Acclimate Partners

Banana Shire Council Callide REZ Procurement Strategy

Maximising local supplier participation in REZ procurement opportunities

Prepared for Banana Shire Council

Banana SHIRE
SHIRE OF OPPORTUNITY

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1. Executive summary

The transition to renewable energy presents a once-in-a-generation economic opportunity for Banana Shire, offering the potential to drive long-term regional growth, job creation, and industry diversification. As of April 2025, 25 large-scale projects are in the pipeline for Banana Shire, the projects, which span wind, solar and battery storage, are collectively valued at over $40 billion and signal a significant transformation for the region (Banana Shire Council , 2025). By anchoring new investment through the proposed Callide Renewable Energy Zone (REZ) and related projects, the Shire can not only strengthen local business participation in emerging supply chains but also build resilience against any future downturn in the resources sector, ensuring a more stable and diversified local economy.

This strategy aims to identify priority areas for Banana Shire supplier participation in renewable energy supply chains. Proactively addressing existing structural, informational, and capability gaps will position the Shire to unlock this transformation's full economic and social benefits. The underlying hypothesis guiding this strategy is that local supplier participation can be maximised if three conditions are met:

1) There is no distinguishable difference for developers when choosing local suppliers over others
2) The advantages offered by local suppliers are relevant to and valued within the procurement frameworks of REZ projects
3) The size and structure of the local supply chain are appropriate to meet the demand generated by REZ projects.

Within this context, Banana Shire Council recognises the need for a targeted, place-based strategy to build local business capability, align regional suppliers with developer requirements, and ensure that procurement processes reflect local participation's economic and social value. This strategy covers three primary renewable technologies: solar, battery, and wind and the underlying transmission network, focusing on interventions across the entire project lifecycle, from impact assessments, community engagement, and early civil works to long-term operations and maintenance contracts. It also addresses requirements for transmission network construction.

Vision

This strategy positions Banana Shire as a proactive regional Australian leader in renewable energy project procurement, underpinned by a visible, capable, and coordinated local supply chain. The strategy and associated initiatives aim to address the capacity of local businesses to engage in renewable energy value chains, to maximise local economic value retention, create skilled jobs, and enhance regional resilience.

Objectives

The Callide REZ Procurement Strategy aims to maximise Banana Shire-based suppliers' participation in renewable energy development, particularly within the proposed Callide REZ. By positioning local businesses to meet the demand of these initial projects, the strategy will establish a foundation for them to expand their capabilities and service developments elsewhere in Central Queensland and across Australia.

Local participation will be enhanced through three key levers:

1) Increasing the readiness and competitiveness of local businesses to meet procurement requirements through tailored training and capability development, coupled with support to identify and apply for relevant government grants, infrastructure funding streams, and risk-offset mechanisms.
2) Providing developers and Tier 1 contractors with clear, accessible, and verified data about local suppliers and their ability to meet the requirements of renewable energy projects using digital platforms and local engagement events.
3) Establishing ongoing collaboration between local industry and regional renewable energy projects that promote collaborative planning, feedback loops, and sustained working relationships.

2.0 Overview of approach

The Callide REZ Procurement Strategy has been formulated through a structured, three stage methodology to ensure that proposed interventions are firmly grounded in evidence and responsive to Banana Shire's unique context.

1. **Understanding the context**
   The strategy commenced with an assessment of the renewable-energy landscape at national, state and regional scales. Key reference points included AEMO's Integrated System Plan, Queensland Government energy and workforce reports, and local economic data, which collectively defined the policy drivers, investment trajectories and labour-market dynamics influencing supplier participation in Banana Shire.

2. **Analysing the opportunities**
   Building on this foundation, a value chain analysis was undertaken across solar PV, wind, battery energy storage and transmission infrastructure. Each segment was evaluated by the competitive advantages that drive regional success in delivering that segment of the value chain. Once a perceived regional competitive advantage was identified for Banana Shire, value chain opportunities were evaluated against three participation hypotheses, no distinguishable difference of service or product offering, procurement advantages valued by developers, and scalable local supply. Where possible, opportunities were validated through engagement with project developers and Tier 1 contractors on their procurement considerations. This analysis organised value chain opportunities into three overarching themes that guide Banana Shire from immediate "quick wins" to more complex, resource intensive opportunities.

3. **Identifying the enablers**
   For each theme, key enablers were defined within the pillars of skills development, infrastructure enhancement, strategic investment and digital and logistics support. These consolidated interventions provide the roadmap that transitions local businesses from foundational participation through to factory scale production and innovation driven activities, thereby ensuring that early successes can be reinvested into progressively more complex value chain roles.

3.0 Renewable energy in Australia and Queensland

Australia's renewable energy value chains are undergoing a period of unprecedented growth. The 2024 AEMO Integrated System Plan notes that under current federal underwriting schemes, nearly 32 GW of new wind, solar and storage capacity will be delivered by 2030, more than tripling today's utility-scale renewable generation (AEMO, 2024). To support this transition, The Powering Australia Plan forecasts over 600,000 jobs nationally by 2030 in the clean-energy transition (DCCEEW, 2022). This surge underscores the opportunity to invest in the energy transition to build a more resilient, inclusive, and future-oriented national economy. The electrification of industry and transport, combined with large-scale investment in renewables, could anchor a new generation of clean-tech manufacturing and circular economy industries.

3.1 Supply chain readiness

Australia's renewable energy sector remains heavily dependent on imported components. The National Renewable Energy Supply Chain Action Plan identifies onshore wind, solar PV, and battery technologies as high-risk value chains susceptible to disruption from geopolitical instability, currency fluctuations, and global logistics constraints (DCCEEW, 2024). According to the Australia Institute's Centre for Future Work report - *Manufacturing the Energy Revolution: Australia's Position in the Global Race for Sustainable Manufacturing*, more than 95% of Australia's solar panels, battery cells, and wind turbine components are currently sourced offshore. This reflects the absence of local OEMs with the necessary scale, certification and integrated production facilities renewable energy projects require. Without strategic investment in sovereign manufacturing and supply chain diversification, infrastructure rollout timelines could be compromised, affecting investor confidence in the sector (Stanford & Joyce, 2023).

The Make It Here Strategy, identifies a pathway to strengthen sovereign capability by transforming existing heavy-industrial clusters into Renewable Energy Industrial Precincts. Regions such as Central Queensland are home to steel and alumina works currently servicing the mining and agriculture industry that could be repurposed to fabricate solar frames, wind towers, battery modules and other cleantech products. This approach could generate up to 53,000 ongoing jobs and $215 billion in cumulative revenue by 2035, while reducing reliance on offshore supply chains and enhancing investor confidence in renewable infrastructure projects (Beyond Zero Emissions , 2024).

3.2 Workforce readiness

AEMO's Focus on Queensland report forecasts the electricity-sector workforce in Queensland will almost double from around 11,000 full-time equivalents in 2024 to 21,700 by 2031 under the Step Change scenario, an increase of some 10,700 jobs over six years (Rutovitz, Gerrard, Lara, Tahir, & Briggs, 2024). However, vocational enrolments in critical trades such as electrical, mechanical and plant-operations remain flat or misaligned with these emerging needs (DCCEEW, 2023). To bridge this gap, Queensland has not only established initiatives like the TAFE Centre of Excellence – Clean Energy, which delivers nationally recognised battery and grid-storage training, and the Regional Renewable Energy Training Hubs in Toowoomba, Kingaroy and Mount Isa, offering immersive, industry-aligned courses and micro-credentials to prepare local workers for these new roles (Queensland Government, 2023). The transition is also leveraging industry-led facilities. The Callide Futures Hub is re-skilling former coal-sector workers for renewables roles, the Powerlink Training Centre in Gladstone delivers specialised network operations and high-voltage safety courses, and Stanwell's Renewable Energy Services Facility provides hands-on learning in grid-scale battery integration and solar farm commissioning (Powerlink Queensland, 2023) (CS Energy, 2024) (Stanwell Corporation, 2023). Together, these initiatives form an integrated training ecosystem designed to equip Queenslanders with the technical and operational competencies demanded by the clean-energy transition.

Strategic workforce initiatives can help bridge critical skills gaps while lifting workforce participation rates among young people, women, First Nations Australians, and displaced fossil fuel workers. The First Nations Clean Energy Strategy underscores the importance of embedding Indigenous-led economic participation into the design and procurement phases of renewable energy projects, maximising social and financial dividends (DCCEEW, 2024).

3.3 Regional capacity challenges

The regionalisation of renewable energy infrastructure, including the proposed Callide REZ, presents significant opportunities for economic revitalisation outside metropolitan centres. However, Infrastructure Australia's Regional Strengths and Infrastructure Gaps report warns that regional communities face longstanding challenges, including shortages in housing, transport infrastructure, training access, and health services (Infrastructure Australia , 2022). These gaps increase friction in project delivery and could undermine the broader social licence needed to sustain the energy transition.

4.0 Banana Shire

Banana Shire occupies a pivotal role in Queensland's energy transformation, balancing legacy fossil fuel infrastructure with emerging renewable energy investments. As of April 2025, 25 large-scale projects are in the pipeline for Banana Shire, the projects, which span wind, solar and battery storage, are collectively valued at over $40 billion and signal a significant transformation for the region (Banana Shire Council , 2025). While the region's location and experience in large-scale power generation present major advantages, workforce, supply chain, and infrastructure gaps must be addressed to fully realise local benefits.

4.1 Economic overview

Mining and Agriculture in Banana Shire are the largest economic sectors, contributing a combined 81% of gross value added and 35% of employment. However, the Shire's diversified economic base offers notable advantages for renewable energy participation, particularly through its competitive strengths in specific manufacturing and construction subsectors (EconomyID, 2025) (Acclimate Partners, 2025). Shift share and location quotient analysis reveal that, despite the Shire's overall decline in manufacturing, analysis shows a positive regional competitive effect in fabricated metal production, primary metal, and metal product manufacturing, all of which are critical to renewable energy supply chains. Similarly, the construction sector, though small overall, demonstrates a positive regional competitive effect in heavy and civil engineering construction, aligning well with the demands of large-scale solar, wind, and transmission projects. By leveraging these niche strengths, the Shire has the opportunity to diversify its economic base, and position local firms as key contributors to Queensland's clean energy buildout (Acclimate Partners, 2025).

4.2 Supply chain participation

Banana Shire is well-placed to deepen its role in renewable energy supply chains; however, focused initiatives are needed to capitalise on key opportunities and overcome existing participation barriers. The region boasts strengths in key sectors directly relevant to renewable project delivery, with 136 civil-construction businesses employing over 450 workers, 79 transport firms with some 230 staff and 64 machinery-servicing enterprises accounting for over 200 local jobs (Australian Bureau of Statistics, 2022). Supply chains currently serving Callide Power Station, encompassing heavy-lift logistics, transformer servicing, bulk cabling and spare-parts warehousing can be adapted to support REZ transmission and substation works. Formalising these linkages will reduce freight lead times, improve parts-availability and demonstrate a proven track record to Tier 1 contractors.

While most local businesses have a strong interest in adapting and growing their business to supply to the renewable sector, they currently lack the scale, systems integration, and technical and occupational health and safety compliance required to meet Tier 1 contractor procurement standards. To capture emerging opportunities, local businesses will need to invest in new technologies and processes ranging from ISO 9001 quality-management certification to systems integration platforms, digital asset-management tools and technical compliance, such as adherence to AS/NZS 5131 for structural steel installations, IEC 61400 turbine-installation standards and remote-monitoring SCADA protocols (Standards Australia, 2016).

Minimum viable scale is a key issue. Consultations with renewable energy developers indicate that many projects require suppliers capable of delivering significant volumes of goods and services at consistent quality and price points. This is something that small and medium enterprises (SMEs) in Banana Shire may struggle to achieve independently. Counterparty risk and gaps in technical expertise, particularly in electrical and energy-specific civil engineering further limit local supplier competitiveness.

Nonetheless, Banana Shire's historical experience in hosting major infrastructure projects, including energy and mining developments, positions it strongly for key success factors for renewable energy projects. Local businesses offer a distinct advantage in agility, responsiveness, and local knowledge. Proximity to project sites reduces logistical costs and delays, while existing industry relationships and landholder engagement capabilities streamline project delivery. Pre-tender programs, capability-building initiatives, and collaboration between SMEs and national large-scale businesses could help bridge existing gaps and integrate local suppliers into the renewable energy value chain, enhancing local economic capture.

4.3 Workforce readiness

Banana Shire faces significant workforce challenges in aligning local skills and labour capacity with the needs of the emerging renewable energy economy. Renewable energy projects particularly wind, solar, and battery storage are proposed to be concurrently under construction in the Shire. According to the Callide REZ Readiness Assessment, adding up to 8.2 GW of new capacity between 2025 and 2039 will require, on average, around 460 additional workers each year, with demand peaking at roughly 1,350 construction roles in 2028 (Queensland Government, 2024). This surge will be most acute for electricians, plant operators, mechanical fitters and civil construction workers. Importantly, the existing cohort of operators, control-room technicians and maintenance trades at Callide Power Station represents a proven pool of high-voltage, instrumentation and plant operations expertise. Structured transition and upskilling programmes can mobilise these workers into renewable O&M and commissioning roles, smoothing the labour transition and retaining critical technical know-how in the region.

However, the existing local labour pool cannot meet these peak requirements without heavy reliance on fly-in-fly-out (FIFO) and drive-in-drive-out (DIDO) arrangements. (Department of Energy and Public Works, 2022).

Banana Shire's labour profile is strongly concentrated in resource-intensive industries, particularly mining and electricity generation, which together represent a significant share of local employment and economic output. According to modelled 2023 data, mining alone employs 28.01% of Banana Shire's workforce and contributes over 73% of the region's Gross Value Added (GVA), highlighting the Shire's deep reliance on the coal and resource sector. Electricity, Gas, Water and Waste Services account for a further 4.56% of local employment, underscoring the role of energy infrastructure in the local economy. By contrast, sectors that align more closely with renewable energy, such as construction (8.47%) and manufacturing (5.89%) remain comparatively smaller, with both sectors experiencing notable GVA contractions over the past decade (30% and 21% respectively from 2013 to 2023) (EconomyID, 2025)

This structural reliance on foundational industries, coupled with the relatively limited size and declining trajectory of the trades-aligned sectors, highlights a misalignment between the existing workforce and the skillsets required for the emerging renewable energy economy. While it is essential to grow skills and capacity in emerging renewable-energy disciplines, any workforce development strategy must ensure that the labour pools sustaining mining and conventional power generation are maintained as long as these industries remain economically viable. Moreover, evolving renewable energy supply chains will demand not only additional workers but entirely new skill sets. However, statewide youth engagement in trade pathways remains low. The National Centre for Vocational Education Research data indicate that under 8 percent of Queensland 15–19-year-olds are enrolled in VET apprenticeships for construction trades (NCVER, 2024). With over a quarter of the Banana Shire's local workers aged over 55 and national apprenticeship completions in key trades flatlining over the past five years, the Shire faces a declining skills pipeline unless targeted retention and youth-focused training programs are implemented. Targeted investment in workforce development such as the Callide Futures Hub (currently focused on re-skilling CS Energy workers for renewable energy) and regional trade training hubs aligned with future energy needs, could significantly increase Banana Shire's competitiveness.

Housing availability remains a critical factor in attracting and retaining both project personnel and essential service workers. With rental vacancy rates below 1 percent across Banana Shire, limited supply and rising costs make it difficult for health professionals, educators and other service providers to relocate to the region, undermining the community infrastructure that underpins long-term workforce stability (Banana Shire Council, 2024). If these constraints are not addressed through targeted housing investments and partnerships with developers, the Shire may struggle to sustain the skilled labour and support services required for ongoing renewable energy deployment and broader economic development.

4.4 First Nations participation

Banana Shire is located on the traditional lands of several First Nations groups, including the Gaangulu, Bidjara, Darumbal, Wadja, Wulli-Wulli, Wakka Wakka and Iman peoples. Despite growing recognition of the need to include First Nations businesses in regional economic development, there are few First Nations owned businesses operating in industries vital to the renewable energy value chain based in the Shire. However, there are several in the Central Queensland region, including businesses owned or employing First Nations people from the Shire operating in sectors such as construction, logistics and professional services.

Barriers to participation

A 2023 report from Indigenous Business Australia (IBA) highlights, First Nations businesses often face multiple barriers to active participation in the renewable energy sector that are common to broader economic participation challenges. Often grappling with low visibility in traditional procurement channels and limited resources or expertise to engage with these processes. The report identifies that only a small fraction of Indigenous-owned businesses are awarded government or large private sector contracts, often due to a lack of familiarity with the procurement processes (Indigenous Business Australia, 2023).

Beyond this, Supply Nations analysis of procurement spending patterns with Indigenous businesses identified that First Nations businesses often have limited access to industry-specific training and capacity-building programs, and often have a lower appetite for risk, which can deter engagement in novel or capital-intensive ventures. Procurement platforms themselves can be prohibitive due to high costs and administrative complexity, placing further strain on emerging enterprises. Moreover, the analysis highlights many First Nations entrepreneurs lack foundational support, such as mentoring, business development services and access to start-up capital, that is critical for establishing the robust governance and financial systems required by major projects. While First Nations businesses are experiencing growth, these combined factors contribute to a significant gap in their capacity to meet the technical, financial and compliance requirements of the renewable energy sector (Supply Nation , 2022).

A 2021 Australian National University (ANU) study found that while there is potential for mutually beneficial partnerships, many Indigenous groups remain cautious of external developers due to previous experiences with insufficient consultation and inadequate follow-through on commitments (O'Neill, et al., 2021). Trust-building remains a critical challenge for fostering ongoing commercial partnerships. Historically, consultations between First Nations organisations and external developers have been transactional or compliance-focused (sometimes referred to as black-washing), rather than genuinely collaborative. This has led to mistrust and scepticism about the intentions of developers, especially in sectors like renewable energy that involve large-scale land use and development.

Policy drivers and opportunities

Despite these barriers, there are several policy drivers and opportunities that can help address these challenges and enhance the participation of First Nations businesses in the renewable energy value chain.

The Queensland Indigenous Procurement Policy (QIPP), established in 2019, mandates that all Queensland Government agencies allocate at least 3% of their annual procurement budget to Indigenous businesses. Additionally, it requires developers, particularly those involved in state-supported initiatives like the proposed Callide REZ, to demonstrate clear commitments to Indigenous employment, training, and procurement (Department of Aboriginal and Torres Strait Islander Partnerships , 2017). While these targets are essential, it is equally important that the economic benefits flow to local Traditional Owner groups and community enterprises, rather than being captured by Indigenous suppliers from distant regions. Importantly, First Nations procurement is increasingly viewed as a preferred form of participation by some Traditional Owner groups, compared to direct employment. This highlights the need for developers and councils to engage early and meaningfully with communities to understand their priorities and preferences. (Clean Energy Council , 2024)

There is growing recognition of the importance of project developers establishing dedicated procurement strategies that reflect both the possibility and practicality of engaging First Nations businesses at all stages of a project lifecycle. This includes supporting equipment and capability gaps that prevent many local businesses from securing contracts, such as the lack of commercial tools required for revegetation or site maintenance work.

Emerging best practice from industry and government includes:

- Embedding preference clauses and targets for Traditional Owner and First Nations businesses in procurement processes. For example, AEMO Services Generation Tenders require a base goal for projects to meet relevant state guidelines (3% for QLD under the QIPP) on indigenous participation, however a stretch goal of 10% is recommended for best practice. (AEMO Services, 2024) (DCCEEW, 2024)
- Advertising local supplier opportunities clearly and early, with timelines, budgets, and requirements
- Securing long-term, 'bankable' contracts to help Indigenous businesses scale and build sustainable capacity
- Providing practical support, such as access to finance, briefings, training, and joint ventures
- Ensuring procurement obligations are upheld through third-party contractors and project transitions
- Regular local engagement, including procurement briefings and partnership-building activities.

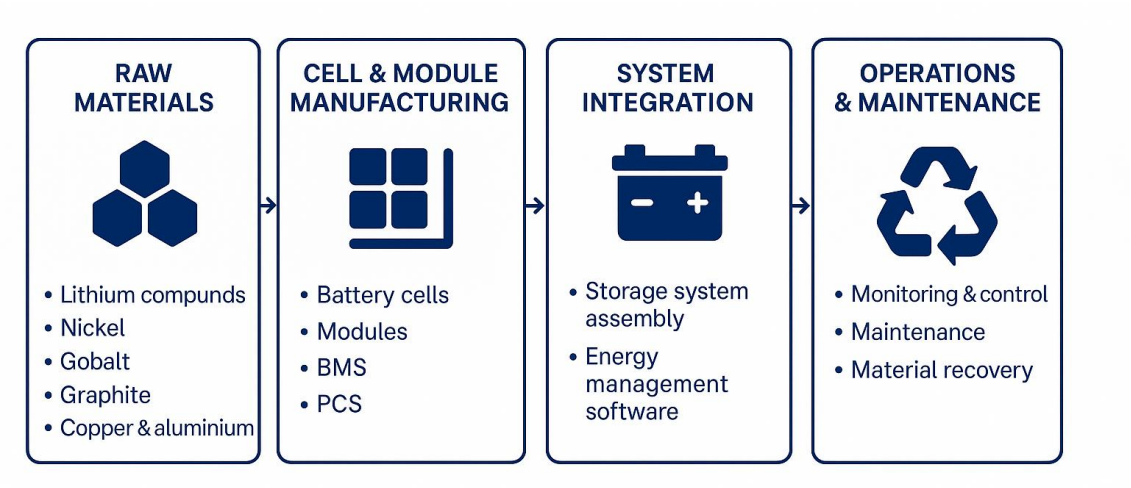
Various programs, such as the *Indigenous Business Sector Strategy* and *Supply Nation's Indigenous Business Directory*, provide opportunities for First Nations businesses to access capacity-building resources, certifications, and networks that can enhance their ability to participate in large-scale projects. Banana Shire Council can support the integration of First Nations communities and play an instrumental role in supporting these businesses to navigate these programs, with a particular focus on tailoring the support to renewable energy needs (Supply Nation , 2022).

5.0 Value chain opportunities

In our analysis, the value chain and the supply chain represent two complementary, but distinct ways of understanding how renewable energy projects are delivered and how economic benefit is captured. The supply chain describes the logistical flow of materials such as steel, polysilicon and lithium from source to site via transport, storage and distribution, whereas, the value chain maps the sequence of locally delivered, value adding activities including, component manufacture, system integration, operations and end-of-life recycling where local industry can contribute expertise, certifications and innovation. Distinguishing these concepts enables targeted interventions then by investing in advanced skills and infrastructure to capture higher margin value chain opportunities.

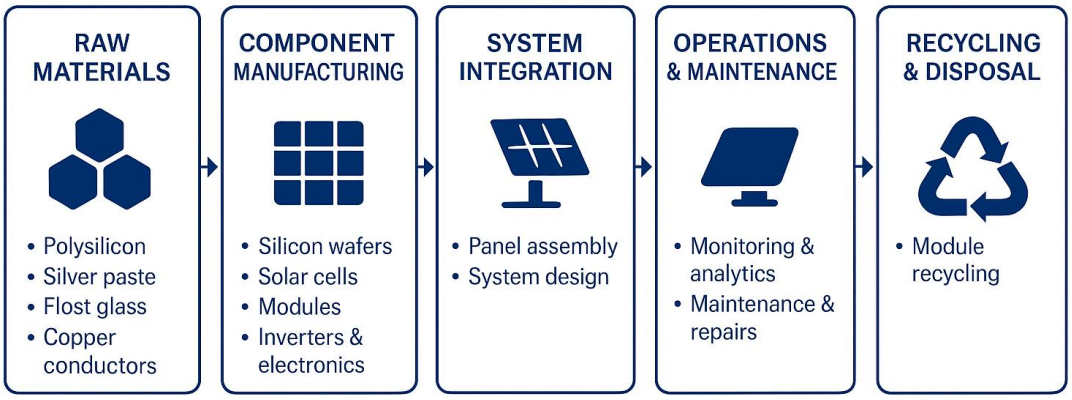
The energy transition is underpinned by three critical technologies, solar photovoltaic (PV) systems, wind turbines, and battery energy storage systems (BESS), underpinned by transmission infrastructure. These key segments are supported by a distinct value chain comprising raw material extraction, component manufacturing, system integration, operations, and end-of-life processing.

Battery energy storage systems value chain



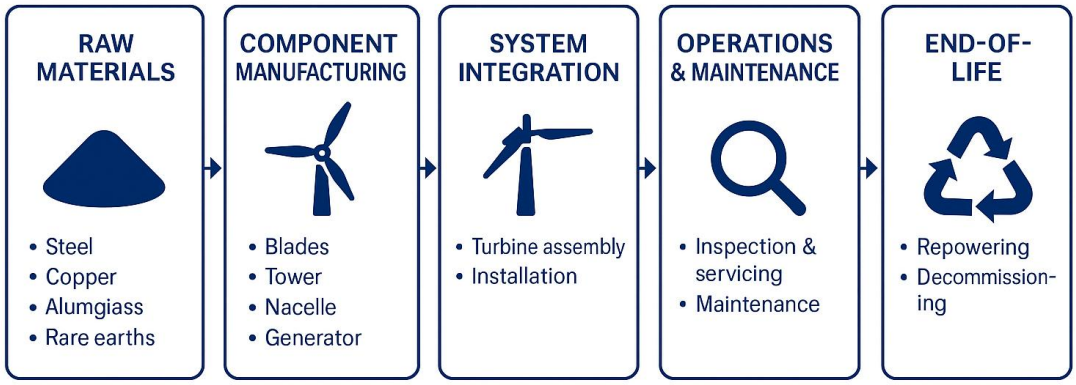
Battery energy storage systems (BESS) rely on raw materials such as lithium compounds, nickel, cobalt, graphite, and conductive metals like copper and aluminium. These materials are used to produce battery cells and modules, along with supporting systems including Battery Management Systems (BMS) and Power Conversion Systems (PCS). System integration occurs through the assembly of battery energy storage systems and deployment of energy management software. Operations focus on monitoring, control, and periodic maintenance. As battery deployments scale, recycling and material recovery are essential to close the loop and reduce reliance on primary extraction.

Solar PV value chain



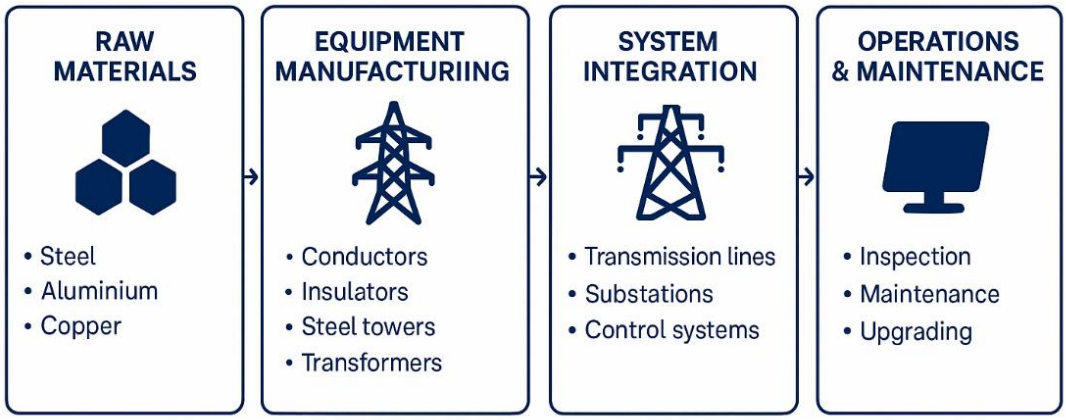
The solar PV value chain begins with raw materials such as polysilicon, silver paste, float glass, copper conductors, and aluminium framing. These are transformed through the manufacture of silicon wafers, solar cells, PV modules, and associated electronics, including inverters. System integration involves the assembly of panels and the design of complete solar systems. Ongoing operations include monitoring and maintenance to optimise energy output. Finally, recycling and disposal processes are increasingly important as early-generation modules reach end-of-life, with module recycling emerging as a key capability.

Wind turbine value chain



The wind turbine value chain is anchored in the sourcing of materials like steel, rare earth elements, composites, and copper. These feed into the manufacture of blades, nacelles, gearboxes, and generators. System integration involves tower erection, electrical connection, and commissioning. Operations and maintenance (O&M) are critical over the turbine's lifecycle to ensure availability and performance. End-of-life considerations are gaining attention, particularly for composite blade recycling and the recovery of critical minerals.

Transmission Value Chain



Electricity transmission relies on its own distinct manufacturing and construction value chain. It begins with raw materials, predominantly steel for towers, aluminium and copper for conductors and busbars which are then fashioned into critical network components such as insulators, high-voltage conductors, steel transmission towers and large-scale transformers. System integration follows, encompassing the erection of transmission lines, establishment of substations and deployment of advanced control and protection systems to manage power flows. Finally, ongoing operations and maintenance, including regular inspection, preventative upkeep and targeted infrastructure upgrades ensure long-term reliability and resilience of the transmission network.

These value chains provide the basis for assessing local participation potential, industrial capability alignment, and investment opportunities in Banana Shire and other Renewable Energy Zone (REZ) regions.

6.0 Opportunities for Banana Shire

6.1 Criteria for analysis

A value chain analysis, outlined in Appendix A, was conducted for solar PV, wind turbines, battery energy storage systems and transmission infrastructure. For each technology, comparative-advantage tables have been developed that:

- **Map key functions and inputs**: Identify critical materials (e.g. polysilicon, rare-earth elements, lithium compounds, structural steel) and outline principal manufacturing and integration processes.
- **Assess competitiveness:** Evaluate each segment's strengths at three levels; global (scale, integration, cost), national (sovereign capability, short supply chains) and regional (existing workshop skills, logistics proximity).
- **Highlight local specialisations:** Surface areas where Banana Shire firms hold no discernible quality or compliance gaps compared with metropolitan or international suppliers.

This comparative advantage analysis establishes the industrial foundation for understanding where the region can immediately activate supply chains and where further investment is required to build capacity. Building the comparative insights, each value chain segment was then tested against a three-point participation hypothesis to determine readiness for REZ procurement:

1) There is no distinguishable difference for developers when choosing local suppliers over others
2) The advantages offered by local suppliers are relevant to and valued within the procurement frameworks of REZ projects
3) The size and structure of the local supply chain are appropriate to meet the demand generated by REZ projects.

To translate the analysis into a clear roadmap, value chain segments have been organised into three progressive themes that indicate the readiness level:

- **Leveraging existing capacity**, where current licences, workshop assets and logistics networks can be mobilised immediately to deliver "quick wins" with minimal uplift.
- **Value-adding and scaling capacity**, deliver targeted upskilling, facility upgrades and strategic partnerships to bridge the gap between small-batch work and factory-scale throughput.
- **Innovation and diversification**, pursue higher-margin and innovative activities, R&D collaborations and circular-economy pilots once foundational and scaled capabilities are established.

Together, this analysis and associated engagement with developers and Tier 1 contractors has identified value chain segments where Banana Shire's existing industrial and service capabilities can be most effectively leveraged.

6.2 Renewable energy developers' procurement considerations

Stakeholder consultations with prospective developers, Tier 1 contractors and industry partners highlighted barriers and opportunities for Banana Shire's potential to participate meaningfully in the renewable energy value chain.

Developers often highlighted the region's strategic location near major infrastructure and ability for local suppliers to support the construction phases of projects through services such as engineering (civil, electrical, mechanical) design, project management, site preparation, construction and installation services, and ongoing maintenance and repair services. These strengths position Banana Shire as a capable and responsive partner in delivering the scale and scope of services required by solar, wind, battery and transmission developments. While there is a broader ambition within the Shire to further service segments of the respective renewable energy value chains, including manufacturing of technical components, developers advise they face commercial and operational risks when opting to procure these items locally or outside their existing supply chains. These include challenges in meeting the minimum viable scale for components or services, concerns around counterparty risk for long-term supply agreements, limitations in specialised technical expertise, and the need for reliable integration with broader systems and project timelines. Additionally, local businesses may require support to meet compliance and certification standards demanded by Tier 1 contractors, with key consideration given to the time required to attain and develop these certifications.

Renewable Energy Supply Chain Procurement Systems:

Renewable energy developers typically procure goods and services through structured systems such as early market engagement, competitive tendering, and **subcontracting via Tier 1 contractors. Platforms like the ICN Gateway and Vendor Pannel are widely used** to identify regional suppliers, while procurement policies often require **compliance with local content targets, Indigenous participation guidelines, and Australian Industry Participation (AIP) plans.** Suppliers must meet strict certification and prequalification standards to participate in major projects.

Despite these barriers, the agility and responsiveness of local suppliers present a compelling value proposition particularly for resolving procurement gaps, reducing logistics costs, and fostering innovative and adaptive project delivery models. Furthermore, aligning procurement with Queensland's Indigenous and local content participation guidelines, and broader policy commitments under the Australian Industry Participation Plan, strengthens the case for sourcing from within Banana Shire.

6.3 Powerlink and transmission procurement considerations

Powerlink Queensland has explicitly embedded local-content and regional engagement objectives within its transmission procurement process. Under its Australian Industry Participation Plan, Powerlink commits to mandatory reporting on local and Indigenous supplier spend, with targets aligned to Queensland's 3 per cent Indigenous procurement mandate and a broader commitment to maximise Queensland-based content. Powerlink local procurement operates on a local radius, typically defined as communities and businesses located up to 100 km from the project are actively encouraged to register via the ICN Gateway and Queensland Procurement Solution, ensuring visibility of local capability and capacity (Powerlink Queensland, 2023). Powerlink's procurement frameworks award additional weighting for demonstrable local content, rapid mobilisation from nearby yards and collaboration with First Nations enterprises based in the region, thereby embedding Banana Shire economic benefit into transmission project outcomes (Powerlink Queensland, 2025).

6.4 Banana Shire renewable energy participation matrix

The matrix tables presented under each value chain distils the analysis for wind turbines, solar PV, battery energy storage systems (BESS) and transmission infrastructure, in which there is a perceived local comparative advantage.

Each value chain segment is assessed against the three hypothesis questions, where Banana Shire suppliers meet the hypothesis (✓), Partially meets or requires further capacity building (⚠), and Gap / additional investment needed (✕). Detailed under each value chain are the specific opportunities identified for Cross-cutting opportunities (e.g. civil works, O&M, professional services and resource recovery) are presented separately to highlight capabilities that underpin all four value chains.

To develop a clear roadmap, value chain segments have been further organised into three progressive themes that indicate the readiness level. A full breakdown of each segment's inputs, processes and competitive-advantage assessment can be found in Appendix A.

6.4.1 Wind turbine value chain opportunities

Value Chain Component	*1. No distinguishable difference*	*2. Advantages valued in REZ procurement*	*3. Scale appropriate for REZ demand*	*Readiness level*
Wind – Component Manufacturing				
Towers & structural components	✓	⚠	⚠	1
Wind – System Integration				
*Turbine assembly**	✓	✓	⚠	1
*Electrical & mechanical systems**	⚠	✓	⚠	1
Wind – Operations & Maintenance				
*Monitoring & control systems**	⚠	✓	⚠	1
*Preventative maintenance**	✓	✓	⚠	1

**Nb: all cross-cutting opportunities that service all value chains (e.g., construction, O&M, professional services) have been separated out to avoid repetition.*

Wind turbine anchor cage assembly

Wind turbine anchor cages form the critical interface between tower foundations and subsoil, ensuring structural stability under extreme loads. Noting that some suppliers incorporate the cage assembly within the procurement of the tower structure. Banana Shire's established heavy-fabrication sector provides a strong base for local assembly of these components. Fabricators already hold ISO 9606-1 welding qualifications, ensuring no disadvantage relative to interstate suppliers. Local assembly reduces crane demobilisation time and freight risk, benefits that procurement frameworks explicitly reward. While existing yards have sufficient industrial capacity to assemble cages, additional investments may result in the local ability to fabricate and assemble.

Alignment with participation hypotheses

- **No distinguishable difference:** Accredited welders and structural-steel fabricators in the Shire meet all requisite industry standards.
- **Valued advantage:** Reduced logistics complexity and faster on-site assembly yield higher social-value and local-content scores.
- **Scale:** Current facilities can be expanded by adding dedicated assembly bays and robotic welding cells to meet REZ demand.

6.4.2 Solar PV value chain opportunities

Value Chain Component	*1. No distinguishable difference*	*2. Advantages valued in REZ procurement*	*3. Scale appropriate for REZ demand*	*Readiness level*
Solar – Materials & Components				
Aluminium framing	✓	✓	⚠	1
Inverters & electronics	⚠	✓	⚠	2
Solar – O&M				
*Monitoring & analytics**	⚠	✓	⚠	1
*Maintenance & repairs**	✓	✓	⚠	1
Solar – End-of-Life				
*Module recycling**	✓	✓	⚠	3

**Nb: all cross-cutting opportunities that service all value chains (e.g., construction, O&M, professional services) have been separated out to avoid repetition.*

Solar mounting frame fabrication

Solar mounting frames are fundamental components that secure photovoltaic panels in both ground-mounted and rooftop installations. Banana Shire offers a strong foundation for local manufacture. Economic analysis, identified the regions fabricated-metal production as having above-average regional specialisation, supported by some 30 metal-fabrication enterprises employing over 200 workers (ABS, 2022). These workshops already maintain AS 1664.2 welding and ISO 9001 quality-management accreditation, ensuring technical parity with metropolitan suppliers. Proximity to the Gladstone aluminium smelter further reduces inbound material lead times and cuts freight costs. Existing regional facilities can satisfy small-batch orders, meeting the full scale of REZ and wider Central Queensland solar projects will require a modest expansion of production lines.

Alignment with participation hypotheses

- **No distinguishable difference:** Local welders and machinists hold the same accreditations and professional licences as national providers, eliminating any perceived quality or compliance gap.
- **Valued advantage**: Developers award additional procurement points for reduced logistics risk and rapid on-site support both clear benefits of a nearby fabrication hub.
- **Scale:** Current capacity to service major industries including mining and agriculture; additional extra CNC laser cutters and a dedicated anodising lines have the potential to increase throughput to meet REZ demand.

Solar inverter assembly

Building on growing local electronics-assembly expertise, Banana Shire can establish onshore assembly of solar inverters. By hosting final assembly, calibration and firmware loading in region, developers gain faster commissioning, expedited support and lower transport and integration risk compared with fully imported units.

Alignment with participation hypotheses

- **No distinguishable difference**: Local technicians already hold or can obtain the electrical licences and accreditations required for inverter installation and calibration.
- **Valued advantage**: Proximity enables immediate on call firmware updates and warranty services, which score highly under performance-based procurement.
- **Scale**: A modest clean room and test bench can support up to 1,500 inverter assemblies per annum, matching projected Callide REZ and regional solar demand.

6.4.3 BESS value chain opportunities

Value Chain Component	*1. No distinguishable difference*	*2. Advantages valued in REZ procurement*	*3. Scale appropriate for REZ demand*	*Readiness level*
BESS – Component Manufacturing				
Battery modules	⚠	✓	✗	1
BMS & PCS	⚠	⚠	✗	1
BESS – System Integration & O&M				
*BESS assembly & EMS**	⚠	⚠	⚠	1
*O&M maintenance & repairs**	✓	✓	⚠	1

**Nb: all cross-cutting opportunities that service all value chains (e.g., construction, O&M, professional services) have been separated out to avoid repetition.*

Battery module pre-assembly

Value chain analysis indicates that Banana Shire has strong regional specialisation in fabricated metal manufacturing and electrical equipment repair, both key activities in the battery energy storage supply chain. Local workshops serving mining and power-station clients are well positioned to transition into battery module pre-assembly, leveraging expertise in welded frame fabrication, busbar wiring and system integration. On-shore assembly promises to retain substantial local value add, reduce inbound logistics costs and accelerate commissioning timelines.

Alignment with participation hypotheses

- **No distinguishable difference:** Local technicians possess the required electrical licences and have completed the industry-standard safety training for battery module assembly and testing.
- **Valued advantage:** Local prototyping and on-site commissioning support minimise integration issues and are rewarded under performance-based procurement.
- **Scale:** Current capacity is limited; scaling up requires additional workshop space and workforce.

BESS Power-Electronics Module Assembly

Leveraging workshops experienced in electrical assembly and systems integration, the Shire can pre-assemble Power Conversion System (PCS) modules for battery-energy storage. On-shore build and factory acceptance testing of PCS units (inverter, transformer, control board) reduces outage windows and freight complexities for large-scale storage projects.

Alignment with participation hypotheses

- **No distinguishable difference**: Regional electrical and instrumentation specialists possess the licences and quality assurance skills needed for high-voltage PCS assembly.
- **Valued advantage**: Pre-commissioned modules minimise field integration risk and earn additional local content points under tender criteria.
- **Scale**: Existing workshop space can be adapted with minimal equipment additions (e.g. test rigs, calibration tools) to meet early REZ-scale BESS deployments.

6.4.4 Transmission value chain opportunities

Value Chain Component	*1. 1. No distinguishable difference*	*2. Advantages valued in REZ procurement*	*3. Scale appropriate for REZ demand*	*Readiness level*
Transmission – Component Manufacturing				
Towers & structural components	✓	⚠	⚠	1
Transmission – System Integration				
*Tower erection & line stringing**	✓	✓	⚠	1
*Substation construction**	✓	✓	⚠	3
Transmission – Operations & Maintenance				
*Line patrol & vegetation management**	✓	✓	⚠	1
*UAV / drone inspections**	⚠	✓	⚠	1
*Substation maintenance**	✓	✓	⚠	1

**Nb: all cross-cutting opportunities that service all value chains (e.g., construction, O&M, professional services) have been separated out to avoid repetition.*

Transmission tower prefabrication

Preliminary industry mapping suggests that Banana Shire's heavy-fabrication sector, may have the core welding and quality-assurance credentials required to prefabricate mid-span tower sections and anchor cages for high-voltage lines. Subject to a detailed capability audit, there should be no material quality disadvantage versus interstate yards. Local workshops already hold the necessary welding and quality-assurance accreditations, so there is no quality disadvantage versus interstate yards. By shifting fabrication to local delivery, developers benefit from reduced transport complexity, faster site support and lower emissions. To meet typical REZ schedules, a modest expansion of bay space and lifting equipment may be sufficient.

Alignment with participation hypotheses

- **No distinguishable difference:** Local fabricators meet all relevant welding and inspection standards required for transmission towers.
- **Valued advantage:** Proximity reduces freight risk, crane mobilisation time and supports rapid on-site adjustments.
- **Scale:** Existing facilities can be adapted or slightly enlarged to handle regular production runs for REZ projects.

Modular substation skid assembly

Drawing on local engineering and electro-mechanical trades experience, Banana Shire can develop a capability to assemble factory tested substation skids complete with cable terminations, transformer bases and switchgear supports. Pre-commissioned skids accelerate site works, reduce outage windows and are highly valued under performance-based procurement. A dedicated indoor assembly area with basic test rigs would enable the region to capture a larger share of substation build activity.

Alignment with participation hypotheses

- **No distinguishable difference:** Regional technicians already possess the licences and safety training required for medium voltage switchgear assembly and testing.
- **Valued advantage:** Factory acceptance testing and integrated quality records minimise field commissioning time and operational risk.
- **Scale:** A purpose adapted workshop can support regular skid deliveries aligned with REZ and broader network build programs.

6.4.5 Cross-cutting value chain opportunities

Civil construction and installation services

Civil construction and installation encompass site preparation, earthworks, access roads, trenching, foundations and electrical reticulation for solar, wind and battery projects. Banana Shire's positive location-quotient in heavy and civil engineering construction, supported by a workforce of Registered Professional Engineer of Queensland (RPEQ) registered engineers and certified plant operators provides a robust platform for local delivery. Developers gain from reduced mobilisation times, lower transport costs and streamlined permitting when engaging contractors with in-region expertise. While existing firms routinely service mining and infrastructure clients, scaling to meet REZ requirements while continuing to service existing clients will necessitate targeted capacity and capability enhancements.

Alignment with participation hypotheses

- **No distinguishable difference:** Local contractors hold the same civil-works licences, certifications and safety accreditations as metropolitan peers.
- **Valued advantage:** Familiarity with regional soil conditions, regulatory processes and community liaison accelerates project delivery and mitigates risks.
- **Scale:** Augmenting plant fleets with additional excavators, trenching rigs and cable-laying crews will align capacity with projected REZ construction volumes.

Operations and maintenance services

Ensuring the long-term performance of renewable-energy assets requires reliable routine inspections, predictive diagnostics and swift corrective actions. Established regional service depots and mobile maintenance crews currently service mining and power station assets offer fully accredited high-voltage, instrumentation and mechanical expertise, so there is no disadvantage in delivering O&M for solar arrays, wind turbines and battery systems. Local response capability reduces operational risk and contractual penalties, advantages that are explicitly valued in performance-based procurement.

Alignment with participation hypotheses

- **No distinguishable difference:** Technicians and service teams have the capacity to meet all requisite electrical, mechanical and safety certifications required by national O&M standards.
- **Valued advantage:** Immediate local fault response and pre-stocked critical spare components would minimise downtime and enhance developer confidence.
- **Scale:** Expanding digital monitoring points and strengthening parts-logistics capacity will enable support for the full REZ asset portfolio.

Professional services

Large-scale renewable projects require thorough social impact assessments, stakeholder and First Nations engagement, heritage and cultural heritage surveys, environmental approvals and ongoing community liaison. Banana Shire hosts professional services firms including planning consultants, social researchers, environmental advisers and Indigenous liaison officers, already accredited under relevant Queensland legislation. By mobilising this local expertise, developers can benefit from trusted community relationships, streamlined approvals and culturally appropriate engagement, all of which contribute positively to project social licences.

Alignment with participation hypotheses

- **No distinguishable difference:** Local consultancies hold the same professional accreditations (e.g. RPEQ, Registered Social Impact Practitioners, Cultural Heritage Vendor Registration) and comply with state and federal environmental and Indigenous engagement legislation, matching metropolitan peers.
- **Valued advantage:** Familiarity with Banana Shire's communities, Traditional Owner groups and landholders accelerates consultations, builds trust and reduces rework or delays in approvals.
- **Scale:** Existing firms can expand capacity through partner networks and digital engagement platforms, scaling up involves adding specialist roles (e.g. cultural-heritage officers, social impact analysts) and leveraging remote survey technologies to cover the full REZ footprint.

Modern methods of construction (site facilities and accommodation)

Rapidly deployed, high-quality accommodation and site offices are critical for supporting large-scale renewable-energy projects. Modern methods of construction (MMC), including modular and prefabricated techniques, offer faster delivery, improved sustainability and consistent quality. Banana Shire's licensed builders and contractors already possess the requisite credentials and project-management experience, ensuring parity with external providers. Developers increasingly value reduced waste, lower on-site labour requirements and predictable build programs, advantages explicitly recognised under community-benefit and local-content procurement criteria.

Alignment with participation hypotheses

- **No distinguishable difference:** Local builders and metal-fabrication enterprises hold QBCC licences and ISO-quality accreditations, with demonstrated experience in manufacturing modular building components and delivering heavy-civil projects, matching the technical capabilities of metropolitan firms.
- **Valued advantage:** Off-site fabrication decreases construction waste, accelerates timelines and enhances build quality, directly scoring under social-value and sustainability metrics.
- **Scale:** By repurposing an existing industrial space for module assembly, local capacity can be scaled to meet concurrent project-camp requirements.

Composite recycling and circular economy pilots

Banana Shire can lead in transforming end-of-life renewable-energy components into new value-added materials. Solar Recovery's Biloela facility provides the first local capability for reclaiming glass, fibreglass, metals and battery residues. By expanding downstream processing such as fibreglass regrind for composite panels, glass cullet for new glazing products and metal alloys for mounting frames the region will retain more local value, reduce waste exports and foster innovative local manufacturing.

In parallel, emerging tyre-recycling initiatives are exploring the recovery of crumb rubber, steel belts and textile fibres for integration with composite reprocessing streams. Other waste materials, including construction and demolition residues, can similarly be transformed into aggregate substitutes, stabilised fill or secondary steel feedstock. These synergies will diversify Banana Shire's resource recovery capability, deepen circular economy practice and ensure multiple waste streams feed into high value local manufacturing opportunities.

Alignment with participation hypotheses

- **No distinguishable difference:** The existing recycling operation can conform to all state and federal environmental and health-safety regulations for hazardous-waste handling.
- **Valued advantage:** Local material recovery significantly cuts transport costs and supports developers' circular-economy targets under Queensland's Waste Avoidance and Resource Productivity Strategy.
- **Scale:** Securing multi-year feedstock agreements with project owners and decommissioning contractors will enable the plant to scale from pilot throughput to full REZ-cycle processing volumes.

References for matrix tables: (AEMO, 2024) (Acclimate Partners, 2025) (DCCEEW, 2024) (Beyond Zero Emissions , 2024) (Department of Energy and Public Works, 2022) (EconomyID, 2025) (Infrastructure Australia , 2022) (DCCEEW, 2024) (DCCEEW, 2022) (Powerlink Queensland, 2023) (Rutovitz, Gerrard, Lara, Tahir, & Briggs, 2024) (Standards Australia, 2016) (Stanford & Joyce, 2023) (Stanwell Corporation, 2023) (Composites Australia, 2022) (Global Wind Energy Council, 2023) (Australian PV Institute, 2023) (World Steel Association, 2023) (Geoscience Australia, 2023) (International Organization for Standardization, 2012) (International Electrotechnical Commission, 2018)

7.0 Activating the opportunities

Supply chain analysis has identified a structured progression of opportunities, organised into three overarching themes that guide Banana Shire from immediate "quick wins" to more complex, resource-intensive value chain opportunities. Each theme aligns with the three participation hypotheses, no developer disadvantage, valued procurement advantages and scalable local supply, while mapping a clear path from "quick wins" to long-term ambitions. Opportunities have also been informed by local business and investor interest. Further opportunities are expected to be identified progressively, as a result of the recommended actions and new investor interest.

To catalyse these opportunities, Banana Shire Council can cultivate an enabling environment that allows local industry to progress three thematic stages of opportunity. Council's role is to convene, coordinate and catalyse across four cross-cutting enabler pillars:

- **Workforce and skills**: partnering with training providers and industry to develop the locally relevant competencies needed at each phase.
- **Infrastructure and facilities**: commissioning assessments and guiding targeted upgrades to ensure workshop, plant and testing assets are fit for purpose.
- **Strategic investment**: brokering grant co-funding, fostering developer engagement and leveraging procurement channels to de-risk capital commitments.
- **Digital and logistics frameworks**: extending remote-monitoring networks, enhancing connectivity and streamlining materials-flow arrangements.

By mobilising activities that support these enabling pillars, Council can support a structured, place-based progression from immediate "quick wins" through to high value, innovation driven value chain activities.

7.1 Leveraging existing capacity

The first theme, **leveraging existing capacity**, focuses on harnessing existing technical competencies, workshop infrastructure and supply-chain networks in areas where local businesses already meet industry standards and can participate with minimal additional investment.

These supply chain opportunities are where Banana Shire already meets required technical and quality benchmarks, enabling immediate mobilisation of local suppliers with minimal additional investment. By leveraging existing accreditations, workshop infrastructure and supply-chain networks, these activities establish early success, build developer confidence in local delivery and minimise risk for future more complex value chain opportunities.

- **Core accreditations and quality systems** – Local businesses hold licences and certifications (e.g. welding, electrical, civil) aligned with national standards, ensuring no perceived quality or compliance gap.
- **Existing workshop infrastructure** – Basic fabrication, assembly and service depots are in place, with proven reliability and safety records to support small-batch and medium-scale work.
- **Local supply-chain networks** – Established transport, logistics and materials-handling capabilities reduce lead times and freight risk, providing a valued advantage under procurement scoring.

Identified opportunities

- Solar mounting frame fabrication
- Wind turbine anchor cage assembly
- Civil construction and installation services
- Operations and maintenance services
- Professional services

Key enablers

These enablers ensure Banana Shire can activate local supply with minimal uplift, building on existing strengths and provide a roadmap for unlocking each value chain opportunity and scaling Banana Shire's participation:

Skills development

- Convene a working group of local fabricators, heavy fabrication workshops and training providers to co-design short courses in aluminium welding, anodising, CNC operation, positional welding and non-destructive testing aligned with AS 1664.2, ISO 9001 and ISO 9606-1 standards.
- Advocate with RTOs and industry bodies for targeted heavy fabrication welding, structural inspection and quality-assurance programs to ensure local welders and machinists meet Tier 1 renewable-energy tender requirements.

Infrastructure enhancement

- Commission a comprehensive industry-capability audit across metal fabrication, civil works and O&M workshops to map equipment inventories, bay space, tooling, workforce qualifications and existing SCADA/telemetry nodes.
- Use audit findings to develop infrastructure upgrade plans, prioritising expansions such as additional CNC bays, anodising lines, robotic welding cells, gantry cranes and quality control stations.

Strategic investment

- Coordinate applications to state and federal manufacturing and infrastructure grant programs to co-fund facility upgrades, new builds and heavy-plant assets needed for solar frames, anchor cages, civil works and battery pre-assembly.
- Facilitate early engagement via procurement platforms (Banana Shire Business Portal, ICN Gateway and Queensland Procurement Solution) to secure expressions of interest, letters of intent and MOUs from EPCs and developers, de-risking capital outlays and signalling project demand.

Digital infrastructure and logistics

- Advocate for upgrades to the region's remote monitoring network by installing additional SCADA telemetry gateways and securing high bandwidth connectivity to support predictive O&M services.
- Advocate for local businesses to establish "just in time" delivery agreements with national parts suppliers and regional transport providers, that minimises inventory costs and enhances developers' procurement scores for rapid response.

7.2 Value-adding and scaling capacity

The second theme, **Value-adding and scaling capacity**, outlines how targeted upskilling, facility enhancements and strategic collaborations will enable local firms to handle larger volumes, tighter quality tolerances and more sophisticated processes as REZ demand grows.

As foundational activities gain traction, targeted interventions will enable local firms to meet higher volumes, tighter tolerances and more sophisticated processes. These supply chain opportunities outline the upskilling, facility enhancements and strategic collaborations required to transition from small-batch capability to factory-scale production that can satisfy full REZ demand.

- **Advanced workforce skills** – Upskilling in automation, precision machining, electronics assembly and quality-assurance protocols will ensure technicians can deliver to tier-one standards.
- **Facility and equipment upgrades** – Planning and funding for expanded bay space, specialist machinery and enhanced quality-control stations will underpin volume growth.
- **Strategic partnerships** – Collaboration with training providers, RTOs and research institutions to co-design courses and co-fund infrastructure ensures alignment with industry needs and de-risked investment.

Identified opportunities

- Battery module pre-assembly
- Transmission tower prefabrication
- Solar invertor assembly
- BESS Power-Electronics Module Assembly

Key enablers

Drawing on the detailed interventions for each priority area, the following enablers underpin Banana Shire's existing capacity and bridge to value adding and large scale opportunities:

Workforce and regulatory facilitation

- Develop training programs in partnership with regional RTOs and QBuild, covering MMC module assembly, battery-module handling and testing, and non-destructive testing protocols.

Skills development

- Convene working groups with local businesses and training providers to co-design short courses in aluminium welding, anodising, CNC operation, heavy-fabrication welding, battery-assembly safety and quality-assurance practices.

Infrastructure enhancement

- Commission comprehensive capability audits to map workshop capacities, equipment inventories and workforce qualifications; use findings to plan facility retrofits, optimising bay layouts, adding lifting equipment, tooling and dedicated inspection stations to streamline production and uphold project grade tolerances.

Strategic investment and market engagement

- Coordinate state and federal grant applications to co-finance facility upgrades or new builds. Leverage procurement platforms (Banana Shire Business Portal, ICN Gateway and Queensland Procurement Solution) to secure letters of intent and expressions of interest from REZ proponents, de-risking capital outlays and signalling clear market demand.

7.3 Innovation and diversification

The final theme**, Innovation and diversification** describes the pathway towards higher-margin, differentiated activities, such as advanced recycling, bespoke software development and composite reprocessing, that deepen regional value capture and establish Banana Shire as a leader in circular-economy practice.

With a solid industrial base and scaled capacity established, Banana Shire can move into differentiated, higher-margin activities that deepen local value capture and support a resilient economy. These opportunities highlight the importance of innovation, digitalisation and resource-recovery pilots, ensuring the region captures maximum benefit from end-of-life streams and advanced service offerings.

- **Innovation and R&D capabilities** – Fostering local expertise in material recovery, composite reprocessing and bespoke software/analytics will position the region at the forefront of renewable-energy innovation.
- **Digital and data-driven skills** – Building proficiency in IoT, SCADA integration, energy-management systems and predictive-maintenance analytics will unlock new service offerings and operational efficiencies.
- **Circular-economy infrastructure** – Developing advanced recycling, remanufacturing and resource-recovery operations in collaboration with industry leaders and funding programs will retain more local value and reduce waste exports.

Identified opportunities

- Modern methods of construction (site facilities and accommodation)
- Modular substation skid assembly
- Composite recycling and circular economy pilots

Key enablers

The following enablers capitalise on Banana Shire's existing capacity and scaled capability to increase innovation and value-add opportunities for the shire:

Skills development

- Partner with regional RTOs and training providers to deliver specialised micro-credentials in electronics-assembly (clean-room protocols, high-voltage testing, QA), substation-skid assembly (terminations, protection wiring), and composite-recycling techniques (delamination, glass separation, chemical recovery).

Infrastructure enhancement

- Commission capability audits to map workshop inventories and workforce skills, then retrofit facilities with Class D clean rooms, gantry cranes, cable tray test rigs, conveyor systems, granulators, solvent recovery units and dedicated material conditioning areas (fibre regrind, glass cullet) to support inverters, skids and recycling pilots.

Strategic investment

- Pursue collaborative R&D and manufacturing grants to co-fund clean room builds, skid assembly test rigs and recycling equipment.
- Secure technology transfer and long-term offtake or feedstock agreements with inverter OEMs, switchgear manufacturers and renewable energy developers to de-risk capital upgrades and guarantee continuous demand.

8.0 Building local capacity in renewable energy value chains

The preceding analysis has identified Banana Shire's most compelling entry points into the renewable-energy sector, from solar-mounting frame fabrication and wind-cage assembly through to battery-module pre-assembly, modern methods of construction and O&M services. This strategy provides a structured framework to support the identified enablers, guiding implementation, developing detailed actions, reviewing progress annually and refining interventions in response to market and investor signals.

The following program of activities translates the identified enablers into a focused $500,000 implementation plan. Each initiative weaves together critical enabler streams, tailored skills development, strategic infrastructure enhancements and coordinated investment to rapidly uplift local capacity, demonstrate early success in live projects and lay the groundwork for longer-term ambitions such as inverter assembly and circular-economy pilots. By embedding clear objectives, timelines and ownership, Banana Shire will move decisively from strategic intent to measurable local participation in the Callide REZ and beyond.

8.1 Activities and implementation plan:

Initiative	Action	Objective	Timeline	Ownership	Key Partners/ Stakeholders	Additional Information
Local business engagement, capacity building and training program (Solar frames, wind cages, battery pre-assembly, civil works, O&M)	**Phase 1: Initial survey** – Conduct a local business capacity survey to gather baseline data and high-level analysis of local business capabilities in renewable energy. ▪ Deploy a structured survey (aligned to the value-chain matrices) to all local businesses in manufacturing, construction, professional services, O&M and recycling.	Identify local business capabilities, gaps, and capacity-building needs for renewable energy projects.	Sep-Oct 2025	Council Economic Development Team and selected delivery partner	Local businesses, QMI, industry partners	Data collection will be aligned with Banana Shire Business Portal development
	Phase 2: Deeper analysis – Conduct site visits and direct engagement with local businesses to identify detailed challenges and opportunities for their participation in renewable energy supply chains. Conduct engagement with Tier 1 and Tier 2 contractors of renewables projects in the region to inform targeted solution and capabilities matching to support local business participation. ▪ Conduct on-site visits with priority SMEs to map equipment inventories (e.g. CNC bays, SCADA nodes) and workforce qualifications. ▪ Analyse responses against the three participation hypotheses to identify "no disadvantage" segments and immediate training needs. ▪ Analyse responses in relation to businesses' lifecycle and their desire to participate, scale, diversify, maintain or scale down ▪ Identify any existing relationships with renewable energy developers or relevant partnerships (including outside the shire) that might enhance their capability ▪ Hold facilitated workshops with Tier 1 EPCs to validate capability requirements (e.g. AS 1664.2 welding, IEC 62109 testing).	Translate high-level survey data into business-specific action plans and identify cohort groups for targeted upskilling.	Nov-Dec 2025	Council Economic Development Team and selected delivery partner	Local businesses, QMI, industry partners	Focus on tailored solutions and sector-specific requirements.
	Phase 3: Targeted solutions – Deliver targeted support, training, and capability-building activities to support local business to develop workforce readiness, technical skills, and B2B connections.	Equip local businesses with the technical credentials, track record and Tier 1 compliance to win REZ contracts.	Feb - Sep 2025	Council Economic Development Team and selected delivery partner, and/or existing	Local businesses, QMI, industry partners	Preference given to First Nations Business seeking targeted support.

	▪ Establish mentor programs pairing local SMEs with national OEMs for compliance coaching (ISO 9001, AS/NZS 5131, UL 1741). ▪ Provide tailored WH&S systems support and coaching and SWIMS training so SMEs can implement site-specific health, safety and environmental management plans, ensuring readiness for Tier 1 contractor audits. ▪ Facilitate 1:1 B2B matchmaking clinics using live project briefs from tier 1 and 2 contractors ▪ Establish peer-learning cohorts of 5–8 SMEs grouped by capability gap (e.g. welding, control-systems, MMC). Each cohort meets in-person to share lessons, troubleshoot common challenges and co-develop standard operating procedures. Nb. This activity may be delivered by multiple parties depending on the opportunities and support needs identified throughout the "deeper analysis" work.			service providers (e. g., TAFE)		
Banana Shire business portal improvement	Targeted improvements to the functionality of the Banana Shire Business Portal ▪ Back-end development of the portal to allow for AI matching of local business capabilities to ICN categories (assisting local businesses in registering for the platform) and capability statement generation for local businesses against target economic industries. Business will also be able to import assets and capacity of those assets in a forward pipeline, allowing Tier 1 and 2 contractors better oversight of capability and capacity to support renewable projects. ▪ Back-end development to enable functionality for Banana Shire Council to generate Shire-wide capability statements for renewable energy and additional target economic industries. ▪ Front-end development of the technology enhancements to integrate with existing Banana Shire Business Portal Nb. This work includes phase 1 of the Local Business Engagement, Capacity Building & Training Program. Data collected through the survey will form the foundation for the updates to the business portal	Improve local business visibility and enable businesses to showcase their skills for renewable energy projects. Enable generation of Shire Wide Capability statements for the renewable energy industry.	6-9 Months	Council Economic Development and IT Teams and selected delivery partner	Local businesses, IT providers	Seamless integration with the local business directory for enhanced participation in projects.

Facilitate developer and local business partnerships	Host networking events and roundtable discussions between renewable energy developers, local businesses, and key stakeholders. Create a platform for local businesses to pitch their capabilities directly to developers seeking suppliers, contractors, and service providers for renewable energy projects.	Encourage collaboration between renewable energy developers and local businesses to ensure maximum local participation in projects.	Ongoing	Council Economic Development Team	Local business, local government, industry partners	
PSWG formalisation funding	The current Public Sector Working Group (PSWG) serves as an important informal coordination mechanism between Council and major local economic businesses in Banana Shire. Transitioning the PSWG into a formal entity the Banana Industry Alliance would create a credible, strategic platform for advancing regional priorities. Ongoing costs for the group will be maintained through membership fees, revenue generated through industry events. As a formalised body, the Banana Industry Alliance would not only serve as a central coordination point for infrastructure planning, investment advocacy, and cross-sector collaboration, but also actively support local business participation in emerging industries. By formalising the PSWG into the Banana Industry Alliance, the Shire can build a proactive regional body that: ▪ Acts as a central coordination point between public sector agencies, renewable energy developers, local industry, and community stakeholders. ▪ Provides a unified industry voice on infrastructure, investment, and workforce needs for the region. ▪ Support local SMEs by modelling best practice engagement in local supply chains for the region's foundational industries.	Strengthen regional governance, coordination, and investment readiness by transitioning the existing PSWG into a formal, place-based alliance that can strategically engage with industry, developers, and government	6-12 months	Council Economic Development Team	PSWG members, local government, industry partners	Ensure support for coordination and ongoing engagement in regional initiatives.
Advocacy for innovative contracting models for local organisations participating in renewables Projects	Advocate for and support the adoption of community-conscious procurement practices in RE projects. This activity responds to the real challenge faced by regional towns with limited specialist services where long-term contracts with RE projects may strip the community of vital access to these skills.	Develop and pilot innovative contracting arrangements with renewable energy developers that maximise local business participation without displacing essential services in	Ongoing	Council Economic Development Team	Local business, local government, industry partners	

	Through collaboration with developers, local government, and SMEs, the Banana Shire Council will advocate for contracting models that allow: ▪ Job-sharing or part-time community service clauses (e.g. a worker or service contracted full-time to an RE project works one day a fortnight on community projects, paid for by the project); ▪ Service rotation models for SMEs across multiple projects, preserving availability in the town. ▪ Subcontracting frameworks that allow local businesses to partner with larger Tier 1 suppliers to share the load while retaining community access. ▪ Procurement templates and model clauses for community benefit contracting to embed these practices in project tenders.	regional towns. Ensuring economic uplift without compromising community functionality.				
Advocacy for an inclusive and regionally connected Callide Futures Hub	Advocate for the design, purpose, and governance of the Callide Futures Hub to ensure it serves more than just the immediate transition needs of CS Energy's workforce. The goal is to position the Hub as a multi-user precinct that enables a broader regional shift towards clean energy and new industries by supporting: ▪ Local SME participation in renewable energy supply chains through skills development, market access programs, and collaborative spaces. ▪ Training and reskilling pathways not only for former coal-fired power sector workers but also for school leavers, job seekers, and workers from sectors impacted by automation or structural change (e.g., agriculture, transport, construction). ▪ Innovation support for new businesses and startups servicing the renewable energy and circular economy industries. ▪ Cross-sector collaboration, where agribusinesses, engineers, manufacturers, and educators can develop integrated solutions to regional challenges.	Ensure Callide Futures Hub is designed and governed as a regionally inclusive innovation and transition facility, open to all local industries and individuals seeking to participate in the emerging renewable energy economy.	Ongoing	Council Economic Development Team	Callide Futures Hub, regional stakeholders	Align with regional development strategies for inclusive growth.
First Nations procurement engagement and barrier analysis	Undertake a two-stage process to both surface and address participation barriers faced by local First Nations businesses in renewable-energy procurement:	Gain a comprehensive, grassroots understanding of the barriers preventing First Nations businesses from winning renewable-	Aug-Dec 2025	Council Economic Development Team	Traditional Owner corporations, First Nations Chamber of Commerce, Supply Nation,	Outputs will include a "Barrier & Solutions Report" informing both Council programs (e.g.

	Barrier Identification Workshops: ▪ Convene roundtable discussions and focus groups with First Nations Businesses, Prescribed Body Corporates, Supply Nation members and other Indigenous enterprises to document practical obstacles (e.g. procurement process complexity, capital constraints, equipment access, capability gaps). ▪ Methods of engagement will be co-designed but could include deploying a short online survey to capture wider feedback on systemic and project-specific challenges. **Co-Designed Engagement Process** ▪ Partner with project proponents, government procurement officers, First Nations representatives and training providers to co-design an engagement framework to present identified barriers and opportunities. ▪ Work collaboratively through iterative workshops to tailor support mechanisms (e.g. shared equipment schemes, compliance mentoring, streamlined tender pathways) and establish clear local content commitments aligned with QIPP and AEMO stretch goals.	energy contracts, then galvanise co-designed actions with industry and government to remove those impediments.			Indigenous Business Australia, project developers, local training providers	capability-building grants) and developer procurement strategies.
First Nations procurement advocacy	Council will engage with project proponents via Community Benefit Agreement processes, formal submissions to industry organisations such as QREC, the Energy Charter, CEC etc), developer workshops and procurement forums to encourage explicit adoption of the Queensland Indigenous Procurement Policy (minimum 3% spend) and AEMO stretch goals (10% First Nations procurement) where practicable.	Drive stronger commitments from developers to award contracts to First Nations businesses in line with state policy and best-practice stretch targets.	Ongoing	Council Economic Development Team	Project developers, Local business, local government, industry partners	Leverages existing policy levers – progress tracked through Council's engagement reporting with project developers

Appendix A: Renewable energy value chains

Renewable energy value chain analysis

Battery energy storage systems (BESS) value chain

Stage	Component / Activity	Function	Materials / Inputs	Processes	Comparative Advantage – Major Suppliers	Comparative Advantage – Australia	Comparative Advantage – Banana Shire Region
1. Raw Materials							
Lithium compounds	Core battery chemistry	Enables lithium-ion charge/discharge	Lithium carbonate, lithium hydroxide	Mining; chemical refining	Integrated mine-to-refinery operations with high-purity output	World-class mining operations; emerging in-country conversion facilities	no refining or chemical conversion
Nickel & cobalt	High-energy-density cathodes	Boosts energy density and cycle life	Nickel sulphate, cobalt hydroxide	Mining; hydrometallurgical refining	Vertically integrated mining and refining complexes	Major nickel operations with local refining capacity	No local refining or processing
Graphite	Conductive anode material	Facilitates electron flow	Natural or synthetic graphite	Purification; spheronisation	Large-scale ore refining and spherical graphite production	Emerging domestic purification and coating facilities	No purification facilities; potential feedstock supply only
Copper & aluminium	Current collectors & busbars	Provides electrical conduction and support frame	Copper cathode; aluminium ingots	Smelting; extrusion; forming	Integrated smelter-to-wire and billet-to-profile operations	Established copper smelting and aluminium extrusion	Regional logistics for raw metals; light fabrication only

2. Component Manufacturing							
Battery cells	Energy storage units	Stores and releases electrical energy	Cathode powders, graphite anode, electrolyte	Electrode coating; cell stacking; formation	Gigafactories with automated coating, stacking, finishing and ABI testing	Pilot-scale cell lines and R&D on advanced chemistries	No cell manufacturing; no test or formation capability
Battery modules	Pack assembly	Groups cells into scalable units	Battery cells, cooling plates, interconnects	Module assembly; welding; testing	Automated module lines with integrated thermal management and safety testing	Small-batch module assembly for demonstration	Electrical contractors could assemble small demo packs; no factory assembly
Battery Management System (BMS)	Charge monitoring & safety	Controls cell balancing and state-of-charge	Microcontrollers, sensors, wiring	Circuit design; embedded programming	Mature BMS platforms with advanced diagnostics, cell-balancing algorithms	Local electronics firms offering custom BMS solutions	Local electricians can wire and commission but no BMS development or firmware capability
Power Conversion System (PCS)	DC/AC conversion & grid interface	Converts stored DC to grid-compatible AC	Semiconductors, transformers, control boards	PCB assembly; system integration; testing	High-reliability inverter lines with grid-support features (e.g., ride-through, reactive support)	Emerging domestic inverter assembly and integration	Electricians commission and maintain imported PCS; no manufacturing or calibration facilities
3. System Integration							
BESS assembly	Full storage system build	Integrates cells, BMS, PCS into turnkey units	Modules, BMS, PCS components	Rack assembly; wiring; factory acceptance	Turn-key assembly plants co-located with logistics hubs	Local integrators building small-scale systems	No current large-scale assembly; Electrical contractors could facilitate industry development

Energy Management Systems (EMS)	System optimisation	Coordinates multi-asset energy flows	Software, communications hardware	Software configuration; system testing	Advanced EMS software suites with AI-driven dispatch optimisation	Software houses providing regional EMS solutions	Local IT firms could adapt existing SCADA platforms; no dedicated EMS development
4. Operations & Maintenance							
Monitoring & control	Performance oversight	Tracks health and performance	Sensors, data loggers, communications	Data gathering; analytics	Cloud-native monitoring platforms with predictive-maintenance capabilities	Domestic SCADA and IoT analytics providers	Agritech telemetry firms and local IT integrators adapting systems
Maintenance & repairs	Preventative & corrective service	Ensures reliability and uptime	Spare parts, diagnostic tools	Inspection; component replacement; firmware upgrades	Global service networks with rapid spare-parts logistics	Installer networks offering O&M across scales	Local trades perform inspection, basic repair and firmware updates
5. Recycling & Disposal							
Battery recycling	End-of-life material recovery	Recovers critical materials for reuse	Spent cells, cathode/anode materials	Mechanical shredding; chemical/thermal processing	Commercial recycling facilities processing large volumes of lithium, cobalt and graphite waste	Pilot recycling initiatives at research institutions	No local recycling capacity; spent batteries currently landfilled or shipped interstate

Solar PV value chain

Stage	Component / Activity	Function	Materials / Inputs	Processes	Comparative Advantage – Major Suppliers	Comparative Advantage – Australia	Comparative Advantage – Banana Shire Region
1. Raw Materials							
Polysilicon	Cell feedstock	High-purity silicon for wafers	Quartz, metallurgical silicon	Chemical purification; crystallisation	Integrated mine-to-refinery complexes delivering ultra-high purity at scale	Single medium-scale metallurgical-grade plant with established QA	No local refining, strong transport links for import.
Silver paste	Cell contacts	Conductive grid for electrons	Silver, aluminium	Smelting; paste mixing; dispersion	Automated, consistent formulations achieving >99 % conductivity	Emerging silver recovery and refining from waste	No local production; scrap recovery only
Float glass	Module cover	Protective, low-iron glass	Silica sand, soda ash, limestone	Float-bed production; cutting; lamination	Continuous float lines producing large sheets with uniform low-iron content	Domestic float-glass capacity serving construction sector	No raw glass production, only minor glazing and repair services
Copper conductors	Wiring & busbars	Electrical interconnects	Copper cathode, aluminium	Smelting; extrusion; casting	Vertically integrated cathode-to-rod operations ensuring low resistivity	Established copper smelting and rod casting facilities	No conductor fabrication assets or capability
Aluminium framing	Panel frames & rails	Structural support and mounting	Aluminium billets	Extrusion; CNC cutting; anodising	Automated extrusion lines delivering precise profiles	Domestic extrusion of standard profiles	Sheet-metal workshops for brackets
2. Component Manufacturing							

Silicon wafers	Photovoltaic substrate	Base for cell fabrication	Polysilicon ingots	Crystal growth; wafer slicing; polishing	High-throughput crystal pullers with kerf-minimising slicing	Pilot wafer slicing operations; R&D on next-gen techniques	No local wafer-slicing
Solar cells	Photovoltaic conversion	Converts light into electricity	Wafer substrate, conductive paste	Doping; metallisation; finish testing	Fully automated cell lines achieving >22 % average efficiency and inline binning	Small-batch cell pilot lines; emerging PERC production	No cell fabrication; only minor repair and testing
Modules	Panel assembly	Encapsulates cells into finished modules	Cells, glass, encapsulant, frames	Lamination; framing; electrical testing	Continuous assembly with <0.2 % defect rates and integrated electroluminescence testing	Local small-batch assembly lines	No dedicated factory or local capacity
Inverters & electronics	DC→AC conversion & control	Power conversion and system management	PCBs, IGBTs, capacitors, sensors	SMT assembly; firmware programming; calibration	High-reliability inverters with embedded grid-support and monitoring features	Growing domestic inverter assembly industry; local electronics R&D	No local manufacturing capacity; Ability to leverage Electrical skills to commission, program, and maintain.
3. System Integration							
Panel assembly	Final build & dispatch	Quality testing and packaging	Finished modules	Assembly; EL/UV testing; packaging	Turn-key assembly facilities co-located with distribution networks	Regional packing centres	Local contractors handle final on-site fit-out and testing
System design	PV system engineering	Sizing, layout, control strategy	Modules, inverters, racking, cabling	CAD design; simulation; commissioning plans	Proprietary design and simulation tools optimising performance	Experienced engineering consultancies	
4. Operations & Maintenance							

Monitoring & analytics	Performance tracking	Remote health monitoring and fault detection	IoT sensors, SCADA, communications	Data acquisition; predictive analytics	Cloud-native platforms with AI-driven maintenance forecasting	Domestic SCADA/telemetry service providers	Agritech telemetry firms and local IT integrators adapting solutions to solar projects
Maintenance & repairs	Scheduled & corrective	Cleaning, component replacement, firmware	Spare parts, lubricants, PPE	On-site inspection; part swap; updates	Independent service networks offering rapid response and stocked spares	Installer networks delivering O&M across scales	Local trades perform cleaning, minor repairs, panel replacement
5. Recycling & Disposal							
Module recycling	End-of-life processing	Recovery of glass, metals, silicon	Decommissioned panels	Mechanical separation; chemical recycling	Commercial multi-material recycling processes handling large volumes	Pilot recycling trials at research institutions	No existing recycling capacity; limited composite waste processing capacity – New resource recovery industries emerging in the region may benefit this

Transmission value chain

Stage	Component / Activity	Function	Materials / Inputs	Processes	Comparative Advantage – Major Suppliers	Comparative Advantage – Australia	Comparative Advantage – Banana Shire Region
1. Raw Materials	Structural Steel	Towers, poles and support structures	Iron ore, alloying elements	Steelmaking, rolling, galvanizing	Vertically integrated mills with very high throughput and global supply chains	Domestic mills with local ore sources, short internal logistics	Local fabrication yards can plate-cut/weld; rail/road access for inbound steel
	Aluminium Rod	Overhead conductors and earth wires	Bauxite-derived aluminium	Smelting, extrusion, annealing	Large-scale smelters with low-cost power inputs	Gladstone smelter and local extrusion capacity	Proximity to rail/port for conductor imports; light fabrication shops
	Copper Cathode	Grounding, substation busbars and connectors	Copper concentrate	Smelting, refining	Integrated mine-to-refinery operations	Established copper refineries and rod-casting facilities	No local refining; strong logistics corridor for bulk copper transport
	Insulator Materials	Electrical insulation for towers and substations	Porcelain, glass, polymers	Pressing, firing, molding	Specialist global manufacturers with high-voltage expertise	Smaller domestic producers of polymer insulators	No production; local workshops can assemble fittings but source finished insulators externally
2. Component Manufacturing	Transmission Towers	Fabricated steel lattice and monopoles	Steel plates, bolts, coatings	Cutting, welding, galvanising, assembly	High-volume tower fabrication lines co-located with ports	Local steel sourcing, medium-scale fabrication yards	Experienced welders and assemblers; workshop space for small to mid-scale builds
	Conductors (stranded cable)	Bundled conductors for overhead lines	Extruded aluminium or copper rods	Strand twisting, annealing, testing	Automated stranding lines with inline QC	Growing domestic cable-manufacturing sector	No local stranding capability

	Insulator Assemblies	Complete insulator strings and fittings	Insulator units, metal fittings	Assembly, torque-testing, UV ageing	Turnkey assembly plants with environmental testing	Limited domestic assembly; import and minor local assembly	Local electricians can assemble strings and leverage existing regional skills
	Substation Transformers	Voltage step-up/step-down	Steel core, copper windings, insulating oil	Core lamination, coil winding, oil filling, testing	Global transformer OEMs with bespoke design and factory acceptance testing	Domestic OEMs serving distribution networks	No local winding; repair workshops for minor substation equipment
3. System Integration	Tower Erection & Stringing	Site assembly of towers and conductor installation	Fabricated towers, conductor reels, hardware	Crane erection, winching, stringing, tensioning	Specialist crews with heavy-lift plant and line-stringing rigs	Experienced civil contractors servicing transmission projects	Local contractors familiar with regional access; hire-in for cranes as needed
	Substation Construction	Installation of switchgear, transformers and controlgear	Transformers, switchgear, cabling	Civil works, mounting, wiring, commissioning	End-to-end EPC contractors with integrated design and project-management capabilities	Local engineering firms delivering turnkey substation builds	RPEQ-registered engineers and plant operators; experience in mining/infrastructure builds
4. Operations & Maintenance	Line Patrol & Vegetation Management	Inspection and clearance to maintain safety margins	Patrol vehicles, trimming gear	Ground and aerial patrol, vegetation trimming	Dedicated O&M networks with predictive scheduling	Domestic providers of line-of-sight patrol and agritech solutions	Local transport and agro-forestry contractors; on-demand crews
	UAV / Drone Inspections	Remote visual and thermal inspection of lines	Drones, sensors, cameras	Flight planning, data capture, anomaly analysis	Specialists offering high-resolution analytics and AI-driven fault detection	Emerging domestic drone service providers	Local IT, agritech and mining inspectors can adapt platforms but may lack large-scale fleets.
	Substation Maintenance	Preventative and corrective servicing	Spare parts, tools, test equipment	Diagnostics, component replacement, recalibration	OEM service networks with stocked depots and mobile workshops	Local service depots supporting distribution assets	Mobile mechanics familiar with high-voltage and fluid systems; limited spare-parts stock

Wind energy value chain

Stage	Component / Activity	Function	Materials / Inputs	Processes	Comparative Advantage – Major Suppliers	Comparative Advantage – Australia	Comparative Advantage – Banana Shire Region
1. Raw Materials	Rare Earth Elements (REEs)	Used in permanent magnets for turbines	Neodymium, dysprosium, praseodymium	Mining, refining, separation	Integrated value chains with low-cost production, extensive reserves, and mature refining capacity	Stable regulatory environment, ethical sourcing, and established export but limited capacity for REEs	No current processing capacity for REEs
	Structural Steel	Used in turbine towers & nacelles	Iron ore, alloying elements	Steelmaking, rolling, galvanizing	Access to vertically integrated operations and low-cost production at scale	Domestic ore supply, short supply chains, and capacity for structural steel	No local milling or rolling capability – local capacity for fabrication, plate cutting and welding
	Fiberglass & Resins	Blade construction	Glass fibre, epoxy, carbon fibre	Composite moulding, curing	Advanced R&D in lightweight, high-performance composites and global manufacturing networks	Niche expertise in industrial composite production for defence and marine	Only minor repair-grade composite skills for agricultural equipment; no production or moulding
	Copper & Electrical Components	Conductivity for wiring & generators	Copper, aluminium	Smelting, extrusion, component manufacturing	Large-scale extraction and refining; vertically integrated production	High-grade copper mining, domestic smelting, and export infrastructure	No current capacity in copper and electrical component manufacturing
	Bearings & Gears	Gearbox and drivetrain components	High-strength alloys, lubricants	Precision machining, forging, heat treatment	Scale, automation, and specialisation in high-load, high-precision components	Precision engineering capabilities in low-volume, high-spec applications	Skilled heavy-equipment fitters can strip, inspect and reassemble bearings/gears, but no forging plant

2. Component Manufacturing	Towers	Structural support for turbines	Steel plate, welding materials	Fabrication, rolling, modular welding	Large-scale tower production facilities close to installation markets	Established wind tower manufacturing with domestic steel sourcing	Local welding and metal working workforce supports structural assembly
	Blades	Capture kinetic energy from wind	Fiberglass, resin, carbon fibre	Composite layup, infusion, curing	Expertise in aerodynamic design, high-throughput composite moulding	Capable of small-scale composite blade production	No blade moulds or production; only small-scale maintenance repairs
	Gearbox	Converts rotor motion to generator speed	Bearings, gears, lubricants	Machining, assembly, testing	Scale and automation in drivetrain production	Low-volume production of high-tolerance gear systems	Potential to leverage regional overhaul workshops that can rebuild and test gearboxes, but no new-build manufacturing
	Generator	Converts motion to electricity	Copper wire, permanent magnets	Coil winding, insulation, testing	High-efficiency systems integrated with power electronics	Electrical manufacturing and design expertise for industrial motors	Local electricians install & maintain imported units; no winding or VPI facilities
	Control Systems & Electronics	Manages turbine operation	Semiconductors, sensors, boards	Circuit design, software, integration	Advanced embedded systems, IoT integration, and diagnostics platforms	Smart energy systems tailored for distributed renewable applications	Local electricians/cabling firms integrate PLC/SCADA packages; no PCB or semiconductor assembly
3. System Integration	Turbine Assembly	Final assembly of turbine systems	Tower, blades, nacelle, drivetrain	On-site or near-site assembly and commissioning	Integration experience across full wind turbine platforms	Domestic capacity for assembly of medium-scale turbines	Local land availability and experience assembling large-scale agricultural and industrial equipment
	Electrical & Mechanical Systems	Integration of internal systems	Wiring, electronics, hydraulic parts	Cabling, configuration, testing	Proven experience in turnkey energy system delivery	Integrated systems design for off-grid and grid-connected renewables	Experienced HV electricians & fluid-power techs serving regional mining and irrigation industries

4. Operations & Maintenance	Monitoring & Control Systems	Real-time turbine performance tracking	Sensors, software, analytics tools	Remote data acquisition, fault detection	Mature digital platforms with predictive maintenance capability	Monitoring systems for small-scale renewable systems and microgrids	Local agritech telemetry companies and IT integrators can adapt to SCADA monitoring
	Preventative Maintenance	Turbine servicing	Tools, lubricants, parts	Inspection, diagnostics, repair	Global turbine maintenance networks and supply chains	Experience in wind asset maintenance and high-reliability servicing	Established heavy-equipment service depots and mobile mechanics for mining & agriculture
5. End-of-Life	Blade Recycling	Reprocessing or disposing of blades	Composite waste	Grinding, thermal/chemical treatment	Early-mover advantage in composite blade recycling technologies	R&D in advanced recycling of fiberglass and resin-based materials	No existing blade recycling capacity; limited composite waste processing capacity

Matrix of value chain segments with identified local comparative advantage against maximised participation hypothesis questions

Value-Chain Component	1. No distinguishable disadvantage for developers choosing local suppliers	2. Local supplier advantages are relevant and valued in REZ procurement frameworks	3. Local supply-chain size & structure is appropriate to meet REZ demand
Wind – Component Manufacturing			
Towers and Structural Components	✓ Local fabricators hold recognised welding and quality certifications comparable to national providers.	⚠ Proximity and fast mobilisation are recognised in procurement scoring.	⚠ Existing yards can manage small-medium scale builds or components such as anchor cages but would need additional capacity for full tower construction.
Wind – System Integration			
Turbine Assembly	✓ Local erection crews hold the necessary licences and have comparable safety records to national teams.	✓ Quick mobilisation & site knowledge prized	✓ Crew size & local lift capability sufficient
Electrical & Mechanical Systems	⚠ Qualified electricians and mechanical technicians handle high-voltage and hydraulic works reliably, similar to non-local contractors.	✓ Regional knowledge & reduced logistics risk recognised	⚠ High-voltage scale still constrained
Wind – O&M			
Monitoring & Control Systems	⚠ Local IT and telemetry firms can deploy and manage monitoring systems with performance on par with specialist providers.	✓ Rapid fault response valued	⚠ Deployment scale moderate
Preventative Maintenance	✓ Established mechanical service depots	✓ Predictable scheduling & local parts stock valued	⚠ Technician pool sufficient; tooling gap remains
Wind – End-of-Life			
Blade Recycling	✗ No local recycling capacity	✗ Environmental benefits not yet accessed	✗ Supply chain for recycling undeveloped
Solar – Raw Materials & Components			
Aluminium Framing	✓ Local fabrication & anodising skills	✓ Reduced transport and lead-time benefits recognised	⚠ Volume capacity needs growth

Inverters & Electronics	⚠ Commissioning expertise good; no local assembly	✓ Local integration & support valued	⚠ Production scale insufficient
Solar – O&M			
Monitoring & Analytics	⚠ Agritech telemetry applies	✓ Real-time data valued by operators	⚠ Regional coverage patchy
Maintenance & Repairs	✓ Local trades perform cleaning, firmware updates	✓ Quick turnaround & local warranty support valued	⚠ Spare-parts staging limited
Solar – End-of-Life			
Module Recycling	✕ No local recycling facility	✕ Circular-economy benefits untapped	✕ End-of-life process absent
BESS – Component Manufacturing			
Battery Modules	⚠ Local assembly possible in small batches	✓ Rapid prototyping & support valued	✕ Factory-scale assembly absent
Battery Management System (BMS)	⚠ Commissioning & wiring skills present	⚠ Local diagnostics valued	✕ Firmware development capacity missing
Power Conversion System (PCS)	⚠ Commissioning strength; no local build	⚠ On-site support valued	✕ Manufacturing capacity absent
BESS – System Integration			
BESS Assembly	⚠ Small-scale integration possible	⚠ Turnkey service valued	⚠ Throughput capacity limited
Energy Management Systems (EMS)	⚠ IT integrators adapt SCADA	⚠ Real-time optimisation valued	✕ Dedicated EMS development absent
BESS – O&M			
Monitoring & Control	⚠ Telemetry skills transferable	⚠ Predictive-maintenance data valued	✕ Scale of deployment insufficient
Maintenance & Repairs	✓ Local trades perform basic service	✓ Rapid response & local trust valued	⚠ Spare parts staging under-resourced
Transmission – Component Manufacturing			
Towers and Structural Components	✓ Local fabricators hold recognised welding and quality certifications comparable to national providers.	⚠ Proximity and fast mobilisation are recognised in procurement scoring.	⚠ Existing yards can manage small-medium scale tower sections but would need additional capacity for full tower production to support REZ delivery.
Transmission – System Integration			

Tower Erection & Line Stringing	✓ Local civil crews hold the necessary licences and have comparable safety records to national teams.	✓ Reduced mobilisation time and local workforce availability are explicitly valued.	⚠ Crews excel at moderate spans but would require additional plant and specialist crews for extensive REZ corridors.
Substation Construction	✓ RPEQ-registered engineers and plant operators deliver civil and electro-mechanical works to standard.	✓ Familiarity with regional permitting and land-access accelerates delivery and reduces risk.	⚠ Local firms can manage small–medium substations; large grid-scale sites may need specialist EPC support.
Transmission – O&M			
Line Patrol & Vegetation Management	✓ Local transport and agro-forestry contractors conduct patrols and trimming to specification.	✓ Rapid local response and knowledge of flora/fuel loads are valued in maintenance contracts.	⚠ Additional crews and equipment would may be required to cover the full REZ line kilometres.
UAV / Drone Inspections	⚠ Local IT and agritech integrators can adapt drones for inspection but lack large-fleet deployments.	✓ On-demand aerial inspections reduce downtime and are explicitly credited under performance metrics.	⚠ More information required to confirm whether local capacity can meet continuous UAV inspection demands.
Substation Maintenance	✓ Mobile mechanics and electricians service mining/infrastructure substations to high standards.	✓ On-site troubleshooting and rapid parts access score positively in O&M tenders.	⚠ Spare-parts stockholding and high-voltage spares depots may need expansion for additional REZ facilities.

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