Hobsons Bay

Re-Imagining the Future of Industrial Land

Prepared for
Hobsons Bay City Council

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Executive Summary.

Reimagining the Future of Industrial Land in Hobsons Bay is a project that seeks to identify new and emerging industries that will diversify, expand and ultimately shift the local economy toward a more sustainable future.

This report identifies new and emerging industries with the potential to benefit from locating in Hobsons Bay City Council (HBCC). These are industries that incorporate locational pre-conditions and business preferences which can be met in HBCC and, in some instances, would achieve operational advantages by being located in HBCC.

In nominating future industries, the project has also been guided by Council development objectives. Council is seeking to attract industries that increase local jobs, demonstrate environmental leadership, balance community needs with job creation and strengthen the role of HBCC as an economic force in Melbourne. Each of the future industries nominated in this report broadly align with these criteria.

Potential future industries are detailed in the table below along with the key synergies that justify the nomination and suggested industry attraction initiatives. The nomination of industries derives from an extensive industry evidence base that incorporates the results of wide ranging stakeholder engagement and independent industry sector research. As part of the delivery of the project, the project team conducted 31 one hour one-on-one consultations with a range of local industry stakeholders and representatives of future industry sectors. This evidence base is deployed throughout the project to guide and validate project recommendations.

The table below identifies industry sectors that might be attracted to Hobsons Bay. This based on identified synergy(s) between sector needs and the municipality. Potential synergies include supportive land use settings, access to markets, existing industry clustering, access to infrastructure and potential alignment of the industry sector with the municipality's future growth aspirations.

Table 1: Potential Industries of the Future

Industry Sub- Sector	Synergies	Initiatives
Advanced Construction	Scale of local construction sector, industry growth, metropolitan accessibility	Facilitate relationships with related research institutes, identify the pre-conditions for establishing an advanced construction hub in HBCC, facilitate industry relationships and networks
Advanced Food Manufacturing	Accessibility, access to the port, self contained sites, established food networks	Promote HBCC as a location for advanced food manufacturing in Melbourne's west
Pharmaceuticals and Biotech	Supportive land use settings, buffered land	Engage with co-working bio-tech start up initiatives
Logistics Technology	Scale of local logistics sector, future form of Spotswood, ongoing expansion of logistic technologies	Promote Spotswood as a technology hub, leverage from Scienceworks to promote Spotswood as a future focused location and facilitate appropriate floor space

Industry Sub- Sector	Synergies	Initiatives
New format e-Commerce	Scale of local logistics cluster, metropolitan accessibility, future form of Spotswood	Monitor the evolution of eCommerce operations, recognise and promote opportunities in Altona and Spotswood for integrated ecommerce facilities
Digital Industries	Future form of Spotswood, Scienceworks, professionalisation of Melbourne's west	Promote Spotswood as a technology hub and facilitate appropriate floor space and leverage perceptions of Scienceworks to promote Spotswood as a future focused location
Robotics and Automation	The scale of the local logistics sector, the future form of Spotswood, take up of robotics in the logistics industry, professionalisation of the west	Promote Spotswood as a technology hub and facilitate appropriate floor space, promote logistics technologies and robotics as specialist area
Data Centres	Accessibility, access to stable high capacity power infrastructure, self contained sites	Consider data centres as an appropriate low density employment use in the Special Use Zone
Bioenergy - Biogas Organic	Potentially supportive land use settings, the scale of local energy needs	Engage with industry and government entities, identify the benefits and disbenefits of new energy industries as they relate to HBCC sustainable growth objectives
Bioenergy – Thermo-Fuel	Potentially supportive land use settings, local energy needs	Engage with industry and government entities, identify the benefits and disbenefits of new energy industries as they relate to HBCC sustainable growth objectives
Hydrogen Industries	Established energy creation, storage and distribution infrastructure	Engage with Toyota Hydrogen Centre, engage with forthcoming state government Hydrogen policy and plan, engage with existing energy industry in relation to their plans for hydrogen
Battery Storage	Access to grid, metropolitan centrality	Promote battery storage as an appropriate low employment density use in the special use zone, seek to link battery technology with sustainable energy initiatives
Plastic Recycling	National polymer expertise, supportive land use settings,	Facilitate and support, if plastic recycling proceeds promote HBCC to plastic recycling manufacturers

Industry Sub- Sector	Synergies	Initiatives
Circular Economy Manufacturing	Potential access to major flows of recycled materials including plastics and glass	In conjunction with the rise of plastic and glass recycling, seek to promote HBCC as a location for manufacturers that make use of recycled plastics and glass
Rail Freight and Intermodal Logistics	Access to the port and rail freight infrastructure, scale of logistics sector	Ensure HBCC is engaged with Inland Rail projects and seek to leverage local benefits.
Rail Maintenance and Rolling stock Asset Management Services	Access to the port and rail freight infrastructure	Ensure HBCC is engaged with Inland Rail projects and seek to leverage local benefits.

Source: Charter Keck Cramer

The future industries section of this report outlines the rationale for nominating the above industries in significant detail whilst also providing a rationale for not selecting non-preferred industries.

The project also identifies a number of aspirational industries. These are incipient industries with significant growth potential that have the potential to develop synergies with industry and land uses in HBCC in the future.

Table 2: Aspirational Industries of the Future

Industry Sub- Sector	Synergies	Initiatives
Additive manufacturing	Supportive land use settings, industrial legacy	Promote HBCC to research institutes and industry sector associations
Composite manufacturing	Supportive land use settings, industrial legacy	Promote HBCC to research institutes and industry sector associations
Advanced materials - Graphene	Supportive land use settings, industrial legacy	Promote HBCC to research institutes and industry sector associations

Source: Charter Keck Cramer

Economic development and land use initiatives are the primary levers by which Council might seek to attract, grow and retain new industries. Accordingly, the project recommends the following economic development and land use initiatives:

Land Use Planning:

- Review the currency of buffering and employment density controls.
- Re-engage industry in relation to the objectives and operation of buffering and employment density controls (project engagement identified a wide range of perceptions about the function, purpose and operation of these controls that may not reflect the most up to date statutory or strategic intent for these controls)
- Ensure future strategic planning identifies a small number of discrete industrial precincts within HBCC as a means of engagement, monitoring and identify development. This project identifies 5 core industrial areas.
- Identify locations in which higher density employment will be supported.

Economic Development

- Ensure the support for future industries aligns with Council's and community's aspiration for a sustainable future. HBCC position on a sustainable future could be further supported in economic development policies and other policy levers
- Engage with new energy and recycling sectors to identify the benefits and disbenefits of these industries and determine how these industries align with HBCC sustainability objectives.
- Develop industry relationships with innovation hubs and research institutes as a means of promoting HBCC as a location for new industry. A major locational disadvantage for HBCC is the lack of established relationships with innovation institutes. HBCC needs to address this as part of its economic development strategy.
- Engage with federal government's Inland Rail project to ensure HBCC is able to leverage new freight rail opportunities from the expansion of freight rail infrastructure.
- Ensure council identifies and engages with digital leaders in the west focusing on new format e-Commerce, logistics and robotics technologies.

2. Introduction

Globalisation, technological change and changing consumer behaviour is transforming Melbourne's economy and the geography of the city's economic activity. The past decades have seen the ongoing decline of Melbourne's manufacturing base, the emergence of a knowledge economy and the ongoing growth of a nationally significant logistics sector in Melbourne's west.

The Covid-19 is accelerating economic change. Changes to the nature of work, the retail and service economy, as well as the manufacture and distribution of goods is set to endure into the post pandemic age.

At the same time the ongoing digitisation of the economy and the overriding need for the economy to rapidly eliminate carbon emissions and expand the re-use of materials, is creating the momentum for paradigmatic change in the processes and operation of established industry.

Reimagining Hobsons Bay's Industrial sectors, therefore, coincides with a time in which there is both the emerging opportunity and broader need to renew and transform the composition of Council's industry sectors.

2.1. Project Objectives

The overarching objective of this investigation is to identify industries and industry sectors that may be attracted to HBCC as a location for their future operations. The project will help create the basis for a new economic narrative that justifies a range of industry attraction initiatives along with further industry engagement and land use reform. This project provides an initial input into these activities by seeking to determine the potential role of the municipality's industrial land in the context of a changing local, metropolitan and national economy.

In seeking to identify future industry sectors, Council officers have also proposed a number of objectives which within this project have been applied as evaluation criteria. In seeking to transform and reimagine its industrial sector Council is seeking to attract industries that will:

- Increase our local jobs
- Be an environmental leader
- Balance job growth with community impacts
- Continue to be a major economic force in Melbourne

2.2. Methodology

The project recommendations reflect the insights gathered in the course of extensive stakeholder engagement, data analysis and independent industry research.

The project evidence base combines data, engagement and research to establish the guiding assumptions, evaluation criteria and justification for nominating specific sectors as potential industries of the future. The identification of future industries follows a clear and transparent methodology in which future industry locational preconditions and business preferences are identified and then reconciled with the geographic, infrastructure, amenity and land use planning attributes available to industry in HBCC.

The project has been developed in three stages which are detailed in the table below.

Table 3: Project Stages

Stage 1: Stakeholder Engagement Hobsons Bay	• The project draws from extensive engagement with manufacturing, logistics, hospitality, construction and property industry stakeholders to identify the comparative advantages and challenges of operating from HBCC. Industry insights and evidence establish the context for the future industries evaluation.
Stage 2: Future Industries	• Engagement with future industry sectors is combined with independent research and the results of the stakeholder engagement to identify and evaluate future industries. The evaluation focuses on identifying industry locational preconditions and assessing the extent to which HBCC is able to meet these preconditions. Industry sectors are rated according to their potential attraction to HBCC and against HBCC Council Officer objectives.
Stage 3: Economic Data and Analysis	• Employment, industry and economic output data for the study area are detailed. Economic indicators are benchmarked against regional indicators that position the local economy in a regional context.

The Future Industries section of this report provides a more detailed account of the industry identification methodology. Likewise, the process and structure of the industry engagement is detailed in Appendix 1.

2.3. Study Area and Scope

The project focuses on industrial areas in Altona, Brooklyn, Altona North, Williamstown North and Spotswood. These areas currently incorporate extensive heavy industry, logistics and manufacturing enterprises of both state and national significance.

The evolution of these areas in the context of changing economy will ultimately determine the future economic role and character of enterprise in HBCC. As such, the project seeks to identify future industries that may be drawn to these areas given their geographic, infrastructure and amenity attributes.

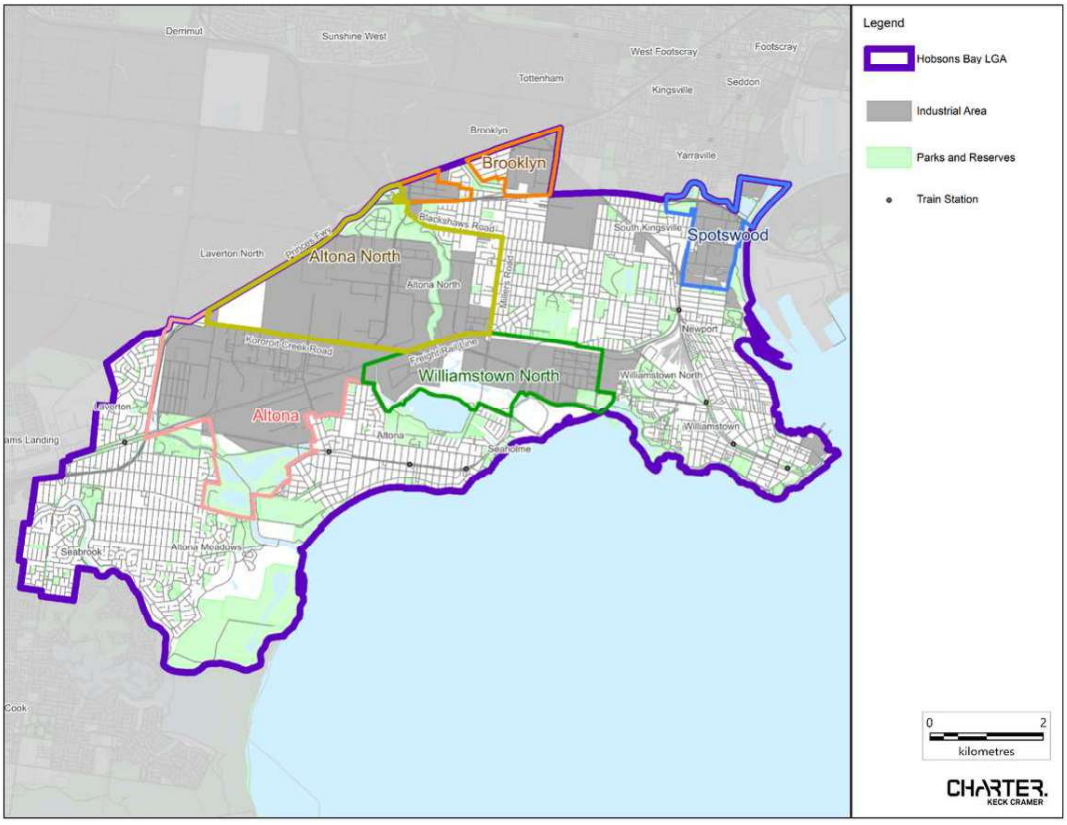
The study does not consider population serving industries as potential future industries for Hobsons Bay's industrial areas with the exception of Spotswood Industrial Precinct. Population servicing industries include the health, education, arts and social assistance sectors as well as government services. These are sectors that, in general, are best located in mixed use/commercial areas with high levels of connectivity and surrounding land uses that are supportive of significant levels of human mobility and interaction. While these sectors will continue to grow within the municipality; zoning, employment density controls, connectivity and surrounding land uses limit their future role and expansion in industrial areas.

Overall, the Reimagining project seeks to identify future industries that will help to sustainably renew and expand industrial activity in Hobsons Bay that are generally in keeping with existing industrial land use settings.

The five precincts that comprise the study area are:

- Altona
- Altona North
- Brooklyn
- Spotswood
- Williamstown North

Figure 1: Hobsons Bay LGA – Defined Industrial Precincts



Source: Charter Keck Cramer

2.4. Economic Context

In identifying future industries the report responds to a number of key economic and socio-economic trends that set the context for future enterprise in HBCC.

These trends include:

- Sustainable growth: The drive toward a low emissions sustainable future is set to transform economic systems. The last 3 years have seen the Victorian government progress a range of policy, funding and investment initiatives to transform energy, waste and recycling systems. HBCC stakeholder engagement confirmed that the next phase of sustainable development will require the broader transformation of production, distribution and consumption systems through behavioural, infrastructure and process change at household, precinct and regional scales. As a major manufacturing, logistics and energy centre in Melbourne, HBCC will be central to this change.
- Digitisation: Covid -19 has accelerated the digitisation of the economy. Digital infrastructure and interaction is rapidly transforming consumption, transport and distribution systems whilst increasingly transforming education and work practices. Stakeholder engagement confirmed the widespread impact but also the benefits of the digital economy within established industry.
- Socio-economic change: The socio-economic make up of Melbourne's west is rapidly changing with far greater numbers of managers and professionals now living in the west with higher education qualifications and associated incomes.

Attracting new contemporary industries to the west will help grow local employment that aligns with local skills and occupations.

- Supply chain security: A more recent theme relevant to future industry in HBCC is the focus on national supply chain vulnerabilities. The Federal government has committed to identifying and addressing issues of national supply chain security. Engagement with local manufacturers identified higher levels of local and international demand due to worldwide supply chain disruptions associated with Covid-19.

The future industries section of this report explores the policy and economic drivers and implications of these trends in further detail.

Table 4: Socio-Economic Change Hobsons Bay

Hobsons Bay LGA	2006	2011	2016
Median total personal income ($/weekly)	$463	$582	$704
Median total family income ($/weekly)	$1,204	$1,566	$1,921
Median total household income ($/weekly)	$1,026	$1,283	$1,564
Total Residents with Bachelor Degree or Higher Qualification	10,606	14,483	18,944
Bachelor Degree of Higher Qualification as a proportion of residents aged over 15	16%	21%	26%
Total Residents employed as Managers or Professionals	11,694	13,913	16,382
Managers & Professionals as proportion of total workforce	32%	35%	39%

Source: ABS; Charter Keck Cramer

2.4.1. Hobsons Bay Economic Context

HBCC supports substantial employment and economic activity within Melbourne's western region.

Charter has identified a number of key statistics that underline the importance of the study area within the HBCC and the broader western region as follows:

- In FY 2019-20 the Hobsons Bay economy generated an estimated $13.8 billion in output.
- Manufacturing contributed the largest share of economic output, contributing 34% ($4.7 billion) of output followed by construction with 15.4% ($2.13 billion) and logistics and transport with 15% ($2.08 billion).
- Transport and logistics is HBCC's leading sector of employment supporting 6,640 full time equivalent jobs at FY 2019-20 which at the time equated to 18.5% of the municipality's employment (measured by full time equivalent jobs). Construction (5,860 jobs) and manufacturing (5,200 jobs) are also major sectors of employment.
- Since 2016, construction and logistics employment has led the municipality's jobs growth followed by Health Care and Social Assistance employment. Manufacturing employment is in decline.
- At 2020 Hobsons Bay was home to 8,150 businesses which represented an increase of approximately 1,000 businesses since 2017. Transport and logistics businesses (+238 businesses since 2017) lead the municipality in business

growth followed by professional services (+212 businesses since 2017), construction (+129) and health care enterprises (+100).

More broadly:

- In FY 2019-20 the economy of Hobsons Bay accounted for approximately 16% of the Gross Regional Product of Melbourne's Western Region.
- Similarly, at 2016, Hobsons Bay supported approximately 16% of total employment within Melbourne's Western Region.

Figure: Key Economic Performance Indicators (FY 2018-19)

	Hobsons Bay LGA (FY 2019-20)	Growth Since 2017
Output ($ billion)	$13.880	+846 million
GRP ($ billion)	$6.43	unchanged
Population (2020):	98,000	+2,900
Total No. Jobs	43,050	-1,290
Businesses	8,150	1003

Source: ABS; ID ; Charter Keck Cramer

As seen below, the five Industrial Precincts that comprise the study area account for just over 50% of the municipality's employment. Over the 2016 to 2020 period areas outside of the study area added significantly more jobs than areas within the study area. This reflects both the growth of local service industries within the municipality's residential areas and the decline of manufacturing within the study area.

Within the study area, the construction and transport and logistics sectors accounted for over 75% of new jobs growth since 2016.

Precinct / Region	Jobs (Total FY 2019-20)	Precinct Proportion (%) of Hobsons Bay LGA	Jobs Growth 2016 - 2020
Altona North Precinct	9,992	23%	-637
Altona Precinct	4,896	11%	548
Brooklyn Precinct	2,590	6%	207
Spotswood Precinct	1,194	3%	-11
Williamstown North Precinct	4,119	10%	297
Sub-total (5 Precincts combined)	22,791	52%	404
Balance of Hobsons Bay LGA	20,578	48%	962

Source: ABS; ID; Charter Keck Cramer

As can be seen below, the Altona North Precinct is the most significant employment precinct within the municipality with nearly a quarter of the municipality's jobs. Over the past 5 years, Altona North experienced a sharp decline in its manufacturing workforce with the loss of over 1,500 manufacturing jobs primarily due to the closure of the Toyota manufacturing facility. Concurrently, the precinct's transport and logistics added approximately +700 new jobs.

Figure: Jobs – Industrial Precincts Hobsons Bay 2020

	Altona North	Altona	Williamstown	Brooklyn	Spotswood	Total
Accommodation and Food Services	293	33	34	31	22	413
Administrative and Support Services	194	228	151	54	46	673
Agriculture, Forestry and Fishing	26	17	17	0	0	59
Arts and Recreation Services	52	3	32	3	127	217
Construction	264	973	1562	868	187	3,853
Education and Training	229	22	16	24	38	328
Electricity, Gas, Water and Waste Services	123	60	76	106	0	365
Financial and Insurance Services	80	32	11	84	15	222
Health Care and Social Assistance	472	135	82	11	34	735
Information Media and Telecommunications	0	13	22	0	3	38
Manufacturing	2,379	1,226	657	204	473	4,939
Mining	0	8	25	12	16	61
Other Services	269	93	272	88	39	760
Professional, Scientific and Technical Services	104	81	184	51	22	442
Public Administration and Safety	218	19	34	23	40	334
Rental, Hiring and Real Estate Services	99	20	39	82	5	244
Retail Trade	782	101	276	211	31	1,401
Transport, Postal and Warehousing	3,397	1,536	359	484	26	5,801
Wholesale Trade	1,014	295	272	256	71	1,908

Source: ID, Charter Keck Cramer

2.5. Policy Context

State Policy

State government's overarching strategic planning vision for Melbourne (*Plan Melbourne*) includes guiding policy directions for the future use and protection of industrial land with direct implications for the ongoing use and development of land within industrial precincts within HBCC.

HBCC industrial land within the western State Significant Industrial Precinct, for instance, are subject to overriding directions that:

- limit the encroachment of incompatible uses on industrial land
- protect major infrastructure, including major hazard facilities
- promote long term planning certainty in order to stimulate innovation, growth and investment in industrial areas.

Guiding state government policy content is detailed in the table below.

Table 5: State Industrial Policy Overview

Strategy	Scope	Directions
Plan Melbourne 2017 (Department of Environment, Land, Water and Planning)	Metropolitan- guiding strategic document for the future growth of Melbourne	- Establishes and defines State Significant Industrial Precincts - State Significant Industrial Precincts are major industrial locations linked to the Principal Freight Network and transport gateways - Protects State Significant Industrial Precincts from incompatible land uses to enable long term growth in freight, logistics and manufacturing investment.
Melbourne Industrial and Commercial Land Use Plan 2020 (Department of Environment, Land, Water and Planning)	Detailed plan that further defines the local and metropolitan implications of *Plan Melbourne* industrial directions.	- Affirms the role and importance of State Significant Industrial Precincts in the Victorian economy. - Establishes a range of policy principles related to industrial land related to land supply, the contemporary role of industrial land and planning certainty. - Includes detailed maps of State Significant Industrial Precincts. - Provides retail and commercial floor space demand projections by municipality. - Includes industrial land supply data and employment growth projections.

Industry Development

Funding, training and market support initiatives detailed in both State and Federal industry development strategies provide a basis to assist existing and new manufacturing, new energy, and construction enterprises within the municipality. The $1.5 billion *Modern Manufacturing Strategy,* for instance, provides support for new energy and recycling industries which are identified as a priority industry sectors by the Federal Government.

There is a significant emphasis in both State and Federal industry policy on promoting and supporting "future industries". As will be discussed in the forthcoming analysis, Hobsons Bay is well positioned to support future industries including advanced manufacturing, advanced construction and new energy industries. These are industries that have been identified for policy support.

Additionally, there is also a focus on continuing to support core manufacturing functions needed to maintain Australian supply chain resilience. HBCC should seek to investigate the local implications of the Federal government's supply chain resilience initiative particularly within its chemicals, energy and food manufacturing sectors.

Table 6: Industry Development Initiatives

Strategy	Scope	Directions
Advancing Victorian Manufacturing: A Blueprint for the Future (2017)	Industry development policy that sets out to revive and refocus Victoria's manufacturing sector	The strategy establishes priority focus areas for advanced manufacturing which are: • Construction Technologies • Defence Technologies • Food and Fibre • Medical Technologies and Pharmaceuticals • New Energy Technologies • Transport Technologies According to the strategy, industries were selected based on their capacity to grow in both scale and scope. The strategy outlines initiatives to build capability, and foster growth.
Invest Victoria – International Investment Strategy (2020)	Outlines the key strengths and benefits for potential international investors seeking to invest in Victoria	The strategy targets growth in 'future focused' industries including Digital Technology, Advanced Manufacturing, Health and Life Sciences, Agri-Food, and New Energy.
Supply Chain Resilience Initiative (2020)	The Supply Chain Resilience Initiative supports projects that address identified supply chain vulnerability in light of the Covid-19 pandemic.	The initiative will map industry supply chains and manufacturing capability and gaps. Map and manufacturing assessments will be used to evaluate supply chain resilience.
Modern Manufacturing Strategy (2020)	To grow the manufacturing industry in Australia.	The $1.5 billion Modern Manufacturing Strategy is intended to make Australian manufacturers more competitive, resilient and be easily able to scale-up production. A key element of the Modern Manufacturing Strategy is the $1.3 billion Modern Manufacturing Initiative (MMI). The Modern Manufacturing

Strategy	Scope	Directions
		Initiative supports projects within six National Manufacturing Priorities: • Resources technology and critical minerals processing • Food and beverage • Medical products • Recycling and clean energy • Defence • Space

Industrial Land Use Policy and Development Hobsons Bay

Hobsons Bay maintains strategies and policies with direct implications for the future use and development of industrial land. The *Reimagining* analysis will ultimately inform the ongoing development of local policy and strategy particularly the refresh of Council's *Industrial Land Management Strategy 2008.*

Table 7: Local Land Use and Development

Strategy	Scope	Directions
Hobsons Bay Industrial Land Management Strategy (2008)	Industrial land	Identifies issues and potential future pressures on industrial land as well as future land use needs and opportunities. Includes a land audit that assesses the suitability and desirability of retaining existing industrial land. Provides guidance on the use of industrial land to support economic growth and provide employment opportunities. Provides guidance on managing the impact of industrial development on the amenity and environment in Hobsons Bay.
Hobsons Bay Economic Development Strategy (2015-2020)	Economic Development	The Strategy outlines the key themes and objectives guiding Council's short and long term economic growth during the 2015 – 2020 period. The Strategy outlines actions to: • address the needs of the local business community • attract new and diverse investment • deliver increased economic and social benefit to the municipality.
Hobsons Bay Activity Centres Strategy (2019-36)	Activity Centres	The Hobsons Bay Activity Centres Strategy aims to support business growth and development by ensuring the creation of accessible, vibrant and high-quality activity centres.
Hobsons Bay Integrated Transport Strategy (2017-2030)	Transport	Articulates a vision for an integrated, innovative, and equitable transport system, providing a range of sustainable, efficient, accessible and safe ways for people and goods to reach their destination.

3. Stakeholder Engagement Hobsons Bay

To equip Council and its residential and commercial stakeholders with detailed insights into the perceptions, outlook and prevailing issues confronting existing enterprises, Charter undertook targeted stakeholder engagement focusing on key sectors of the municipality's industrial base.

Insights gathered during the stakeholder engagement provide a basis to identify and confirm the locational advantages and disadvantages of operating from within HBCC. These insights help to describe and validate the locational attributes that are likely to attract or deter new industry. As such, the engagement forms the first stage in establishing the framework to identify future industries.

The engagement occurred via extensive one on one interviews with individual stakeholders. Overall, the project interviewed near on 21 existing stakeholders. Interviews were approximately one hour in length and conducted over the November to December period in 2020. See Appendix 1 for further information on the engagement structure and questions.

HBCC incorporates a wide array of industry sectors including an emerging social service, professional service and hospitality and arts focused industry sectors. To ensure the project focused on future industrial sectors most relevant to HBCC's industrial precincts the project engagement largely focused on manufacturing, energy, property, construction and logistics sectors.

In agreement with Council, the engagement sought to meet the following objectives:

- Engage with target businesses generally within the manufacturing, logistics, construction, energy and chemicals sectors.
- Develop qualitative data that establishes the competitive strengths and weaknesses of the municipality's industrial locations.
- Facilitate information that identifies the prospects, drivers and barriers for future industrial change and growth within the municipality.
- Understand the take up and planned take up of sustainable technologies, practices and associated innovations.
- Create insights into the potential role of new industries within Hobsons Bay and their land use needs.
- Create a basis to table qualitative insights with Local Government, State Government and State Agencies.
- Strengthen local industry relationships and communication channels via professional engagement.
- Identify Covid-19 impacts, responses and long term adaptations.

The following details the key insights and outcomes generated in the course of the engagement.

Advantages of Operating within Hobson Bay

Respondents were asked to identify the locational advantages of operating from HBCC. Additionally, respondents were also asked to identify the way in which perceived advantages influence the strategic outlook of their enterprise and its commitment to the area.

Major themes to arise from this focus area were as follows:

- **Accessibility**: Access to metropolitan and nationally significant road infrastructure and the associated capacity to service Melbourne's population and national clients was universally cited as the area's leading advantage. Most often respondents referred to road accessibility, however, for some respondents access to the port and freight rail infrastructure were also identified as important accessibility advantages. This accessibility has facilitated the clustering of numerous logistics firms and associated infrastructure (depots, container storage) which within the logistics industry is regarded as a major advantage (one respondent remarked "*distribution goes with distribution*" which reflects the preponderance of business to business activity in the logistics industry).
- **Enabling regulatory conditions**: Extensive industrial infrastructure, and the associated regulatory frameworks and legacies that permit industrial activity were seen as a key advantage and enabler by many respondents. Specifically, respondents in the manufacturing and petro-chemical sectors referred to the capacity to undertake major industrial activity within the area as a critical enabler and factor that differentiated HBCC from many other locations. This was also cited as a potential attractor for future industries, particularly those that require similar land use conditions and regulatory support to established heavy industry.
- **Land availability**: More recent arrivals cited land availability and the availability of large self contained sites as a key advantage and attractor. However, as will be seen shortly, long term tenants who have witnessed significant cost increases in the cost of floor space tended to perceive land costs as a locational disadvantage. Nonetheless, newer tenants identified industrial land as relatively affordable within a metropolitan context and hence an advantage[1].

[1] Charter identified a further advantage not specifically identified by stakeholder but nonetheless evident in feedback. The area is attractive to institutional investment and major developers which means that the quality of development and tenant and amenity is likely to be high.

HBCC Operating Disadvantages

Respondents were also asked to identify the locational disadvantages of operating from HBCC.

Key disadvantages cited by industry included:

- Residential encroachment: opposition to industrial activity by local residents and associated odour and noise complaints were frequently cited as disadvantages. These respondents tended to express opposition to residential growth which is perceived as a risk to industry and, for some respondents, a public health risk. Conversely, it should be noted that a number of enterprises identified a lack of local population as a disadvantage. These enterprises advocated for more residential development, amenity and density. Each of these respondents were in population serving industries that directly benefit from population growth.
- Planning restrictions: Limits on employment density and buffering requirements were most frequently cited as a major disadvantage and barrier to employment growth, investment and the evolution of commercial uses within industrial areas. Criticism of the zone [zoning / planning scheme] was most frequently expressed by property developers, manufacturers and non-petro chemical/heavy industry based enterprises.
- Land availability: A number of established enterprises identified a lack of land and the rising cost of land as a limitation. In general, these enterprises have needed to limit local expansion plans due to a lack of available land that is contiguous with their existing operations.
- Amenity: A range of amenity issues were cited as disadvantages [predominately, secondary disadvantages] including the impact of constant heavy vehicle traffic and a lack of worker amenity. The noise, dust and safety implications arising from constant heavy vehicle traffic were also identified as a major detractor. Poor quality food and beverage options and a lack of attractive destinations for workers was seen to diminish worker amenity particularly for enterprises in Altona and Altona North. A lack of public transport options were also identified as a limitation by a small number of respondents.

Employment densities

The engagement revealed divergent perspectives on the merits of land use limitations on employment densities and industry buffers. For some respondents buffering and density controls are a major advantage while for others they are a major barrier as is illustrated by the following quotes:

> *"However, it's worth noting that HBCC is at risk of 'succumbing' to residential development [in/nearby the Buffering Zone]. But actually – this [Buffering Zone] is a great opportunity to attract the "Jobs of the Future" [in the Waste, Energy and Recycling Industries] since it allows these industries-of-the future to locate here in Hobsons Bay Council.*

> *"They need to clean up the Special Use Zone. It's out-dated – it's a fossil, that zone. It's a joke. They need to clean it up. It's a barrier."*

The project team experience a wide variety of views and perspectives on the operation of employment densities that suggested that industry knowledge of the zone and buffer requirements may require updating and renewed engagement with industry.

A lack of electrical power, poor local road infrastructure, environmental limitations and unattractive industrial amenity were also identified as disadvantages.

Sustainability and Amenity

Respondents were asked about their experience, understanding and take up of sustainable technologies and their views about future sustainable investment. This revealed near universal take up of solar power technology. The vast majority of respondents were now generating a proportion of their energy requirements onsite which was commended as an effective cost saving measure and worthwhile investment.

Respondents also reported on the take up of rainwater harvesting infrastructure, energy saving machinery, and the incorporation of recycling processes into their operations. Heavy industry maintains water treatment infrastructure within their facilities as well as odour treatments.

A small number of respondents critiqued sustainability requirements and the introduction of what they perceived to be tokenistic sustainability infrastructure due to planning requirements (most often cycling infrastructure).

Respondents were also asked about their future sustainability plans and aspirations and their ongoing adoption of sustainable technologies and practices. This revealed a significant diversity of views. A number of respondents provided suggestions and examples of opportunities to transform broader processes within the HBCC. While other respondents suggested that the scope for further sustainable investment within their individual business was limited without broader macro-change.

> *"To get there, we need to get there in conjunction with our customers and our suppliers. No one single group can achieve the emissions targets by themselves. We all need to pitch in."*

Accordingly, respondents expressed the view that their own approach to sustainability needed to link with broader sustainable transformation. For these respondents there was a need for wider co-ordination of multiple entities to transform the way in which the community and business created, consumed and disposed of goods and energy.

Future Outlook

Respondents were asked about their commitment to HBCC, the outlook for their industry sector and opportunities for industry expansion and growth.

The vast majority of respondents expressed an ongoing commitment to the HBCC. Accessibility, high capacity power and supportive industrial settings were regularly cited as core attributes sustaining enterprise commitment to the area. Again, buffering and employment density controls provoked vexed responses with some respondents identifying this as an attribute sustaining their commitment to the area while others identified it as a potential barrier.

Beyond their own enterprise, a range of opinions were canvassed about the broader outlook for future of industry in HBCC. A number of property based respondents envisaged the continued decline of the petrochemical industry. For these respondents the transformation of heavy industry sites into contemporary warehousing, manufacturing and office space was seen as the key factor that would reshape HBCC's industrial sector. Notably, respondents from the energy sector expressed continued commitment to their operations within HBCC, particularly fuel distribution operations.

Local manufacturers expressed strong support for the future of manufacturing and optimism in increased demand resulting from renewed interest in local manufacturing resulting from Covid19 and initiatives to bolster national supply chains. At the same time, property related interests expressed pessimism in the growth of local manufacturing citing the capacity for logistics enterprises to pay a premium for space and their experience of limited demand for new manufacturing space within HBCC.

There was broad agreement that HBCC would continue to experience high demand from logistics enterprises given its locational advantages and the ongoing growth of the ecommerce sector.

There was significant enthusiasm expressed for new energy industries and growth in the local recycling industry. There was, for instance, support expressed for hydrogen generation and distribution as well as the waste to energy industry. A number of respondents, nonetheless, cautioned that the overall benefits and disbenefits of new industries needed to be better understood.

There was significant optimism expressed for the expansion of the recycling industry with concepts such as an ecology industrial park and the circular economy referred to in the engagement. The recycling industry is becoming more professional and technical which is seen as an opportunity for HBCC given its existing concentration of industry, buffering and potential to interconnect various industry sectors in a circular economy.

Given the municipality's significant and growing construction sector, recycling of construction materials was identified as a logical opportunity for the HBCC.

As per the earlier discussion on sustainability, growth of recycling industries in HBCC would seem to depend on broader co-operation and endorsement within the community:

> *"There are different expectations / perceptions in Europe. For example, it's quite common throughout Europe for households to be located right next door to Thermal Plant [waste treatment] facilities. That does not happen here in Australia. But the fact that it does happen in Europe shows that this is possible, and that society's perceptions have already shifted in those European countries.*

This, in turn, helps residents/society take greater 'ownership' of their own waste, which generates an increased interest in participating in recycling programs."

Warnings were also expressed about waste facilities that had in the recent past commenced operations guided by socially responsible intentions only to become dangerous storage areas with no environmental benefit.

Growing the HBCC's rail based logistics sector into a multiple modal system accessible to a greater range of businesses was also identified as a major opportunity given HBCC's freight rail and port access. Access to high capacity energy, large sites and proximity to the metropolitan area were also seen to be attractive to the data centre and data storage industry.

Covid-19 Impacts

Respondents were asked to detail the impact of Covid-19 restrictions on their enterprise. In general, manufacturing, construction and logistics were less impacted by lockdown restrictions than most other industries. Manufacturing and construction operations were permitted to continue operating under reduced workforce conditions while logistics, likewise, operated throughout both lockdown periods.

Stakeholders in manufacturing industries reported increased demand resulting from supply chain disruptions and difficulties procuring goods overseas. Logistics, likewise, saw increased demand. In 2019 an average of 1.6 million Australian households made an online purchase each week, by April 2020 during the first national lockdown this figure had risen to 2.5 million households per week.[2] During Victoria's second lockdown (August – October) all non-essential retail was closed for 12 weeks forcing all retail trade online. During this period warehouses and distribution centres along with postal and freight services continued to operate and experienced a significant spike in demand. This was confirmed in industry engagement. Like all enterprises, logistics organisations needed to modify their operations to comply with Covid-19 safety measures.

The project engaged with automotive distribution, hospitality, education and hospitality supply services. Each of these industries reported adverse impacts resulting from stay at home orders.

3.1.2. Stakeholder Engagement: Summary and Key Findings

The engagement provides insight into the perceptions of HBCC as a location for enterprise and economic activity. As is evident in the feedback detailed above:

- The vast majority of enterprises are committed to HBCC as a location for ongoing economic activity and future industry growth.
- For most stakeholders the centrality and accessibility of HBCC is the municipality's defining advantage
- On balance HBCC is seen as supportive of industry and commercial activity
- There is significant momentum in the property sector to invest in HBCC primarily to meet the demands of the logistics and distribution sectors which continues to grow driven by demand within the ecommerce sector. As discussed in the future industries section of this report, this may represent an opportunity to attract digital industries to HBCC particularly those that serve the west's growing logistics sector.

[2] Australia Post – Ecommerce trends

- There is a wide ranging take up of solar technology which has resulted in a reduction in energy related operating costs for enterprises.
- Established industrial infrastructure and the legacy of heavy industry based industrial uses is also seen as a locational advantage.
- Over the 2020 lockdown periods the manufacturing, construction and logistic sectors continued to operate and were therefore less impacted by lockdown restrictions than most other face to face based industries.

Charter also notes that demand for land and floor space by major institutional and private property investors is also a comparative advantage for the municipality as the scale of investment and development provides Council with a basis to achieve best practice amenity and environmental outcomes on new sites.

The engagement, nonetheless, revealed a range of issues confronting existing stakeholders that include:

- Growth limitations resulting from employment density controls and buffering requirements
- Limited and poor quality worker amenity
- Growing complaints by residents in relation to the amenity impacts of industrial activity
- Heavy vehicle traffic
- The increasing cost of land and floor space
- Environmental constraints

The breadth of responses in relation to the employment density controls suggests that there is a significant level of uncertainty and potential misunderstanding related to the current form and application of these controls. As it resolves its position in relation to the future form and operation of buffering and density controls, HBCC will need to engage with existing industry to ensure local enterprises and decision makers have the most up to date understanding of the operation and implication of the controls.

The engagement also suggests that there is a need (perhaps through the Reimagining project) to update the municipality's economic narrative to more closely align with sustainable development objectives. For over a century, HBCC has supported substantial industry and local employment. New residents are less likely to have a direct connection with HBCC's industrial areas as compared to residents in the past. The Reimagining project provides a basis to begin developing a new shared narrative with the community about continuity and change in the industrial composition of HBCC.

The next section will apply the insights, views and perceptions gathered during the stakeholder consultation to assist in identifying potential industries of the future.

4. Future Industries

This section of the report identifies future industries and industry sectors that have the potential to help renew, expand and transform HBCC's industrial sectors to achieve employment growth in conjunction with economic and environmental sustainability.

4.1.1. Method

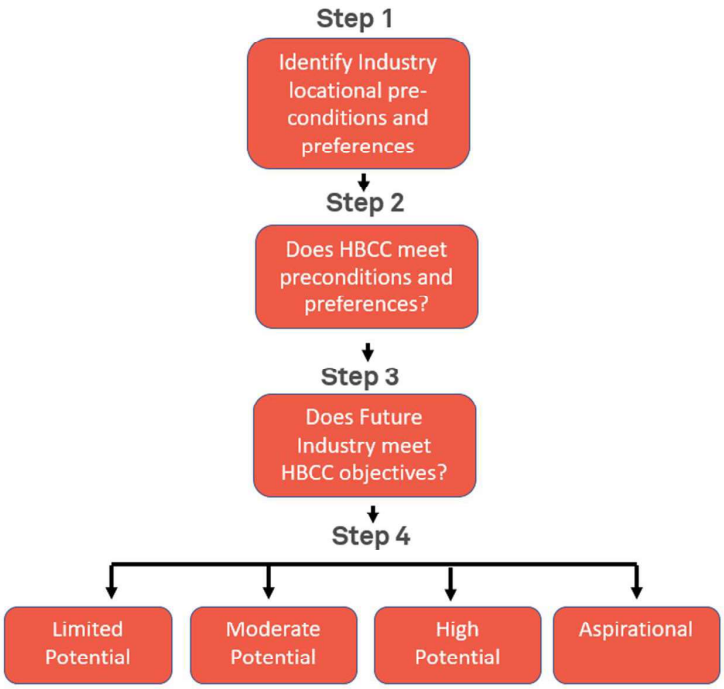
The future industries methodology fundamentally seeks to marry the locational attributes and advantages for industry in HBCC with the locational needs of future industries to identify those industries would benefit from operating from HBCC.

The future industry methodology draws from local stakeholder engagement, engagement with future industry representatives and independent research to:

- Step 1: Identify the locational pre-conditions and preferences of future industries
- Step 2: Assess the extent to which HBCC meets the locational pre-conditions of future industry
- Step 3: Assess whether the future industry meets HBCC development objectives (which are discussed shortly).

Based on the outcomes of steps 1, 2 and 3, Charter rates the potential for industry sub sectors to be attracted to HBCC. Sub-sectors are rated as having either limited, moderate or high potential to be attracted to HBCC.

Figure 2: Future industry identification process



A number of industry sub sectors are identified as aspirational sub sectors. These subsectors represent incipient industries (such as graphene, additives, waste to energy and polymer recycling) in which there are potential industry synergies and opportunities in HBCC. For these industries, there is an opportunity to facilitate long term relationships with new entrants via industry engagement and facilitation.

The assessment focuses on advanced manufacturing, recycling, new energy, and digital economy as future industry sectors as well as specific sub sectors of transport. These focus areas were established via consultation with Council officers.

Council Development Objectives

The future industries methodology also evaluates the desirability of future industry sectors against Council development criteria (step 4).

Council development criteria aim to identify future industries that will both sustain HBCC's role as a leading economic and employment location in the metropolis while also identifying industries that will lead the transformation of HBCC's economic base toward environmentally sustainable economic outcomes and impacts.

Each future industry sector is assessed in relation to the following criteria:

- Increase our local jobs
- Be an environmental leader
- Balance job growth with community impacts
- Continue to be a major economic force in Melbourne

As will be seen, at times, the application of the criteria have resulted in the ratings for a number of industry subsectors to be downgraded. Most often this is a result of potential amenity and environmental impacts. There also industry sub sectors which are identified as potential future industry sectors in which it is recommended that Council further investigate their potential benefits and disbenefits.

Future Industries Engagement

The future industries assessment draws on the results of the stakeholder engagement, independent industry sector research as well as engagement with future industry enterprises and peak groups.

To help identify the locational needs of future industries, Charter engaged with representatives of peak groups in advanced manufacturing and bio tech and pharmaceuticals, government representatives in the recycling sector and new energy, a number of private new energy enterprises and a digital enterprise leader. The project team also engaged with government specialist investment attraction representatives with a particular focus on Melbourne's north and west. These engagements ranged between 45 minutes to an hour in length.

Future Industry Focus: Population Serving Industries

The study does not consider population serving industries as potential future industries for Hobsons Bay's industrial areas with the exception of Spotswood Industrial Precinct.

Population servicing industries include the health, education, arts and social assistance sectors as well as government services. These are sectors that, in general, are best located in mixed use/ commercial areas with high levels of connectivity and surrounding land uses that are supportive of significant levels of human mobility and interaction. While these sectors have the potential to grow within the municipality; zoning, employment density controls, connectivity and surrounding land uses are likely to limit their future role and expansion in industrial areas.

Overall, the Reimagining project seeks to identify future industries that will help to sustainably renew and expand industrial activity in Hobsons Bay that are generally in keeping with existing industrial land use settings.

4.1.2. Locational Advantages and Disadvantages Recap

The engagement with existing stakeholders provided insight into the breadth of locational advantages and disadvantages for industry operating from HBCC. These insights are central to the future industry assessments and are recapped as follows.

Key advantages include:

- Outstanding road and port accessibility
- Rapid accessibility to metropolitan consumers
- Established heavy industry
- Supportive planning frameworks that enable industrial activity
- Large self contained sites
- Established high capacity power

In addition, HBCC is well positioned to leverage broader socio-economic change emerging throughout Melbourne's Western Region. The skill, occupation and education base of the west is transforming to incorporate higher numbers of professionals and managers with higher education qualifications creating the basis for new knowledge based enterprises within the region as well as new locally based businesses that reflect the locational preferences of western region based entrepreneurs.

Potential locational deterrents including:

- Negative perceptions of heavy industry
- Limits on employment densities
- Uncertainty related to the implications of employment density provisions
- Poor worker amenity
- Heavy vehicle traffic
- Cost of floor space

In engaging with future industry sectors Charter also identified the lack of established relationships with major research institutes and education facilities as a potential barrier, particularly in attracting start up enterprises to HBCC. Industry advice suggested this may not be an absolute barrier particularly for industries that require specific planning environments and larger enterprises that have grown beyond the start up phase. The cost of floor space is, likewise, seen to limit the attractiveness of HBCC for start up enterprises (but not necessarily established entities).

In considering the above it is important to note that no identified advantage or disadvantage is absolute and may under specific circumstances be mitigated by other factors that may be more highly valued – for logistics enterprises, speed to market justifies floor space costs.

4.2. Advanced Manufacturing

Advanced manufacturing is a form of manufacturing that relies on unique knowledge including specialised technologies, manufacturing inputs and production processes.

In every industry what constitutes "advanced" differs. In most cases, however, when unique knowledge is embedded either in a process or technology to create high value objects this tends to distinguish the manufacturer as demonstrating leadership in their sector.

While the differences are not absolute, traditional manufacturing tends to draw on high volumes of labour and energy in the mass production of products that tend to be less specialised and more easily replicable than those produced in an advanced manufacturing context. Competitive advantage in a traditional manufacturing relies on cost and production efficiency while in an advance manufacturing context, competitive advantage is strongly aligned with specialised knowledge and processes. This is not to suggest that the cost of inputs are not critical in an advanced manufacturing process. They are not, however, the sole competitive advantage.

Under liberalised trading conditions, much of Australia's conventional manufacturing base has been unable to compete with overseas based high volume, low cost manufacturers. This has resulted in the ongoing decline in the mass production of textiles, bulk chemicals, automotive products and electronic goods within Australia.

Some manufacturing industries continue to compete successfully, particularly in sectors where either perishability, shipping costs, niche outputs and local reliability and speed to market are important market determinants.

For government and industry, the future of manufacturing in Australia is largely focused on niche and advanced processes in which competitive advantage draws from specialised knowledge and skill (and not the cost of production).

Government is therefore seeking to promote both skill and knowledge through research and development initiatives and funding for targeted industry sectors as well as "hard" improvements via direct investment in technology and advanced machinery.

4.2.1. Industry Policy

State and federal governments are seeking to promote the renewal of manufacturing within Australia via a range of incentives for specific target industries, all of which entail an advanced manufacturing focus.

In October 2020 the Federal Government announced the $1.3 billion Modern Manufacturing Initiative (MMI) focusing on:

- Resources Technology and critical minerals processing
- Food and beverage
- Medical products
- Recycling and clean energy
- Defence
- Space

The MMI provides co-funding for large manufacturing projects in line with the above priority areas. For HBCC, federal assistance for new facilities in the food and beverage and recycling and clean energy sectors would seem to align with current and potentially future industry sectors (which will be explored shortly).

In response to Covid-19 impacts on global supply chains, the MMI also contains funds to build supply chain resilience. Government is focusing on identifying essential goods and services critical to Australians at times of crisis, mapping industry supply chains and manufacturing capabilities and evaluating supply chain resilience. HBCC should ensure it remains abreast of this project, as the results of the project may help further establish the role of HBCC in Australia's supply chain systems (for instance, in energy security and potentially in food and logistics).

Victorian Policy

Within Victoria *Advancing Victorian Manufacturing* (2017) provides a blueprint for Victoria's manufacturing future. The document outlines a vision for Victoria as home to internationally competitive manufacturers generating new economic value from design, engineering, data and services.

Advancing Victorian Manufacturing identifies a range of training, investment, networking and capability building initiatives that will support the renewal of manufacturing in Victoria. For HBCC, the initiatives detailed in the plan articulate the breadth of actions needed to support the renewal and growth of industry in HBCC.

Goal	Actions
Prepare for the jobs of the future	Target specific skills needs through the work of the Victorian Skills Commissioner and support the development of needs driven training packages designed for the next generation of manufacturing jobs. Promote and link opportunities for science, technology, engineering and mathematics (STEM) graduates and other high-skill professionals within manufacturing in partnership with education providers and industry organisations. Support industry associations to deliver manufacturing leaders forums and other mechanisms to enhance management and leadership capabilities.
Innovate to capture high-value manufacturing opportunities	Strengthen links between industry and research, design and engineering capabilities and facilitate uptake of transformative technologies to create new high-value products, processes and market opportunities. Facilitate improved access to risk capital for scale-up and start-up advanced manufacturing businesses. Further strengthen procurement processes to better support innovative design, engineering and manufacturing. Secure Victoria's global position as a leader in engineered materials such as fibre composites.
Build scale, capability and supply chain excellence	Help small and medium enterprises (SMEs) enhance their business capabilities to capture more market and supply chain opportunities. Drive the digital transformation of manufacturing through training, demonstrations and knowledge exchange to share global best practices and optimised processes across Victoria's manufacturing industry. Work with industry to create place-based economic development plans, facilitating the future development of high-performing and cooperative clusters.

Goal	Actions
Foster a globally competitive business environment	Boost Victorian manufacturers' capabilities to export and secure global supply chain opportunities. Prioritise attraction of advanced manufacturing investment in Victoria as part of the state's investment attraction strategy. Work with industry to manage exposure to volatility in energy markets. Work with the Commonwealth Government to enhance the benefit of its expenditure for Victorian manufacturers, and advocate for competitive national tax and regulatory settings.

Building on the above, the Victorian Government's *Future Industries* initiative focuses on securing Victoria's economic prosperity by supporting the transition of Victoria's economy and establishing the building blocks for future growth.

Future Industries focuses on bolstering core manufacturing capabilities by providing policy, organisational and investment support for growth in:

- Construction technologies
- Defence technologies
- Food and fibre
- Medical technologies and pharmaceuticals
- New energy technologies
- Transport technologies
- Professional services

The 2020/21 Victorian Budget includes a $2 billion *Breakthrough Victoria Fund* to position Victoria as an international leader in research and technology. The fund focuses on driving investment in priority industries including medical research, health and life-sciences, agri-food, advanced manufacturing, clean energy and digital technologies.

For HBCC, Victorian government funding and industry policy initiatives may provide opportunities to support the renewal of its energy sector, promote advanced manufacturing and grow an advanced construction sector.

4.2.2. Locational Pre-Conditions

Locational attributes required by the advanced manufacturing sector have been drawn from consultation with the sector and independent research. The analysis in the table below also considers the extent to which HBCC meets these preferences.

Overall, HBCC meets many of the locational criteria for advanced manufacturing. However, a lack of established relationships and networks with research and innovation institutes and a perceived lack of access to knowledge workers may represent impediments. Neither of these impediments are absolute specifically because:

- New communication technologies support networking and personal connectivity independent of location (which was confirmed in the consultation).
- Other factors such as location and accessibility, particularly for larger enterprises may outweigh the need for co-location with knowledge networks and knowledge workers.
- Knowledge networks can be nurtured over time.
- The skills profile of the west is changing due to skilled migration.

Locational criteria	Explanation	HBCC Evaluation
Networked access to unique knowledge	Advanced manufacturing is deeply linked with the application of unique knowledge. For emergent industries such as nanotechnology and bio-tech strong and proximate associations with the university sector are needed. The emergence of Carbon Revolution in proximity to Deakin University in Geelong exemplifies this form of relationship. Likewise, the emergence of CSL within the context of Parkville has been supported by highly symbiotic relationships between research institutes and industry.	HBCC does not currently support unique knowledge networks in which there is an established, ongoing and public association between industry and research institutions that supports industry innovation.
Access to skills	Advanced manufacturing creates significantly more skilled jobs than unskilled jobs. It therefore relies on a skilled and knowledgeable workforce. Proximity to talent is important for advanced industries.	The skill profile of Melbourne's west is steadily changing, primarily due to skilled migration to the region. At present, most advanced industry is located in the city centre and south east. As the Centre of Melbourne continues to shift west ward and the level of skill in Melbourne's west evolves the attractiveness of the west as a source of highly skilled workers will change. Likewise, local entrepreneurs a class of advanced knowledge focused local entrepreneurs will also emerge.
Secure self contained sites	Advance manufacturing enterprises need to protect their unique knowledge. Thus, self contained secure sites are attractive to the industry.	HBCC incorporates many self -contained single sites that may suit the secure conditions of advanced manufacturers.
Access to high capacity energy	Manufacturing relies on substantial and reliable supplies of energy.	HBCC has well established high capacity energy infrastructure.
Supportive land use framework	All manufacturing relies on a supportive environment in which their hours of operation, potential noise impacts and movement of products are supported by favourable land use settings.	Land use settings are supportive of manufacturing activity
Access to consumers and markets	For some advance manufacturers rapid access to markets and consumers is a major locational attractor.	HBCC provides high levels of metropolitan and national accessibility.

4.2.3. Potential Sub Sectors - Advanced Manufacturing

High potential and aspirational advanced manufacturing sub sectors are detailed below. The study also identified a number of sub sectors with moderate potential including the pharmaceuticals and biotech sectors. A comprehensive evaluation is available at Appendix 3.

Sub sector	Definition	Outlook	Commentary	Opportunity Evaluation
Advanced Construction	Advanced construction includes construction systems in which core elements of building construction including external walls, facades and internal structures are developed within an off site manufacturing context. Prefabricated construction minimizes material and energy waste and accelerates the speed of development and increases worker safety.	Victoria aims to become the national centre for innovation in construction technologies. Government is committed to supporting development and testing of new construction innovation infrastructure and the facilitation of associated skills, networks and trade relationships. Adoption of prefabricated construction is likely to grow in line with worldwide trends.	HBCC is well placed to facilitate a cluster of advanced construction companies. Advanced construction is rated as a high potential industry sector that justifies policy support and advocacy for the development of an industry support hub in HBCC.	High potential – Industry targeted for advocacy.
Advanced food manufacturing	The application of advanced techniques to influence the taste, structure, productivity, longevity, health and hygiene of food. Plant based meat, 3-d printing of food, the replacement of salt and sugars in conventional foods and the reuse and reduction of waste in food production are examples of advanced food manufacturing applications.	Demand for food continues to grow along with the need for healthy low environmental impact high productivity food. Food and fibre are identified as key future industries for Victoria.	The west is earmarked as a location for food and fibre manufacturing and already supports a growing cluster of food and advanced food manufacturing enterprises. To date, Werribee has attracted advance food manufacturing investment that leverages from CSIRO investment in this sector within Werribee. As has occurred in the construction sector, successful food manufacturers may choose to relocate in HBCC as their enterprises expand.	High potential to attract high growth established enterprises attracted to improved accessibility Limited potential to attract start up enterprises

Sub sector	Definition	Outlook	Commentary	Opportunity Evaluation
Additive manufacturing	Additive manufacturing techniques create complex continuous materials via 3-D printing, powder-bed laser printing and fused modelling. Additive manufacturing creates objects that reduce failure points, weight and thermal dissipation. Aerospace, medical, automotive and consumer industries increasingly use additive objects.	Victoria's blueprint for manufacturing identifies additive manufacturing as a priority area of policy support and co-ordination. Applications for additive based outputs are set to expand driving associated growth in this industry and potentially a degree of re-localization of manufacturing.	As an incipient industry, additives should be targeted as an aspirational industry. Given the industrial legacy of HBCC and potential synergies with existing manufacturing industries and chemical industries, additives is a credible aspirational industry sector, HBCC should seek to engage with the additives sector.	Aspirational. HBCC should engage with additive sectors
Composite manufacturing	Composite manufacturing involves the creation of advanced materials including high strength alloys, recyclable plastics, Kevlar, advanced ceramics/glass, metal-polymer, fibre reinforced composites and graphene. Composite materials increase durability and performance by reducing friction and abrasion and help end users avoid the need to consider material trade offs when selecting between materials.	The growing use of composite components in a variety of consumer, industrial and medical settings is set to drive significant growth in this sector. The sector is dependent on access to skills and land use settings that support industrial activity.	As with additive manufacturers, composite manufacturers are currently concentrated in Melbourne's south east with more limited numbers of enterprises in the west. Over time, continued growth in the west's knowledge workforce will see new knowledge based enterprises emerge. As with additive manufacturing, HBCC might target specific advanced areas of composite manufacturing such as graphene and plastics as sectors of aspirational future growth.	Aspirational.

Sub sector	Definition	Outlook	Commentary	Opportunity Evaluation
Advanced materials - Graphene	Graphene is flexible, transparent, strong, and electrically and thermally conductive. It is 200 times stronger than steel and six times lighter. The material conducts electricity 30 times faster than silicon and is also transparent and bendable. Potential applications for graphene include energy storage and battery products, wearable electronics, smart phones, nano-electronics, super thin and unbreakable touchscreens, industrial scale batteries and supercharged quantum computers.	Graphene is still a prohibitively expensive substance, however, its substantial potential is driving world wide research into its commercialisation. Graphene and graphene applications have been identified as a future industry by the Victorian State government. In 2018, state government facilitated the development of the Graphene Industry Association.	A lack of proximity to related research institutes is likely to be a disadvantage in attracting start up enterprises. HBCC should consider targeting this sector as an aspirational sector for future growth. HBCC should engage with the sector to explore locational needs.	Aspirational.

4.2.4. Council Objectives

The following reviews advance manufacturing industries against Council development objectives.

Council Objectives	Advanced Manufacturing
Increase our local jobs	As advanced manufacturing tends to focus on more niche processes the volume of employment is more limited than traditional manufacturing. Notwithstanding this, advanced manufacturing operations in Victoria tend to employ between 50 to 150 people in mostly higher value occupations (engineering and technical jobs). If HBCC were to attract a cluster of advance manufacturing medium sized enterprises this would cumulatively support a significant high knowledge workforce.
Be an environmental leader	It cannot be assumed that all advanced manufacturing process will demonstrate environmental best practice. However, within the sector there is high likelihood that enterprises will incorporate low emission technology, and utilise less carbon intensive materials, energy and water in manufacturing processes. Overall, a local advance manufacturing sector is likely to include enterprises that will help lead environmental best practice in HBCC.
Balance job growth with community impacts	Will contribute high quality jobs growth that aligns with the growing professionalisation of the western region workforce.
Continue to be a major economic force in Melbourne –	Attracting agglomerations of advanced manufacturing in specific industries will help renew the role of HBCC in Melbourne's economy and shift and diversify perceptions of its ongoing economic role.

4.2.5. Case Study: Co-Labs

Co-labs is a biotech-focused co-working space, located in Brunswick, Melbourne. Co-Labs is an innovation hub which provides space for applied and translational research, which addresses a need for cost-effective infrastructure support, by providing laboratory space, laboratory equipment and co-working facilities for biotech businesses, independent researchers and life science start-ups. Co-Labs is an innovation hub which provides space for applied and translational research, which addresses a need for cost-effective infrastructure by providing laboratory space, laboratory equipment and co-working facilities for biotech businesses, independent researchers and life science start-ups.

Co-Labs has partnerships with a number of charity groups, including BioQuisitive (an open community laboratory) and The Phoenix School Program (focused on the promotion of STEM literacy and the application of circular economics to the scientific ecosystem).

A range of memberships are offered at Co-Labs on weekly and monthly arrangements, with a key benefit for start-ups being the reduced need to make extensive up-front lease commitments. Additional services are offered such as assistance with the procurement process for biological reagents and bio-hazardous waste management services.

In the context of the current and future growth of biological life sciences, Co-Labs aims to produce a range of benefits including job and value creation spanning across a range of new and emerging biologically-based industries.

Co-working bio-tech space may provide HBCC the opportunity to test demand for biologically based start-up enterprises in the west that links to growing professional workforce in the west and the historic strength of HBCC's chemical industries.

4.3. Digital Enterprise

Consumer engagement, marketing, distribution, and core customer and supplier processes increasingly rely on digital technology and capability. The onset of the digital age has seen the emergence of new and unprecedented forms of service delivery, marketing and social and business networking that are rapidly displacing long established business models. Digital technologies and industries now lead growth and value generation in the economy.

In Melbourne, Cremorne has emerged as a core location for digital enterprises. Cremorne is home to 700 digital businesses that currently employ over 10,000 workers that generate over $4 billion in annual revenue. Home grown digital start ups such as CarSales, MYOB, REAGroup and Seek are all based in Cremorne which is also home to local representatives for Uber, Tesla and Disney. Project engagement suggests that Cremorne is an important part of the identity of digital enterprises, particularly in the perceptions of other digital enterprises and staff.

Covid-19 has accelerated the take up of e-commerce services and sales in Australia. In 2020, more people shopped online than ever before. According to Australia Post, E-commerce in Victoria grew 111% year on year in April (compared to 19.9% in 2019). Established businesses, now face the choice of digital transformation or extinction. Fortunately, in HBCC, engagement conducted during this project suggests that enterprises are embracing the digitalisation of the economy with a vast variety of local processes managed via digital systems.

The rise of e-Commerce is driving associated growth in demand for logistics services. From 2013, online retail sales as a proportion of total retail sales, has risen from approximately 2.1% to 11.3% of sales in April 2020.

Figure 3: Online Sales, as a Proportion of total Retail Sales (Australia

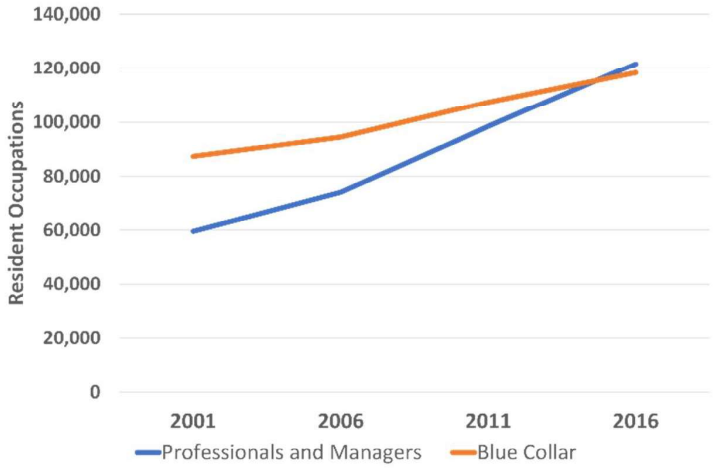
Source: ABS; Charter Keck Cramer

The rise of ecommerce and demand for all forms of digital infrastructure and expertise has driven exponential growth in demand for tech workers. According to Australian Computer Society's Digital Pulse Report of 2018, more than 100,000 additional tech workers will be required to 2023.

Prior to Covid-19, Victoria was importing skilled labour from overseas to fill skill gaps in the economy. The west is now home to high numbers of skilled migrants to the extent that professionals and managers now outnumber blue collar workers. There is,

therefore, a growing basis for a knowledge based high skilled economy in Melbourne's west which is somewhat reflected in the recent unprecedented take-up of commercial floor space in Williams Landing by local entrepreneurs (30,000 sqms of commercial floor space).

Figure 4: Occupations Melbourne's Western Region 2016



Source: Charter Keck Cramer

Within Hobsons Bay, the growth of online retailing through smartphones and tablets is set to continue to drive demand for floor space for logistics purposes. Retailing is now largely a function of integrated marketing and logistics. Respondents during the project engagement consistently noted the attractiveness of Hobsons Bay's for logistics uses and the associated willingness of investors to fund the development of logistics floor space.

Digitisation is increasingly transforming logistics. The use of robotics and automation technology will be a feature of e-commerce into the future. Automation in warehouses allows businesses to cut overall costs whilst also increasing efficiency. Automation through a network of connected systems in conjunction with the Industrial Internet of Things will eventually enable automated:

- Material batching
- picking
- packing
- warehouse security
- inspection.

Robotic technology provides numerous benefits to logistics operators including the ability to scale operations up or down as required while offering major efficiency gains and mitigating inherent challenges associated with labour and staffing. It is forecast that by 2025, in excess of 4 million robots will be in operation across more than 50,000 warehouses within the United States.

As discussed below, the proliferation of robotics may provide HBCC with the opportunity to support a logistics based tech sector. Additionally, as e-commerce sales increase as a proportion of total business sales, businesses may choose to begin managing a larger share of their own ecommerce and logistics functions via in-house operations (rather than using third party providers). This, likewise, may provide Hobsons Bay with the

potential opportunity to attract new digital businesses that encompass both logistics, marketing and administration in the same facility.

4.3.1. Policy Drivers

The federal government is seeking to optimise Australia's digital economy capability via the Industry 4.0 initiative. Industry 4.0 refers to the way in which technologies will connect the physical world with the digital world. This encompasses advanced automation and robotics, machine-to-machine and human-to-machine communication, artificial intelligence and machine learning and sensor technology.

Government is seeking to boost capability via a series of initiatives including,

- Collaboration: Government is orchestrating a collaboration with the German industrial sector
- Standardisation: developing reference architectures, standards and norms for the internet of things
- Testlabs: government will fund 5 testlabs within the university sector
- Apprenticeships: Government will fund a higher apprenticeship scheme dedicated to advanced industry

Federal government's priority growth sectors initiative will also prioritise Industry 4.0 initiatives within sectors of the economy that have been identified for priority support.

Within Victoria, State government has identified Cremorne as a centre for innovation, technology and high-skilled jobs. The *Cremorne Place Implementation Plan* seeks to further develop Cremorne as a global innovation and technology precinct. This will include a purpose-built digital hub that fosters collaboration and joint projects as well as digital skills and training.

4.3.2. Locational Pre-Conditions

HBCC satisfies all locational preconditions for ecommerce operations and only limited number of preconditions for digital enterprises.

Locational criteria	Explanation	HBCC Evaluation
Access to road networks and consumers	**Ecommerce**: The ability to distribute significant volumes of product to a large number of consumers within a short timeframe is imperative for any e-commerce business. In order to reduce the time of last mile journeys (from fulfilment/distribution centres to consumers) it is necessary for e-commerce fulfilment/distribution centres to be located within close proximity to major arterial roads and the freeway network. Similarly, with consumers demanding same day or next day delivery it is necessary for e-commerce businesses to have their distribution centres located as close as possible to large numbers of consumers.	**Ecommerce:** HBCC is located in proximity to the Princes Freeway and the Western Ring Road, which provide connectivity to Melbourne's western, northern and south eastern suburbs. In addition, HBCC is supported by a significant local arterial road network which provides easy access to the freeway network. HBCC is also located within the heart of Melbourne's growing west. By 2036, the region is forecast to contain approximately 1.5 million residents (*VIF2019).* HBCC is well positioned to support the logistical functions of ecommerce operations.
Access to skills	**Digital enterprises**: The digital economy relies on a highly skilled workforce which was confirmed during the project engagement. Metropolitan access to high	**Digital Enterprise:** Skilled migration is changing the skills profile of Melbourne's west. At present, most advanced industry is located in the city centre and south east

	value workers is a key consideration for digital enterprises. **Ecommerce:** Many e-commerce fulfilment and distribution centres are leading the way in embracing automated technology and robotics. As such there is a need for skilled workers to oversee the use of this technology rather than traditional warehouse employees. E-commerce and logistical operations prioritise road access over worker accessibility. Over the past decade, the west has seen logistically focused technology companies establish in Melbourne's west. Schaefer is, for instance, located in Sunshine.	which tends to reflect the locational preferences of enterprise owners and managers who are likely to live in these areas. As the centre of Melbourne continues to shift west ward and the level of skill in Melbourne's west evolves, the attractiveness of the west as a location and source of highly skilled workers and knowledge based businesses will also grow and change. Spotswood is well positioned to attract commercial office uses that service the western economy including new digital industries. **Ecommerce**: Spotswood is an ideal location to attract new digital companies that support ecommerce and warehouse infrastructure.
Established Industry Cluster	Co-location with other digital suppliers, providers and clients is a critical locational factor for digital business. During the engagement a company based in Cremorne stated that their Cremorne address was an important part of the profile and identity of the enterprise amongst workers and industry.	HBCC does not currently support a cluster of digital businesses. New clusters of economic activity will emerge in the west as the west continues to grow. The amenity and historic architecture of Spotswood is likely to be attractive to new digital enterprises and commercial office uses.

4.3.3. Potential Sub Sectors: Digital Enterprises and e-Commerce

High potential and aspiration digital sub sectors are detailed in the table below. A more comprehensive assessment is detailed at Appendix 3.

Sub sector	Definition	Outlook	Commentary	Opportunity Evaluation
Digital Industries	Digital enterprises provide digital services include the array of enterprises that enable digital commerce including digital marketing, technical support, infrastructure and platform development and maintenance, recruitment and project management.	Digital services are a key growth area of the contemporary economy. Demand for digital skills currently exceeds supply.	With supportive planning controls and commercial accommodation that draws on its industrial legacy, Spotswood has the potential and amenity to attract digital businesses noting that these businesses can grow rapidly from start-up to establishment.	High Potential – the future form and amenity of Spotswood may prove attractive to digital enterprises. Council should work with developers to deliver built form that is attractive to this industry
Logistics Technology	This encompasses the development, implementation and maintenance of technological platforms that support contemporary logistics including robotic and automation technologies.	This is a key growth area of logistics as supply chain management, inventory management and order processing and dispatch are increasingly automated and sophisticated.	Given the prevalence of logistics enterprises in HBCC, Spotswood is well placed to support a logistics technology hub.	High Potential – As robotics and automation become ubiquitous in logistics, the logistics technology sector will grow – Spotswood is well positioned to logistics technology industries.

Sub sector	Definition	Outlook	Commentary	Opportunity Evaluation
New Format E- Commerce	Integrated e-commerce entails operations in which the commercial office functions of ecommerce (marketing, administration and platform maintenance) are co-located with logistics functions.	This is not currently a prevalent form of ecommerce operations. As ecommerce grows some organisations may seek to consolidate functions within a single premises and location.	With appropriate accommodation that enables the co-location of office and logistics uses Spotswood might support a small number of integrated ecommerce enterprises. These might establish a precedent for other organisations in Altona and Altona North.	High Potential – Spotswood is well positioned to attract integrated e-commerce enterprises provided there are suitable facilities and these comply with land use frameworks.
Data Centres	Data centres are facilities that store, process, and disseminate data.	The demand for data storage and services is set to grow in line with the continued take up of cloud computing and the exponential growth of industry, government and personal data.	Data storage requires secure, self contained sites with high capacity reliable energy supply. HBCC's central location combined with the prevalence of self contained sites and established high capacity energy supply makes the area highly attractive for data storage purposes. If data storage were eventually linked to battery technology that stored energy from sustainable sources, then HBCC may have the opportunity to support a sustainable data storage enterprises. Locations within buffers and subject to density controls are likely to suite the low density employment character of data storage.	High Potential particularly within Altona and Altona North.

Sub sector	Definition	Outlook	Commentary	Opportunity Evaluation
Robotics and automation	The use of robots to automate production processes, undertake heavy lifting and precision movement and to undertake hazardous tasks. Robotics improve consistency and speed while reducing costs and limiting human risk.	The application of robotics in commercial and domestic life is set to expand. Robotics are common in automotive, aerospace, forging, and consumer good manufacturing. As industries automate production and service systems robotics will expand. Robotics is not identified as a national or local sector for government facilitation.	The logistics industry has been an early adopter of robotic technologies. The existing and growing cluster of logistics uses in HBCC provides a basis for HBCC to attract higher order technology enterprises that service logistics needs and create a genuine HUB of innovation for logistics uses. The breadth of logistics enterprises in HBCC creates logical synergies with robotics and automation sectors as they relate to processing and the movement of goods.	High potential to attract logistics focused robotics and automation enterprises

4.3.4. Council Development Objectives

The growth of digital enterprises within HBCC has the potential to provide a number of employment and economic leadership benefits.

Council Objectives	Digital Economy
Increase our local jobs	Digital employment has the potential to significantly boost job densities in line with jobs densities normally associated with professional services. A growing digital sector will also boost the diversity and value of local jobs as well as generating flow on demand for local hospitality, accommodation and conference based enterprises.
Be an environmental leader	Digital and e-Commerce enterprises are unlikely to spur environmental leadership.
Balance job growth with community impacts	Unlike heavy industry, digital employment does not tend to result in amenity disbenefits. The long growth of a digital sector in Spotswood needs to be carefully planned so as to protect the operations of existing heavy industry whilst leveraging from historic industrial architecture.
Continue to be a major economic force in Melbourne	The growth of a digital sector will help the west attract higher order employment and help re-position the west as a location for contemporary knowledge based industries. As discussed, Spotswood is the ideal launch point for digital industries in HBCC as well as new format e-commerce operations.

Brooklyn Navy Yard

The renewal of the Brooklyn Navy Yard in New York City into a high tech hub exemplifies the renewal of former industrial areas in ways that bridge new and old economies.

Figure 5: Brooklyn Navy Yard

To date the Navy Yard has attracted over 450 businesses employing over 11,000 people including a significant number of technology, electronics and advanced manufacturing businesses. The Yard is home to leading sound, payment, portable power, hardware, custom electronics, digital design, advanced pro-typing and printing enterprises.

For HBCC the Navy Yard represents a form of reimagining traditional industrial built form into a contemporary location that maintains manufacturing capability via a focus on new economy/digital methods and enterprises. Fundamentally, future manufacturing combines digital technologies with advanced production processes requiring the co-location of both manufacturing and technology companies.

The company Nanotronics is illustrative of this change. In 2021, technology company Nanotronics built a new 45,000-square-foot facility in the Brooklyn Navy Yard, to make hardware and software used to detect flaws in manufacturing. The company's platform uses artificial intelligence, automation, and imaging to find flaws in manufactured products.

Nanotronics Navy Yard facility currently employs 190 staff including professionals in physics, optics, robotics, artificial intelligence and software engineering. Staff provide inspection solutions for companies in the aerospace, automotive, pharmaceutical, advanced materials, and semiconductor industries. The company is the first tenant of Building 128 which is the Navy Yard's multi-disciplinary technology centre, known as New Lab.

4.4. New Energy Industries

The future will see the transformation of energy systems as dependence on renewable energy grows and the use of fossil fuels declines. HBCC has a long history in the refinement, storage and distribution of energy. Given its expertise, land use settings and infrastructure, HBCC is well positioned to help lead the sustainable transformation of Melbourne's energy systems via the establishment of new energy industries and the renewal of existing industry.

The growth of renewable and clean energy is critical to combating climate change. The project engagement identified significant take-up of solar energy systems within local industry and associated cost savings. Council is also leading initiatives to introduce precinct based energy generation.

Sustainable energy includes energy from naturally renewing sources including wind, solar, geothermal and wave energy. The creation and consumption of energy produced by renewable sources tends to result in no emission of carbon dioxide. Over the next two decades the retirement of fossil fuel energy infrastructure will be accompanied by the ongoing growth of renewable energy.

New energy opportunities also incorporate alternate forms of energy including hydrogen fuel and various forms of energy generation from biomass. These forms of energy are generally not considered carbon neutral as they tend to generate emissions either at combustion or in their development (the extent to which alternative energy forms are clean and renewable is subject to debate, albeit they tend to be far greener relative to fossil fuel based energy).

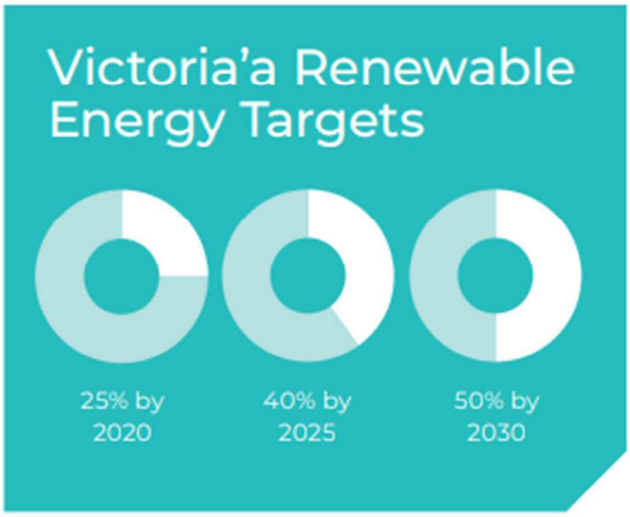
The growth of renewable energy is resulting in concomitant growth in the demand for high capacity energy storage technology. The intermittent nature of renewable energy requires complimentary storage systems that support predictable and reliable energy consumption. As such, battery technology has recently emerged as an important component of renewable energy infrastructure.

Relative to traditional fossil fuel energy generation, renewable energy systems source energy from a far greater number of locations and inputs which is rapidly decentralising energy systems.

The Victorian government in particular has outlined specific targets for renewable energy and has identified the sector as a major sector for employment growth, investment and technological research and development.

4.4.1. Industry Policy

The Victorian Government is committed to a net zero emissions target by 2050 and a road map of emissions reductions that will see Victoria obtain 40% of its energy needs from renewable sources by 2025 and 50% by 2030.



State government's Renewable Energy Action Plan includes a variety of initiatives to spur sustainable change by

- Transforming Victoria's generation stock towards renewable energy
- Addressing barriers to distributed generation and storage
- Encouraging household and community renewable generation
- Expanding the Government's role in facilitating the uptake of renewable energy

Government's 2020/21 Budget will see approximately $1.6 billion spent on renewable energy projects. Notably, for HBCC government will invest $540 million to establish six Renewable Energy Zones across the state. Renewable energy zones are intended to improve energy reliability and security by co-ordinating the transmission of new renewables into energy systems. Additionally, government is also focused on boosting the hydrogen energy sector via funding for new hydrogen projects ($108 million).

Waste to energy systems encompass both recycling and energy initiatives. In Victoria state government is seeking to carefully support the growth of appropriate waste to energy systems by focusing on waste to energy investment that is effective in reducing emissions, supports long term business models and works with the existing community. Government has introduced a 1 million ton per annum cap on waste to energy generation that is intended to limit over investment in the industry. At present there are a number of seriously entertained waste to energy proposals in the state that will consume all of the allocated cap (proposals are in Laverton North, Dandenong, Maryvale, Ballarat and Craigieburn). The cap, however, will be reviewed in 2021 potentially opening new opportunities for waste to energy in other locations. Waste to energy has been criticized by sustainability groups in relation to their potential to fuel toxic emissions and generate pollution.

In addition, to the above HBCC has committed to zero emission targets in its recent *Community Greenhouse Strategy.* The strategy entails achieving carbon neutrality through a combination of reduction in emissions and compensation for emissions through purchase of carbon offsets. The strategy includes actions to promote and implement energy efficiency measures for residents, business and industry.

The Federal Government's *Energy Policy Blueprint* (December 2020) outlines federal energy objectives and policies which strongly focus on energy security and affordability. Specifically, the blueprint seeks to:

- Maintain and increase the supply of reliable electricity
- Increase domestic gas supplies
- Promote efficient investment in energy infrastructure
- Ensure Australia's fuel security

As part this, the blueprint also aims to ensure that all of Australia's international commitments are kept by:

- Encouraging emissions reduction across the economy
- Accelerating technological energy solutions

Hydrogen

Authored by the Council of Australian Governments Energy Council, the Australia's National Hydrogen Strategy seeks to:

- Advance priority pilots, trials and demonstration projects
- Build demonstration scale hydrogen hubs
- Assess supply chain infrastructure needs
- Develop supply chains for prospective hydrogen hubs

The Strategy identifies 57 joint actions, considered to be 'first steps' towards developing a hydrogen industry in Australia.

In Victoria state government has committed to a new multi-million-dollar Hydrogen Hub in Melbourne's south east. The $10 million Swinburne University of Technology Victorian Hydrogen Hub (VH2) will explore new hydrogen technologies, including clean energy vehicles and hydrogen storage containers.

According Victorian Government information VH2 will create about 300 new full-time jobs. The initiative links with a twin facility slated for Stuttgart in Germany, which will foster an international hydrogen development partnership.

2021 will see government release its Renewable Hydrogen Industry Development Plan which will set the framework for building a hydrogen economy in the state. For HBCC the project illustrates the importance of fostering research relationships as means of stimulating new industry.

4.4.2. Locational Pre-Conditions

In seeking to identify pre-conditions Charter has sought to identify the attributes needed to support the development of large scale energy facilities that provide high volumes of reliable and commercial energy supply to consumers.

As such, the preconditions for precinct based and local energy generation are not considered within the framework.

Preconditions	Overview	HBCC
Reliable energy sources	Large scale renewable energy facilities require favourable meteorological conditions (solar requires locations with high average solar radiation while wind power requires locations with windy conditions). Waste to energy facilities require access to ongoing streams of material which depending on the energy facility might include organic waste, plastics and other forms of waste. Notably, recent federal government regulation will see the effective ban of waste exports which will impact on the volumes of waste supply in Victoria. At present, large quantities of electricity are need to power electrolysis in the production of hydrogen energy.	In general, HBCC lacks favourable conditions to support commercially viable large scale solar and wind farms. Cloud cover, for instance, lowers solar electricity generation by 70%. In discussions with the solar industry, Melbourne's weather is identified as a barrier to large scale solar farm investment. As is evident in HBCC, this does not preclude local precinct based solar initiatives that support local needs and the individual energy needs of enterprises. HBCC is not currently part of the materials flow of Melbourne's waste systems. This, however, could change under different conditions.
Grid/ and Or System Integration	Access to energy infrastructure is a major challenge for the renewable energy sector. There is often considerable distance between large scale renewable facilities and locations in which high volumes of energy are consumed. Grid capacity, access to the grid and issues of energy loss in transporting energy over long distances impact on the viability of renewable energy projects as they impact on projected revenues and start up costs (if new grid infrastructure is required this can create a substantial barrier to investment). Hydrogen requires similar storage and distribution infrastructure to conventional gas. While waste to energy, requires conventional access to the electrical grid. In Europe waste to energy is also linked to precinct based thermal infrastructure that is used by households and industry for heating purposes.	Access to the metropolitan electrical grid within the centre of Melbourne is a major advantage for HBCC. Co-location of energy generation with consumption minimises marginal energy loss (which is an important cost factor for energy producers). This, as will be discussed, creates favourable conditions for battery storage within HBCC. HBCC's established gas storage and distribution infrastructure may be a major advantage in supporting the development of a hydrogen industry within HBCC.
Established Skills and Technology	Most of the components needed for renewal infrastructure are imported. There is, nonetheless, a significant need for skilled construction, engineering and planning in the development of new infrastructure. The Victorian government is targeting renewable infrastructure as a growth area of the local economy.	HBCC incorporates substantial skills in energy generation, refinement and distribution that might be deployed to support the growth of new energy industries.
Supportive land use context	A supportive land use context is identified as a critical factor for the establishment of new energy industries. Engagement suggests that there is significant risk and uncertainty related to approvals for new facilities including the introduction of industry buffers. Social license to operate and associated planning support are essential to all large scale energy projects.	Industry engagement identified existing buffering and land use controls as highly attractive to new energy industry.

4.4.3. Sub Sector Potential – New Energy

High potential and aspirational new energy subsectors are detailed below. Appendix 3 includes a detailed assessment.

Sub sector	Definition	Outlook	Commentary	Opportunity Evaluation
Bioenergy - Biogas Organic	Biogas is a methane-rich gas which is produced when organic matter is broken down by micro-organisms. Anerobic digestors are used to decompose wet organic wastes such as agricultural and food processing waste, sewage, plant materials, green waste and food waste to produce Bio gas. Biogas can be cleaned to meet natural gas standards and can be compressed as a transport fuel in cars, buses and trucks. It can also be used to fuel electrical transmission systems. The nutrient-rich sludge that remains after anaerobic digestion, is a valuable biofertiliser.	At present 2% of Victoria's energy derives from bioenergy primarily from facilities located within sewerage farms and land fill operations. Government aims to catalyse investment in bioenergy which given Victoria's extensive agricultural and food sectors, is seen as an area of comparative advantage for Victoria.	Existing land use settings and local expertise within energy industries provide a basis to support new bioenergy infrastructure such as Anerobic Digestors. Bioenergy could provide fuel for local industry and commercial sale. A group of Councils in Melbourne's south east are currently developing a business case for advanced waste management that includes bio mechanical treatment of waste. HBCC should carefully monitor and, if necessary, engage with this process to identify comparable local opportunities.	High Potential – requires further investigation to determine the potential benefits and disbenefits of this industry

Sub sector	Definition	Outlook	Commentary	Opportunity Evaluation
Bioenergy – thermo-fuel	The creation of thermofuel from waste involves the application of high temperatures to waste to create fuel (without using combustion). Gasification is a major method of thermofuel creation. Gasification results in syngas which is a synthesis gas that includes hydrogen which can be used in fuel cells. Syngas can also be used to fuel gas engines.	Thermal plants are most prevalent in Europe and the United States. At present, gasification is being considered as a potential component of the Victorian recycling/circular economy system. The future is likely to see new technologies emerge in this sector that improve the efficiency, output and environmental credentials of thermofuel creation.	Existing infrastructure and buffering within HBCC are likely to be attractive to new thermofuel industry (engagement suggests that planning settings for this form of energy generation in greenfield locations are problematic, as such, areas that already support heavy industry activity and energy creation are likely to be viewed favourably by industry). A further advantage is the abundance of high energy consumers within HBCC and the potential to link thermofuel production with the emerging hydrogen economy and local users.	High Potential – the costs and benefits need to be further investigated by council.
Hydrogen industries	Hydrogen fuel is a zero carbon fuel that can be used in fuel cells and combustion engines. Hydrogen fuel is produced from methane or by electrolysis. At present, most hydrogen fuel is produced using fossil fuel inputs. Once produced, hydrogen can be used in the same way as natural gas and can be delivered to fuel cells to generate electricity and heat or burned in a combustion engine (all methods produce no carbon or methane emissions). Hydrogen supports greater transport distances than electrical power.	Hydrogen has been identified as a potential fuel of the future given its abundance in nature. The federal government is seeking to facilitate an export based hydrogen industry (primarily in Australia's north).	Given its extensive transport energy infrastructure, HBCC is ideally placed to drive the adoption of Hydrogen in Victoria and potentially local hydrogen generation. Toyota Altona will shortly open a Hydrogen Centre which will include a hydrogen education centre and Victoria's first commercial refuelling station. There is an opportunity for HBCC to develop an identity as a hydrogen leader both in distribution and in production. For example, aligning hydrogen generation with other forms of energy generation (biofuel, thermofuels, battery storage) may provide the basis to support a green hydrogen production system.	High Potential.

Sub sector	Definition	Outlook	Commentary	Opportunity Evaluation
Battery Storage	Batteries use chemicals to absorb and release energy.	Large scale battery storage has emerged as key part of managing the intermittent power output of sustainable energy sources. The future of the battery energy storage system market looks promising with opportunities in the residential, non-residential, and utility industries. The major drivers for this market are increasing demand for grid-connected solutions, high demand for lithium-ion technology in the renewable energy industry, and declining prices of lithium-ion batteries.	HBCC is well placed to support metropolitan expansion of battery storage. Linking battery storage to waste to energy generation and other renewable sources will help lift the sustainability of industry. Land limited by employment densities may be suited to battery storage uses which could then deliver power to local industry and residents. Battery storage linked to renewable energy production provides a basis to attract new advanced manufacturing industry via the opportunity to access sustainable energy sources. Industry sources suggest HBCC is ideally located to support battery storage as the centrality of HBCC would minimise issues of marginal energy loss.	High Potential.

4.4.4. New Energy and Council Objectives

In general, new energy industries adhere closely to Council development objectives, albeit that the potential benefits and disbenefits of specific sub sectors needs to be further investigated.

Council Objectives	New Energy
Increase our local jobs –	Bio-energy facilities generate significant employment at their start up, approval and construction phases. Beyond their start up phase, established facilities support direct and indirect employment at generally low to medium employment densities. It is important to note that new facilities in HBCC are likely to occupy locations that currently support no jobs or very limited numbers of jobs. As such, a new bio-energy sector is likely to either help re-introduce employment to redundant locations or help sustain and transform employment in these locations. A new hydrogen industry provides the basis to sustain and transform employment within the existing energy industry while also providing a basis to grow the number of high value technical jobs in HBCC. Battery storage is likely to generate very few jobs but may provide a basis to support the sustainability of co-located industry and may function as an industry attractor.
Be an environmental leader –	New forms of energy creation and distribution will help renew, modernise and redirect existing energy industries toward a more sustainable future. HBCC is well positioned to play a key role in the roll out of new energy infrastructure and sustainable energy systems. Waste to energy systems need to be carefully reviewed for their environmental implications and benefit to disbenefit implications.
Balance job growth with community impacts	The potential community impacts of new energy industry need to be better understood. The hazard and amenity implications of waste to energy and hydrogen industries may be very similar to those of existing petro-chemical industries. The introduction of new energy industries are unlikely to alleviate residential concerns in relation to the amenity impact of heavy industry. This, however, requires further testing.
Continue to be a major economic force in Melbourne	The sustainable renewal of HBCC's energy industries will help affirm the role of HBCC as a leader in the transformation of Melbourne's energy systems. Linking new sustainable energy production with HBCC's manufacturing and logistics sectors will help HBCC lead the sustainable transformation of local industry and represent the type of transformation that other industrial areas may seek to emulate.

4.4.5. Case Study: Jandakot Bioenergy Plant

The Jandakot Bioenergy Plant, located in Jandakot, Perth (WA), is a leading example of an operational waste to energy plant.

The Jandakot Bioenergy Plant converts commercial and industrial organic waste streams to power generation. The plant utilises anaerobic digestion technology to convert commercial and industrial waste into onsite electricity, heat and clean methane gas.

The Jandakot Bioenergy Plant was developed by Biogass Renewables, an Australian energy company that plans and builds site-specific anaerobic digestion plants for a range of purposes.

The client for the Jandakot Bioenergy Plant was Richgro garden products, a licenced waste receiver of organic waste streams, predominately green waste from council collections.

Key metrics for the Plant include:

- The plant receives 35,000 – 50,000 tonnes p.a. of food waste from new waste producers in the region.
- The facility can produce approximately 2MW of baseline electricity with 1.7MW exported to the local grid.
- The facility has eliminated previous electricity costs from energy retailers of approximately $400,000 p.a.
- The facility outputs a bio-fertiliser to blend with existing Richgro products, improving nutritional and breakdown characteristics.

An electricity grid connection was required for exporting surplus power generated on site, with this process requiring approximately two years to complete.

Figure: Jandakot Bioenergy Plant (Perth, WA)

Source: Biogass Renewables; Charter Keck Cramer

Anaerobic digestion produces large quantities of biogas, comprising methane and carbon dioxide. The cleaned methane fraction can be stored, pressurised and used to generate onsite power and heat, with surplus fed into the electricity grid, or used to power equipment and vehicles.

Anaerobic digestion is a proven technology, having been refined through extensive use and development by industry in Europe over the last 15 years. This is, however, a relatively new technology in Australia. Waste to energy is set to become a major part of Victoria's sustainability and circular economy systems.

4.5. Recycling Industries

Prohibitions on exporting waste materials and concurrent commitments to facilitate a more circular and sustainable economy are set to transform waste and landfill systems and industries throughout Victoria.

Victoria will be significantly impacted by Federal waste export bans that are set to be introduced in 2024 which prohibit the export of waste. Victoria already faces considerable waste challenges following China's 2018 implementation of waste import restrictions. Prior to China's import restriction, Victoria was exporting approximately 1.27 million tonnes of paper, plastic and cardboard per annum. Very soon, all of this waste will need to be processed locally.

All levels of government are currently seeking to establish, expand and accelerate advanced recycling systems. There is now significant momentum (and impending need) to upgrade waste systems and infrastructure to extract valued materials from all forms of waste.

Within Victoria concepts such the circular economy and waste to energy opportunities are guiding planning and investment within both State and local government. At the same time, project engagement suggests that the overall skill base and strategic outlook of the recycling sector is steadily professionalising, particularly as the technological sophistication of the sector grows.

HBCC is well positioned to play an important role in key (but not all) segments of Victoria's incipient but rapidly evolving recycling systems.

4.5.1. Industry Policy

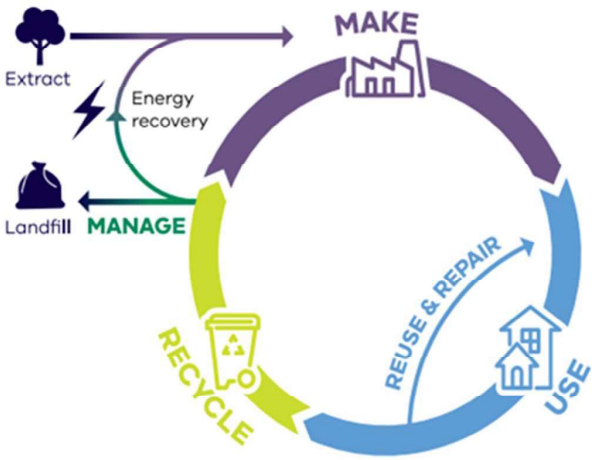
In December 2020 the Australian Government introduced legislation which bans the export of unprocessed waste overseas via the *Recycling and Waste Reduction Act 2020*. The ban prohibits the export of specific raw (unprocessed) materials collected for recycling including plastic, paper, glass and tyres.

The full effect of the waste export ban will come into effect by 2024 and will require Australia to recycle an additional 650,000 additional tonnes of waste plastic, paper, glass and tyres each year. The bans on waste exports will significantly impact New South Wales and Victoria, with over 80% of Australia's exported plastic coming from New South Wales and Victoria, and 90% of Australia's exported glass coming from Victoria.

In order to fund the necessary infrastructure required to increase Australia's recycling capacity the Australian Government will invest $190 million into the Recycling Modernisation Fund (RMF). The RMF will support innovative investment in new infrastructure to sort, process and remanufacture materials such as mixed plastic, paper, tyres and glass, with federal funding contingent on co-funding from industry, states and territories.

In February 2020 the Victorian Government introduced *Recycling Victoria: A New Economy*, a policy and action plan which will overhaul Victoria's recycling system over the next decade. The policy will see Victoria transition to a circular economy whereby the environmental impacts of production and consumption are reduced whilst still enabling economic growth through more productive use of natural resources.

Figure: Recycling Victoria Framework



Source: DELWP

Recycling Victoria outlines four key goals which will allow Victoria to transition to a circular economy.

Goal	Targets
• Design to last, repair and recycle • Use products to create more value • Recycle more resources • Reduce harm from waste and pollution	• 15 per cent reduction in total waste generation per capita between 2020 and 2030. • Divert 80 per cent of waste from landfill by 2030, with an interim target of 72 per cent by 2025. • Cut the volume of organic material going to landfill by 50 per cent between 2020 and 2030, with an interim target of 20 per cent reduction by 2025. • 100 per cent of households have access to a separate food and organics recovery service or local composting by 2030

To support the above, the Victorian Government will introduce:

- introduce a new standard 4-bin waste and recycling system for every household across the state by 2030.
- introduce a container deposit scheme by 2023 where empty cans and bottles can be swapped for cash.

In addition to the above, government will begin regulating the waste and recycling sector, as an essential service through a new waste and recycling Act and a waste authority while also.

- expanding waste to energy initiatives
- increasing funding to support local and attract new manufactures to make new products using recycled materials.
- helping businesses improve resource efficiency, reduce waste and increase recycling.
- introducing the Ecologiq program and *Recycled First* policy to optimise the use of recycled and reused materials in the construction and maintenance of infrastructure assets.

Local government is also active in addressing looming recycling issues. The Metropolitan Waste and Resource Recovery Group is currently progressing a procurement process that will deliver services for 16 Southeast Metropolitan Melbourne councils for managing municipal solid waste away from landfill (waste to energy).

The group recently short-listed three applicants to deliver alternatives to landfill services. Proposals include new waste to energy and recycling facilities in Melbourne's south east.

4.5.2. Locational Pre-Conditions

Industry consultation and independent research identified a number of preconditions for the establishment of new recycling facilities and associated industries.

Preconditions	Overview	HBCC
Access to material streams – sorted, and processes repurposed	Recycling facilities rely upon reliable streams of material waste for sorting, processing and repurposing.	HBCC is not currently a major part of waste material streams in the western region.
Access to technological networks	Technological networks are essential to proving the merits of recycling technology under local conditions and satisfying regulatory requirements.	HBCC does not currently incorporate technological and specific knowledge networks for recycling. However, these, according to industry engagement, do not need to co-located in HBCC to begin the development of a recycling industry.
Supportive land use context	The sorting, processing and storage of waste inputs generates dust, noise, traffic and odours and thereby requires a highly supportive land use context for continued operations. Industry engagement confirmed the importance of buffering from residential uses in conducting these activities. Moreover, these facilitates are increasingly subject to stringent EPA requirements.	HBCC, while incorporating potentially supportive land use settings, is unlikely to support the large scale storage, sorting and processing of waste. HBCC, is best placed to support the repurposing and renewal of already processed materials.
Access to End Markets	While this is not a locational factor, recycling requires end markets for processed and repurposed materials.	HBCC's accessibility provides speed to market for recycling materials across Victoria, nationally and to potentially export markets for high quality recyclables (high quality recyclable materials will be permitted for export).

4.5.3. Opportunities Evaluation – New Recycling

High potential and aspirational recycling sub sectors are discussed below. A comprehensive evaluation is detailed at Appendix 3.

Sub sector	Definition	Outlook	Commentary	Opportunity Evaluation
Plastic Recycling	Plastic recycling involves the breaking down of plastic waste into raw materials that can be reused as plastics. There are two main forms of plastics recycling. Mechanical recycling where the plastic is washed, ground into powders and melted, and chemical recycling, where the plastic is broken down via chemical treatments.	Prohibitions on the export of plastic waste have generated a significant backlog in plastic waste which will only grow following further restrictions in 2024. There is, therefore, a significant need to expand Victoria's plastic recycling industry (there is also associated demand for thermal depolymerization discussed in the energy section of this report).	Qenos's Altona facility is Australia's largest polythene and polymer manufacturer. There is an opportunity to build on and harness the existing breadth of skills and expertise within Qenos to support a plastic recycling industry in Altona. Council should explore the partnerships, grants, incentives, and technological and waste network changes needed to encourage a plastic recycling industry within HBCC. There also may be synergies that emerge with additive industries and existing polymer moulding industries that could be explored.	High Potential – investigate further and provide support and facilitation
Circular economy manufacturing	Manufacturers that explicitly use recycled inputs to develop new products.	Developing a circular economy entails recycling materials but also creating demand for recycled outputs. Without this demand, recycled outputs lose value and can be discarded. Manufacturers that use recycled inputs are therefore fundamental to the growth of a circular economy and central to Victoria's recycling response.	The addition of new recyclers into HBCC should ideally be accompanied by manufacturers that draw on recycled inputs. HBCC is potentially well positioned to attract construction based manufacturers that use local glass and in the future manufacturers that use recycled plastic. Replas, in Melbourne's south east, for example, exemplifies this type of enterprise.	High Potential – Council should seek to attract.

4.5.4. Recycling and Council Objectives

In general recycling is likely to meet Council's development objectives. However, recycling entails a number of environmental and amenity risks.

Council Objectives	Recycling and the Circular Economy
Increase our local jobs	Recycling tends to support low to medium employment densities. This report advocates for HBCC to support recycling facilities that renew and repurpose waste that has already been collected, sorted and processed. As such, the type of recycling advocated for in this work involves more technical rather than labour intensive employment (which is likely to be at a relatively low density). This needs to be confirmed. Circular economy focused recycling manufacturing is likely to support higher job densities and a range of high and low skill forms of employment.
Be an environmental leader	Growth of plastic and glass recycling in HBCC will support HBCC's environmental agenda. Likewise, the growth of associated businesses that use recycled inputs will help further HBCC's role in achieving a circular economy.
Balance job growth with community impacts	Contemporary forms of recycling infrastructure and industry should enable HBCC to activate new industry and employment opportunities without generating significant adverse amenity impacts on the community. In so doing, HBCC should seek to avoid the storage and processing of recycled waste. HBCC needs to continue to engage with its community to affirm its sustainability objectives and the type of industries that this encompasses.
Continue to be a major economic force in Melbourne	The introduction of best practice recycling facilities focused on plastics will boost the role of HBCC in addressing Melbourne's plastics challenge and demonstrate economic and environmental leadership. Likewise, recycling based manufacturers will help HBCC support the growth of Melbourne's circular economy.

4.5.5. Case Study: Replas Australia

Replas is a leading example of a recycling company that has grown to become one of Australia's leading plastic product manufacturers.

Replas reprocesses a range of soft plastic, kerbside plastic waste and commercial plastic waste into approximately 200 recycled plastic products, primarily for outdoor use.

By diverting plastic waste from landfill Replas contributes to the Circular Economy. Input materials include:

- Post consumer material comes from the soft plastic collected at Coles and Woolworths through the "REDcycle" program
- Post commercial materials from hospital waste,
- Post industrial mixed plastics from factory scraps,
- Mixed hygiene products from multiple polymer types and paper

Finished products include:

- Outdoor Furniture
- Garden Products
- Outdoor sheeting
- Traffic Control products
- Signage and plaques
- Bollards and bollard caps
- Decking
- Dog Agility
- Fencing
- Fitness Equipment

Replas deploys advanced automated technology in its production processes, for both sifting and sorting of raw materials and in its manufacturing process.

Figure: Replas – Products and Robotic Manufacturing Processes

Source: Replas; Charter Keck Cramer

Finished plastic products demonstrate a number of benefits, primarily the products are long-lasting and durable, with low maintenance by comparison with traditional materials previously used (such as timber and steel).

4.6. Other Industries

A number of other industries present potential for consideration by HBCC.

These include:

- Freight rail. The increasing use of, and investment in, freight rail networks and intermodal freight services, including the potential to integrate with a new "Inland Port" facility in Truganina provides an opportunity to expand HBCC's freight rail industries.
- Rail maintenance services and rolling stock asset management services, to enhance existing (and future proposed) freight rail infrastructure

Freight rail provides a number of advantages over other modes of transport, primarily in terms of cost-effectiveness and efficiencies, especially by comparison with road-based transport over long distances. In light of these benefits, future freight and logistics entities are showing increasing interest in harnessing freight rail into their transport patterns and supply chains.

There has been significant government investment in major infrastructure in recent years (in particular the Inland Rail project – see below) and accompanying policies indicate a growing awareness and interest in the benefits associated with freight rail.

The existing (and any future proposed) freight rail network serves as critical infrastructure for the associated transport, warehousing and logistics sectors which, in turn, rely on freight rail for their economic activities. As is demonstrated in this report, transport, warehousing and logistics industries are important contributors to the Hobsons Bay economy.

Significant freight rail infrastructure in Spotswood, Newport and Altona provides a basis to expand freight rail based industries that link into expanding national and state wide activities. At present, there are a number of freight rail operators within HBCC, yet there is significant potential to expand the use of freight rail infrastructure in HBCC.

Businesses providing critical rail maintenance services and rolling stock asset management services are already present within Hobsons Bay. Future freight rail expansion should enable associated maintenance and asset services to likewise expand.

HBCC is well positioned to play an important role in some key (but not all) segments of these industries, drawing on key strategic strengths (as discussed below).

Along with the construction of the Inland Rail network, a future proposed intermodal freight terminal (also known as an "Inland Port") will likely be constructed in metropolitan Melbourne, to connect with the Inland Rail line (once completed). In light of the existing freight rail infrastructure in HBCC, and the close proximity to the Port of Melbourne, there is an opportunity for HBCC to integrate with a future intermodal freight terminal, and strengthen HBCC's role in the broader freight rail network.

4.6.1. Industry Policy

A range of policy initiatives provide momentum and support for increased industry focus on freight rail activity, driven by a range of government commitments to major physical infrastructure projects and also driven by a growing awareness and recognition of the benefits that freight rail can bring to the economy in terms of efficiencies and improved environmental benefits.

Growing population, economic expansion and trading volumes will likely drive additional demand for freight rail into the future. The *National Freight and Supply Chain Strategy* estimates Australia's freight volume will grow by over 35% between 2018 and 2040. Rail freight will play a critical role in meeting this estimated future demand and maintaining international competitiveness.

Furthermore, given that one freight train is capable of transporting cargo equivalent to approximately 100 heavy-vehicle trucks, there is an increasing recognition that freight rail has the capacity to generate significant environmental outcomes, reduce road congestion, and improve efficiency.

The *Inland Rail* project is a significant infrastructure project for the Australian Government. When completed, the *Inland Rail* project will become a 1,700 kilometre freight rail line connecting Melbourne to Brisbane. The route is also anticipated to connect to the Sydney–Perth rail corridor. The Inland Rail project consists of 13 individual projects across Victoria, New South Wales and Queensland, constructing approximately 600km of new track and connected via a series of individual track sections to create the total Inland Rail project.

The Tottenham to Albury section of Inland Rail will upgrade approximately 305km of existing rail corridor between metropolitan Melbourne and Albury-Wodonga.

This section of the project is broken into two stages:

- Stage One: Beveridge to Albury: The first stage of the project is the enhancement of 12 sites along the North East Rail Line from Beveridge to Albury. Work on this section of the alignment is now underway.
- Stage Two: Metropolitan Melbourne: The second stage of the project involves works in metropolitan Melbourne. This stage is temporarily on hold while a study is undertaken to determine the location, configuration and timing of a new intermodal terminal in Melbourne.

The map below provides an overview.

Figure: Inland Rail route

Source: Inland Rail; Charter Keck Cramer

According to the *Victorian Freight Plan: Delivering the Goods 2018*, multiple levels of government are committed to ensuring that an intermodal terminal with sufficient capacity to accommodate Inland Rail trains is functioning in Melbourne from the commencement of Inland Rail services in the mid-2020s.

The federal and Victorian governments are currently jointly undertaking a detailed business case to consider the development of an intermodal terminal in Melbourne capable of supporting Inland Rail. The Victorian Government has stated that it is considering intermodal terminals at two potential sites for the intermodal terminal:

a) one at Truganina, west of Melbourne (referred to as the Western Interstate Freight Terminal), and

b) the other at Beveridge, north of Melbourne (referred to as the Beveridge Interstate Freight Terminal).

The proposed *Port Rail Shuttle Network* are Victorian Government's proposed freight rail services which connect the Port of Melbourne with intermodal freight facilities in the west, north and potentially the south-east of metropolitan Melbourne. The Federal and Victorian governments are investing in projects with the objective to reduce truck movements on local roads and connect the Port of Melbourne to major freight hubs using the existing rail network.

The Victorian Department of Transport in 2018 announced the first fully-funded Port Rail Shuttle network projects, which included announcements of $16.2 million being invested at the Austrak site in Somerton and $9.5 million being invested at the SCT Logistics site in Altona to connect these major freight hubs to the Port of Melbourne by rail[3]. For HBCC this funding will deliver new rail spurs that provide increased rail connectivity to the Port.

The Port of Melbourne articulates its own *Plan for Rail*, which integrates the Port Rail Shuttle projects along with other freight rail projects, with the goal of enhancing a strong and efficient freight transport system, for Victoria's economy.

4.6.2. Locational Pre-Conditions

Industry consultation and independent research has identified a number of preconditions for the establishment of facilities which may enhance and/or connect to existing facilities and infrastructure.

Preconditions	Overview	HBCC
Presence of existing industry and businesses	The presence of existing freight rail operators and industry entities is an important pre-condition, since start-up costs for this industry are extremely high, and new entrants will likely seek co-location with potential customers as well as economies of scale in their operations. Furthermore, there is a significant need for skilled construction, engineering and planning in the development of new (and maintenance of existing) rail infrastructure and rail facilities.	Hobsons Bay has a number of nationally significant freight rail entities currently operating, providing access and connectivity to the physical infrastructure for potential customers (as well as potential new entrants).
Access and connectivity to major freight	Having co-location with, and access to, major freight rail infrastructure and intermodal freight facilities is a key 'hurdle requirement' for	There are significant freight rail networks throughout the Hobsons Bay area, providing a critical pre-

[3] Victorian Department of Transport see https://transport.vic.gov.au/our-transport-future/our-projects/port-rail-shuttle

rail infrastructure.	participation in attracting major freight rail operators.	condition for new entrants seeking to potentially locate in the area.
Supportive land uses	Potential entrants seeking to enter these sectors will almost always require land in very close proximity to the existing freight rail network. Given the inherent scarcity of such sites, availability of appropriately located land parcels of sufficient size may act as a barrier to entry for potential entrants.	While sites may be available in close proximity to the existing freight rail infrastructure within HBCC, these may be subject to planning constraints, and likely warrant further investigation to determine the optimum outcome for capitalising on freight rail opportunities.

4.6.3. Potential Sub Sectors – Other Industries

There is the potential to expand existing rail services and rail industry as discussed below. Appendix 3 includes a more comprehensive evaluation.

Sub sector	Definition	Outlook	Commentary	Opportunity Evaluation
Rail Freight and intermodal logistics	Key rail freight networks provide the infrastructure and haulage for significant volumes of goods throughout the Victorian and wider Australian economy, Intermodal terminal services provide the handling services to facilitate transition of cargo between multiple modes of transportation; for example, transitioning cargo from ship to rail, from rail to trucks, or vice-versa.	Australia's freight volume will grow by over 35% between 2018 and 2040, with rail freight playing a critical role in meeting this estimated future demand. Construction of the Inland Rail project to connect Brisbane and Melbourne, with connections to Sydney, will drive increased volumes of rail freight..	With the anticipated significant increase in rail freight volumes there is the potential for HBCC to further integrate with growing freight rail infrastructure.	High potential to attract freight rail focused enterprises.
Rail Maintenance and rolling stock asset management services	Rail maintenance and rolling stock asset management services provide critical supplementary services for freight rail infrastructure (for example, maintenance and repair of train carriages).	As freight volumes are likely to grow significantly in the future, this will drive demand for associated rail maintenance and rolling stock asset management services.	Attractors: • Existing cluster of major freight rail logistics providers and operators in HBCC and the inner west, providing critical existing connectivity and customer base • Highly specialised skills and workforce requirements, meaning presence of existing major industry entities serves to potentially attract new entrants	Moderate Potential to attract new rail maintenance focused enterprises.

4.6.4. Council Objectives

This report advocates for HBCC to support existing rail freight entities/facilities, encourage the attraction of new entrants where appropriate and conduct further investigation to explore the employment opportunities and network constraints inherent in the existing rail freight network. The Inland Rail project in particular may provide major opportunities for HBCC to attract new industry and to help reduce trucks movement. This requires further investigation.

Council Objectives	Other Industries
Increase our local jobs	Further information is required to verify the density of employment that new rail freight facilities would support.
Be an environmental leader	There is an increasing recognition that rail freight constitutes a more environmentally responsible transportation solution, especially for long-haul overland freight. Overall, a local rail freight sector is likely to include enterprises that will help lead environmental best practice in HBCC.
Balance job growth with community impacts	Will likely contribute high quality jobs growth that aligns with the growing professionalisation of the western region workforce.
Continue to be a major economic force in Melbourne	Rail freight industries will help affirm and diversify the role of HBCC in Melbourne's freight networks, especially in light of HBCC's close proximity to key metropolitan infrastructure. Linking rail freight with HBCC's manufacturing and logistics sectors will help consolidate HBCC's economic role within the national economy.

4.6.5. Case Study: Moorebank Logistics Park

The Moorebank Intermodal Terminal Project is a major project which, when completed, will be the largest intermodal logistics park in Australia. The Moorebank Logistics Park, also known as an "inland port", is being developed by Qube.

The new intermodal terminal at Moorebank is a nationally significant infrastructure project that will provide additional capacity for Sydney to manage the expected growth in freight volumes. When completed, the project will comprise development of up to 850,000 sq.m of warehousing and two intermodal transport terminals. Initial planning and development approvals have been received and work is now underway on the 243 hectare site.

Moorebank has been identified by successive Australian Governments and NSW Governments as a key strategic location for increased intermodal capacity to serve freight logistics centres in Sydney's south-west.