



ARCHÉ

Capability Statement

2023

Acknowledgement of Country

Arche acknowledges and pays respect to the Traditional Custodians and Elders of the nations on which we work and the continuation of cultural, spiritual and educational practices of Aboriginal and Torres Strait Islander peoples.

We acknowledge the history of colonial violence on Country.

We acknowledge that the land and waters of the First Nations were never ceded.

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About Arche

Arche Energy contributes our practical expertise to support our clients in their investment decisions.

Arche's team members have been providing balanced technical-commercial project due diligence and transaction support on NEM projects for over 15 years.

Our thorough review process encompasses resource quality, grid connection risks, approvals risk, construction and operation risks along with technical review of project design. We balance risk with practical solutions and mitigation advice.

Trusted partners work with us to provide approvals and legal services alongside our core technical-commercial strengths.

Arche's technical experience includes:

- solar farms
- wind farms
- renewable hydrogen
- pumped hydro and hydro-electric
- battery storage systems
- waste to energy
- biomass
- biogas.

Flexibly meeting client needs

Advise, second, deliver

Project Management

Led by Peter Bradnam, Arche's Project Services Team provides project management, project controls, procurement management and commercial management services.

From a one-hour commercial risk review to a complete project delivery service, we can help.

Net-Zero Glide Paths

Arche assesses portfolio carbon footprints, develops marginal abatement cost curves (MACC) and develops strategies to help organisations reach net-zero.

The team has recently completed an assessment over the portfolio of a major superannuation fund and is moving on to develop the MACC.

Publishing

Arche also offers professional publications services delivering tender responses, annual reports and other documents. Led by Sarah Jansen, our communications team works with clients to ensure their messages are presented with clarity, flair and professionalism.

Strategic Studies

Arche offers strategic studies to answer specific questions, analyse risks, develop strategies or to provide advice.

Studies are typically undertaken for fixed prices against a fixed scope of work.

Third party reliance for due-diligence work is available, subject to insurer endorsement.

Secondments

Arche offers secondments into project or owners teams, where we have the right person for the role.

We integrate into project teams to satisfy short term or intermittent requirements in a flexible manner.

Our associate network includes an incredible array of talent over a range of capability.

We currently have an engineering manager, project controller, data centre specialist/project manager and a health and safety manager in seconded roles.

Strategic consulting

Complex problems call for creative minds

How much hydrogen does my airport need?

When Arche's Daniel Nieto was asked to calculate how much hydrogen a major airport with all hydrogen aircraft will need in 2050, he rose to the challenge. Starting with the physics of flight, Daniel calculated the energy consumption of a range of aircraft operating over diverse sectors, and integrated these figures to estimate the airport's total hydrogen consumption.

Based on Daniel's outstanding work, Arche's client incorporated into its airport masterplan the hydrogen infrastructure necessary to cater for a changing world.

How do I get my ore to market?

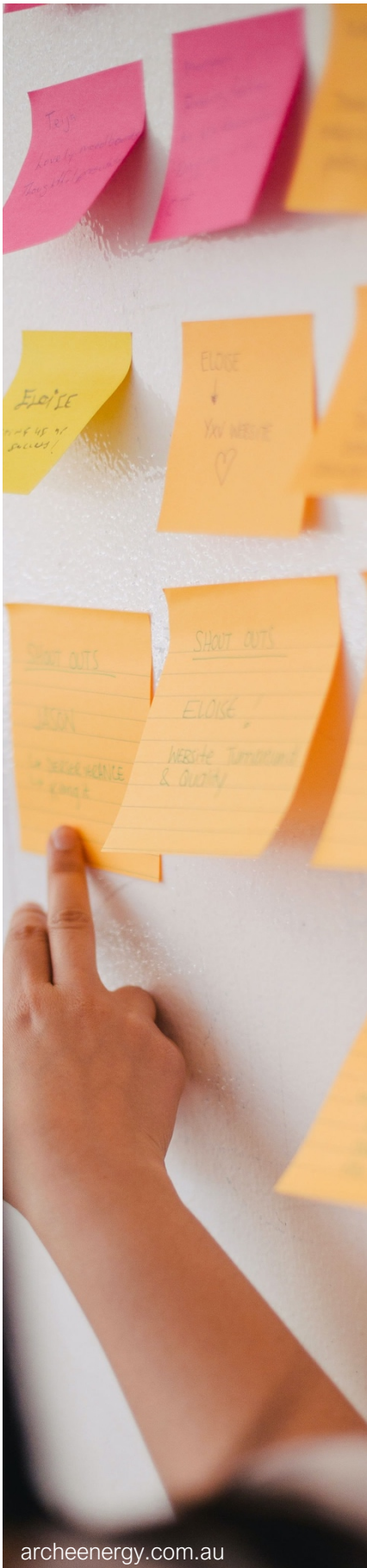
Infrastructure planning for new mines requires complex technical-commercial analysis. To identify the best combination of port and overland transport options for a new Australian mine, Arche's Martin Smith considered the technical and commercial aspects of four port options, six rail options, and three slurry pipeline options.

Working through technical aspects, estimating capital and operating costs, and assessing regulatory charges and access regimes, Martin estimated the cost per tonne (FoB) and identified the options with lower regulatory and approvals risks. Arche's input improved the competitiveness of our client's project and derisked its Development Phase.

Balancing commercial risks and negotiating better contracts

Our clients trust us to help negotiate better contracts. For example, Arche's Peter Bradnam provides one of our valued clients with regular commercial reviews for civil works contracts.

Working with the client's legal team, he contributes an essential commercial risk perspective to the negotiation of construction and other contracts.



Key Projects

Energy



Ord River Hydrogen Project — Marketing and Logistics Study

Arche Energy was engaged to undertake a markets and logistics study for a remote, outback hydrogen production facility. Arche Energy was able to identify the highest and best use for the hydrogen in a set of circumstances that was unique to this particular project. The study also identified the minimum viable capital spend required to access a realistic market for the hydrogen.

Galilee Basin Carbon Storage Prospectivity

Arche Energy was engaged to undertake a desktop study to determine the prospectivity of a large-scale carbon dioxide storage reservoir in the South West Galilee Basin. The study included identification of an appropriate geological structure and a concept level arrangement and capital and operating cost estimate.

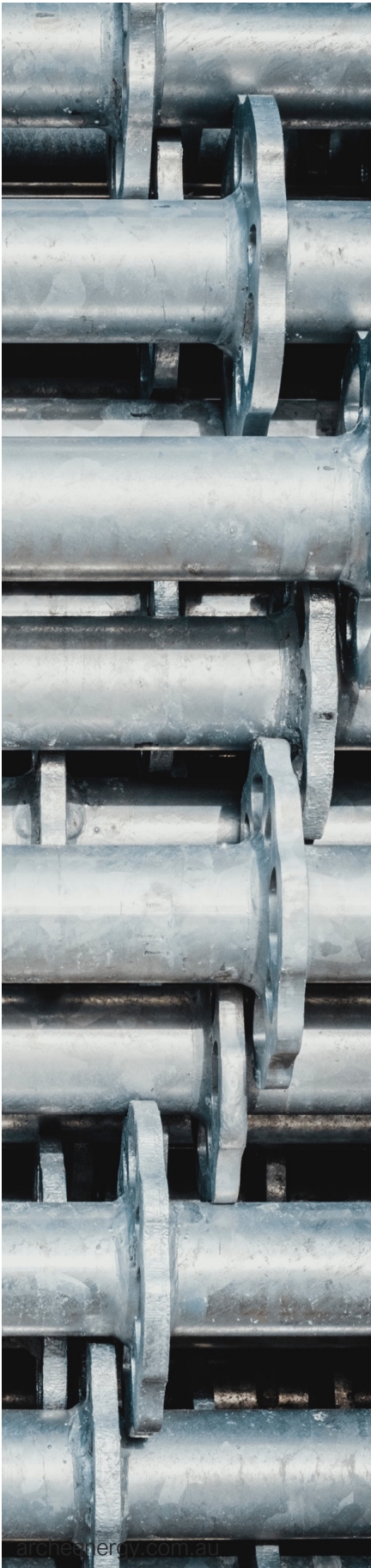
Central Queensland Hydrogen Project

Arche Energy's Martin Smith is currently seconded to Stanwell Corporation to provide engineering management. Working in collaboration with the Stanwell, APA and Iwatani team, Martin is playing a key role in steering the project using his international oil and gas experience in a clean hydrogen role.

Services to the project include technical support and scoping, technology OEM engagement (including electrolysers), key infrastructure stakeholder engagement (power generation and transmission, water, ports), alignment of project's international consortium pre-MOU agreement, and procurement process support and planning activities leading up to commencement of the Feasibility Stage.

Key Projects

Energy



C2X Concepts

Arche Energy developed and assessed a number of C2X (coal to other products) options for a major Queensland based coal developer.

The study identified a range of products from coal in its most basic form through power, hydrogen, ammonia, diesel, urea and methanol. For each option, the study estimated the product's value per tonne of coal mined and its net carbon intensity, with and without CCUS.

The study identified an option for integrated power, sequestration and methanation that was able to recycle carbon dioxide generated by a power station for reuse as pipeline quality methane.

Blue Hydrogen and Ammonia Concept Study

Arche Energy developed a concept for the production and export of blue hydrogen and ammonia from a major Queensland coal project.

The scope of work included process sizing, performance estimates, capital and operating cost estimates and a trade-off of export as hydrogen against export as ammonia.

The scope also included calculation of carbon sequestration requirements and identification of potential sequestration sites and an estimate of the cost of hydrogen and ammonia production.

Key Projects

Energy



Rugby Run Solar Farm

Arche Energy's Andrew Murdoch was previously engaged as the General Manager responsible for the development of the Adani Renewables business in Australia. During this time, the team developed the 65 MW Rugby Run Solar Farm located south west of Moranbah in Central Queensland.

Confidential Solar Farm — Battery Farm Concept Study

Arche Energy completed a combined solar farm and battery farm study (with a similar scope of work to Pulua Bulan) for a site in Victoria. The assignment includes identification of a suitable layout, resource estimates and optimisation of the battery-solar farm configuration.=

Greenvale West Solar and BESS Farm

Arche Energy developed a concept for the development of a solar farm at Greenvale West on the western Melbourne urban fringe green belt.

The concept included preliminary design, cost estimates, resource yield, battery sizing and grid connection arrangements.

Key Projects

Infrastructure

Wiggins Island Export Terminal

Andrew Murdoch was the Project Manager for the WEXP1 and WEXP2 expansions during the Feasibility and Development Phases. During this period, he managed the technical feasibility and obtained environmental approvals for the expansion.

Andrew also developed the financing and procurement strategy for the project.

Mount Dore Copper Project

Arche was engaged to develop an energy supply concept for the project. The study traded off options for diesel, gas and transmission along with integration of renewable. Arche then went on to support the tendering process.

Woolgar Gold Project

A \$200m mine is proposed to be built over 700km² of major historic gold prospecting areas in North Queensland. Arche Energy developed a power supply concept that assessed options including solar, wind, pumped hydro, mini-hydro, batteries, CNG, LPG, diesel and transmission.

The team made a recommendation on the basis of cost of gold production with an estimate of the relative carbon intensity of each of the options.

Wesfarmers Curragh Extension Studies

Peter Bradnam was Senior Mechanical Engineer for the Concept and Prefeasibility Studies for the expansion of the mine's coal washplant, including train loading system modifications.

Peter also developed Request for Tender documents for the coal washplant D&C contract.



Key Projects

Infrastructure



CopperString 2.0

Arche's Managing Director, Andrew Murdoch, was seconded to the CuString team for 12 months to provide his unique combination of knowledge and experience as Technical Director. He developed the concept for the project, defined the functional requirements specification, oversaw route selection and substation siting (including the Selwyn Substation), initiated the system modelling, and developed the execution strategy for the project.

Aurukun Bauxite Project

Arche's Andrew Robson was the Department of State Development's Project Director for this project. He managed a complex land and mining tenure in western Cape York, Queensland, 23km northeast of Aurukun and 160km south of Weipa, as part of exploring the feasibility of developing a new open cut bauxite mine.

Galilee Rail and Port Study

Arche delivered a study on a proposed 310km greenfield rail line in Central Queensland, connecting the northern Galilee Coal Basin to the Port of Abbot Point.

The study refined a 1km-wide investigation corridor to 100m-wide rail corridor. The ultimate rail infrastructure could be scalable to a capacity of 100 million tpa, and include:

- passing loops
- road and rolling stock maintenance facilities
- water supply pipeline
- track and signalling maintenance facilities
- staff accommodation and training facilities.

Key Projects

Strategic Clean Energy Advisory

Lockyer Energy Project

Arche Energy provides Quinbrook Infrastructure Partners with ongoing development services and project management. These included managing development approvals and the network connection process, gaining EPBC approval, EPC contractor selection and contract negotiations, and the development of execution strategies for the project.

Arche Energy is currently completing the FEED study for the 750MW BESS project and has completed a FEED study for the 120MW gas turbine project.

Arche Energy implemented a compliance program and oversaw the execution of the clearing and site preparation scope of works for the project.

Arche Energy will continue on as the owner's project manager and engineer during construction.

Confidential Technical Due Diligence

Arche Energy recently undertook a technical due diligence on a novel hydrogen, graphite and clean fuel production process (using hydrogasification) in order to assist a confidential client make an investment decision.

Remote Hydrogen and Water Project Technical Review

Arche Energy was engaged to provide a pre-investment technical review on a novel hydrogen and water production project in a remote Northern Territory location. Arche Energy validated production performance estimates (for both water and hydrogen production), estimated project resilience to drought and undertook a review of the technical parameters including the hydrogen's suitability for end user's requirements.

Key Projects

Publications Services

Arche also offers professional publications services. Led by Sarah Jansen, our communications team works with clients to ensure their messages are presented with clarity, flair and professionalism.

During this dynamic time in the energy and infrastructure sector, reports and other deliverables that go beyond what is expected can be a point of difference that helps get you noticed.

Having worked across energy, resources, transport, water, urban planning, and property development, Arche or our team members in previous roles have published:

- reports and other publications for print and digital mediums
- annual reports
- prospectuses
- tenders, proposals, EOIs
- environmental, geotechnical, cultural heritage and other specialist reports
- guidebooks and literary anthologies.

The expertise and experience Arche offers includes:

- project managing major reports and submissions
- writing and editing to brief and word count
- creating stable, user-friendly MS Word templates
- managing artwork creation and graphic design
- adhering to best practice accessibility practices.

Key Projects

Publications Services

Victorian Building Association Annual Report 2021–22

The VBA engaged Sarah Jansen to manage the content production for its annual report according to statutory requirements and the VBA's writing and visual style guides. Sarah's role included:

- worked with Communications and Finance teams to publish an professional, accurate report fulfilling legislative and departmental requirements for CEO approval and State Parliamentary tabling
- adhered to VBA and Victorian Government branding and writing style guidelines to ensure the report met the organisation's requirements
- maintained version control, clarity, and consistency.

MS Word Template Update and Usage Guidelines

Sarah is working with environmental and cultural heritage consultancy Biosis to refresh a suite of around 80 MS Word templates and update them to reflect legislative and other industry changes. The new templates are more stable and easier to use and are accompanied by user guide posters and cheat sheets.

VicRoads 2016–2017 Annual Report

Sarah worked with VicRoads to deliver the publication for Victorian State Parliamentary tabling. She maintained version control, clarity, and consistency; designed and laid out 160-page document in MS Word; used advanced MS Word skills to ensure the report displayed well and was readable in digital and print formats; followed VicRoads branding and writing style guidelines to ensure the report met the organisation's requirements; and proofread the final print proof.

City of Darebin Cycling Strategy and Publication Support

Sarah edited and laid out for publication two crucial sets of documents: Darebin's Cycling Strategy and a suite of induction materials for newly elected Councillors.

Key people

Andrew Murdoch
Founder and
Managing Director

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Andrew Murdoch founded Arche Energy in 2017 to provide high-quality clean energy, power and infrastructure consultancy to facilitate investment in the clean energy sector.

Andrew is an experienced general manager, project director and engineer in renewable power, power generation, energy, ports and heavy infrastructure. His experience spans business development, major approvals, project execution, operations and maintenance and decommissioning.

He is an innovator and optimiser thriving in changing environments through the adaptation and integration of emerging and innovative technologies into business applications.

Andrew is a compassionate, motivating team leader and project manager, approachable, personable and always willing to assist team members to realise their potential. His highly developed feel for interpersonal nuance is key to shaping productive team dynamics.

It is his strategic thinking, professionalism, technical knowledge and passion for his work that has made Andrew an established leader in the industry — an excellent addition to any project.

Key People



George Mellick: Director of Studies

- 25 years' experience in energy and infrastructure in sustainability, energy conservation, heavy industry and rail
- Project, contract and asset manager, particularly in operations and maintenance costs planning
- Excellent communication and client relationship management skills



Peter Bradnam: Director of Project Services

- Highly experienced commercial executive, project manager, mechanical engineer
- Track record on large infrastructure projects across the resources, energy, transport and communications sectors.
- Assists clients to achieve business and project outcomes



David Nolan: Principal Consultant

- MBA-qualified mechanical engineer
- 25 years in mining, construction and rail
- Engineering management, study management, project management, coordination of technical teams
- Excellent people management and communication skills as well as business development expertise



Richard Lukianto: Project Director and Principal Consultant

- Business developer, project manager, project director
- Working on energy transition for many years, having been a senior member of SK ecoplant, Siemens Headquarters in Germany, and on constructions sites

Key People



Matthew Richards: Principal Consultant

- Experienced engineer and manager who has been delivering multidisciplinary projects for 25 years
- Works across project lifecycle: feasibility, detailed design, manufacture, construction, commissioning for complex heavy industrial plants and systems



Neil Cross: Specialist Electrical Engineer

- Design, construction and commissioning of energy, mining and datacentre infrastructure
- Advises clients on electrical, battery systems, mechanical and cooling, fire services, UPS, DCIM, and cabling



Martin Smith: Principal Consultant

- 24 years in technical and commercial
- Specialised oil and gas, transfers directly into emerging clean energy technologies
- Greenfield and brownfield energy projects (including onshore and offshore oil and gas, LNG and CSG)
- Major projects with complex stakeholder relations
- Strongly committed to OHS



Graeme Finsen: Principal Consultant

- Project and engineering manager with 30 years of experience specialising in electrical and control systems
- RPEQ (Electrical), Fellow of Engineers Australia, Chartered Professional Engineer, member of IEPNG, registered with Professional Engineers Registration Board of PNG

Key People



Walter Hodgins: Senior Consultant — Project Controls

- 20 years in program/project management
- Worked with major companies, EPCMs in energy, mining, construction, rail, roads, water, and wastewater.
- Engineering and project management principles, contract law, accounting control, risk management



Daniel Nieto: Senior Consultant

- Petroleum engineer with Master of Sustainable Energy Management
- Develops new technologies for energy transition and sustainable future
- Managed upstream oil projects
- Strong focus on social engagement, health and safety.



Abel Quintero, Senior Consultant

- 8 years delivering renewables projects
- Utility scale and grid-connected hydropower plants, wind and solar farms
- Research projects in hydrogen and future transport systems
- Master of Sustainable Energy and Master of Engineering Science in Water Resource and Environment



Sarah Jansen: Principal Consultant

- Science and engineering writer and editor, storyteller, and communications manager
- 20 years of experience working with infrastructure and arts/cultural organisations
- Highly skilled in translating complex technical information for non-technical audiences

Key People



Andrew Robson: Construction and Compliance Manager

- 40 years' managing development of large, complex projects
- Oil and gas, mining, rail, port facilities, civil infrastructure, waste management, fleet management
- Land acquisition, stakeholder engagement, approvals management, compliance management



Maria Centeno: Electrical Engineer

- Electrical engineer with Master of Sustainable Energy (Management)
- Development, design and operation of electrical substations; and voltage and power control of grid-connected PV
- Development, review and approval of technical specifications
- Excellent numerical and problem analysis, achieving challenging goals



Nicky Hitz: Financial Manager

- Wealth of experience in accounting, banking, and the management and development of small consultancies.
- Experienced operations director, entrepreneur and investor
- Worked across professional services, financial services, information technology



Jonathan Mendez Gonzalez, Senior Consultant

- Engineer with a Master of Sustainable Energy
- Oil and gas
- Clean energy technologies such as solar photovoltaic, biogas and hydrogen
- Project design, production, process and project engineering

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Let's discuss what we can do for your business.

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