Capability Statement

zenhar

“Our Mission is to raise the standard of the solar and smart energy industry through excellence in engineering, project development and quality management“

Demian Natakhan and Trevor Ackland, The Founders of Enhar

ABOUT US

Enhar is an innovative cutting-edge consulting business specialised in the design engineering and delivery of Solar PV and BESS projects. Comprised of the most experienced PV professionals in Australia, the team includes registered and chartered engineers as well as CEC accredited solar electrical engineers and CEC accredited electricians.

Founded in 2006 at the dawn of the solar awakening in Australia, they have proven their smarts through the successful delivery of services to numerous project developers; local governments; educational institutes; large energy users as well as assisting vertically integrated solar companies. In over a decade of operations, Enhar has provided services to over a gigawatt of projects ranging from concept to delivery and commissioning.

Zenhar is our utility division that brings together our full spectrum of expertise and services for solar farm and BESS projects. Key specialities include feasibility studies; developing strategic energy plans for business, educational and governmental institutions; business case development for solar PV and BESS projects, concept design, detailed design and engineering, managing tender processes including developing specifications, design and engineering reviews; component selection and procurement management; and project superintendent from concept to commissioning.

With over a decade of experience in successfully delivering projects, Enhar has been a trusted independent consultant delivering high quality and profitable outcomes to their clients.

Enhar is a member of the Clean Energy Council and the Smart Energy Council.

EXPERT COMMERCIAL & UTILITY SCALE SOLAR & BESS SERVICES

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“We believe that renewable energy solutions can be accessible to all. Our business was formed to support the development of renewable energy projects, no matter what scale. Passion is the key essential force that drives our success.“

- PROJECT MANAGEMENT
- FEASIBILITY STUDIES
- TECHNICAL DUE DILIGENCE
- OWNERS ENGINEER
- LENDERS ENGINEER
- ENERGY YIELD ASSESSMENTS
- GRID CONNECTION
- DETAILED DESIGN
- DETAILED ENGINEERING
- SYSTEM COMMISSIONING
- DEVELOPMENT APPROVALS
- ASSET MANAGEMENT

PROJECT MANAGEMENT

Enhar has extensive experience in managing solar projects all the way from conception to commissioning. As such our team has a solid understanding of what it takes to develop a project and navigate the financial, legal, technical and regulatory hurdles to ensure a successful outcome. Enhar works closely with our clients' legal, finance, engineering and commercial teams to move a project to Financial Close. Our team can take responsibility for all aspects of solar developments, including:

- Securing Land Options and Rights
- Managing Grid Connection Processes
- Securing Development Approvals
- Coordinating Building Permits
- Identifying PPA Providers
- Preparing and managing EPC tender processes and evaluating responses

Enhar can also maximise the efficiency in the implementation of detailed project plans, keeping track of goals, tasks, resources, schedules, costs, and contingencies.

FEASIBILITY STUDIES

The goal of any project is to ensure all risks are identified and assessed early so as to identify any fatal flaws that may impact the success of the project. Enhar has extensive experience in developing tailored feasibility studies for our clients to ensure these risks are suitably assessed and mitigation strategies developed early on to ensure the projects can be delivered successfully, and on time and budget. We offer a range of services for both roof mounted and ground mounted systems that include Grid Connected PV systems, Battery Energy Storage Systems, PV -Battery Hybrid Systems and Off-Grid Systems. The types of services we offer include:

- Technical site assessments including Fatal Flaw Analysis
- Concept designs and image renderings
- Hourly analysis of electrical load profiles
- Hourly solar yield modelling using PVsyst or Helioscope or SAM
- Recommendations on suitable products
- CAPEX and OPEX estimations
- Preliminary Financial Analysis

TECHNICAL DUE DILIGENCE

Critical to the success of a project is that all potential risks have been thoroughly assessed. Enhar's Technical Due Diligence services provide a detailed independent technical assessment of projects that can be used by financial institutions to support their investment or acquisition processes. Our reviews target all the key technical aspects of the project including site considerations, grid connection, energy yield estimates, technology and equipment, design reviews, contracting arrangements, project schedules, budgets, permitting and approvals, operation and maintenance schedules and costs.

Our review can also include project site visits, equipment manufacturer audits including factory visits, detailed on site equipment inspections, construction monitoring, and verification of completion.

Having fully considered all the technical information, we present a detailed report of our findings with a set of conclusions and recommendations which are relevant and appropriate for the project and parties involved.

OWNERS ENGINEER

As an Owners' Engineer we will provide ongoing review and assessment of all aspects of the design and engineering associated with the project. We coordinate with all the stakeholders effectively to maintain clear lines of communication and ensure there are no lapses throughout the execution of the project.

Generally , our primary responsibility will be to review EPC contractor's designs, documentation, calculations and reports to ensure that they are fit for purpose. We also check that they are in accordance with all relevant Australian and International standards, Project Technical Requirements, DNSP Technical Requirements, AEMO Standards, DA Requirements and meet all regulatory obligations.

As the EPC scope of works generally only extend to the on site point of connection, and other parties may be responsible for works to the actual point on interconnection with the electricity network , we can also review TNSP and DNSP designs, documentation, calculations, and report to ensure that they are fit for purpose and also in accordance with the above requirements.

LENDERS ENGINEEER

As the lenders technical advisor, Enhar review the technical aspects of the project on behalf of financial institutions in detail as well as the related information including energy yield, development approval, grid connection approval, site studies, concept design and technical specifications. This service includes checking the at the project is:

- Compliant with Australian Standards and local engineering requirements.
- Identification of any deficiencies in designs, calculations and reports that may be relevant to the project success.
- Compliant with Development Approval requirements.
- Compliant with Technical Requirements.
- Compliance with TNSP and DNSP Requirements.
- Compliant with AEMO Requirements.
- Testing and Commissioning Plans.
- Review Operation and Maintenance Plans
- Compliant with other regulatory body requirements having jurisdiction over the works.

ENERGY YIELD ASSESSMENTS

A successful solar energy project requires investment, and to gain adequate support it has to demonstrate technical and financial viability. Enhar provide independent, accurate and reliable assessments of the expected energy yield of your project, that can be used by developers to secure funding for projects. Our expertise is recognized by developers, debt and equity providers and insurance companies.

Our energy yield assessments take into account numerous factors to accurately determine the expected annual energy yield, the performance ratio and probabilities of exceedance cases of your project in both the long and short term. We take into account all the particulars related to your specific project including:

- Available Solar Resources
- Meteorological Data
- Technical Design
- System Components
- Energy Losses
- Uncertainties related to each step of the simulation.

GRID CONNECTION

Grid connection is the most significant challenge facing large-scale solar energy projects. Over the years, Enhar's team has developed strong relationships with TNSPs, DNSPs and AEMO to ensure that we secure approvals to connect in a timely and efficient manner. Our understanding of Australian grid allows us to quickly assess the available capacity at a project site so as to ensure that the project is viable before undertaking significant investments. We manage this process on behalf of our clients from pre-feasibility, enquiry, application all the way through to the final approval. In support of an application to connect, AEMO will typically require:

- Completed Application to Connect Form.
- Proposed performance standards
- Description of the proposed installation, including data requirements outlined in the Schedules 5.4 and 5.5 of National Electricity Rules.
- Model package, including simulation models and associated design data
- Project and commissioning programs.
- Proposed switching arrangement for connection to the Declared Shared Network.
- The location of the proposed connection point.

DETAILED DESIGN

Our team of CEC accredited designers and certified electrical engineers can assist with all medium to large-scale solar and hybrid technical designs to suit our client's needs. Our typical drawing lists would include

- Module Layouts;
- Mounting System;
- PV Module Clamping Arrangements;
- Tracker; Piling and Foundation Designs;
- Inverter Station Drawings;
- Inverter Station Foundations;
- MV Station;
- MV Station Foundations;
- HV Kiosk ; HV Kiosk Foundations;
- Operations and Maintenance Facility Layout;
- Single Line Diagrams (DC, AC, SCADA, Security, etc.);
- Solar Farm SCADA System; Communication Drawings ;
- Power Plant Controller Drawings;
- Solar Farm Earthing and Bonding Design;
- Solar Farm Lightning Protection System Design;
- Layout Diagrams (General, cables, inverters, civil, etc.);
- Cable Management;
- Civil (roads, trenches, foundations, etc.);
- Drainage System (including flood risk assessment);
- Security System;
- Final Fence and Gate specification;
- Meteorological stations.

DETAILED ENGINEERING

In addition to preparing drawing sets for projects, we also undertake detailed engineering reports to ensure the project will be built in accordance with the relevant Standards, Codes and in compliance with all other requirements. These include:

- Technical Design Reports;
- Dilapidation Studies;
- Naming Convention of Equipment Plans;
- Energy Yield Studies;
- DC & AC (LV & HV) Cable and Transformer Loss Calculations;
- Earthing Studies;
- Auxiliary Load Calculations;
- Topographic Survey Reports;
- Geotechnical Studies;
- Piling and Foundation Designs Calculations;
- Site-specific Galvanising Requirements;
- Fire Protection and Fire-fighting Systems;
- Solar Farm Internet Connection.

SYSTEM COMMISSIONING

Our qualified and certified team of electricians and engineers undertake system commissioning services to ensure a safe and successful system energisation. We can provide a range of services suited to our clients' requirements including:

- Commissioning and Test Report audits;
- Technical support to navigate the complicated commissioning requirements set out by network operators and ensure it is done correctly;
- Protection Testing, Injection Testing and Power Quality Testing;
- Comprehensive inspection services pre energisation;
- Solar DB and switchboard inspection and compliance;
- Thermal imagery of modules, module connectors and isolators
- Review of Documentation including As Built Drawings and O&M manuals to ensure they and are compliant with Australian Standards and all other requirements;
- Detailed and concise colour coded audit reports including photos, clear description of defects and recommended for corrective measures.

DEVELOPMENT APPROVALS

We work with developers to ensure the information requirements of an application for Development Consent are in accordance with juridical requirements and can manage the process from preparation of application to consent being granted. The types of information we generally collate for an application would include a site and context analysis to show the current lie of the land and the immediate surrounds of the proposed solar energy and or BESS facility. This generally includes a site plan, photographs and/or other techniques to accurately describe the site and the surrounding area and a location plan showing the full site area, electricity transmission network, access roads to the site and any other notable features, constraints or other characteristics of the site and the surrounding area.

We also manage the process to ensure all appropriate site surveys are undertaken including topographical, geotechnical, native vegetation assessments, flora & fauna studies, visual amenity, noise assessments, cultural heritage and flood risk analysis.

TECHNICAL ASSET MANAGEMENT

Ongoing analysis and benchmarking of solar yield data is key to ensuring optimal performance of your solar asset and that it is meetings its financial expectations. And to ensure safety it is critical to have a reactive and preventive maintenance and rectification plan in place. We provide technical asset management services, including monitoring and maintenance, to ensure your assets are performing in line with expectations and achieving energy generation targets. We provide a range of services to asset owners including:

- Initial Asset Review and Audit;
- Independent verification of system performance benchmarked against expected yield and weather data;
- Monthly solar yield and fault reporting;
- Supply and install third party monitoring systems;
- Review and respond to system faults and alarms as they occur;
- Identify and report on systems that are under-performing or in fault;
- Warranty claim management
- Preventative Maintenance by our CEC accredited electricians as required.

PROFESSIONAL EXPERT TEAM

DEMIAN NATAKHAN

Director

Demian is a Chartered Energy Engineer (UK) and Registered Professional Engineer with Engineers Australia. He brings 20 years of experience in taking solar, wind, battery, and energy efficiency projects through planning to implementation. Demian has managed all aspects of the development process of both utility scale and 'behind the meter' projects, specialising in solar, battery and wind technologies.

He supports clients to achieve ambitious emissions reductions, leading a team providing excellence in engineering and project management for renewable energy deployment.

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ANWAR MOHAMMED

Technical Director of Utility Solar & BESS Engineering Services

Anwar has over 25 years' experience in developing and implementing solar energy projects. A skilled listener and communicator, he is able to rapidly assess client needs and convey necessary information concisely, with clarity and enthusiasm.

Highly innovative and creative team player, able to take responsibility and drive cohesive teams. He is a results oriented professional able to identify and delegate tasks to ensure a project is delivered within time and budgetary constraints. He has proven success in managing design and engineering teams. He brings exceptional analytical expertise

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ROGER MANSFIELD

Electrical Design Engineer

Roger is a CEC accredited Solar Grid Connect PV Designer with over 22 years' experience in electrical engineering including project management and design of solar power systems. Roger has worked for consultancies and turnkey solution providers, delivering numerous ground and commercial rooftop systems.

As a Project Manager/Solar Designer, his work covers commercial solar applications. His principal areas of focus are project management, contractor management, grid connection design, project estimating, secondary protection, equipment specification, connection approvals, commissioning, training and operations & maintenance.

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DAVID KINKAID

Construction Program Clients Engineer

David is an experienced Commercial Operations and Technical Project Manager specializing in the installation of renewable energy projects throughout Australia. He has extensive experience as a solar electrician and operations manager. He is comprehensively skilled in technical installation, operational and project management, monitoring and grid connection of PV systems.

David has managed and delivered several solar farm projects across Australia and he has been part of multiple roll-outs including multiple megawatt roll-outs across Australia for some of Australia's largest Universities and companies.

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CHRIS ALDERTON

Environmental Planner - Site Acquisition And Permits

Chris is responsible for all consents and permits related to a project and building relationships with external authorities related to consents and permitting in order to have Development Consent granted for projects to achieve financial close and move to construction.

With a degree in Environmental Management, he is specialised in the development of construction environmental management plans, on site environmental management, contaminated site assessments, extractive industries licensing, project management, flora and fauna assessments and natural resource management plans. He is also responsible for managing specialist external consultants.

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KEVIN PABALINAS

Solar & BESS Design Engineer

Kevin is an experienced electrical engineer with over 13 years of professional experience. He has a track record in solar farm design having successfully delivered numerous projects over the years. With a Bachelor and Masters in Electrical Engineering, he understands the intricacies of a project.

He has extensive experience in medium and high voltage electrical design. He is familiar with solar power engineering industry safety rules and regulations and has superior ability to implement mechanical structural and electrical civil engineering designs. Exceptional knowledge of electrical power system design and large-scale solar power electronics.

ROSALIE DELA CRUZ

Solar & BESS Design Engineer

Rosalie is an experienced electrical and solar engineer, with 12 years of professional experience in detailed solar PV engineering for commercial and utility projects. She has a Bachelor of Electrical Engineering is certified by the Board of Electrical Engineering.

As a lead electrical engineer, she is responsible for the preparation of project electrical design drawings complete with supporting calculations, including single line schematics, DC wiring schematics, electrical site plans, and equipment layouts. In addition, she also provides sheet sets which include detailed mechanical, electrical, protection, civil and structural designs.

IAN FOSTER

Commercial Solar Team Leader

Ian is a CEC accredited Solar Grid Connect and Stand-Alone PV Designer with over 17 years' experience in project management, system design, sales and distribution of solar power technologies. Ian has worked within different levels of the solar industry being, turnkey solution providers, product manufacturers and wholesale distributors which provides an in-depth knowledge of the solar PV industry.

He prides himself on effective communication with a wide variety of stakeholders, this coupled with solid experience and technical knowledge has resulted track record of successful projects.

TEAM STATISTICS

2006 Founded

16 Years

12 Local Staff

4 Remote Staff

>1 Gigawatt

>1000 Projects

3 Registered engineers

5 CEC engineers

>10 DA Consents

OUR EXPERIENCE

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Our engineering team have a diverse range of skills and experience and consists of registered and CEC accredited solar design engineers in disciplines including electrical, mechanical, environmental and civil engineering. Over the years we have successfully worked on well over 1000 projects totalling well in excess of a gigawatt of generation.

14MW SOLAR FARM WITH 3MW BATTERY

Review design and construction of a solar farm and battery system operating at Defence Estate's RAAF base and Robertson Barracks in Darwin, Northern Territory, to ensure quality and compliance.

400MW SOLAR FARM

Develop solar farm concept designs for planning permit and liaison with town and country planners and environmental specialists. Design iterations all the way through to final planning approval submission. Planning permit successfully awarded.

150MW TO 1000MW SOLAR AND BATTERY

Develop solar farm and battery concept designs for multiple projects located in Queensland, New South Wales and Victoria. Assessment of available grid capacity and network constraints. Also undertaking energy yield assessments and estimating project costs.

1MW SOLAR FARM WITH BATTERY

Engaged to undertake preliminary design; detailed tender design; tender evaluation and provide owner's engineer services throughout installation at the Bathurst Waste Water Treatment Plant. Work included solar and battery modelling and grid connection approval.

5MW SOLAR FARM WITH LANDFILL GAS AND BATTERY

Detailed feasibility analysis of solar along with battery and possible landfill gas generation. Estimating project capacities, system costs and developing multiple business cases to assess optimal mix of technologies.

770KW SOLAR FARMS

Detailed design and engineering services for 3 water treatment plants. Deliverables included site layouts, single line diagrams, string configurations, conduit and cable lists, fault studies, grid connection applications and also system commissioning and quality management.

2 X 5MW BATTERY

Detailed Electrical Design of 2 x 5MW Batteries for Tonga island grid. BESS #1 at 5.1MW/2.5MWh is intended to provide reserve capacity, reactive power, voltage and frequency control. BESS #2 at 5.1MW/17.4MWh is intended to provide increased flexibility.

SOLAR FARMS

Nillumbik Shire engaged Enhar to deliver a solar farm feasibility study for former landfill sites at Plenty and Kangaroo Ground. The project progressed to RFT phase in 2020 for a commercial developer to lead the project and sell power to the council.

5.5 MW SOLAR FARMS

Feasibility assessments of former landfill sites. This included community consultation by AEF and a biochar component as an added use these sites. Several sites were assessed and two sites shortlisted for a combined 5.5MW of solar.

20MW TO 100MW BATTERY

Engaged to develop their BESS project pipeline in Australia. Identify suitable sites, assess grid constraints and negotiate land options. Undertake concept design and obtain planning permits for battery projects sized from 20 MW to over 100MW in SA, VIC and NSW.

OPTIMAL BATTERY SIZING

An analysis of the Australian market for solar PV with battery energy storage systems (BESS). Identify optimal battery capacity which provides the maximum ROI. It included evaluation of state-specific load profiles, solar resources and retail electricity tariffs.

3MW SOLAR FARM WITH 3MW BATTERY

Engaged to undertake a detailed feasibility assessment for a 3MW solar farm with a 3MW battery, prepare technical specifications for tender, assess energy yields, and advise on grid connection and project configuration.

2MW SOLAR FARMS

Engaged as project superintendent to develop and commission project. Tasks included feasibility assessments, preparation of tender documentation, evaluation of EPCs, stakeholder management and post installation audits.

5 MW SOLAR FARM

Feasibility study to assess the suitability of installing a solar farm on a former landfill site. Modelling of energy yields and life-cycle economics was performed. Also undertaken was a review of land zoning and planning including bushfire and DNSP consultations.

1.5MW PV SYSTEMS

Detailed design and engineering for 5 sites. Deliverables included detailed design and drawings for construction; single line diagrams; protection schematics and communication design; grid application and management (Powercor); and bespoke interlocks.

Enhar

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