LK ADVISORY

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City of Greater Geraldton – Industrial Lands Study

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1 INTRODUCTION

The City of Greater Geraldton in the Mid-West of Western Australia is home to some 40,000 residents and spans a vast area of 12,625 km^2 – twice the size of the greater Perth metropolitan region.

The City enjoys around 60km of Indian Ocean frontage, favourable year-round climatic conditions and is rich in cultural heritage, natural landscapes, fertile soils, and valuable minerals and resources – attributes which have sustained and supported growth in the local tourism, fishing and agricultural sectors for more than a century.

These characteristics, together with abundant, large, cleared landholdings, Geraldton Port access, established road and rail networks, major utility and infrastructure corridors, and future development of the nearby Oakajee Strategic Industrial Area (Oakajee), are now also attracting significant interest from renewable energy producers, green industries, mining and downstream processing, seeking to establish major new projects in the City's broadacre farming areas.

Projects such as these can contribute enormously to the City and the Mid-West broadly, through economic diversification, employment creation, investment attraction, infrastructure improvements, enhanced energy stability, and carbon emission reductions. However, if not carefully planned and delivered, these projects can also produce poor environmental outcomes, adversely affect amenity and landscape values, deliver little or no community benefit, and cause the fragmentation and loss of productive agricultural land.

The Industrial Lands Study positions the City to proactively address these challenges, by examining whether, where and how a new generation of industrial projects could reasonably be accommodated within the City's broadacre farming areas in future.

To achieve this, the Study has –

- Identified critical enabling infrastructure requirements, such as transport, transmission (gas/power), desalination and energy storage needed to support new industrial growth sectors;
- Assessed the state of emerging energy markets and technologies and their relevance to the City of Greater Geraldton and the Mid-West region;
- Evaluated the City's existing, planned, and future industrial land requirements;
- Comprehensively mapped and analysed opportunities and constraints for large-scale energy, green industry, mining and downstream processing industries;
- Reviewed the potential social and economic benefits of energy, industrial and resource projects in the City;
- Engaged with key stakeholders and the broadacre farming community to understand their perspectives, priorities and preferences; and
- Defined key approval requirements and barriers to delivering these new projects in the City.

Importantly, two key principles have underpinned this work –

Farming First: Broadacre farming on high-yielding agricultural land should take primacy over new industrial projects. Those new projects will need to safely and sustainably co-exist with agricultural operations to ensure that highly productive farmland is not unduly taken out of production.

Flexibility: The new generation of industrial projects are highly dynamic and will evolve faster than the planning framework can keep pace with. It will therefore be vital to establish a flexible and informed decision-making framework capable of dealing with these proposals in an ever-changing environment.

This report sets out the research methodology, observations and outcomes of the Industrial Lands Study, and includes a suite of practical recommendations that will strategically position the City to seize the opportunities presented by new industrial projects, effectively respond to the needs and desires of the farming community, and mitigate any adverse impacts potentially attached to these new industries.

2 STRATEGIC CONTEXT

2.1 Local

2.1.1 City of Greater Geraldton

The City of Greater Geraldton is located 420km (or a 4.5-hour drive) north of Perth, the capital city of Western Australia and covers an area of 12,625 km^2 or 5% of the Mid-West region. With a population of around 40,000 residents, the City is home to almost three quarters of all people living in the Mid-West region.

Geraldton, the City's primary settlement is the largest town in the Mid-West, and the second largest regional city in Western Australia, behind Bunbury. Mullewa, the City's second most populous town is located approximately 98km by road east of Geraldton.

The City is serviced by major road and freight rail connections, and an existing port capable of up to 25 Million Tonnes Per Annum (Mtpa) throughput. Other key infrastructure traversing the City include the Dampier to Bunbury, Midwest and the APA Northern Goldfields Interconnect natural gas pipelines.

The Gross Regional Product (GRP) of Greater Geraldton is estimated at $4.395 billion – representing 48.6% of the Mid-West region's total GRP of $9.038 billion, 1% of Western Australia's Gross State Product (GSP) of $455.707 billion, and 0.2% of Australia's Gross Domestic Product (GDP) of $2.673 trillion[1].

2.1.2 Planning Framework

The City's Local Planning Scheme No. 1 (LPS 1) is the primary planning instrument guiding land use and development decisions in the City.

Under LPS 1, wind and solar generation projects fall within the definition of '*Renewable Energy Facility*', which means –

"premises used to generate energy by a renewable resource and includes any building or other structure used in, or in connection with, the generation of energy by a renewable resource. It does not include a renewable energy facility principally used to supply energy for a domestic property or existing use of premises."

Renewable Energy Facility is an 'A' use in the General Industry and Rural zones, meaning the use is not permitted unless the City has exercised its discretion by granting development approval after advertising the proposal for public comment.

Large-scale industrial processing and production facilities, such as those incorporating hydrogen, ammonia, lithium, vanadium as an input or output, are defined as '*Industry*' under LPS 1 which means –

"premises used for the manufacturing, dismantling, processing, assembly, treating, testing, servicing, maintenance or repairing of goods, products, articles, materials or substances and includes facilities on the premises used for any of the following purposes:

a) the storage of goods;
b) the work of administration or accounting;
c) the selling of goods by wholesale or retail;
d) the provision of amenities for employees;
e) incidental purposes."

Industry is a 'P' use in the General Industrial zone, which means the use is permitted as of right. However, Industry is an 'X' (prohibited) use in all other zones, meaning the City cannot approve any activity falling within the LPS 1 definition of 'Industry' except on land that is zoned General Industrial, or otherwise covered by a site-specific zoning that allows the use to occur.

Due to this, large-scale industrial projects will be forced to locate within the Nargulu Industrial Estate unless:

- the planning framework changes to zone additional land General Industrial;
- the planning framework changes to expand the zones where the Industry land use can be approved; or
- the proposal seeks approval of their proposal under the Western Australian Planning Commission's (WAPC's) Significant Development Pathway.

Notwithstanding, major industry and energy projects can still be approved by the Western Australian Planning Commission (WAPC) outside of the General Industrial zone in LPS 1, under Part 11B (Significant Development Pathway) of the *Planning and Development Act 2005*.

When determining applications under this pathway, the WAPC can set aside the requirements of the local planning framework and approve a proposal if:

1. The proposal raises issues of state or regional importance and the decision would be in the public interest; or
2. The Local Planning Scheme has not been reviewed in accordance with legislative requirements and the decision complies with any requirements prescribed by Part 11B regulations; or
3. Any conflict with the Local Planning Scheme is minor and the decision would be consistent with the general intent of any relevant State Planning Policy, Planning Code, Region Scheme, and Local Planning Strategy.

In making a decision that conflicts with a local planning scheme, the WAPC must have due regard for the principles of orderly and proper planning and the preservation of the amenity of the locality.

The Part 11B pathway presents both opportunities and risks for the City and its community. On the one hand, this pathway allows desired industrial projects to be approved by the WAPC in the Rural zone without needing to comply with any aspect of the Local Planning Scheme or planning framework; but on the other hand it largely removes the City from the decision-making process and can allow proponents to bypass the planning framework and obtain approval for developments of a type or in a location that may not be favoured by the City and its community.

[1] https://app.remplan.com.au/geraldton/economy/industries/gross-regional-product

2.1.3 Narngulu Industrial Estate

Narngulu Industrial Estate is the City of Greater Geraldton's existing General Industry-zoned precinct and is shown within a broken black line in Figure 1.

The Narngulu Industrial Estate comprises 182 General Industry-zoned lots covering 1,098ha, distributed across around 100 different landowners, including the Industrial Lands Authority (DevelopmentWA), which owns three lots comprising a total of 146.465ha. The Western Australian Government has earmarked two of DevelopmentWA's lots for a South Korean consortium to develop a 1 Mtpa green ammonia facility[2].

About half (545ha) of the Narngulu Industrial Estate comprising 115 lots has been developed or partially developed, while the remainder is undeveloped, incorporating 65 vacant industrial lots. Lot sizes within the Estate range from 990m^2 to more than 100ha.

Figure 2 illustrates the developed and undeveloped Industrial-zoned land in Narngulu, along with prospective future industrial expansion identified in the City's Local Planning Strategy, encircling the southern half of Narngulu. This expansion area comprises 65 lots covering 1,052ha and, if implemented, would almost double the size of the existing Narngulu Industrial Estate. However, realising the full zoning potential of this expansion area will be constrained by factors such as –

- The Obstacle Limitation Surfaces for Geraldton Airport, which need to be protected from encroachment by tall structures such as wind turbines, industrial chimney stacks and other industrial equipment or emissions that could interfere with aircraft visibility or instrumentation;
- Proximity to current and future Residential zoned land and other sensitive land uses, particularly to the north, south and west, which will deter certain noise and odour-emitting industries from locating in Narngulu;
- Narngulu forms part of the eastern viewshed of Geraldton and zoning additional land to attract large industrial facilities to this location could result in a visual blight on the landscape outlook from Geraldton and surrounds; and
- Narngulu is not ideally positioned to leverage access to major gas transmission pipelines or future large-scale local renewable energy projects in the City's central, eastern and northeastern areas, which many new industries will likely rely upon.

[2] https://reneweconomy.com.au/korea-consortium-wins-land-deal-for-10-billion-australian-green-ammonia-project/

Figure 1 – Narngulu Zoning Plan

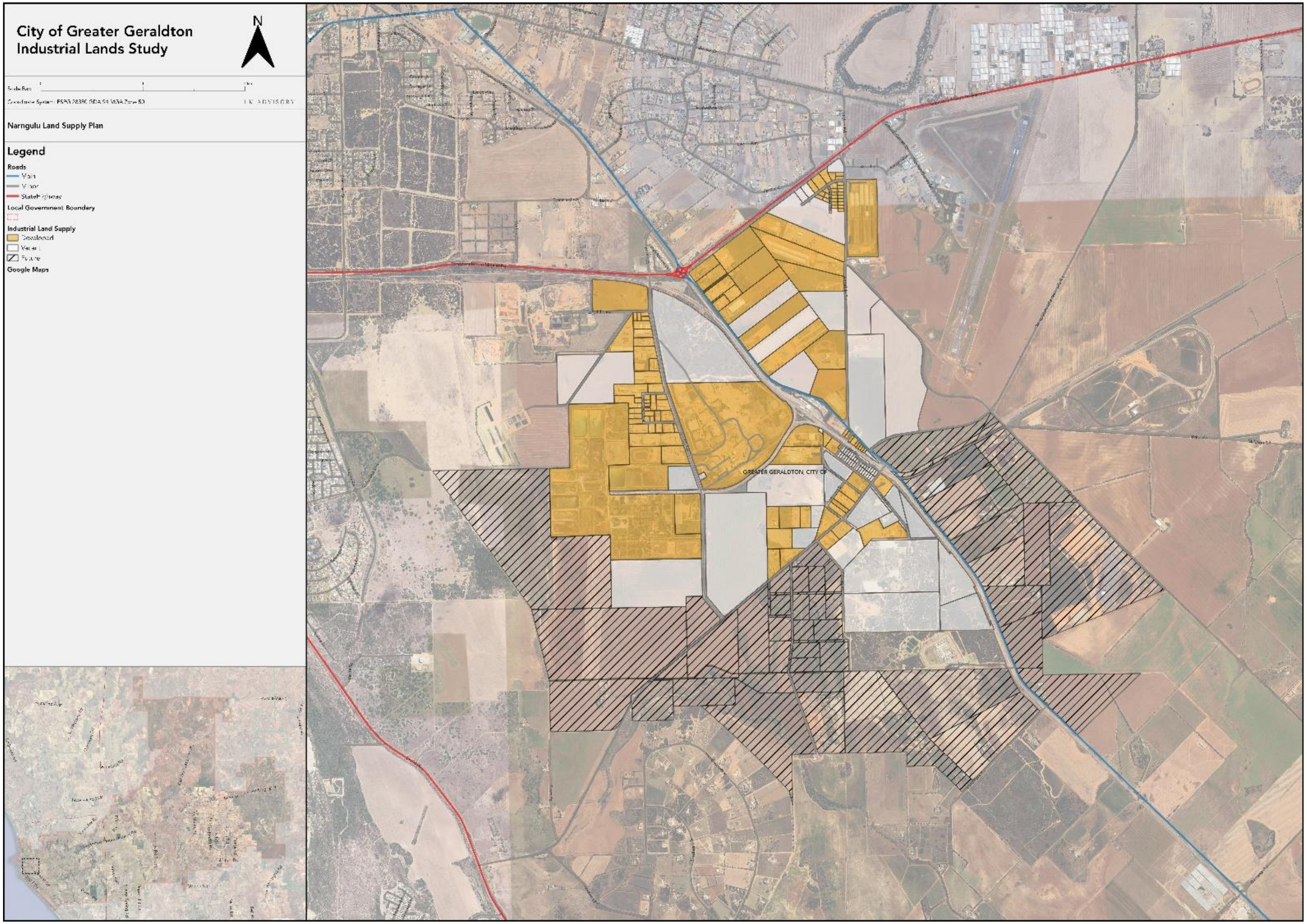


Figure 2 - Narngulu Development Takeup and Expansion Areas

2.2 Regional

2.2.1 Mid-West Region

The Mid-West region comprises 285,000km^2 and is home to 57,096 people, most of whom (73%) live in Geraldton[3].

In recent years, the Mid-West's estimated Gross Regional Product (GRP) has grown by an average of $650 million p.a., from $7.074 billion in 2021 to $8.217 billion in 2022, $8.883 billion in 2023 and $9.038 billion in 2024[4]. This includes $4.28 billion in value-added product from mining, $413 million from construction, $592 million from agriculture, forestry and fishing and $461 million from health care and social assistance (see Figure 3).

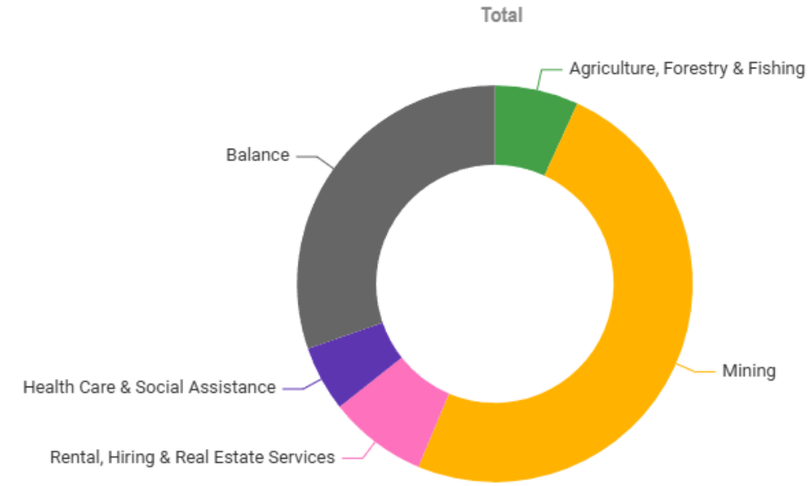


Figure 3 - Midwest Value Added (Source: REMPLAN 2024)

The Mid-West region is one of the most diverse and richest mineral provinces on Earth[5], containing nationally and internationally significant deposits of iron ore, lead, copper, zinc, gold, rare earths and mineral sands. The Midwest is also rich in renewable energy and is consistently identified as one of Australia's foremost regions for harvesting solar and wind energy for domestic consumption and for export to nearby major markets[6].

In 2019, the Department of Industry, Innovation and Science engaged Geoscience Australia to map areas with high potential for hydrogen production via electrolysis using renewable energy sources (also known as renewable or green hydrogen) and fossil fuel-derived hydrogen coupled with carbon capture and storage (CCS). The outcome was five hydrogen prospective scenarios that all indicated the City of Greater Geraldton and the Midwest more broadly as one of the highest-rated locations in Australia to gather and export renewable energy for export hydrogen/ammonia. Each hydrogen prospectively scenario is shown in Appendix 1.

2.2.2 Geraldton Port

Geraldton Port, operated by Mid West Ports Authority, has served as the region's major seaport since the late 1840s[7] when lead ore was first exported from Champion Bay.

The Port lays claim to various firsts, including construction of the first government railway in the state in the 1870s – a 55 kilometre line to carry lead ore from Northampton to the Port, the first reinforced concrete berth in WA in 1931, and Western Australia's first shipment of iron ore in 1966. The region's first shipment of mineral sands was dispatched from Geraldton Port in 1974 and talc was first exported from the Port in 1980.

Figure 4 - Geraldton Port, 1920s (Source: Mid West Ports Authority)

As a designated 'First Point of Entry' under the *Biosecurity Act 2015*[8], Geraldton Port can accept the following vessels and goods as their first port of call in Australia, providing diverse economic opportunities and strengthening the region's trade ties with other ports and countries –

- International commercial cargo vessels;
- International commercial vessels carrying passengers;
- Inorganic bulk goods; and
- Waste.

[3] https://www.mwdc.wa.gov.au/f.ashx/MWDC_Annual_Report_2022-23.pdf
[4] https://app.remplan.com.au/midwestregion/economy/summary
[5] https://www.aph.gov.au/Parliamentary_Business/Committees/House_of_Representatives_Committees.aspx?url=trs/networks/subs/sub100.pdf
[6] https://arena.gov.au/assets/2021/08/bp-ghd-renewable-hydrogen-and-ammonia-feasibility-study.pdf
[7] https://www.midwestports.com.au/our-port/history-of-the-geraldton-port.aspx
[8] https://www.legislation.gov.au/F2019L00765/latest/text

Geraldton Port continues to support the region's agricultural, fishing and tourism sectors and remains one of Australia's largest ports for wheat export trade[9]. In recent years, Port exports of Mid-West iron ore, metal concentrates, mineral sands, grain and agricultural products such as Ammonia Nitrate, averaged 16-18 Million Tonnes Per Annum (Mtpa), as shown in Figure 5 below.

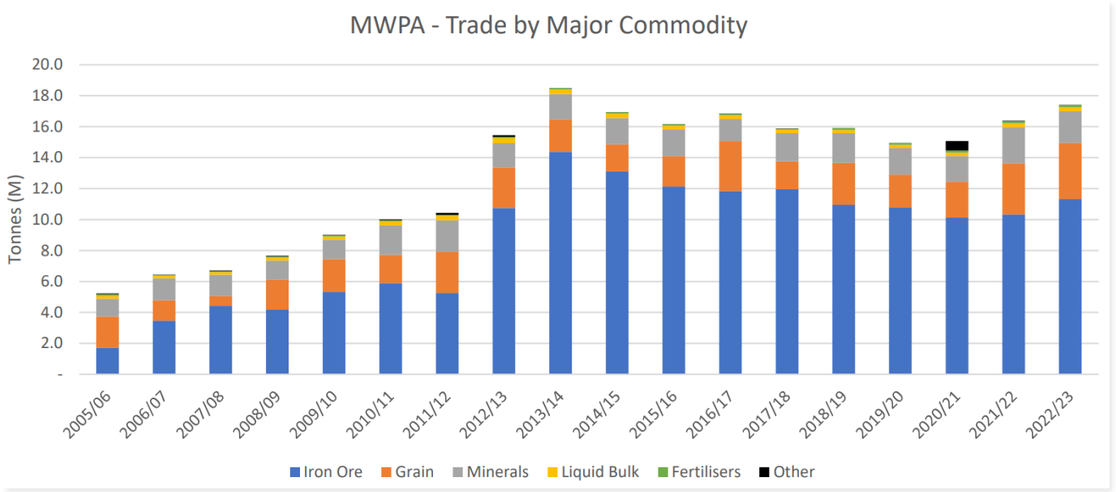


Figure 5 – Geraldton Port Trade Statistics[10]

One of the major barriers to large-scale export of hydrogen and ammonia from the Mid-West is that Geraldton Port does not currently possess the infrastructure and licencing necessary to export dangerous goods such as these in significant quantities. Furthermore, the near-city location of the Port has the potential to expose a high number of people and property to the risks of exporting these commodities at scale. The cost of the required Port upgrades to cater for these shipments may not be justifiable if the quantity of hydrogen and ammonia is confined to small-scale or pilot projects.

In May 2022, the WA State Government committed $332 million (in addition to the previous $18 million commitment) to deliver the Geraldton Port Maximisation Project by 2026/27[11]. The project involves an increase in throughput from 16 Mtpa to 25 Mtpa but does not explicitly incorporate facilities to export hydrogen and ammonia.

2.2.3 Oakajee Strategic Industrial Area and Port

DevelopmentWA's Oakajee Strategic Industrial Area (SIA) is located 23km north of Geraldton in the Shire of Chapman Valley and comprises a total greenfield area of 6,400ha including 1,000ha for the Oakajee Port and 1,134ha of strategic industrial land[12].

Oakajee is intended to accommodate strategic and downstream processing industries operating at scale in the Mid-West region. Predominantly, the land is expected to facilitate the conversion of H_2O to Hydrogen and subsequently to Ammonia for export at a commercial scale of ~1 – 2 Mtpa per project.

Planning for Oakajee has been ongoing for many decades, having been identified as a potential port location in 1972 and subsequently as a strategic industrial estate in the Geraldton Regional Plan in 1976[13].

Recent progress on Oakajee includes the award of a $20 million contract to deliver a new access road[14] and allocation of land to six major proponents (Figure 6) for green hydrogen/ammonia production and other associated activities.

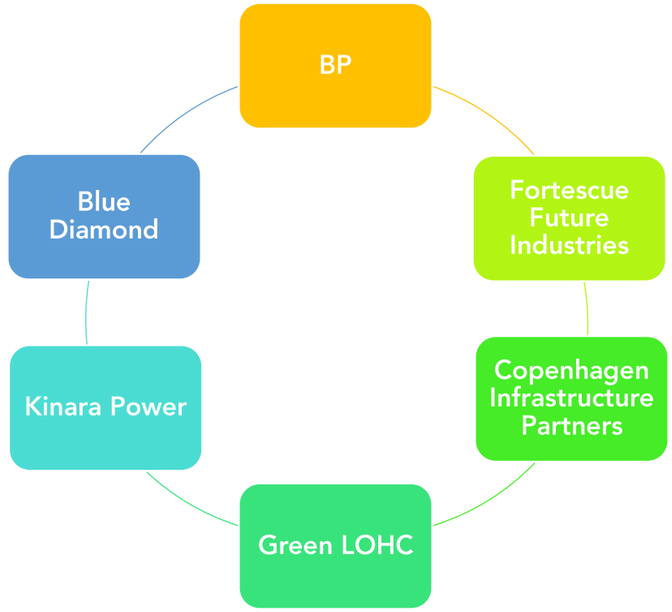


Figure 6 - Oakajee Project Proponents

With much of the land in the Oakajee 'Core' and 'Port' precincts now allocated to major proponents, limited opportunity exists to accommodate other large-scale industries in Oakajee. Those industries have therefore maintained a focus on establishing within the City of Greater Geraldton's broadacre farming areas due to myriad factors, including –

- Larger land area requirements than what remains in Oakajee;
- Ease and affordability of acquiring or securing land tenure rather than seeking a lease option or lease from DevelopmentWA;

[9] https://www.cgg.wa.gov.au/economic-sectors.aspx#:~:text=The%20Geraldton%20Port%
[10] https://www.midwestports.com.au/Profiles/midwestports/Assets/ClientData/Documents/Trade/CompTradeStats/12_-_Revenue___Trade_Performance_Report_-_June_2023.pdf
[11] https://www.wa.gov.au/government/media-statements/McGowan%20Labor%20Government/Mid-West-Ports-Authority-appoints-Port-Maximisation-Project-tender-20221024
[12] https://developmentwa.com.au/projects/industrial-and-commercial/oakajee-sia/overview
[13] https://www.midwestports.com.au/profiles/midwestports/assets/clientdata/documents/general/oakajee-master-plan.pdf
[14] https://www.wa.gov.au/government/media-statements/Cook-Labor-Government/Road-contract-awarded-for-Oakajee-Strategic-Industrial-Area-20240801

- Not requiring a strategic port-side location; and
- Prioritising access to existing rail, major gas infrastructure, and future renewable energy projects in the central, eastern and north-eastern parts of the City.

Development of the long-planned Oakajee deep-water port would substantially increase the throughput capacity of the operational ports in the Mid-West and position the City of Greater Geraldton as a global scale exporter of the region's diverse mineral resources and renewable energy. However, construction of a deep-water at Oakajee is not expected in the foreseeable future.

Engagement with Mid West Ports Authority has identified that an interim Oakajee port could comprise a Single Point Mooring (SPM) comprising a Catenary Anchor Leg Mooring (CALM) buoy connected to the seabed and shore by a Pipeline End Manifold (PLEM). This would allow vessels to connect and weathervane around the SPM while loading hydrogen and ammonia, facilitating exports of 3 – 4 Mtpa. As exports scale up, a full breakwater and deepwater port with four berths would be required to accommodate the 55,000 Deadweight Tonnage (DWT) tankers necessary to export ~12 Mtpa of Ammonia from Oakajee.

2.4 State & National

2.4.1 Strategic Alignment

In recent years, the Western Australian and Australian Governments have established many strategies, plans, policies and positions aimed at diversifying the economy; investing in local value-adding, down-stream processing and manufacturing; optimising the use of existing enabling services and infrastructure; increasing renewable energy generation; and transitioning to net zero greenhouse gas emissions.

By carefully planning for and strategically accommodating new resource, processing and renewable energy projects in the City of Greater Geraldton, the Mid-West region stands to contribute enormously to these state and national priorities.

Set out below is a summary of the key government initiatives which this Industrial Lands Study aligns to –

i. **Future State – Accelerating Diversity WA (2024)** – Outlines a range of targeted investments in diversification opportunities including in hydrogen, renewable energy, critical minerals and cross-sector enablers to accelerate growth such as infrastructure delivery, updates to policy, regulatory, social and environmental frameworks.

ii. **National Hydrogen Strategy (2024)** – Recognises Geraldton's potential as a central hub in Australia's hydrogen export economy. The City's existing infrastructure, vast renewable energy resources, and strategic location are poised to support the strategy's goals of large-scale hydrogen production and export.

iii. **National Battery Strategy (2024)** – Prioritises battery manufacturing to support a circular economy and sustainability efforts and acknowledges the scalability of Vanadium Redox Flow Batteries (VRFBs) and other storage technologies.

iv. **Future Made in Australia Economic Plan (2024)** – Focuses on transitioning to renewable energy to create a healthier environment and leveraging this emerging industry to secure future job opportunities.

v. **The National Energy Performance Strategy (2024)** – Aims to integrate net zero planning into energy practices.

vi. **Sectoral Emissions Reduction Strategy for Western Australia (2023)** – Aims to decarbonise the electricity sector.

vii. **Net Zero Plan (2023)** – Identifies the energy sector as a significant contributor to achieving net zero emissions by 2050.

viii. **Climate Adaptation Strategy (2023)** – Highlights the importance of reducing greenhouse gas emissions whilst simultaneously avoiding any reduction in environmental resilience.

ix. **Climate Resilient WA (2022)** – Focuses on State Government investment and provision of energy infrastructure.

x. **Green Energy Approvals Initiative (2022)** – Aims to diversify and decarbonise WA industries through a streamlined assessment pathway for renewable energy production and associated industries.

xi. **Western Australia's Future Battery and Critical Minerals Industries (2022)** – Promotes investment in the production of batteries and critical minerals.

xii. **State Infrastructure Strategy (2022)** – Promotes a shift to a more diversified and complex economy for a stronger and more resilient state, including a focus on domestic value-adding for strategic commodities and transitioning to net zero emissions technology.

xiii. **Future Fuels and Vehicles (2021)** – Focuses on investment in future fuel technologies to expand consumer choice by minimising costs.

xiv. **Long-Term Emissions Reduction Plan (2021)** – Aims to deliver affordable and reliable power through renewable energy efforts including solar facilities.

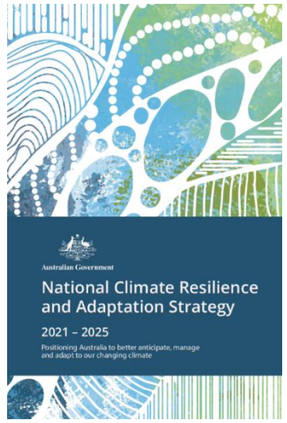
xv. **National Climate Resilience and Adaptation Strategy 2021-2025 (2021)** – Articulates the importance of adaptation and resilience building in all areas including energy.

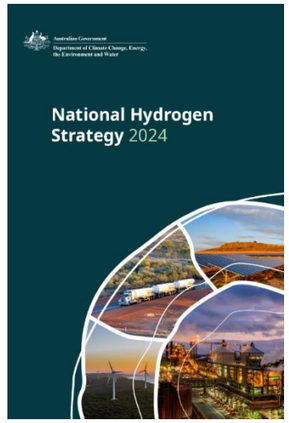
xvi. **WAPC Position Statement: Renewable Energy Facilities (2020)** – Seeks to ensure these facilities are located to minimise potential impact upon the environment, natural landscape and urban areas while maximising energy production returns and operational efficiency.

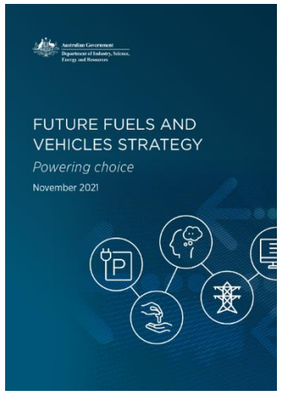
xvii. **Western Australian Climate Policy (2020)** – Prioritises transforming the energy industry through supporting decarbonisation efforts.

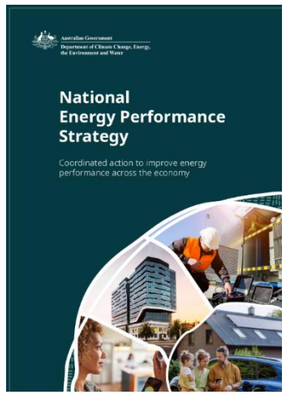
xviii. **Climate Change in Western Australia Issues Paper (2019)** – Identifies the opportunities for fringe off-grid and remote off-grid low-carbon energy locations without displacing traditional thermal energy generation.

xix. **Energy Transformation Strategy (2019)** – Aims to maintain a secure, reliable, and affordable electricity supply whilst reducing energy emissions and promoting local jobs and growth through a government focus on delivering power systems in more reliable and cost-effective areas such as Geraldton.









3 DRIVERS OF CHANGE

3.1 Hydrogen and Ammonia

Global energy markets are experiencing unprecedented growth in demand and a shift towards decarbonisation, driving the need for more sustainable energy generation, storage and transmission.

Wind, solar and other renewable energy resources are vital to meeting these needs; however, the power generated from these resources can vary depending on climatic and seasonal conditions, while the sites where this power is generated are often remote from the endpoint of energy consumption. To address these challenges, energy producers are exploring new ways to store renewable energy for discharge during peak demand and to transmit or transport energy to where it is needed most.

While the Mid-West is one of the best locations in Australia to harvest solar and wind energy[8], the electricity produced here cannot be readily transmitted or transported to external markets – regionally, interstate, nationally or internationally, and there is currently insufficient local demand for the amount of renewable energy capable of being produced locally.

Over the past decade, Hydrogen (H_2) and particularly renewable or 'Green Hydrogen' (see Figure 7[15]) has emerged as one of the most important mediums to collect, store and transport renewable energy to market at scale.

Green Hydrogen is produced by generating electricity from renewable energy sources and using that electricity to power an electrolyser which water is passed through. The electrolysis process splits the water molecule into its two chemical components of Hydrogen (H_2) and one Oxygen (O).

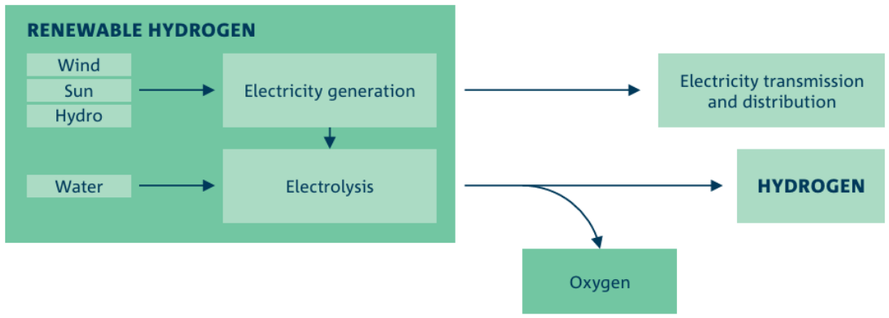


Figure 7 - Green Hydrogen Production Pathway

H_2 in its natural state is a gas with a very small molecule and low viscosity, making it prone to leakage and creating challenges for transmission over long distances and durations. H_2 has a high energy content by weight, but not by volume, meaning large amounts of space are needed for storage and transport[16]. Therefore, to be moved efficiently, H_2 must be converted into an alternate state through either[17] –

- Compression;
- Liquefication; or
- Chemical compounding with other molecules to form liquid organic hydrogen carriers (LOHCs), or with Nitrogen to form Ammonia (NH_3), or with metallic substances to form hydrides.

Of these methods, the conversion of Hydrogen to Ammonia presents the greatest opportunity for the City to become a globally significant producer and exporter of renewable energy.

Ammonia is the second most widely used inorganic bulk chemical in the world, it has a high energy density, and a mature and efficient supply chain that can take advantage of existing infrastructure for transport and distribution[18].

Hydrogen can be converted to Ammonia using the Haber-Bosch process, by merging locally produced Green Hydrogen with Nitrogen (N_2) from the air, at high temperature and pressure[18]. The Ammonia can then be transported to the end consumer where it can be re-converted or 'cracked' back into H_2, which can then be used directly as a fuel, injected into the natural gas supply network, or converted to electricity by combining it with oxygen in a fuel cell. However, the technology required to implement these processes is not yet mature enough to be commercially feasible at a large scale.

The City's abundant renewable energy resources; rich mineral deposits; established road, rail, port and gas infrastructure; and vast areas of cleared and sparsely populated broadacre farmland are factors that have undeniably contributed to its industry attractiveness for the establishment of renewable energy facilities, Green Hydrogen and Ammonia production.

3.2 Symbiosis

The production of Green Hydrogen through electrolysis, and the addition of Nitrogen to form Ammonia, followed by the re-conversion of Ammonia to Hydrogen by the end power user, are all energy intensive processes that require access to significant, secure and affordable electricity.

While these needs can be met by renewable power, the viability of those power generation methods will be impacted by the changing landscape of energy markets, pricing and regulators.

Two key priorities have emerged from this environment –

i. The importance of renewable energy producers securing offtake agreements with a local base of industrial consumer(s) that guarantees a minimum rate of electricity supply in exchange for a minimum rate of payment, to justify the investment and ongoing operation of large-scale renewable energy facilities; and

ii. The need to pair power generation with energy storage in the form of large-scale battery technologies to help manage supply fluctuations, grid congestion, prevent curtailment, and improve overall grid stability.

This combination of factors reveals a symbiosis or co-dependency of sorts between renewable energy producers and energy-intensive consumers, such as large-scale industrial electrolysers producing Hydrogen, industries converting Hydrogen to Ammonia as an exportable energy commodity, and industries extracting, processing and value-adding to critical battery minerals such as Lithium, Cobalt, Graphite, Magnesium and Vanadium.

These relationships coupled with the City's natural attractiveness to renewable energy producers and new industries, are expected to drive an industry preference for clustering and co-location, taking advantage of economies of scale and shared infrastructure, while allowing for localised, off-grid, energy-intensive industrial plants and processing at scale.

[15] https://www.chiefscientist.gov.au/sites/default/files/HydrogenCOAGWhitePaper_WEB.pdf
[16] https://h2tools.org/bestpractices/gaseous-gh2-and-liquid-h2-fueling-stations/hydrogen-compared-to-other-fuels
[17] https://www.anz.com/content/dam/anzcom/pdf/institutional/reports/hydrogen-handbook-vol-2.pdf
[18] https://pubs.acs.org/doi/10.1021/acs.iecr.3c01419#

3.3 Green Steel

The steel industry is one of the largest emitters of CO_2, contributing approximately 6-7% of global greenhouse gas emissions[19]. As global markets decarbonise, there is an emerging transition towards steel production methods that do not rely on coal.

Hydrogen-based Direct Reduction Iron (DRI) is currently the most developed alternative and presents a viable pathway for reducing emissions in the production of steel. In simple terms, the DRI process involves the removal of oxygen from iron ore without melting, as in a blast furnace, by using a reducing agent such as Hydrogen[20]. An example of this is Green Steel WA's proposed Mid-West DRI Plant which plans to use locally sourced Green Hydrogen to produce green DRI for export[21].

Hydrogen in the DRI process replaces coal as the reducing agent and produces iron that can then be melted in an electric smelting furnace to produce steel, with the furnace itself capable of being powered by renewable energy, as in the case of the proposed NeoSmelt furnace in Kwinana[22].

The City is ideally positioned as a potential hub for Hydrogen-based steel production due to its abundant renewable energy resources, and access to critical minerals and metals required for steel and steel-alloy production and downstream processing, including high-grade Magnetite, Vanadium, Nickel, and Titanium.

While realising this potential will require substantial investment in metallurgical infrastructure and supply chain development, establishing a Hydrogen-based steel industry in Geraldton could enable greater value capture for the Australian economy while supporting global efforts to decarbonise heavy industry. With the right infrastructure and policy support, the City could support Western Australia becoming a key player in the green steel supply chain, through domestic production and strategic exports of Hydrogen and its derivatives.

3.4 Vanadium

Vanadium is a transition metal that uniquely combines excellent corrosion resistance, electrical conductivity and thermal insulation properties.

The primary use of vanadium, accounting for approximately 80% of its production, is as an alloying agent in steel manufacturing. Vanadium-steel alloys are renowned for their robustness, making them integral to the production of high-tech steel alloys and specialised tools.

An emerging application of vanadium is in the Vanadium Redox Flow Battery (VRFB), a technology gaining traction for large-scale energy storage solutions which is currently being trialled by Horizon Power in Kununurra[23]. While VRFBs are less energy-dense than Lithium-Ion (Li-Ion) batteries, requiring larger and heavier structures for equivalent energy storage, they excel in scenarios needing long-duration energy storage and frequent cycling. They can discharge at full capacity throughout their lifespan and are scalable by simply adding more electrolyte solution. Although VRFBs come with a higher initial cost, technological advancements and economies of scale are expected to drive down these costs in future.

VRFBs can effectively capture excess renewable energy during low-demand periods and release it during high demand, meaning the City of Greater Geraldton and the Mid-West broadly could become energy self-sufficient. When combined with Li-Ion batteries for handling load spikes, VRFBs could enable the City and the Mid-West to consume more energy than the entire South West Interconnected System (SWIS) combined.

Geographically, Geraldton is positioned just west of the 'Vanadium Triangle' (see Figure 8), a region rich in Vanadium, Titanium, and Silicon, essential for manufacturing high-grade steel, various battery technologies, and solar panels. Vanadium processing in this area also generates Magnetite as a byproduct, which is exported through the Port of Geraldton. There are numerous projects either established or under development here, with the proposed Australian Vanadium Limited (AVL) concentration plant set to significantly influence these by unlocking local offtake agreements and promoting infrastructure sharing, as indicated in the recent term sheet between AVL and Neometals LTD (NMT)[24].

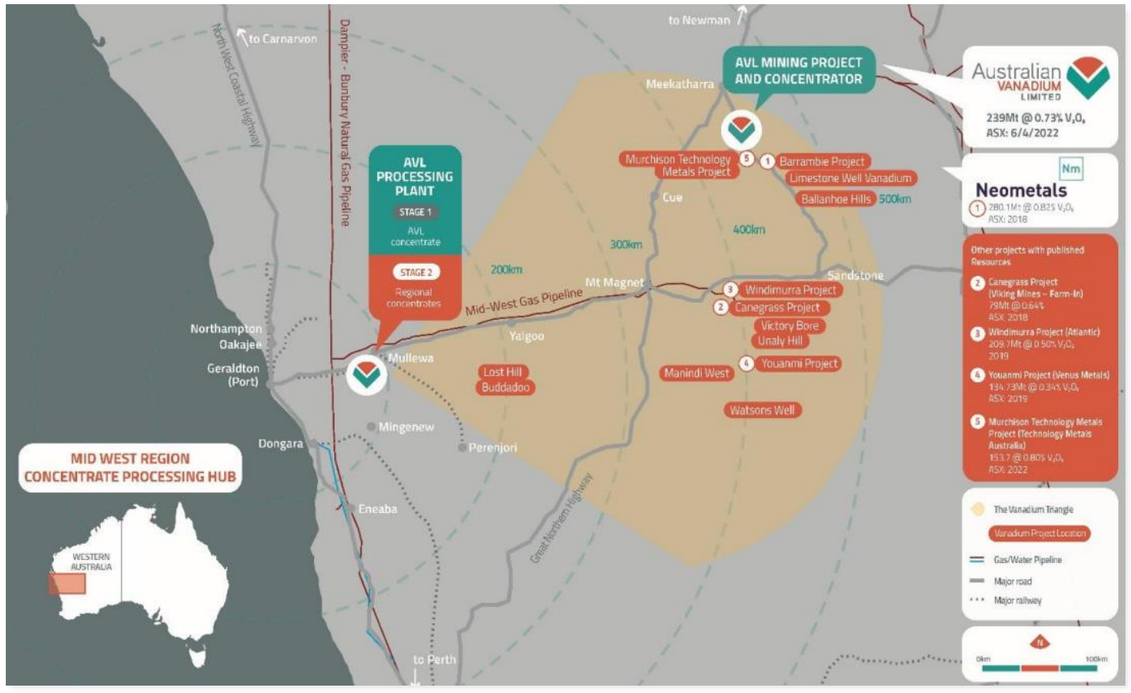


Figure 8 – Vanadium Triangle

[19] https://rmi.org/wp-content/uploads/2019/09/green-steel-insight-brief.pdf
[20] https://www.metallics.org/dri-production.html
[21] https://www.greensteelwa.com.au/collie-green-steel-mill-copy/
[22] https://www.wa.gov.au/government/media-statements/Cook%20Labor%20Government/Nation%27s-largest-ironmaking-electric-smelting-furnace-set-for-WA-20241217
[23] https://www.wa.gov.au/government/media-statements/Cook%20Labor%20Government/Long-duration-storage-trial-securing-regional-WA%27s-energy-future-20241119
[24] https://www.mining-technology.com/news/neometals-avl-critical-minerals/?cf-view

3.5 Future Markets

In future, it is anticipated the energy demands from information industries will significantly add to the energy needs of traditional and emerging industries such as those discussed earlier in this section. These future industries include facilities for data storage and analytics, machine learning and Artificial Intelligence (AI) which have all accelerated sharply in recent years.

Global AI companies such as OpenAI, Meta, Google and Tesla are dramatically increasing their investments in this sector, driven by major data centres consuming significant amounts of power. One McKinsey study estimated that United States (US) data centre energy consumption alone may reach 405TWh per annum by 2030, being around 150% more than all the electricity generated in Australia in 2022/23 (274TWh[25]).

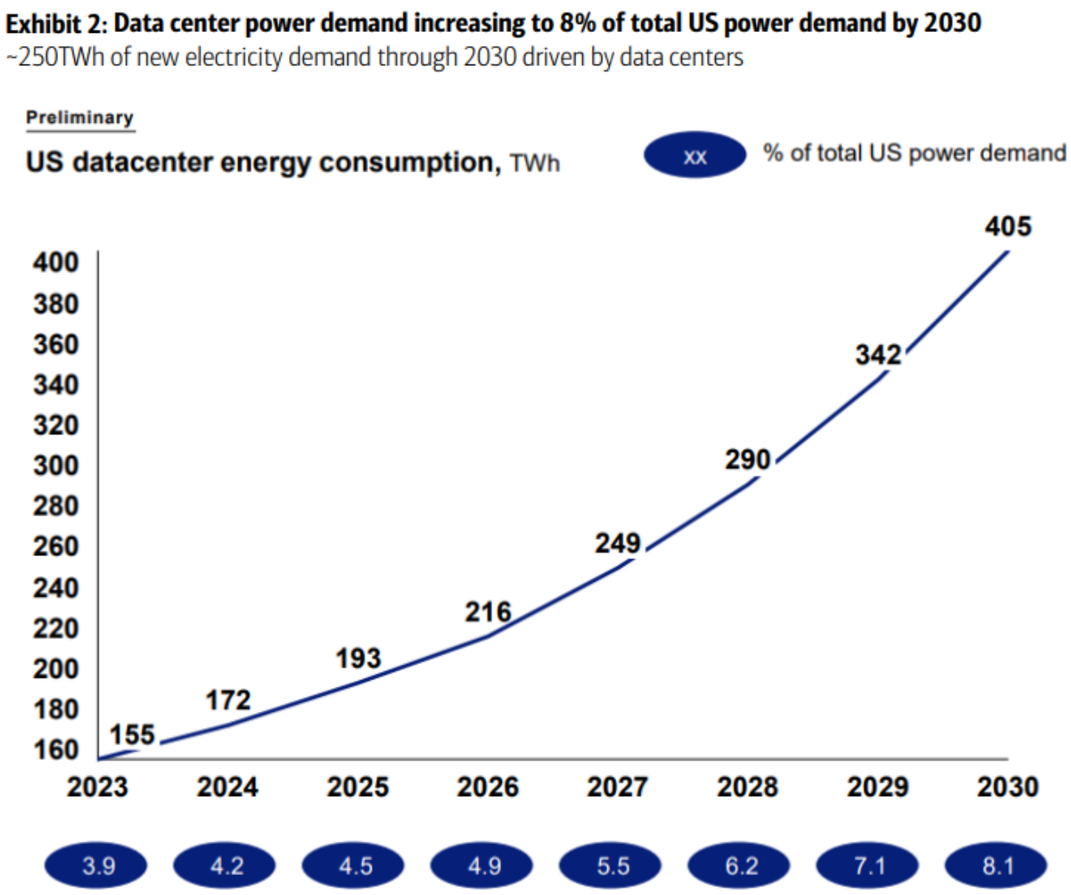


Figure 9 – US Data Centre Power Demand Projection

A key constraint to computational power is the availability of sufficient electricity generation, transmission, substations and transformers. Data centres can be located anywhere in the world and therefore, could be co-located with major renewable energy projects in the City of Greater Geraldton.

Using data centres in this way can act as a flexible demand response system, complementing energy storage solutions like battery technology. When renewable energy production is at its peak and storage facilities are nearing full capacity, data centres can absorb excess energy, preventing grid congestion and avoiding wastage of renewable power.

This approach aligns with the growing trend of using data processing as a medium for energy export, where the transmission of energy is converted into computational tasks rather than relying on traditional physical infrastructure. This approach only requires a high-speed internet connection instead of processing facilities, transmission lines/pipes, roads, rail, ports and ships, and is subject to none of the associated efficiency losses along the supply chain.

Data centres located in the City of Greater Geraldton, close to renewable energy facilities, would be ideally suited to the energy-intensive process of training increasingly large-scale language, vision and multi-modal AI models, which can be performed at data centres anywhere with abundant, affordable and reliable energy[26].

By accommodating large-scale data centres locally, the City could attract global investment in AI and machine learning technologies, positioning itself as a hub for the future of energy-intensive computing. This would not only enhance the region's energy export potential but also create new economic opportunities in the form of high-tech jobs, infrastructure development, and partnerships with global tech companies seeking to leverage Australia's abundant renewable energy. An example of this the Equinix Power Purchase Agreement (PPA) to secure 151MW of wind power from Victoria's 1.3GW Gold Plains Wind Farm East[27].

[25] https://www.energy.gov.au/energy-data/australian-energy-statistics/electricity-generation
[26] https://www.mckinsey.com/industries/technology-media-and-telecommunications/our-insights/ai-power-expanding-data-center-capacity-to-meet-growing-demand#/

[27] https://international.austrade.gov.au/en/news-and-analysis/success-stories/equinix-signs-first-green-ppa-in-asia-pacific-with-tagenergy

4 INFRASTRUCTURE

The City of Greater Geraldton already possesses the requisite characteristics to attract large-scale renewable energy facilities, green industries, mining and downstream processing – evidenced by the high level of interest and investment shown by these sectors to establish in the City's broadacre farming areas.

While careful planning and informed decision-making are needed to facilitate sustainable growth in these sectors while managing their potential adverse impacts, the following key infrastructure considerations must be addressed if the City is to realise its potential of becoming a global hub for these industries.

4.1.1 Water Availability

Insufficient groundwater resources are available to cater for the demands of new industries and an enormous quantity of additional water will be needed, of varying quality, along with on-site project-specific water and wastewater recycling and reuse.

An obvious but costly option for providing additional, high quality and potable water is seawater desalination.

It is estimated that seawater desalination of around 200GL/annum or more would be required to meet the needs of future industries in the City. This is equivalent in scale to Australia's largest desalination plant, the Wonthaggi plant in Victoria (150-200GL/annum), and double the capacity of Water Corporation's proposed $2.8 Billion Alkimos Seawater Desalination Plant (100GL/annum) which will be the largest in Western Australia when operational later this decade.

4.1.2 Renewable Electricity Generation and Storage

A substantial increase in local renewable electricity generation and storage will be needed to power energy-intensive desalination and production processes for new industries, in the order of three times more than the generation capacity of the South West Interconnected System (SWIS) (See Figure 11).

Existing technical studies that support the Oakajee Deep Water Port (DWP) and Strategic Industrial Area (SIA) Structure Plan appear to significantly underestimate the region's future industrial electricity requirements.

The May 2023 SWIS Demand Assessment indicates 1.7GW of the projected 1.8GW increase in the North Key Load Area to 2042 will be attributable to green hydrogen[28]. At least one renewable energy project plans to install 14GW of solar and wind energy generation to address projected energy demand[29] to service around 7GW of hydrogen electrolysis capacity.

4.1.3 Freight & Materials Handling

High-capacity and effective freight and port infrastructure that coordinate the movement of goods via roads, rail and pipelines are critical to facilitate new and emerging industries. The future Oakejee Deepwater Port and planned upgrades to Geraldton Port are vital for growing and diversifying the region's export capacity, along with new shared user infrastructure such as intermodal and logistics facilities that leverage the dual function of both ports and optimise the use of different transport modes.

Priority transport infrastructure upgrades identified through this Study include:

i. Geraldton Mount-Magnet Road

   In 2023, Infrastructure WA identified the criticality of upgrading this vital freight link[30]. The estimated project cost of $225 million was expected to return a net economic benefit to the State of $388 million through improved freight efficiency and productivity, as well as safety benefits due to an expected reduction in crash numbers.

ii. Geraldton-Mullewa Rail Freight Line

   The Geraldton-Mullewa Rail Freight Line managed by Arc Infrastructure (formerly Brookfield Rail) is currently a narrow-gauge line but incorporates dual gauge sleepers to accommodate the installation of an additional standard gauge line (see Figure 10[31]).

   Upgrading this rail line to dual gauge will add versatility and capacity to the rail freight network, as existing rolling stock can be used in addition to the larger cars and locomotives that use standard-gauge lines. Extending this line to provide a rail freight connection between Narngulu, Geraldton Port, Oakajee and the future Oakajee Deepwater Port will also be important in the longer term.

[28] https://www.wa.gov.au/system/files/2023-05/swisda_report.pdf
[29] https://research.csiro.au/hyresource/geraldton-export-scale-renewable-investment/
[30] https://www.infrastructure.wa.gov.au/geraldton-mt-magnet-road-upgrade-main-roads-wa-mipa-summary-assessment-report
[31] https://www.arcinfra.com/Rail-Network/Network-Specifications

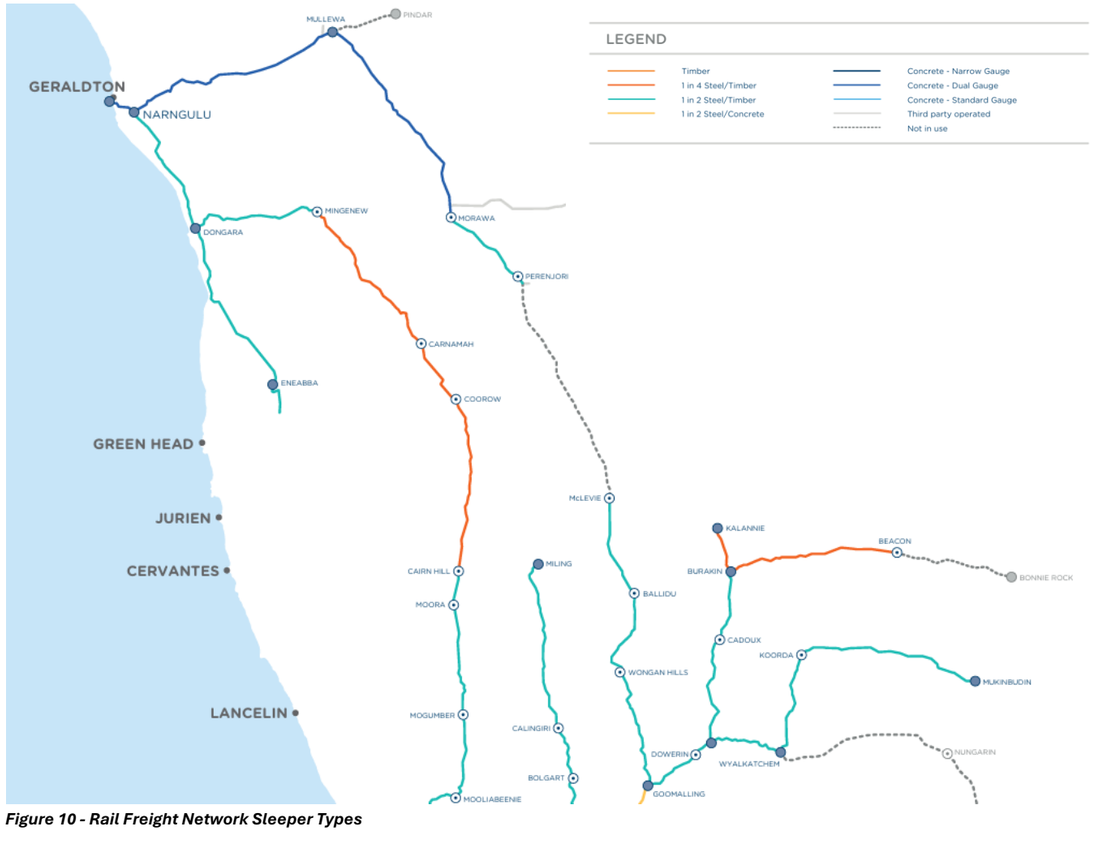


Figure 10 - Rail Freight Network Sleeper Types

iii. Intermodal Terminal

Establishing an intermodal rail/road terminal with road train assembly and large-scale laydown areas adjacent to both Geraldton-Mount Magnet Road and the Geraldton-Mullewa rail freight line will facilitate the safe passage of large-scale plant, infrastructure, equipment and goods by road and rail between the City's inland areas and Geraldton Port. Depending on its location, an intermodal facility could also provide a connection to North West Coastal Highway for freight transport to and from Oakajee.

With freight movements expected to increase in future as renewable energy, industry and resource projects grow within and beyond the City of Grater Geraldton, private development of an intermodal facility is likely to be commercially viable, particularly if arrangements are secured with Arc Infrastructure to access its rail corridor in the chosen location.

iv. Oakajee Strategic Industrial Area (SIA)

Accommodating large-scale energy, resource and industry projects in the City's broadacre farming areas will complement rather than compete with the Oakajee Strategic Industrial Area.

For Oakajee to thrive as a heavy industrial precinct and port, it will require a supporting ecosystem of diverse projects accessing the services and infrastructure to be provided at Oakajee, while also generating the energy, commodities and throughput that Oakajee will require but which cannot be sourced or produced at scale within Oakajee.

While the Port of Geraldton may be able to accommodate pilot projects and smaller-scale non-agricultural commercial exports, or a single 1 Mtpa ammonia facility in the medium term, Oakajee is critical to unlocking access to global markets for large-scale Hydrogen/Ammonia export.

4.1.4 Transmission Infrastructure

Renewable energy generation at the intended scale will require 330-500kV transmission infrastructure to connect to downstream processing facilities and the SWIS or local large-scale energy generation facilities.

Transmission upgrades between the Metro North and North Country Load Areas are earmarked for delivery around 2027–2034 and include 500kV double circuit transmission lines initially energised to 330kV[28] (See Figure 11). However, these upgrades alone will not be enough to drive investment in renewable energy production in the City.

Appropriate policy and legislation will also be needed to complement these physical infrastructure updates, in the form of more competitive renewable energy pricing to support Western Australia's transition to a decarbonised energy future. Energy Policy WA is already working to increase the generation and use of renewable energy in rural and remote mining and manufacturing sectors without incurring additional costs[32]. Future mining and industrial projects in the City's broadacre farming area may be well placed to take advantage of these reforms.

[32] https://www.wa.gov.au/organisation/energy-policy-wa/increasing-renewable-energy-mining

Figure 11 – SWIS Nodal Upgrade Map

5 SOCIAL & ECONOMIC IMPACTS

The development of large-scale renewable energy and related industrial projects in the City of Greater Geraldton – and in the broadacre farming area particularly – has the potential to generate both positive and negative social and economic impacts in the City, as summarised below.

i. Positive Social Impacts

- Enhanced quality of life through improved access to local services (e.g. education, healthcare, retail, and entertainment) driven by increased investment, employment, economic diversification and population growth.
- Potential for stronger community development and cohesion by leveraging meaningful and lasting community benefits from new projects.
- Opportunities for improved local infrastructure (e.g. housing, roads, public amenities) as increased demand spurs investment in community services.
- Maintenance of local lifestyles, with renewable projects coexisting alongside traditional agricultural and rural activities when appropriately integrated.

ii. Negative Social Impacts

- Large-scale renewable and industrial projects could adversely affect an area's character and amenity through visual, noise, and odour pollution.
- Increased traffic and strain on local road networks may disrupt daily life and contribute to congestion and safety concerns.
- Inadequate community participation and engagement can result in social conflict and discontent from opposing community views and friction between landowners who stand to financially benefit from new projects and those who will be impacted without such benefit.
- Risk of overconsumption of local water resources and environmental degradation, which can negatively affect the social fabric, health and longevity of rural communities.

iii. Positive Economic Impacts

- Substantial short-term employment opportunities generated during project construction, benefiting both local and regional workforces. For example, the proposed Australian Vanadium concentrator is anticipated to create 400 short-term construction jobs and 125 ongoing permanent jobs. Based on these forecasts, the development of multiple large-scale renewable energy, industrial or resource processing projects in the City of Greater Geraldton could generate thousands of construction jobs and several hundred permanent operational jobs in sectors that are underrepresented or not present at all in the City and the Midwest.
- Long-term creation of specialised roles in plant operation and maintenance that contribute to the development of a more skilled regional workforce. Projects across sectors such as wind, solar, hydrogen, ammonia, and green steel do more than just provide immediate construction employment, they lay the foundation for a more sustainable and specialised workforce. Through targeted training programs, long-term operational roles, and strategic partnerships with educational institutions, these projects can help build a local talent pool equipped to manage, maintain, and innovate within advanced industrial environments. This ongoing development of specialised roles not only supports the success of individual projects but also enhances the overall economic and technological capacity of the region.
- Local businesses gain from supply-chain opportunities by providing goods and services for large-scale renewable energy and industrial projects, boosting investment and economic activity.
- Economic growth is stimulated across a broad range of sectors, with each new job potentially creating additional demand in industries such as education, healthcare, retail, and entertainment.
- A surge and/or long-term growth in accommodation demand can strengthen the local housing market and support a more resilient construction sector.
- Renewable energy facilities designed to co-exist with agricultural operations can provide farmers with a stable, supplementary income, supporting long-term agricultural viability.

iv. Negative Economic Impacts

- If not properly managed, large-scale industry can disrupt local agricultural productivity and affect producers with specialised export licences.
- Environmental mismanagement (e.g. overuse of groundwater or ecosystem disruption) may lead to increased operational costs and reduced land value, impacting overall economic sustainability.
- Strains on local infrastructure, including housing, roads, and public services, could result in increased public spending or economic disparities within the region.
- Potential loss of economic opportunities if negative externalities (such as pollution or degradation of natural amenities) deter investment or reduce the attractiveness of the area for tourism and other local economic activities.

6 METHODOLOGY

The investigative process underpinning the Industrial Lands Study has encompassed the whole of the City of Greater Geraldton local government area and comprised extensive documentary research (see Appendix 3), compilation and analysis of complex spatial data, ground-truthing findings, application of a bespoke multi-criteria assessment, and engagement with industry stakeholders and affected landowners, to determine whether, where and how a new generation of industrial projects could be accommodated within the City's broadacre farming areas in future.

Our research methodology is summarised below, while our findings are documented in Section 7 and the results of our engagement with stakeholders described in Section 8.

6.1 Spatial Data

A multitude of spatial data was compiled and assessed for this Study, including –

a. City of Greater Geraldton Local Planning Scheme No. 1 (LPS 1) Zones and Reserves
b. Infrastructure, including roads, water, sewer, electricity, power generation, rail and gas pipelines
c. Restricted Access Vehicle (RAV) rated network data including Tri Drive 1-5, Tandem Drive 1 – 10 and Oversize Road Train data
d. Topographical data, visualised as both 3D exaggerated terrain and as slope data
e. Aboriginal and European heritage data, including active native title claims and Indigenous Land Use Agreement (ILUA) boundaries
f. Freehold and crown land tenure and reserves established under the *Land Administration Act 1997*
g. Agricultural versatility derived from multiple sources of information, including Department of Primary Industries and Regional Development (DPIRD) datasets
h. Unexploded Ordinance (UXO) risk
i. Mines, mining, resource/mineral and basic raw materials data
j. Environmental data, including flood risk, environmental offset sites, carbon sequestration projects, contaminated land, Department of Biodiversity, Conservation and Attractions (DBCA) lands of interest, Threatened Ecological Communities (TECs), flora and fauna, native vegetation extent, surface acidity, groundwater sub-areas, geological systems & linear hydrography
k. Groundwater licence allocations
l. Environmental Protection Authority (EPA) referred significant proposals

Aerial imagery from Nearmap, Google Earth and Landgate was also used to georeference and spatially analyse plans and studies relevant to this project, including –

a. Geoscience Australia's hydrogen prospectivity scenarios and onshore wind speed/solar data
b. Oakajee Industrial Estate Structure Plan
c. Oakajee Narngulu Infrastructure Corridor
d. City of Greater Geraldton Local Planning Strategy Map
e. Greater Geraldton Structure Plan 2011
f. Wizard Peak Industrial Lands Study 1997 – East of Narngulu
g. Geraldton Regional Plan 1999

6.2 Industry Stakeholder Feedback

Our comprehensive assessment of spatial data was supplemented by engagement with key industry stakeholders to build a representative profile of the priorities and preferences underpinning their site identification and selection process for future projects in the City's broadacre farming area.

Due to the commercially sensitive nature of feedback received from industry stakeholders, their precise site-selection considerations cannot be disclosed for the purpose of this project. It is, however, confirmed that industry site-selection preferences for new industrial projects in the City predominantly include:

- Access to[33] established road and/or rail infrastructure capable of accommodating heavy and bulky freight (increasing with project scale-up), initially for import/export of goods and materials during construction and subsequently for operation/production and employee transport;
- Access to a high-pressure gas pipeline;
- Proximity to an established infrastructure/pipeline corridor capable of transmitting industry inputs and outputs from the industry production facility to Oakajee and/or the Port of Geraldton;
- Relatively flat, large landholdings in singular or small ownership, unencumbered by environmental and/or cultural constraints; and
- Proximity to significant renewable energy facilities and/or transmission infrastructure connecting to those facilities.

6.3 Multi-Criteria Analysis

Using the spatial data and industry stakeholder feedback, a comprehensive *capability* and *suitability* analysis was applied to identify unconstrained land that meets industry stakeholder site selection preferences. This two-stage analysis is illustrated in Figure 12.

A series of maps separating the data we analysed into key groups is included at Appendix 5 and is summarised in alphabetical order in Table 1.

6.3.1 Stage 1 – Land Capability

Stage 1 of this analysis assessed the *capability* of land in the City to accommodate future industrial, energy and resource projects by excluding all land comprised in the following:

a. Within a 1km distance from any Residential or Rural Residential zoned land
b. Environmental Conservation Reserves
c. Foreshore Reserves
d. Primary and Distributor Roads
e. Cadastral lots referenced as land_type = 'ROAD'
f. Any Native Vegetation greater than 10 Hectares

[33] For the purposes of this stakeholder feedback, "access to" means proximity to and the ability to access, connect into, and utilise the infrastructure stated.

g. Land registered as an environmental offset

h. Land with a greater than 3% risk of flood and where 30-50% or more has a risk of surface acidity pHCa <4.5

i. High Versatility Agricultural Land (HVAL) – Group A Greatest Versatility, Group B High Versatility and Group C Moderate Versatility (High Yield)

j. Registered Aboriginal Heritage Places (including lodged sites) and any future Yamatji landholdings referenced as batch_report = 'CAT 1', which are of particularly high cultural significance to the Yamatji Aboriginal Corporation

k. Significant geological supplies Basic Raw Materials (BRM)

l. Carbon Sequestration projects

6.3.2 Stage 2 – Land Suitability

Having regard to stakeholder site selection preferences, Stage 2 of this analysis examined the *suitability* of land identified in Stage 1 to accommodate future industrial, energy and resource projects. The criteria applied to determine land *suitability* included:

a. Land in freehold tenure and common or clustered ownership

b. Relevant interests in land, including easements, leases and reserves

c. Topographic data from multiple sources, including vertically exaggerated 3D models and slope data

d. Water, electricity and gas infrastructure, particularly the Dampier-Bunbury Natural Gas Pipeline (DBNGP) and Mid-west Pipelines

e. Proximity to established road and rail freight routes, particularly the RAV network, defined by a 5km-wide corridor on either side of these routes

f. Workforce accessibility for drive-in/drive-out construction and operations personnel, defined by a maximum 60km driving distance along existing roads from the edges of Geraldton and Mullewa.

6.3.3 Outcomes

This comprehensive two-stage analysis identified nine Investigation Areas which exhibit the highest *capability* and *suitability* for future industrial, energy and resource projects. While there is no expectation these areas will all be developed for new industrial, energy and resource projects, it is clear there is an abundance of land that could be put to those purposes throughout the City's broadacre farming region.

A detailed explanation of each Investigation Area is provided in Section 7 of this report.

Importantly, 'constrained' land that has been excluded from consideration through this analysis may still be targeted by proponents in future if:

- The constraints affecting that land can be overcome; or
- Those constraints do not impact the nature and scale of an individual project; or
- The proponent's site selection preferences substantially differ from those identified from stakeholder feedback through this study; or
- The physical/locational characteristics attracting a proponent to that land outweigh its identified constraints.

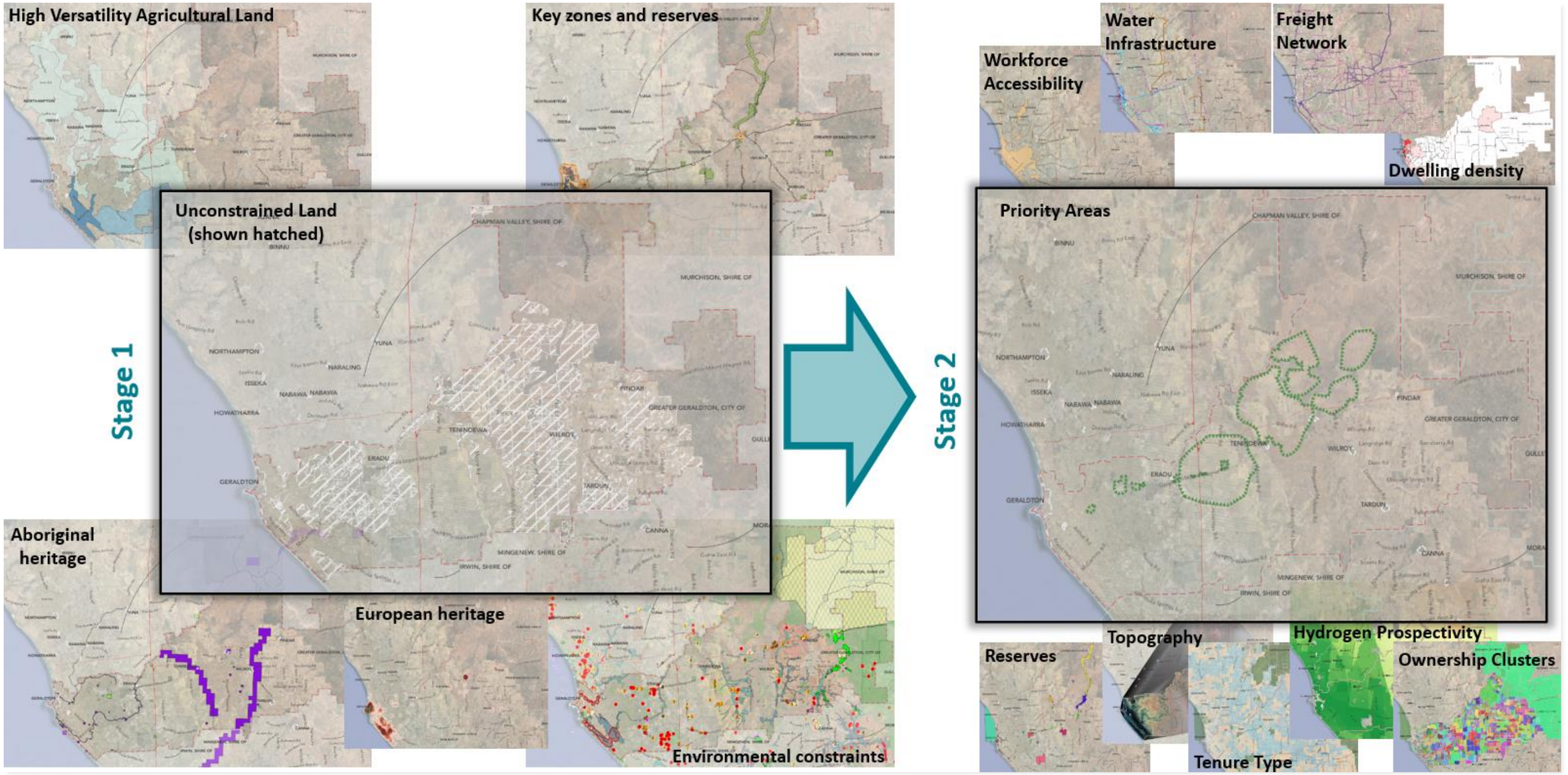


Figure 12 – Multi-Criteria Analysis

Table 1 – Multi-Criteria Analysis Summary

Map (Appendix 5)	Summary
Aboriginal Heritage Places and Native Title	This map includes all lodged and registered aboriginal cultural heritage places and Native title claims and determinations, including the Yamatji Native Title Determination, which covers much of the City's Local Government Area. A range of smaller and larger (typically linear hydrological features) are identified as constraints to avoid.
Dwellings Distribution	This map uses spatial ABS Census data from 2021 (G37) to visualise the distribution of dwellings across the City by locality. The use of localities ensures finer-grained representation of dwelling figures in areas with low density and shows very few dwellings in all areas outside of Geraldton, except for the Mullewa locality which has 118 dwellings as per the ABS dataset. Most of the other broadacre farming localities have in the order of 0 to 15 dwellings.
Electricity	This map includes established electricity infrastructure and forecast remaining capacity to 2030 for each substation area. The infrastructure includes overhead transmission powerlines and underground and overhead distribution networks. The map identifies areas with and without access to the distribution network, revealing that most of the area is serviced by the Rangeway substation, which is expected to have more than 30MVA of remaining capacity by 2030. Overall, the electricity network serving the study area is expected to have a supply capacity of ~24 – 28 MW by 2030. This is substantially below the energy requirements of large-scale electrolysers and 'green industries', which will typically require anywhere from 50 – 500MW each. While the distribution network is relatively accessible, the power capacity of that network will be inadequate to cater for future large-scale energy-intensive industries. To overcome this limitation, significant energy supply upgrades will be needed across the network and/or proponents will need to acquire or generate power from gas and/or renewable energy sources.
Environment	This map combines a range of relevant datasets including: • Flood Plain Management for a 1 in 100 (1%) Annual Exceedance Probability (AEP) event; • Environmental offsets register; • Carbon sequestration projects; • Contaminated sites register; • DBCA Lands of Interest; • Threatened Ecological Communities, Threatened and Priority Flora and Fauna; • Government sewerage policy buffers • Native vegetation extent (filtered to remove polygons of 10ha or less); • Flood risk; and • Surface acidity. The combined dataset, when overlayed together identifies land that is largely unaffected by environmental and flood risk constraints, and where significant clearing of vegetation would be required.
European Heritage	This map shows the distribution of places included on the City of Greater Geraldton's Local Heritage Inventory. Each place is shown as points with an underlying heatmap to show the concentration of heritage places, which are largely located in the townsites of Geraldton and Mullewa and southeast of Geraldton.
Freight	This map includes data from the Restricted Access Vehicle (RAV) Networks, primarily for Tri Drive and Tandem drive networks, and for overside road trains. The map illustrates RAV ratings using progressively darker colours that correspond with higher ratings. In other words, the darker the colour depicting the road the larger the vehicle size permitted on that road. The map also shows the oversized road train corridor from the Port of Geraldton along Geraldton Mount Magnet Road and the freight rail corridor, which diverts southeast at Mullewa. This data reveals areas along Geraldton Mount Magnet Road have excellent freight accessibility and that the RAV rating is highest north of this road from Eradu through to Old Pindar Road past Mullewa. The RAV Network in these areas is relatively good, meaning minimum upgrades and/or extensions to the network are necessary to facilitate green and other industries at scale. Areas closer to Geraldton, and south of Geraldton Mount Magnet Road do not benefit from a dense network of high RAV-rated roads, typically due to the topography of the area, which is a constraint in itself. Overall, this dataset indicates that areas north of Geraldton Mount Magnet Road between Eradu and Mullewa will be more attractive to industries that rely on high-rated RAV networks and access to freight rail for importing and exporting goods and materials.
Gold	This map identifies the significant gold ore resources in the region and depicts operational, proposed, undeveloped, care and maintenance and under-development gold mines in the Midwest.
High Versatility Agricultural Land	This map draws on the (now withdrawn) Department of Agriculture and Food's (now DPIRD) report entitled 'Identification of high-quality agricultural land in the Mid West Region: Stage 1 – Geraldton Planning Region'. The report is no longer publicly accessible because the water resource information (which relates to broader areas of the Midwest south of the City of Greater Geraldton) has been superseded by new hydrological studies and financial information (Cropping values) that affected the Agricultural Land Area (ALA) rankings in some areas. The datasets include high-level ranking of land into seven groups as follows: • Group A: Greatest Versality – Largest water resource, high rainfall and yields. • Group B: High Versality – Large to moderate water resources, high rainfall, moderate to high yields. • Group C: Moderate Versatility – High crop yields, some areas for potential for horticulture. • Group D: Moderate Versatility – Moderate or potential water resources, good rainfall, moderate to lower yields. • Group E: Lower Versatility – Potential to insignificant water resources, variable rainfall, moderate to low yields.

Map (Appendix 5)	Summary
	• Group F: Low Versatility – Limited to insignificant water resources, low rainfall and yields. • Group G: Limited Agricultural Potential. The map shows Groups A to C are prevalent in some areas of the City of Greater Geraldton, including between Eradu and Tenindewa and the south and immediately southeast of Narngulu. The majority of the City is shown as Group E or Group F, particularly in areas coinciding with high potential for wind generation. The analysis used Groups A to C, being higher yielding Agricultural Land Areas as a constraint, based on the 'farming first' principle of this Industrial Lands Study. However, some areas are identified for further investigation notwithstanding their high agricultural versatility due to their optimal location, significant size and otherwise unconstrained characteristics. This means that renewable energy projects and some industry types could potentially locate here, providing their activities will not compromise the agricultural productivity of the area more broadly.
Iron	This map shows operating, proposed, undeveloped and care and maintenance iron ore mines to the east and northeast of the City of Greater Geraldton. Iron ore resources from the Midwest are a significant export commodity for the Port of Geraldton, whose iron ore throughput currently exceeds 10mtpa.
Key Influences and Unconstrained Land	This map shows land that is relatively unconstrained when applying the methodology set out in Figure 12 and Section 7 of this report and the key influences that comprise a 5km buffer alongside railways, primary distributor roads and gas transmission infrastructure. The areas where these elements overlap are considered to be largely unconstrained for the purpose of this Study. The maps include several hotspots where analysis of unconstrained land against other spatial datasets revealed areas exhibiting multiple favourable characteristics for renewable energy and other industry projects. These hotspots were further refined into the nine Investigation Areas (IAs) discussed in Section 7 of this report.
Other Mining	This map showcases the variety of operational, proposed, undeveloped and care and maintenance mines (Other than Gold, Iron and Vanadium) in the Midwest, primarily to the east and north of the City of Greater Geraldton. The map demonstrates that the Midwest is one of the most mineral-rich and diverse regions in Western Australia.
Population at Home	Similarly to the Dwellings Distribution map, this map includes spatial ABS Data of Persons counted at home on Census night (G03) in 2021. Again, this map emphasises that population density is concentrated in Geraldton, followed by Mullewa and Tenindwa, which comprise 332 and 53 persons respectively. The remainder of the City's localities are very sparsely populated, which means that renewable energy and new industry projects could locate in these areas with little to no impact on the resident population
Slope	This map uses a conversion of contour topographical data to slope data to spatially analyse the likely impact of the City's significantly undulating landscape on renewable energy and other industrial projects that favour relatively flat ground for development. The slope gradient assumes that 0-3 degrees are ideal for development, 3 – 10 degrees may be suitable but require additional costs to manage, 10 – 15 degrees are challenging and subject to high costs to manage and more than 15 degrees of slope is generally too steep and not likely to be suitable.

Map (Appendix 5)	Summary
Tenure type	This map showcases the distribution of predominantly Company versus Private land ownership, along with Crown land. Underlying this map is a further analysis of the clustering of landholdings. For confidentiality, individual land ownership is not disclosed in this report. Tenure is a relevant consideration for this Study because multiple landholdings in single ownership provide an opportunity for renewable energy and new industrial projects and their associated buffers to be wholly contained within a lot(s) all in the same ownership, thus avoiding offsite impacts on neighbouring landowners. Among other things, this tenure mapping reveals that: • IA 6 comprises mostly large properties owned by relatively few landowners. • IA 7 is more fragmented, comprising smaller properties owned by a greater number of landowners. • IA 8 is almost wholly owned by a single entity, despite measuring some 27,927 hectares in size (almost 280km^2 or 69,000 acres).
Travel distance	The primary purpose of this map is to illustrate workforce accessibility. The map uses a 60km driving distance by road from the edges of Geraldton and Mullewa (at an assumed average of speed of 80km/h) to identify a reasonable worker commuting distance and duration. This analysis reveals that: • a worker living in Geraldton could travel as far as Tenindewa in about a 45-minute drive while a worker living in Mullewa could travel as far as far as Eradu in the same driving duration. • Investigation Area 6 will be accessible for a workforce living in either Geraldton or Mullewa. • Investigation Areas 1 – 5 will be more accessible to a workforce living in Geraldton, while Investigation Areas 7 – 9 will be more accessible to a workforce living in Mullewa.
Unexploded Ordinance Risk (UXO)	The UXO map uses spatial UXO risk data to analyse the potential impact of historical live firing military activities on the development of renewable energy and other industries within the City's broadacre farming region. UXO Risk is expressed as either substantial, slight or remote and typically relates to historical firing ranges/targets. The areas of highest risk are in Eradu South and further to the southwest. A vast area of land is identified as slight risk, extending from Mullewa and Pindar in the north to Tenindewa in the west and Mingenew in the south. For the purposes of this Study, UXO risks have broadly been treated as a constraint and avoided when defining the nine priority Investigation Areas. The exception to this is UXO Site No. 813 (Mingenew N E Armoured Infantry Field Firing Range) where there is some overlap with beneficial characteristics of the land. In any case, where a proposed development site is identified as a UXO risk area, site-specific surveys will need to be conducted to mitigate the UXO risk unless otherwise advised by the Commonwealth Department of Defence.
Vanadium – Titanium	This map includes operating, proposed, undeveloped and care and maintenance Vanadium – Titanium mines in the Midwest. The map highlights the considerable Vanadium Resource that is located east of the City of Greater Geraldton, with many proposed and approved (but undeveloped) vanadium mines. The Australian Vanadium concentrator (if approved and developed) may be a significant catalyst for the further development of these vanadium resources.

Map (Appendix 5)	Summary
	Locally produced Vanadium concentrate may lead to further downstream development and value-add for green steel in the Midwest and may also support locally produced Vanadium Redox Flow batteries to stabilise the electricity grid and accommodate increased renewable energy generation.
Groundwater availability	This map combines the spatial data for groundwater subareas and the Department of Water published licencing and remaining capacity for each of these areas. It establishes the availability of groundwater resources across the City of Greater Geraldton. Each sub-area and associated resources with a yearly allocation limit are included in a table along with the difference between the allocation and the aggregated quantity of groundwater extraction licences granted at the time (mid-2024). This analysis identifies there is ~14 million kL/yr available in the Gascoyne, Casuarina subareas (generally south of Geraldton Mount Magnet Road) and 6 million kL/Yr from various resources in the Gascoyne Yuna/Eradu subarea, which is generally north of Geraldton Mount Magnet Road. The subarea generally east of Mullewa in the Gascoyne, Bullewa/Byro Combined subarea has no allocation limit but has already licenced over 17 million kL/yr. The two sub-areas that comprise Geraldton and immediately east of Geraldton have a combined 10 million kL/yr of allocation remaining. While the region's groundwater supplies may support some construction and operational activities: • Large-scale industrial projects that rely on water at scale will require significantly more water than is available from available groundwater resources alone. • Large, water-intensive industries could monopolise the limited available groundwater resources, leading to inequitable access to water. • Without a desalination plant(s), the finite groundwater resources will be a significant constraint to the establishment of new industries in the region.
Water and sewer	This map includes all reticulated water and sewer infrastructure and pipes, including bores, tanks, pump stations, dams, treatment plants, both drinking and raw water pipes and sewer pressure mains and gravity pipes. The map depicts access to reticulated water throughout the City of Greater Geraldton and illustrates that reticulated water is generally only available in Geraldton, Mullewa and along Geraldton Mount Magnet Road. Raw water is available south of Mullewa and to the west and northeast of Eradu.
Yamatji Land	This map includes all landholdings included under the Yamatji Nations Indigenous Land Use Agreement (ILUA), which was registered with the National Native Title Tribunal on 30 July 2020. The ILUA includes a range of benefits for the Yamatji people and includes the transfer of ~14,000ha of freehold land and Management Orders over ~134,000ha of reserved land, including within the City of Greater Geraldton. While much of the Yamatji Land is located outside of the City and/or Investigation Areas identified by this Study, the ILUA does include significant landholdings in and around Mullewa. As such, the Yamatji people, as owners of significant freehold landholdings in and around Mullewa, could benefit economically from making its land available for new industries and the sale or lease of housing for a future Mullewa-based workforce servicing those industries.

7 INVESTIGATION AREAS

The ‘hotspots’ identified in the Key Influences and Unconstrained Land map (Appendix 5) were refined into the Priority Areas shown in Stage 2 of Figure 12. These were then further refined to more closely align with cadastral boundaries, resulting in the nine Investigation Areas (IAs) shown in Figure 13 and described in Table 2.

For each IA, Table 2 also nominates a ‘preference’ for renewable energy or new industrial projects, or both, based on the multi-criteria analysis discussed earlier. This does not mean these alternative land uses are preferable to existing farming activities, but rather denotes which of these alternate land uses would be preferred, based on the specific characteristics of each IA.

These nine IAs represent the geographic locations throughout the City’s broadacre farming region that exhibit multiple favourable characteristics which render them generally attractive to, suitable for, and capable of accommodating renewable energy projects and other new industries.

In total, these Investigation Areas cover a vast area of 110,000 Hectares (1,100km^2 or around 272,000 Acres) equating to around 8.7% of the entire City of Greater Geraldton.

Important qualifications to note when viewing these IAs are:

a. Land included within an IA has been assessed as being preferable and appropriate for the development of renewable energy projects and other new industries compared to land outside of the IAs. However, this does not mean proponents will only focus their attentions on land within IAs nor that they will exclude from consideration land that falls outside IAs.

b. The identification of land within an IA does not mean that land is de-constrained, de-risked and immediately available for renewable energy and other new industrial developments. Individual project proponents will need to address and overcome any site-specific limitations on a case-by-case basis.

c. Given the enormous amount of land identified across all Investigation Areas, this Study does not propose or recommend rezoning that land for industrial purposes, in keeping with the ‘Farming First’ and ‘Flexibility’ principles underpinning this Study and given that:

    - Renewable energy facilities are a permissible land use in the rural zone under the City’s Local Planning Scheme and can therefore be approved anywhere in that zone.

    - The WAPC’s Part 11B significant development pathway allows the Commission to approve eligible state or regionally significant developments despite any conflict with the local planning framework.

    - When considered necessary, a site-specific scheme amendment can be progressed on a case-by-case basis to rezone land to accommodate a proposed renewable energy project or other new industrial development.

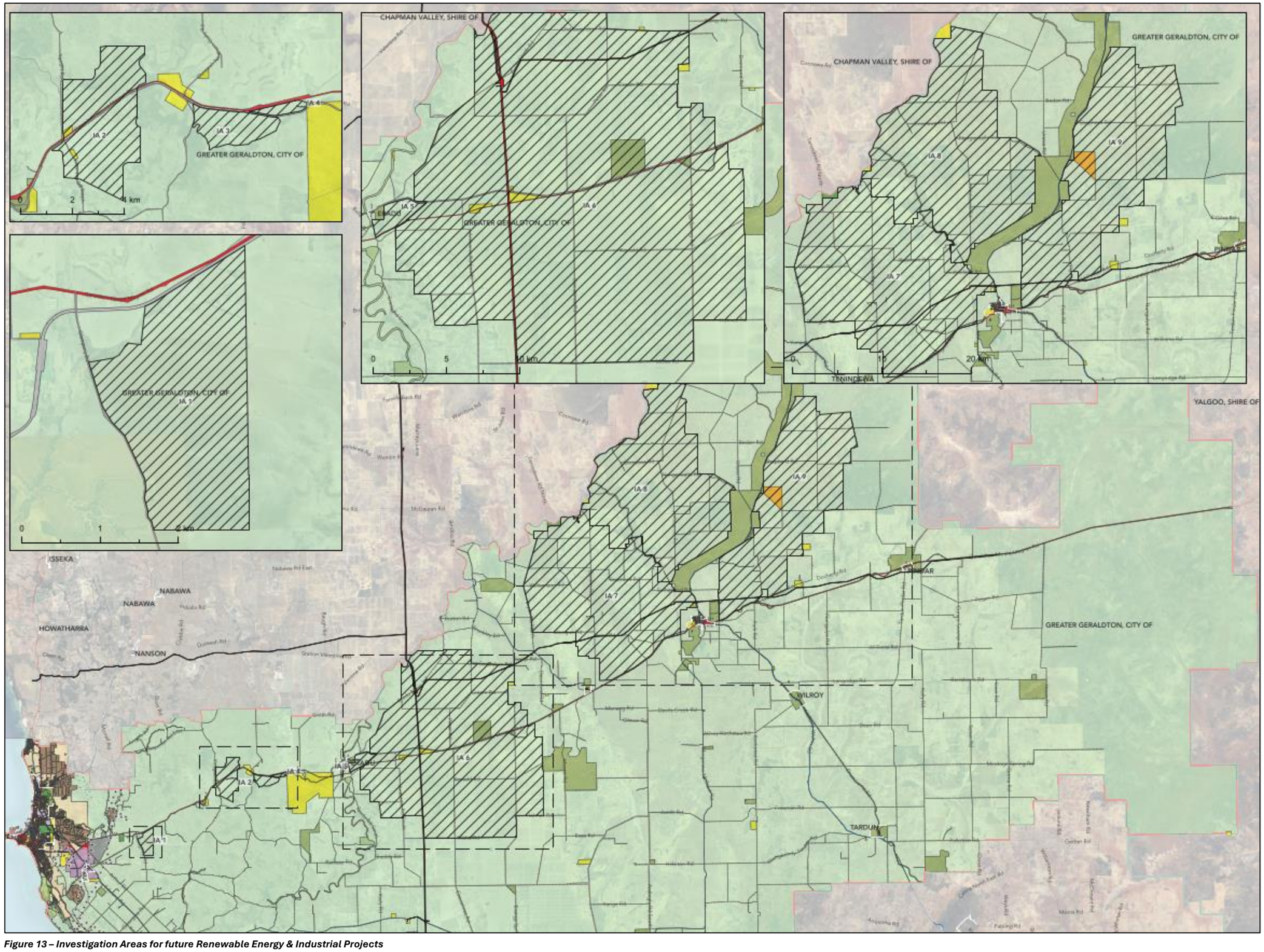


Figure 13 – Investigation Areas for future Renewable Energy & Industrial Projects

Table 2 – Description of Investigation Areas

Name	Area	Preference	Description
IA 1	489 Ha	Industry	Moonyoonooka IA 1 comprises a single property, Lot 100 Glengarry Road, located adjacent the Geraldton-Mullewa Freight Railway and near Geraldton-Mount Magnet Road. The property slopes gently down from east to west, is less than 10km from the edge of Geraldton, and enjoys excellent access to Geraldton's workforce, power and water. While the property is remote from the DBNGP, it is only 5km north of the distribution main that services Geraldton, which may be feasible to connect to if a project is reliant on gas supply. An example of this would be a green steel production facility, whose only emission would be water vapour if hydrogen is used as a reagent. The property is large enough to accommodate a range of renewable energy and industrial activities, or transport and logistics-oriented development, with buffer distances capable of being largely contained on-site or located in such a way as to not have any impact on nearby sensitive receptors.
IA 2	1,306 Ha	Industry	Kojarena IA 2 is a relatively unconstrained collection of 12 large lots held in freehold by only seven landowners, two of whom own most of the land as a cluster of landholdings. The land is relatively flat within a very undulating context. There is access to power and water and good access to transport and Geraldton's workforce. Desktop assessment indicates there are only two dwellings within IA 2 and, given their location, it would be possible to accommodate industrial activities in in this area, without impacting sensitive receptors.
IA 3	355 Ha	Industry	Tibradden IA 3 comprises an unconstrained portion of Lot 3 Northern Gully Road, which is cleared of native vegetation, relatively flat and large enough to contain external impacts within its boundaries. It is well located adjacent to the Geraldton-Mullewa Freight Railway and near Geraldton-Mount Magnet Road with good access to Geraldton's workforce. Power and transport are readily accessible, although the area is not serviced by any reticulated water supply.
IA 4	68 Ha	Industry	Wicherina IA 4 comprises the whole of Lot 9677 Geraldton-Mount Magnet Road. The property is flat, almost entirely cleared of native vegetation, long, narrow (approximately 400m at its widest point), and uniquely positioned between the Geraldton-Mullewa Freight Railway and Geraldton-Mount Magnet Road. Power is available, although there is no reticulated water supply. A dwelling exists on the property and would be deemed a sensitive receptor to any future industrial activity on site. The size, shape and location of the property make it ideally suited to low-impact industrial activities or transport and logistics-oriented development. Land uses such as stockpiling, transport depot and warehouse/storage are all already permissible in the rural zone under the City's Local Planning Scheme.
IA 5	423 Ha	Industry	Eradu / Ambania IA 5 is a large, relatively flat, unconstrained area ideally positioned between the Geraldton-Mullewa Freight Railway to the north and Geraldton-Mount Magnet Road to the south. The area comprises only two properties, being Lot 15 Eradu North Road, Eradu and the western portion of Lot 7 Geraldton-Mount Magnet Road, Ambania. This area has access to water and power, good transport links, and is located less than 50km by road from the edge of Geraldton, making it within commuting range for a Geraldton-based workforce. The DBNGP is located approximately 5km to the east, so if there is a significant energy requirement it may be feasible to connect into this pipeline for gas supply. Some native vegetation and environmental features are present on Lot 15 and would need to be protected from future development impacts, however, there is still ample scope for a variety of industrial and transport and logistics-oriented activities to occur in this IA 5. Stockpiling, transport depot and warehouse/storage are all already permissible uses in the rural zone, but industry is not permitted. The City's Local Planning Strategy identifies Eradu is as a suitable location for future industry in the City.
IA 6	44,256 Ha	Renewable Energy / Industry	Eradu / Eradu South / Ambania / Tenindewa / West Casuarinas Covering more than 442km^2, IA 6 is the largest of the Investigation Areas and comprises 78 properties distributed amongst only 26 landowners. The area is relatively flat and benefits from excellent transport access, including the Geraldton-Mullewa Freight Railway and high RAV-rated road networks, particularly in the northern half. The precinct is traversed by the DBNGP (see Figure 14) and MidWest Pipeline, providing access to energy at scale. The precinct is also serviced by an established pipeline corridor to Oakajee, so access to desalinated water at scale is possible, as is the transfer of gas and/or liquids to Oakajee by pipeline, rather than by road and/or rail. Additionally, the precinct has good access to a local workforce, being around a 45-minute drive from Geraldton. This precinct is ideally suited to large-scale renewable energy generation, which is a permitted land use in the rural zone under the City's Local Planning Scheme. 'Green' and resource-processing industries could also be accommodated where they do not unduly compromise existing agricultural operations, taking advantage of the location and infrastructure characteristics of this area; however, the City's Scheme does not currently permit industrial land uses in the rural zone.

Name	Area	Preference	Description
IA 7	28,877Ha	Renewable Energy	Tenindewa / Nunierra / Mullewa IA 7 is the second-largest Investigation Area and is characterised by a gently undulating landscape to the west of Mullewa. The 176 properties contained in the precinct are held by only 27 landowners, many of which are in clustered ownership, allowing future development and their related buffers to be contained in either the same property or same ownership. This is advantageous for avoiding land use conflicts and offsite impacts on neighbouring landowners. The precinct is relatively unconstrained, other than some identified areas of native vegetation and flood risk that may need to be avoided. The precinct is around a 1-hour drive from Geraldton, which could affect its attractiveness for daily workforce commuting from Geraldton. However, the precinct's proximity to Mullewa could promote a Mullewa-based workforce and stimulate local population growth. IA 7 has reasonable access to power and good access to high RAV-rated roads. Water is available along Geraldton Mount Magnet Road and from groundwater supplies.
IA 8	27,927 Ha	Renewable Energy / Industry	Nunierra / Mullewa IA 8 is unique from other Investigation Areas because it is the third largest in land area and comprises 63 individual properties in the ownership of a single entity, meaning the impacts and buffers of a range of large-scale renewable energy and industrial activities could be contained within a single landholding. This IA exhibits relatively flat terrain, with some vegetated areas needing to be protected from development and/or subject to clearing approval. The precinct is near an existing airstrip and has access to freight routes, and electricity supply to its southern and northeastern edges. There is no reticulated water, although groundwater is available. Due to the precinct's remoteness from Geraldton, any future developments in IA 8 may need to rely on a drive-in/drive-out rostered workforce from Geraldton or local workforce commuting from Mullewa.
IA 9	24,173 Ha	Renewable Energy	Nunierra / Mullewa IA 9 comprises generally flat terrain across 63 individual properties held by only 5 landowners. The Wandanooka Indigenous Community is contained within this precinct, representing an ideal opportunity for proponents to incorporate partnering, capacity building and economic value-adding with traditional owners in future developments. The precinct has good freight access, although as in the case of IA 8, its remoteness from Geraldton may influence workforce practices and distribution and may need to rely on a local workforce based in Mullewa. Power is generally accessible and although there is no reticulated water, groundwater may be available subject to licence allocation availability. IA 9 is largely unconstrained except for some native vegetation and risk of surface acidity on the eastern edge. Renewable energy facilities, stockpiling, transport depots and warehousing/storage are already permissible land uses in this area under the City's Planning Scheme, but Industry is not a permitted use.

Figure 14 – Drone Imagery of IA 6 showing approximate alignment of DBNGP

8 ENGAGEMENT

Two distinct engagement approaches have underpinned and informed this Study – consultation with a sample of proponents and key stakeholders, and engagement with all landowners within and adjacent to the identified Investigation Areas.

8.1 Proponents & Other Stakeholders

The first phase of engagement involved one-on-one conversations with key stakeholders, including industry proponents, the Yamatji Southern Regional Corporation (YSRC) and the Mid West Ports Authority. These conversations sought to understand stakeholders' issues, opportunities, constraints and aspirations in respect of future renewable energy and industrial projects in the City's broadacre farming region.

This feedback identified four considerations common to all stakeholders:

- **Land** – Location, size, tenure and physical characteristics.
- **Logistics** – Establishing a reliable supply chain network to efficiently transfer large volumes of materials, bulky goods and personnel intra-regionally, for import, export, construction, processing and value-adding purposes.
- **Infrastructure** – Capacity and deficiency of enabling infrastructure to meet anticipated demand.
- **Impacts** – Understanding and managing the impacts and unintended consequences of renewable energy and industrial projects in the broadacre farming region.

In every respect, "scale" was the key theme identified by stakeholders, in respect to the vastness of the City's broadacre farming area and its enormous potential to accommodate renewable energy and industrial projects at scale, and the unprecedented but not well understood magnitude of projects that could be attracted to the area, now and in future.

Subject-specific issues raised by stakeholders are outlined below.

8.1.1 Energy

The proposed Western Green Energy Hub (WGEH) on the southeast coast of Western Australia was raised as an example of the nature and scale of projects that could potentially locate in the City's broadacre farming area. The WGEH is envisioned as the world's largest renewable energy project, spanning more than 10,000 square kilometres and comprising:

- 25 million solar panels and 3,000 wind turbines generating 50 GW of energy.
- Production of 3.5 million tonnes of green hydrogen and 20 million tonnes of green ammonia annually.
- Marine loading/offloading facilities.
- Workers accommodation.

While the WGEH is much larger in size than could be accommodated in the City of Greater Geraldton, it illustrates the different types of energy projects that might be needed to power new and emerging industries in the City.

Stakeholders consulted through this Study identified local energy production, and electricity particularly, as a key consideration because:

- The SWIS has limited capacity to cater for the growing needs of emerging and energy-intensive industries[34].
- The City's broadacre farming region possesses the ideal climatic and other conditions for renewable energy generation[35], together with ideal physical characteristics that will continue to attract emerging industries.
- The energy needs of emerging industries will need to be met by on-site or project-specific energy generation, off-take agreements with local or intra-regional renewable energy facilities, electricity supply from the SWIS, or a combination of these.
- Electricity off-take agreements with new industries and improvements to the physical network and economic structure of the SWIS will support the significant investment needed to produce renewable energy at scale in the region.

With these considerations in mind, stakeholders suggested that in the short-term, emerging industrial projects would likely prioritise proximity and connection to natural gas transmission pipelines as a fuel for electricity generation, pending the growth and maturation of accessible renewable energy at scale in the region, and/or increased capacity in the SWIS to power future industries.

8.1.2 Water

There is increasing concern around the availability of water at scale in the region.

Whilst groundwater resources might cater for some new projects in the short-term, concerns were raised that these supplies could be exhausted by allocation on a 'first in – first served' basis. Stakeholders therefore identified the need for large-scale desalination to deliver sufficient water for emerging industries and water-intensive projects, such as hydrogen electrolysis.

Securing the region's water future through desalination will bring the added benefit of enabling agricultural diversification in the dryland farming region. A successful example of this is the YSRC's Yamatji Fresh Produce venture.

Given the importance of water as a key input to most industries and value-adding processes, stakeholders expressed a need for greater strategic and economic attention to be given to this issue, and a preparedness to contribute to finding solutions.

8.1.3 Transport

Road and rail networks and port facilities were cited as critical ingredients to the success of any energy or industrial project in the City's broad acre farming region. Improving the capacity of this infrastructure will allow larger volumes and sizes of goods to be more safely and efficiently transport throughout the region, will unlock more land for alternative uses, and will ultimately increase the City's economic output. Doing so will also deliver improved export and supply networks to support continued broadacre farming in the region.

Stakeholders indicated that, until road, rail and port networks are broadly upgraded, proponents will seek to locate their projects near existing RAV-rated roads, rail and pipeline corridors to access materials and export markets.

[34] The 2023 SWIS Demand Assessment (here) identified that meeting the anticipated level of demand over the next 20 years would require almost 10 times the amount of generation capacity currently on the SWIS.

[35] Evidenced by Australian National University's heatmaps for the best solar and wind generation potential in Australia (here), particularly coinciding with Investigation Areas 6, 7 and 8..

It was also noted that investing in shared transport infrastructure would provide mutual benefit to project proponent's, particularly in the form of common-user rail and pipeline infrastructure, intermodal/assembly/laydown areas, and upgrading the existing Geraldton-Mullewa railway from narrow to standard gauge, taking advantage of gauge upgradeable concrete sleepers along the route (see Figure 15).

Figure 15 – Gauge Upgradable Concrete Sleepers (Geraldton-Mullewa Railway)

8.1.4 Land Characteristics

Stakeholders acknowledged that while there is more than 1,000 hectares of industrial land in Narngulu, it does not have sufficient access to electricity or water supply for large-scale industrial production and is compromised by its proximity to Rural Residential land to the south, Geraldton's urban front to the west and the nearby Geraldton airport with its associated Obstacle Limitation Surface (OLS).

It was also observed that the Industrial-zoned land is relatively fragmented, on lots that are too small to singularly accommodate projects that require a substantial buffer zone, with key properties seen to be 'locked-up' or 'land-banked' in common ownership, thereby increasing the cost of land that is available elsewhere in Narngulu.

For these reasons, stakeholders indicated that project proponents were instead drawn to larger, more affordable, less constrained Rural-zoned land exhibiting the following key characteristics:

- Properties generally 50 – 250 ha in size for industrial projects and land or leasehold spanning several hundreds or thousands of hectares for renewable energy projects.
- Proximity to current or future renewable energy projects.
- Proximity to high RAV-rated roads.
- Proximity to rail.
- Proximity to natural gas transmission pipelines (DBNGP & Midwest Pipeline).
- Largely unconstrained by environmental, heritage, flood, surface acidity, excessive land gradient constraints.
- Access to workforce, existing and future infrastructure corridors and points of export and import.

8.1.5 Infrastructure Upgrades

Stakeholders identified the following infrastructure upgrades as a vital catalyst to realising the City's potential for renewable energy generation and emerging industry projects:

- Upgrades to Geraldton Port to facilitate the safe export of ammonia.
- Upgrades and improved maintenance of Geraldton – Mount Magnet Road.
- Single Point Mooring facility at Oakajee.
- Large-scale desalination plant(s) located to take advantage of the established inland pipeline corridor.
- First point of entry approval for Geraldton and Oakajee Ports.
- In the longer-term, development of a breakwater port at Oakajee;
- Electricity transmission infrastructure upgrades to support large-scale renewable energy projects (>10GW).
- Transmission pipelines to efficiently move water, natural gas, slurry, hydrogen, ammonia and other such substances at scale.
- Intermodal, logistics, laydown and assembly facilities.
- Conversion of Geraldton – Mullewa railway line to standard gauge.
- Large-scale grid energy storage, in the form of lithium ion and redox flow batteries, or pumped hydro systems.

8.1.6 Interdependencies

Stakeholders observed the relationships that exist between renewable energy projects and new industries in the broadacre farming region but expressed a need to guard against these synergies becoming dependencies. It was observed that interdependency risks could arise when multiple infrastructure elements or systems rely, largely or exclusively, on each other to function effectively. Examples of this could include:

- ***Water Supply and Hydrogen Production***

  Hydrogen electrolysis requires significant quantities of water, so a delay in desalination plant construction or water pipeline delivery would delay hydrogen production.

- ***Energy Supply and Industrial Operations***

  Green hydrogen production, ammonia synthesis, or other green industries require massive, uninterrupted electricity supplies. Delays in transmission infrastructure upgrades and renewable energy generation would therefore impact the feasibility of starting and sustaining these new industries.

- ***Export Facilities and Production Timelines***

  New industries producing green hydrogen, ammonia, and other export products will both rely on and justify investment in new and upgraded port facilities. Delays in upgrading Geraldton Port or developing a single point mooring (SPM) facility at Oakajee will undermine the region's appeal as a major production and export hub for these new commodities and may impact production timelines and the feasibility of new projects. Therefore, it may be strategically necessary to invest in port infrastructure before, not once, new industries commit to establishing in the region.

- ***Transport Networks and Material Supply***

  As with upgrades to the region's port facilities, new industries in the City's broadacre farming area will rely on the road and rail networks to transport construction material, plant/equipment, workers and commodities/products within and beyond the region. These industries will justify and necessitate upgrades to the region's road and rail networks. These upgrades should be strategically targeted and timed to both precede and facilitate new industrial projects, because doing so will benefit the region's agricultural producers while also strengthening the City's economic appeal for new industries.

- ***Renewable Energy Generation and Grid Connection***

  Large-scale renewable energy projects depend on and support investment in robust transmission networks, to deliver power to industrial users, export hubs, and to feed power back to the grid. However, there is a risk that planned transmission network upgrades will be outpaced by and misaligned to development of renewable energy projects within the region, and that the ultimate planned network capacity may still be a barrier to realising the City's full energy and production potential.

- ***Shared Infrastructure and Coordination***

  Stakeholders identified the opportunity for shared infrastructure – such as pipelines, transmission lines, and intermodal facilities – to support multiple projects, however, a lack of planning, coordination and variations in project timelines will impede the likelihood of realising this opportunity, lead to project inefficiencies, and duplicated costs and infrastructure.

It is clear from stakeholder feedback that water, power, transport, and export facilities are tightly interconnected elements of the 'ecosystem' needed to support new resource, industrial and renewable energy projects in the City. Disruption or delays to any one of these elements can have cascading effects on other elements, in turn impacting the viability of new projects and the appeal of the City to accommodate those projects.

There are, however, a range of strategies which can be deployed to manage these interdependency risks, including:

1. Phased Development Plans – Develop infrastructure in phases to match the growing needs and timelines of new projects. For example, start with smaller desalination plants or interim energy solutions that can scale over time.
2. Diversified Systems – Build redundancy into critical systems (e.g. dual water pipelines, and backup power generation) to reduce exposure to a single point of failure.
3. Centralised Coordination – Establish a reference group of key stakeholders to map and align timelines and priorities for public infrastructure upgrades and private sector projects.
4. Priority Infrastructure Development – Define, scope and cost priority infrastructure elements (e.g. desalination, and renewable energy transmission networks) and fast-track their development.
5. Contingency Planning – Develop contingency plans for critical delays in priority infrastructure development, such as sourcing temporary water supplies, using portable power solutions, or implementing interim export facilities.
6. Collaborative Funding Models – Encourage public-private partnerships to share costs and risks for priority infrastructure, particularly where the need for upgrades is generated by new projects. For example, multiple proponents could co-invest in a desalination plant or transmission line.
7. Scenario Testing and Risk Mapping – Use scenario planning to identify the potential cascading effects of delays in infrastructure investment and develop mitigation strategies. Scenario questions could include – What if the desalination plant is delayed by 12 months? And what if the Oakajee Breakwater Port is delayed by five years?
8. Clear Agreements and Timelines – Promote formal agreements between stakeholders to ensure shared infrastructure is delivered on time to an agreed scope and standard.
9. Distributed Infrastructure Development – Where possible, avoid concentrating infrastructure in one geographical location or to service one stream of industry, and instead pursue a decentralised model characterised by smaller, staged and scalable infrastructure investments for wider spread infrastructure resilience.

8.2 Landowner Engagement

Following our conversations with key stakeholders and refinement of Investigation Areas (IAs), we partnered with the City of Greater Geraldton to conduct meaningful, human-centred engagement with landowners whose agricultural properties fall within the Industrial Lands Study Area, extending from Moonyoonooka and Bringo in the west to Mullewa and Nunierra in the east.

The purpose of this engagement was to share our preliminary findings and examine the following questions together with landowners –

- Why the City's broadacre farming region is so attractive to emerging 'green industries', resource processing, and renewable energy projects?
- How landowners feel about the possibility of large-scale industrial and energy projects locating in the broadacre farming region?
- What controls and conditions landowners would like to see introduced if industrial and energy projects were to develop in the region in future?
- Which parts of the region might be appropriate or inappropriate for future industrial and energy projects, and why?
- How can the City protect the interests of affected landowners while planning and preparing for the prospect of these new industries establishing in the farming region?

Tools and techniques used in this engagement are discussed below and included – establishing a dedicated project page on the City's website, sending an introductory letter to all landowners accompanied by answers to Frequently Asked Questions (FAQs), holding a landowner information session in Moonyoonooka facilitated by LK Advisory, distributing a follow-up questionnaire to all landowners, and nominating a dedicated City contact for ongoing one-on-one landowner conversations about the project.

8.3 Landowner Information Session

In September 2024, the City and LK Advisory (LKA) hosted a landowner information session, opened and attended by Mayor Jerry Clune and various staff, including the City's Director of Development Services, Manager City Growth, and Coordinator Strategic Planning.

This session generated deep and diverse discussion with landowners and provided vital insights into the sentiments, apprehensions and aspirations of the City's farming community regarding the changes facing the region in future. Key issues and themes raised in these discussions are summarised in Table 3 with our corresponding comments and observations about how these issues could be addressed.

Table 3 – Landowner Information Session Summary

Issue/Theme	LKA Comment
1. Concern was raised about the impact (particularly visual) of the upgraded and expansive power infrastructure/network needed to service future industrial projects in the area.	The alignment of high impact infrastructure corridors should consider visual amenity and the importance of preserving the region's scenic landscape.
2. Landowners questioned what value or benefit new projects, such as energy production, resource extraction and processing, would provide to the local community. Past experiences were cited of "empty promises" from mining proponents, leading to scepticism and mistrust that future industries would be held to account to deliver tangible and lasting benefits to the community. A shared view was expressed that community benefits need to be genuine, meaningful, lasting and provide a measurable improvement to the lives of the community.	Further, targeted engagement is needed to understand the community's expectations and desires for the benefits that future industrial projects should bring to the region. Community needs should be clearly established so that a clear position can be developed on the benefits that different projects need to deliver, commensurate with their scale, value and impact. This work can underpin the City's response to future projects, in terms of the information to be provided up-front, the decision to be made, and the conditions to be imposed if approval is granted.
3. Landowners were concerned that new projects would monopolise scarce water allocations. Water reuse/recycling and desalination were identified as a possible solution, but these were likely to be cost-prohibitive and time consuming to deliver at the scale needed to service future industrial projects throughout the broadacre farming region.	Further work should be done to define the City's role and influence in this matter. Details of water consumption and provision should be required for all industrial project applications.
4. To have confidence in the environmental studies that accompany these proposals, they need to be based on rigorous on-ground assessment. The City's broadacre farming region is attractive to these industries due to the amount of cleared land and limited environmental features/constraints.	The City should prescribe the minimum standard of information to be provided for industrial projects in its agricultural region. These could include requirements for environmental assessments to be justified by comprehensive on-ground inspections. The City should also consider engaging external experts to peer review different elements of these projects if it does not have the capability or capacity to do so in-house. In this regard, consideration could be given to invoking the provisions of Regulation 49 of the *Planning and Development Regulations 2009* and Section 261(2)(d) of the *Planning and Development Act 2005* to recover any expenses incurred by the City to assist in its decision-making processes.

Issue/Theme	LKA Comment
5. Engagement approaches taken by industrial proponents were heavily criticised for being divisive, individualistic, selective, and misrepresenting a landowner's quiet consideration of a proposal as equating to their consent or consensus. Landowners also questioned what it looks like to be a good neighbour? The example was raised that one landowner might be willing to lease or sell their land for an industrial project, without considering or caring about the impact of that project on their neighbours.	The City should prescribe the minimum standard of information to be provided for industrial projects in its agricultural region, including pre-lodgement landowner engagement[36], broad scale 'landscape, agriculture and amenity impact assessment', and identification of sensitive premises over a broader geographical range than just the project site and its immediate periphery. The City should also consider producing a guide[37] for landowners if they are approached by project proponents, outlining their rights and entitlements, along with the information they should be asking for and questions they should raise, so they can make informed choices.
6. Sentiment varies greatly on whether and why some landowners are opposed to future industrial projects locating in the agricultural region, while others are not. Reasons raised at the session included adverse visual impacts and loss of productive agricultural land contributing to reduced food availability.	These sentiments are examined in more detail through the landowner survey responses.
7. Landowners expressed concern with the standard of roads throughout the region and their inadequacy to cater for the vehicles associated with future industrial projects. It was stated that upgrading these roads should be a pre-requisite to industrial development occurring not a condition or consequence of those developments.	The City should exchange road asset condition data with MRWA to determine the suitability of key roads in the network to accommodate the vehicular traffic (construction and operational) likely to be generated by future industrial projects. This will enable the City and MRWA to define priority road projects that future industries could contribute to.
8. Related to 5 above, there is concern around the lack of disclosure by proponents about which landowners they are engaging with and their reasons for doing so. This is causing fear, mistrust and suspicion in the community that proponents could be 'shopping around' for landowner consent to secure project sites of least resistance.	The City is well placed to provide information, education and engagement to build confidence and cohesiveness in its farming community; noting, however that landowners will each have their own motives, preferences, priorities and life circumstances driving their actions and behaviours in relation to these projects.

The landowner information session revealed that the City's current local planning framework does not provide sufficient instruction to proponents, clarity for landowners, or standards for development to address important factors such as – consultation and pre-lodgement requirements, development permissibility/desirability, development separation distances, visual and landscape impact assessment, environmental protection, community benefits, and water use.

[36] A useful example of standards for proponent engagement is available here – Yamatji Marlpa Aboriginal Corporation (YMAC) *Best Practice Standards for Projects on Country*.

[37] An example of a landowner guide is available here – Shire of Narrogin *Negotiating with Renewable Energy Developers – Fact Sheet for Landholders*.

8.4 Landowner Survey

Following the landowner information session, a survey was distributed to all landowners within the Study Area, building upon the key themes raised at the landowner information session and through other channels with the City directly. In total, 22 survey responses were received, representing a significant proportion of the identified Investigation Areas, with many individual responses accounting for multiple landholdings under single ownership.

The key themes explored through the survey and landowner responses received are discussed below.

8.4.1 Information and Awareness

The survey examined landowner awareness of industrial and energy projects being contemplated in the City's broadacre farming region. This revealed that landowners were generally divided on how aware and informed they felt in respect of these new projects, as illustrated in Figure 16.

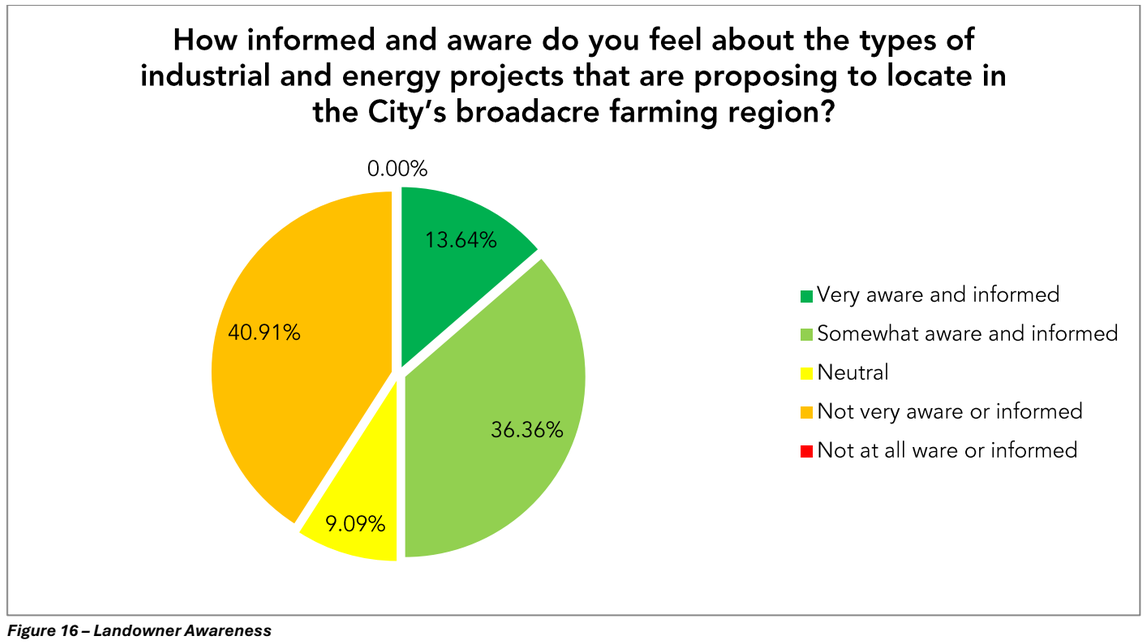


Figure 16 – Landowner Awareness

The survey then sought to understand whether the level of landowner awareness and information correlated with different project types, leading to the following observations (illustrated in Figure 17):

a. High Awareness of Renewable Energy Projects

   The most recognised project type is Renewable Energy Production (Wind and Solar), with landowner awareness of these projects exceeding 90%. This suggests that renewable energy is a dominant topic in the respondents' knowledge base and is likely a result of word of mouth, direct engagement with renewable energy providers, local media, and visibility of these projects in the physical landscape (see Figure 18).

b. Moderate Awareness of Mining and Processing Projects

   Survey respondents indicated a moderate awareness of mining/resource extraction, and processing/production of resources, minerals and chemicals. This awareness likely stems from the proposed Australian Vanadium Limited (AVL) Project which has been the subject of extensive media attention and community comment. Mining is also a prominent industry in the region and awareness of this is likely high due to the long tradition of this industry class in the Mid West and direct community exposure to heavy freight traffic carrying iron ore on key transport routes and in stockpiles at Geraqldton Port.

c. Limited Awareness of Other Project Types

   - Telecommunications Infrastructure and Transport, Storage, and Logistics have moderate awareness levels, likely reflecting their prevalence in the region.
   - Workforce Accommodation has lower recognition, likely due to it being more industry specific and typically associated with discreet projects.
   - Waste Processing has the least awareness, suggesting a lower prevalence and level of community knowledge than other industry types.

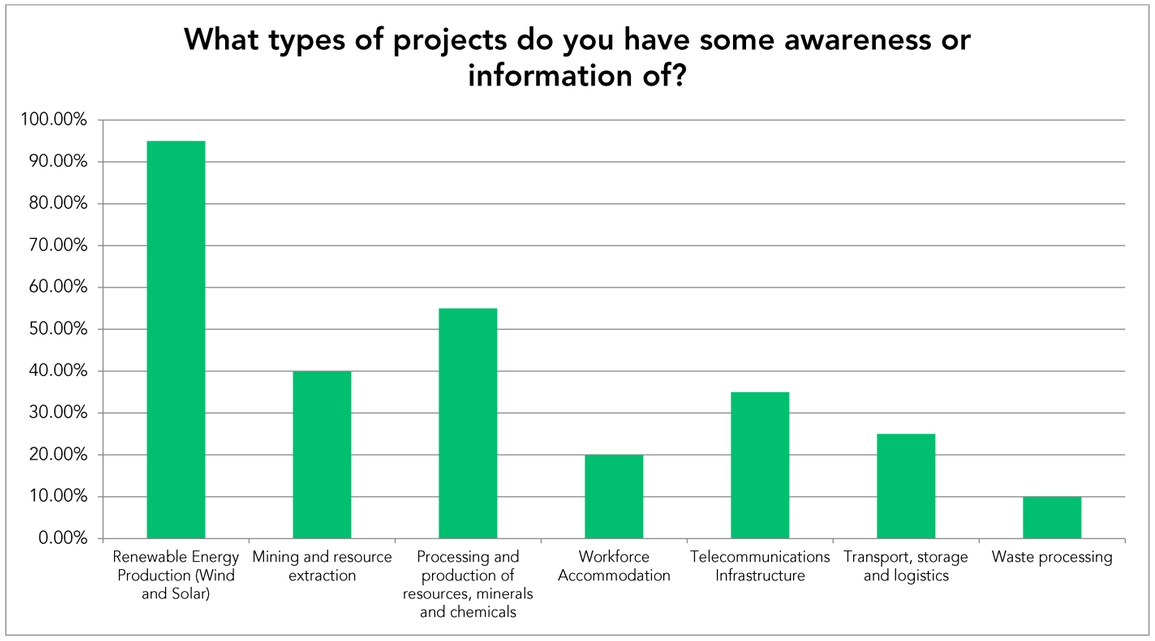


Figure 17 – Project Type Awareness

Landowner feedback, both in the survey as shown in Figure 18 and in more direct engagement highlighted the important role played the City of Greater Geraldton as a source of truth and wayfinding for community awareness and information.

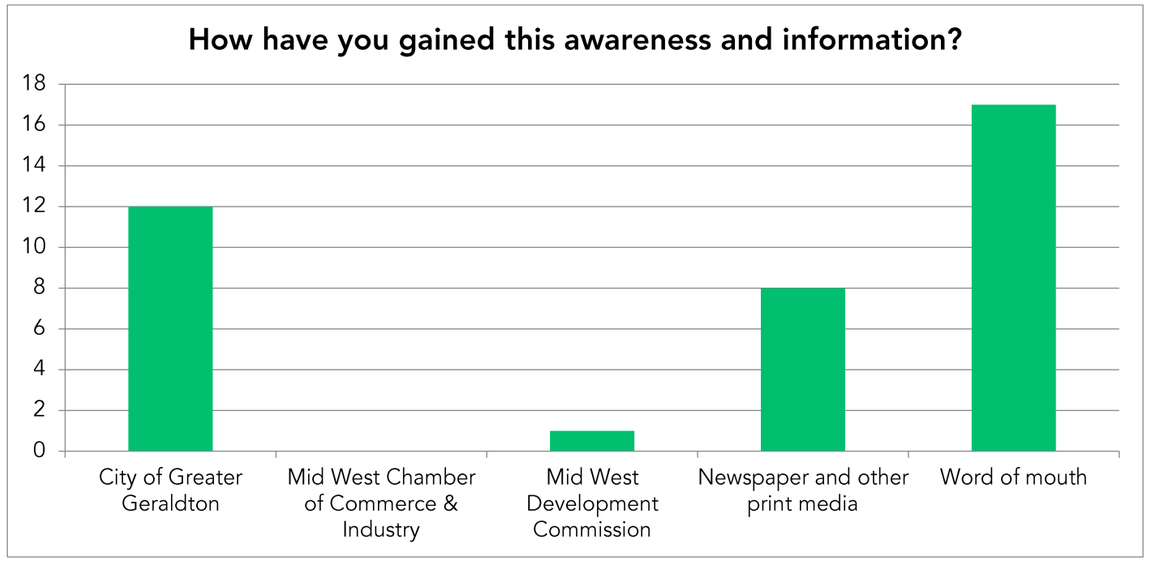


Figure 18 – Industrial and Energy Project Awareness Questionnaire

8.4.2 Support and Opposition

The survey directly examined the level of support or opposition to industry and energy projects located in the City's broadacre farming region. Responses were very balanced with 27% indicating a neutral position and a small majority being more supportive than more opposed to those activities, as shown in Figure 19.

Importantly, the survey design deliberately offered a "neutral/it depends" selection, allowing subsequent questions and discussions to examine "it depends on what?" and explore what circumstances and conditions would influence respondents to more directly express support or opposition to a project.

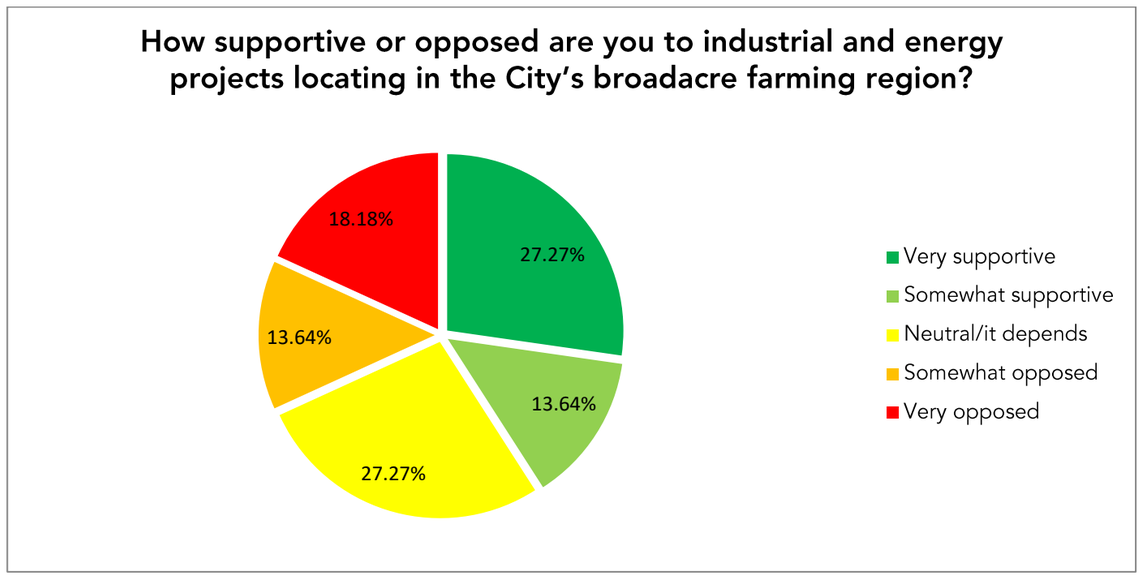


Figure 19 - Support level for Industry and Energy Projects

The bar chart in Figure 20 illustrates the levels of support and opposition that respondents raised towards different industrial and energy projects, revealing how different projects are perceived based on the responses in Figure 19. These findings are summarised below –

a. High Support for Renewable Energy and Telecommunications Infrastructure

- *Renewable Energy Production (Wind and Solar)* received the strongest support, aligning with broader government and societal trends which favour sustainable energy solutions.
- *Telecommunications Infrastructure* also enjoys high support, likely due to its necessity for regional development, commerce and connectivity.
- *Transport, Storage, and Logistics* also received high support, likely in recognition of the essential role these activities play in the supply chain network for the transit of goods, equipment and services within and beyond the region – including agricultural commodities.

b. Mixed Views on Mining, Processing, and Workforce Accommodation

- *Mining and Resource Extraction* and *Processing and Production of Resources, Minerals, and Chemicals* and *Workforce Accommodation* show a more balanced split between support and opposition. While some respondents view these industries as essential for economic growth, others expressed concern about environmental, amenity and land-use impacts. A small majority of these respondents supported Workforce Accommodation, likely due to the need for construction and operational worker accommodation in the region, across all sectors, including agriculture.

c. Notable Opposition to Waste Processing

- *Waste Processing* faces significant opposition, indicating landowner concerns about land use, amenity, and environmental impacts, and incompatibility with established farming operations due to offsite impacts such as pollution, odours, and potential contamination of agricultural crops and land. This is particularly true near agricultural land where strict compliance standards have been obtained for crop certification and farm management practices, which need to be protected.

d. General Polarisation Across Industrial Projects

- Strong opposition was expressed to multiple project categories, suggesting that industrial and non-renewable energy production are viewed with contention and concern in the broadacre farming areas, due to the scale of their potential and perceived adverse impacts.
- This diversity of responses underscores the need for careful planning and engagement to balance economic opportunities with land use priorities, protection of amenity and environmental objectives.

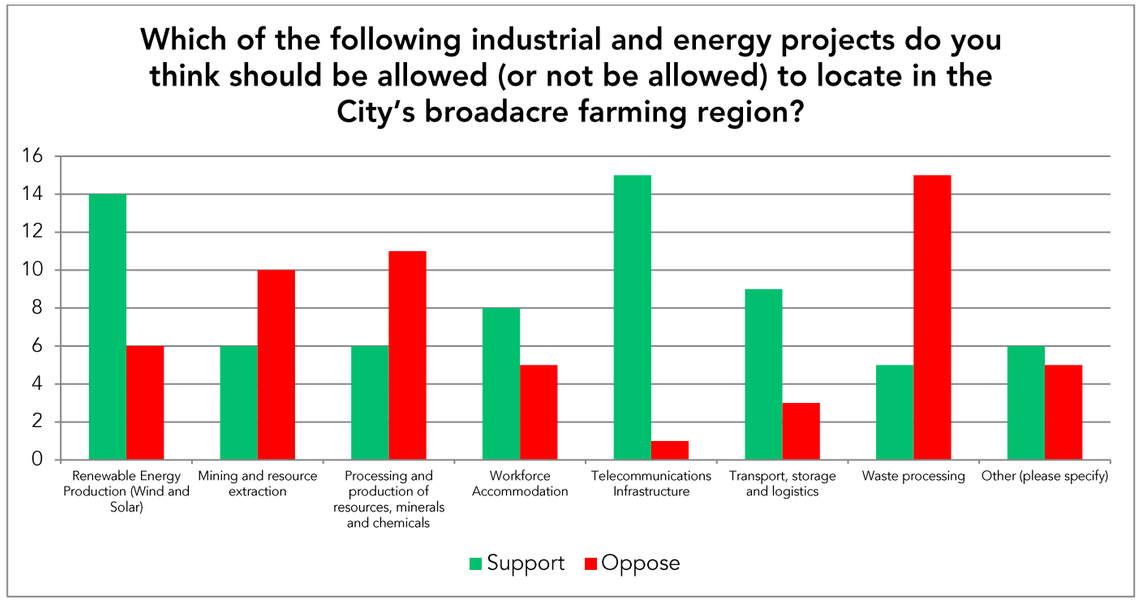


Figure 20 – Support level by project type

The chart in Figure 21 highlights the primary reasons why respondents might support industrial and energy projects in the City's broadacre farming region. The most cited reason is the *"Ability to carry on farming"*, suggesting that support is conditional on projects not disrupting agricultural activities (this is further emphasised in Figure 22). Other significant factors include:

- Financial gain from land sales or leases – indicating commercial incentives are a key influencer.
- Economic diversification and employment growth – showing recognition of broader economic benefits.
- Improved infrastructure and business attraction – suggesting that respondents see potential advantages in new projects triggering infrastructure investment and catalysing regional development.
- Environmental benefits from renewable energy – though slightly lower in priority, it is still a consideration for some.

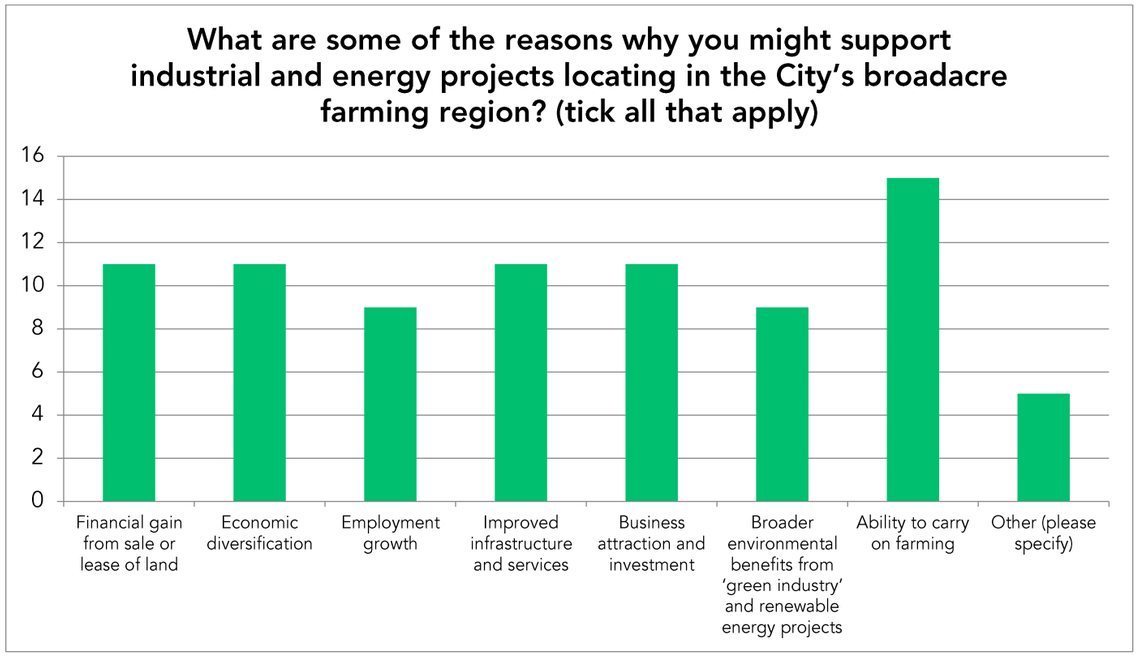


Figure 21 - Reasons why landowners may support industrial and energy projects

8.4.3 Qualitative Responses

The qualitative survey responses provide deeper insights into the nuances underpinning landowner preferences, as summarised below –

a. Support for Economic Diversification and Revival
   - Some responses suggest that industrial projects could provide a much-needed economic and employment stimulus for rural communities (e.g. *"They could become a lifeline for towns like Mullewa"*).
   - This aligns with the support for economic diversification and business attraction and investment in Figure 21.

b. Strong Agricultural Identity and Concerns Over Industry Displacement
   - This study's guiding principle of 'farming first' resonated strongly with landowners, indicating a desire for projects to 'fit in with' and not displace or damage the agricultural sector.
   - This explains why *"Ability to carry on farming"* was the most selected influencing factor in Figure 21, with support hinging on whether projects can coexist with farming.

c. Concerns About Infrastructure and Road Safety
   - Respondents raised concerns about the current inadequacy of vital infrastructure in the region, particularly key transport networks such Geraldton-Mt Magnet Road, which are viewed as already unfit for existing agricultural use, with little or no capacity or safety to accommodate construction and operational traffic for new industries, resource and energy projects.
   - While *"Improved infrastructure and services"* appears in Figure 21, the feedback suggests that without up-front road upgrades, industrial projects may face strong and sustained community opposition.

d. Scepticism Towards Proponent Promises

- Some respondents expressed doubt about the true benefits of new projects in the agricultural region, particularly mining projects, citing previous examples of 'empty benefits' and hollow community benefits.
- This suggests that support for industrial projects may depend on whether the project can demonstrate (up-front) and ultimately deliver a transparent, meaningful and lasting benefit to the community, beyond financial investment, economic diversification and employment creation.

While this feedback reveals general support for the economic and infrastructure advantages that can attach to new projects, this is tempered by caution and concern about land use conflicts, impacts on farming livelihoods, infrastructure adequacy/readiness, and meaningful community benefit.

Decision-makers and project proponents must address infrastructure concerns, ensure coexistence with farming, and provide clear community benefits to gain wider acceptance.

Support appears strongest where projects can integrate with rather than displace existing agricultural activities, as illustrated in Figure 22.

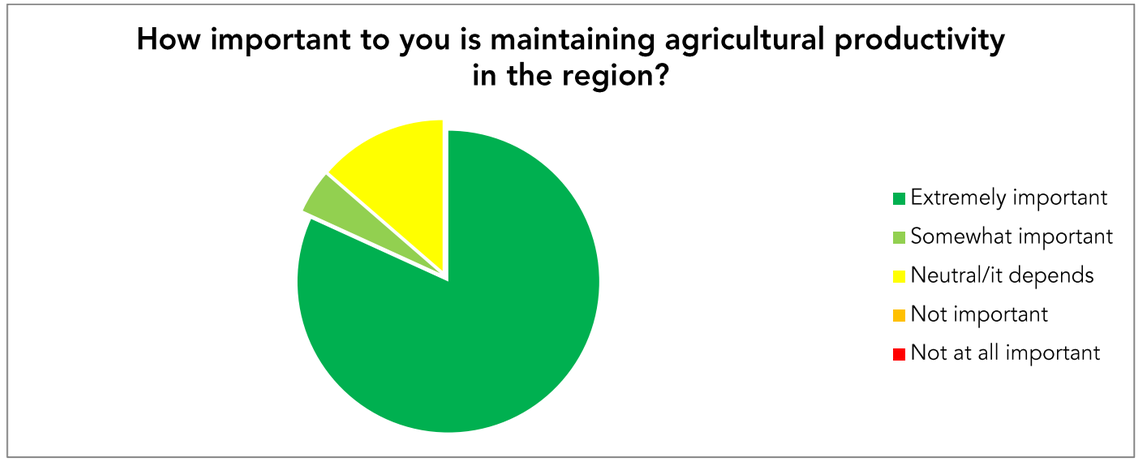


Figure 22 - Importance of maintaining agricultural productivity

The chart in Figure 23 identifies the primary concerns that drive opposition to industrial and energy projects in the broadacre farming region. The most significant of these relate to –

- Environmental and pollution concerns – the highest-ranked opposition factor, suggesting strong fears about contamination and ecosystem degradation.
- Loss of productive agricultural land – a major concern, highlighting that industrial expansion is perceived as a threat to farming viability.
- Impact on farming operations – reinforcing that farmers fear disruptions to their businesses and livelihoods.
- Traffic and transport issues – reflecting worries about road safety and infrastructure limitations.
- Visual impacts and property value concerns – indicating that liveability, land devaluation, and rural character are key considerations.

Other insights gained through analysis of these qualitative responses include –

a. Concerns about the impacts on and loss of productive agricultural land.

b. Concerns that offsite project impacts will burden neighbouring properties if the subject land cannot itself contain its impacts, resulting in financial gain for the owner of the subject land but financial and amenity loss for neighbouring properties. This directly connects with the top opposition factors cited in Figure 23, namely – Environmental and pollution concerns (fear of contamination); Impact on property values, rates, insurances and taxes (land devaluation affecting financial security); and Visual impacts (loss of rural aesthetics and liveability).

c. The community should be expected to bear the negative impacts of new projects in the broadacre farming region absent any clear and lasting community benefit.

d. The scarcity of water resources and the monopolisation of water by new industrial projects was a key concern seen to impact future generations.

Project proponents should seek to resolve these concerns through sensitive location, planning, consultation, design and delivery of new projects.

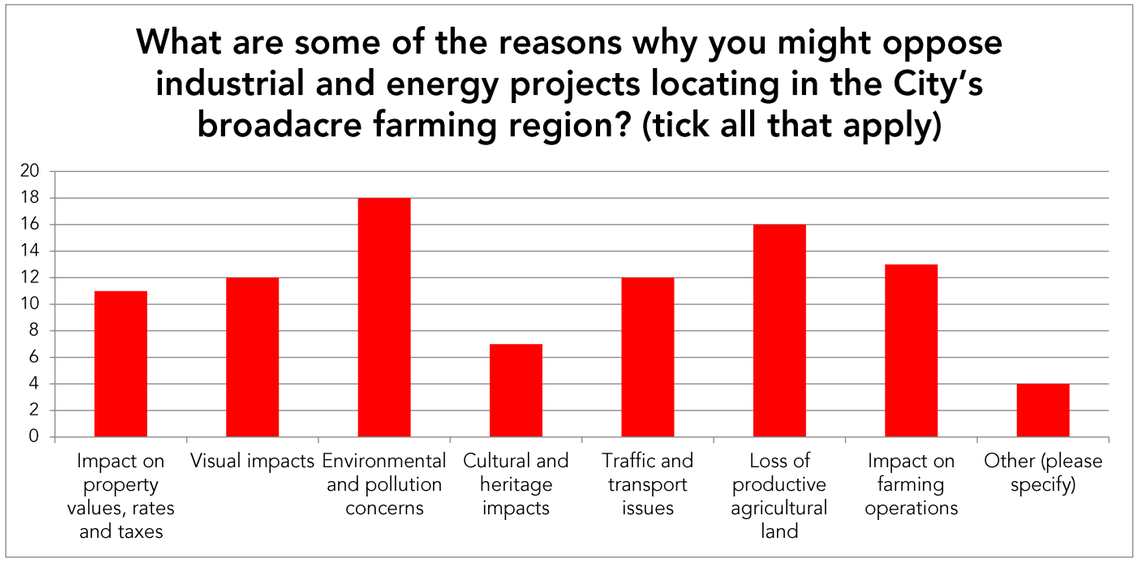


Figure 23 - Reasons why landowners may oppose industrial and energy projects

8.4.4 New Project Co-existence with Agriculture

Figure 24 captures landowners' opinions on the extent to which industrial and energy projects can co-exist with broadacre farming.

The responses are evenly distributed, with 45.46% of respondents indicating industrial and energy projects can integrate with broadacre farming *"extremely well"* or *"to some extent"*. 22.73% of respondents separately expressed neutrality or conditional views on this matter, while 31.82% of respondents indicated little or no ability for these activities to co-exist with broadacre farming.

Respondents who answered *'neutral/it depends'* highlighted two key reasons for doing so –

- Uncertainty Due to Lack of Information – Respondents indicated they do not have enough information about the type, scale, or specific locations of proposed projects, suggesting a need for more tailored, on-ground engagement to provide clarity on future projects and proposals.
- Offsite Impacts – The nature and scale of a project's offsite impacts is seen as a determining factor in how well a project can integrate into the broadacre farming region, with projects capable of containing their impacts on the subject land considered more acceptable than those which cannot achieve this.

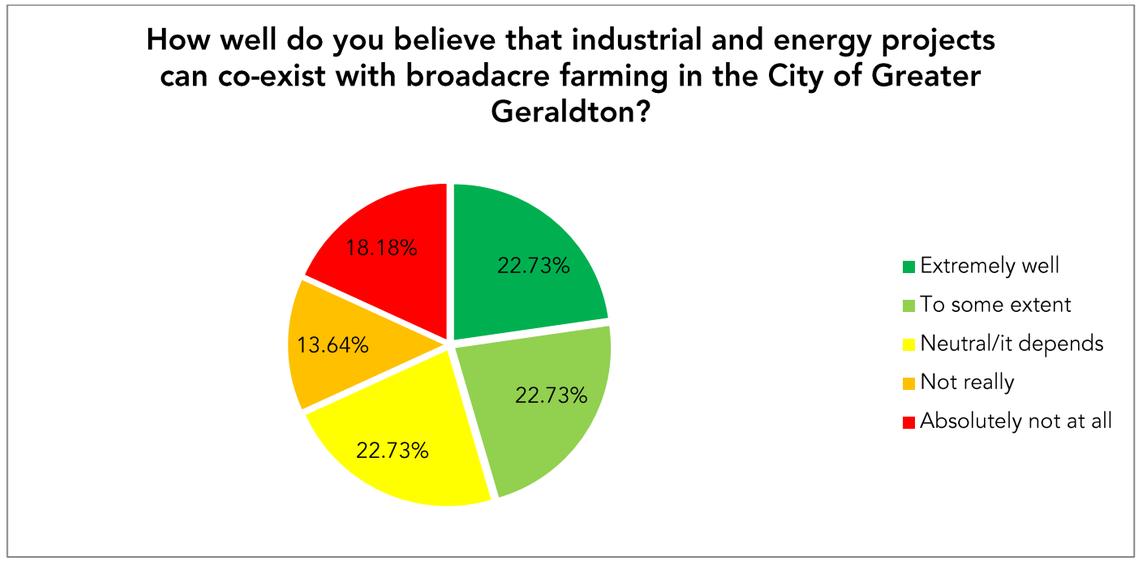


Figure 24 - Perspective on the co-existence of industrial and energy projects with broadacre farming

The survey also provided respondents with an opportunity to identify areas within the broadacre farming region which might be suitable for industry and energy projects. Moonyoonooka, Mullewa, Nunierra, and Tenindewa ranked as the top locations for all respondents (see Figure 25). These localities are spatially identified along with the IAs in Appendix 6.

While highlighting the suitability of these localities to accommodate new projects, respondents also stated that existing agriculture, other businesses, and homes in these areas must be protected, and stressed the importance of extensive consultation with landowners.

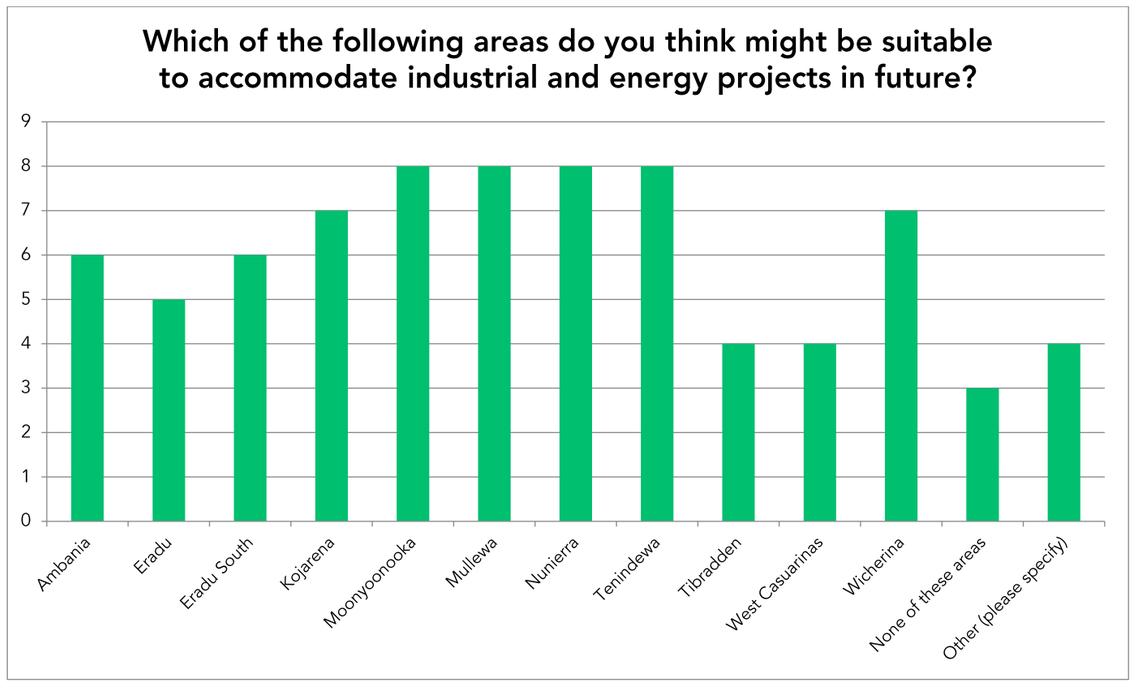


Figure 25 – Suitable areas to accommodate industrial and energy projects

8.4.5 Consultation Takeaways

The majority (77.27%) of the landowners in the high-ranking localities in Figure 25 indicated they have been approached for access, use, and/or purchase of their land for a future industrial or energy project, as illustrated by Figure 26.

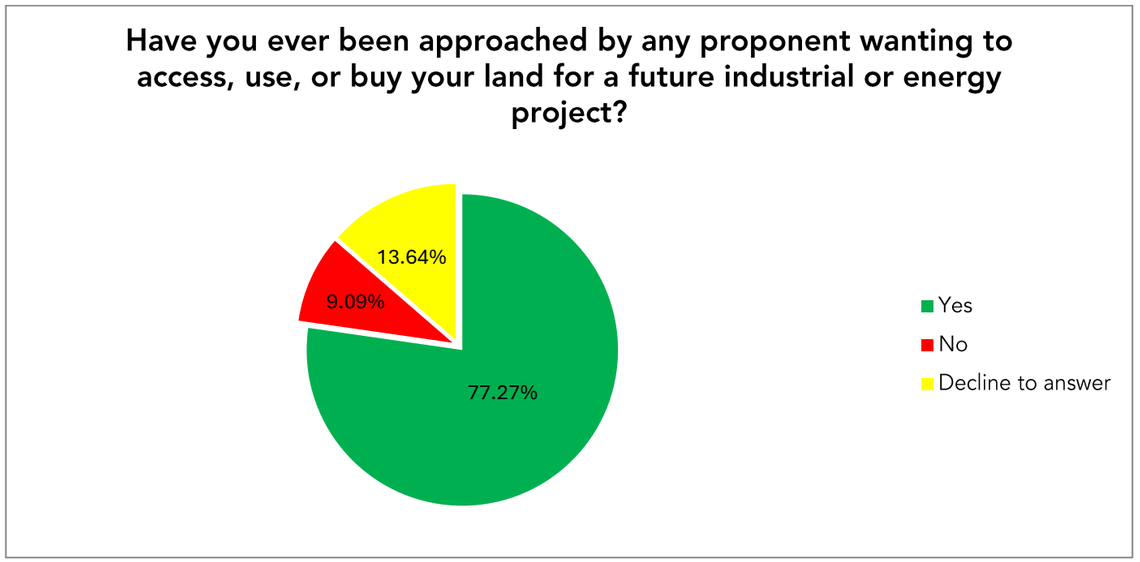


Figure 26 - Direct Engagement with Industry

The final survey question invited respondents to provide free text feedback, revealing the following themes –

- Scepticism that project-specific consultation was more procedural than purposeful, with perceptions that proponents had already finalised their intentions and decision-makers had "already made up their minds".
- Concerns were raised about the ability of the regulatory process to effectively respond to, control and condition the myriad new projects that appear to be targeting the City and the Mid West generally.
- A more structured, transparent and meaningful approach is needed to assess the impacts and benefits of new projects.
- Respondents identified a need for greater support and guidance to assist them in responding to proponent approaches and engaging with neighbouring landowners in respect of new projects. Respondents were cautious and concerned about entering these engagements unprepared or alone.

To respond to these themes –

a. The community should be invited to assist in designing the planning framework and key decision-making tools. Additionally, project-specific consultation should occur at inception rather than merely during the assessment of a statutory application. These actions will shift community participation from ‘consultation’ to ‘engagement’, away from perceptions of a ‘design / release / defend’ exercise, towards ‘we asked / you said / we heard / we did’ and ‘closing the feedback loop’.

b. Roles and responsibilities of proponents and decision-makers should be clearly defined to provide greater transparency around assessment processes, approval gateways, determining factors/considerations, condition-setting, and compliance/enforcement.

c. Clear, consistent and structured impact and benefit assessments should be developed to inform the site selection, design, assessment and determination of new projects and community/stakeholder feedback on the same.

d. Resources should be developed to assist landowners in engaging with project proponents and considering neighbour relations from an informed, objective and structured viewpoint.

9 CONCLUSION

The Industrial Lands Study responds to intensifying activity from proponents and concerns from community about large-scale industrial, resource production and renewable energy projects locating within the City's vast broadacre farming region, to take advantage of the abundant cleared land, rich mineral deposits, favourable climatic conditions, established infrastructure networks and generously sized, affordable, unfragmented freehold land.

The Study has objectively sought to examine whether, where, how and why the broadacre farming region could reasonably accommodate these diverse projects, ensuring the City and its community are well-positioned to meaningfully assess and positively influence project outcomes in future.

Guided by the principles of **Farming First** and **Flexibility**, the Study has –

- Identified critical enabling infrastructure requirements needed to support new industrial growth sectors;
- Assessed the state of emerging energy markets and technologies and their relevance to the City;
- Evaluated the City's existing, planned, and future industrial land requirements;
- Defined key approval requirements and barriers to delivering these new projects in the City.
- Comprehensively mapped and analysed opportunities and constraints for large-scale industrial, resource-related and renewable energy projects;
- Sought to understand the potential impacts and benefits these projects can bring to the region; and
- Engaged with key stakeholders and the farming community to understand their perspectives, priorities and preferences for the future.

This analysis has revealed important changes needed to engagement approaches and planning frameworks relating to new projects; vital infrastructure upgrades required to attract and sustain these projects into the future; and nine priority Investigation Areas exhibiting multiple characteristics that render them attractive to, suitable for, and capable of accommodating these projects.

In total, these Investigation Areas cover a vast 110,000 Hectares (1,100km^2) equating to around 8.7% of the entire City of Greater Geraldton. For a variety of reasons, land outside these Investigation Areas is also likely to be attractive for new projects, highlighting the enormity of the City's appeal as a hub for new industries and renewable energy projects, and the need for decision-making frameworks to plan for prospect of these developments occurring throughout the City, beyond the Investigation Areas.

While these projects can positively contribute to the City and the Mid-West through economic diversification, employment creation, investment attraction, infrastructure improvements, enhanced energy stability, and carbon emission reductions; if not carefully planned and delivered, they can also generate poor environmental outcomes, adversely affect amenity and landscape values, deliver little or no community benefit, and cause the fragmentation and loss of productive agricultural land.

Key findings and targeted recommendations are distributed throughout this report to realise the City's full potential in accommodating new industrial and renewable energy projects and effectively respond to community sentiments. These recommendations are summarised in Section 10 and will reinforce the City's important role as a trusted educator, informed ambassador, critical influencer and considered decision-maker in shaping the future of the region.

10 RECOMMENDATIONS

The principal recommendations arising from the Industrial Lands Study are summarised below –

1. While it is not proposed or recommended to rezone vast areas for industrial purposes under LPS 1, the project is underpinned by a robust and interrogable spatial database that will support the City to influence and inform the site selection process for new energy facilities and green industries. This report, along with the actioned recommendations, will empower the City to provide greater certainty to all stakeholders, both about when and where certain land uses and development may be supported, and the information required to be submitted in support of such applications.

2. Amending the City's Local Planning Strategy to identify the investigation areas as desirable, capable and suitable for renewable energy facilities and green industries (subject to certain standards and requirements being met). This will provide an important foundation for future location-specific Scheme Amendments (whether City-led or proponent-led) to be classed as 'Standard Amendments' under the *Planning and Development (Local Planning Schemes) Regulations 2015* due to their consistency with the Local Planning Strategy – thus simplifying and improving the certainty of the approval process.

3. Develop a Local Planning Policy (in accordance with the WAPC Position Statement: Renewable Energy Facilities and other key policies) to establish and guide the circumstances where the City would support and or not support development of the type contemplated in this study, including through the 'Part 11B' Significant Development Pathway under the *Planning and Development Act 2005*. This pathway allows the WA Planning Commission to approve a development despite any conflict with the local planning framework where it is considered necessary, appropriate and in the public interest[38] to do so. The Local Planning Policy may also be used to refine bespoke development application information requirements that address the risk of land use conflict among emerging green industries and pre-existing agricultural land uses and the environment, establish minimum standards for preliminary engagement with community members and establish standards to test and validate the stated claims of engagement with the community by proponents[39].

4. Establish an advocacy agenda for essential enabling infrastructure upgrades to support engagement with State and Commonwealth governments, and partner with key stakeholders such as the Mid-West Ports Authority, DevelopmentWA and proponents to advance and coordinate the delivery of shared user infrastructure. This may also pave the way to large-scale coordination between private and public sectors to deliver shared user infrastructure such as road and rail upgrades, transmission (including electricity and pipelines), desalination and port infrastructure.

5. Involve the community in designing the planning framework and key decision-making tools. Additionally, project-specific consultation should occur at inception rather than merely during the assessment of a statutory application. These actions will shift community participation from 'consultation' to 'engagement', away from perceptions of a 'design / release / defend' exercise, towards 'we asked / you said / we heard / we did' and 'closing the feedback loop'.

6. Roles and responsibilities of proponents and decision-makers should be clearly defined to provide greater transparency around assessment processes, approval gateways, determining factors/considerations, condition-setting, and compliance/enforcement.

7. Clear, consistent and structured impact and benefit assessments should be developed to inform the site selection, design, assessment and determination of new projects and community/stakeholder feedback on the same.

8. Resources should be developed to assist landowners in engaging with project proponents and considering neighbour relations from an informed, objective and structured viewpoint.

[38] https://consultation.dplh.wa.gov.au/strategy-and-enagagement/op1-13/consult_view/

https://www.wa.gov.au/system/files/2021-07/POS-Renewable-energy-facilities-position-statement.pdf