitigated electrical hazards, optimised protection system performance, and established a standardised assessment framework across the portfolio.

The project delivered enhanced safety outcomes, improved visibility of arc flash risks, and greater confidence in the operation of critical electrical infrastructure.

BEON ENERGY

Quorn Park Solar Farm & BESS Power Quality Studies

PSC supported Beon Energy in progressing the Quorn Park Solar Farm and BESS through detailed power system studies that addressed grid connection requirements and key network integration risks.

By assessing power quality performance, Generator Performance Standards compliance, transformer energisation and transient impacts, PSC helped optimise project design, reduce technical risk, and support a smooth and reliable connection to the electricity network.

X-ELIO

Concept design for various hybrid projects

X-Elio engaged PSC to support the early-stage development of several large-scale renewable and energy storage projects, including the 300 MW Halys BESS, 220 MW Rollsville Hybrid Project and 720 MW North Burnett Hybrid Project.

PSC delivered concept designs encompassing plant optimisation, electrical layouts and key design studies, providing X-Elio with the technical foundation required to progress connection enquiries and Generator Performance Standard (GPS) assessments.

POWERCOR

Impact of EV Charging on ADMD

As EV adoption accelerates, Powercor wanted to better understand how evolving charging behaviours could influence future network demand.

PSC assessed the impact of EV charging on After Diversity Maximum Demand (ADMD) across Victorian distribution networks, combining customer charging data analysis with industry and regulatory insights.

The study enabled Powercor to strengthen demand forecasting assumptions, improve planning standards and make more informed network investment decisions. By quantifying the impact of future EV adoption on network demand, Powercor able to better align future network development with electrification trend and evolving customer behaviours.



**Specialist Consultants
to the Electricity Industry**

pscconsulting.com

North America
Kirkland, WA
+1 425 822 8489

Europe
Edinburgh, UK
+44 191 249 6492

Australia
Fortitude Valley, QLD
+61 1300 933 632

New Zealand
Wellington
+64 4 232 7680

Asia
Singapore
+61 1300 933 632

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CONTACT US