

Taking a closer look

New Zealand High Value Manufacturing & Services Value Proposition Report

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1.Executive Summary

This report shows that New Zealand can make a robust value proposition to offshore companies looking to set up operations in the high-value manufacturing and services (HVM&S) sector.

The manufacturing sector has seen rapid change over the last decade, with large-scale manufacturing gravitating towards countries with large, low-cost workforces. In western countries with traditional manufacturing operations, this has created a vacuum in the manufacturing sector and led to high growth in the value-added HVM&S sector.

As well as financial and commercial advantages, New Zealand has a large talent-pool of highly-skilled and experienced workers to draw from. The combination of good business sense, highly skilled workforce, and an innovative edge makes New Zealand an ideal location for HVM&S operations.

New Zealand has consistent access to materials, a favourable time-zone for doing business with Asia and North America, and an excellent workforce. The business environment in New Zealand is supported by well developed infrastructure, and the government is very pro-business with a focus on developing good trade relations to ensure New Zealand competitiveness in doing business with the world.

Foreign exchange is a major concern for companies setting up offshore operations, and with New Zealand's often volatile currency, understanding the exposure to risk is of the highest importance. The costing exercise has revealed New Zealand's low-cost workforce allows a natural reduction in currency-based risk exposure. In comparison with other countries, this shelters operations from being over-exposed to currency fluctuations.

The remainder of this document sets out our findings from research and consultation, and illustrates two broad scenarios we used to model the costs of operating in New Zealand compared to several other countries. The threads from the research and modelling are brought together to define New Zealand's value proposition in HVM&S operations.

2. Background and Scope

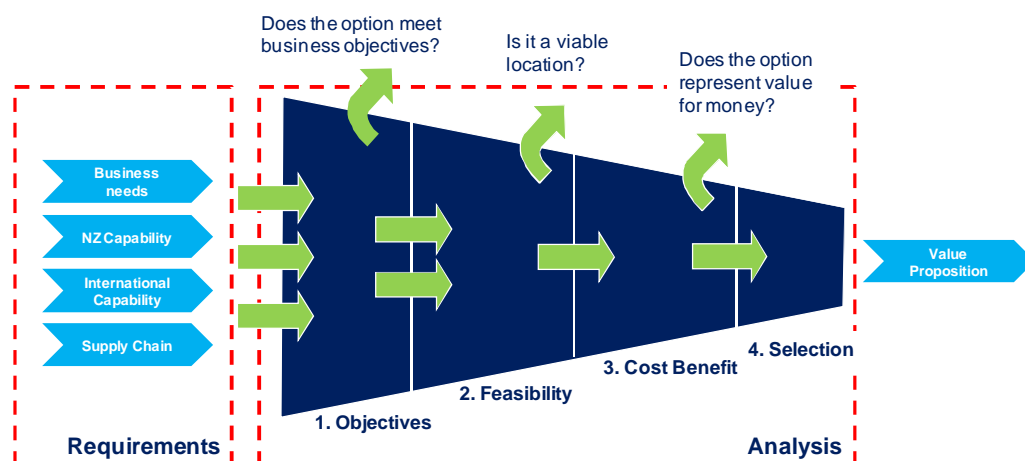
The New Zealand economy has the potential to expand rapidly in certain sectors. New Zealand Trade and Enterprise (NZTE) has identified the high-value manufacturing and services (HVM&S) sector as an area which could attract significant foreign investment.

The challenge for New Zealand business is to secure this investment. To aid in this goal, NZTE commissioned Deloitte to develop a decision support tool that can be used for rapid responses to investor enquiries. Such a tool can also be used for proactive marketing activities. The model we have developed provides robust cost comparison data and business information for investigating the feasibility of HVM&S operations in New Zealand compared to several other international locations.

This report outlines our findings after a sweep of available literature and data sources, and a consultation round with sector participants, investors, and relevant support agencies.

2.1. Consultation Framework

To frame our approach to the research and modelling, we developed the following framework

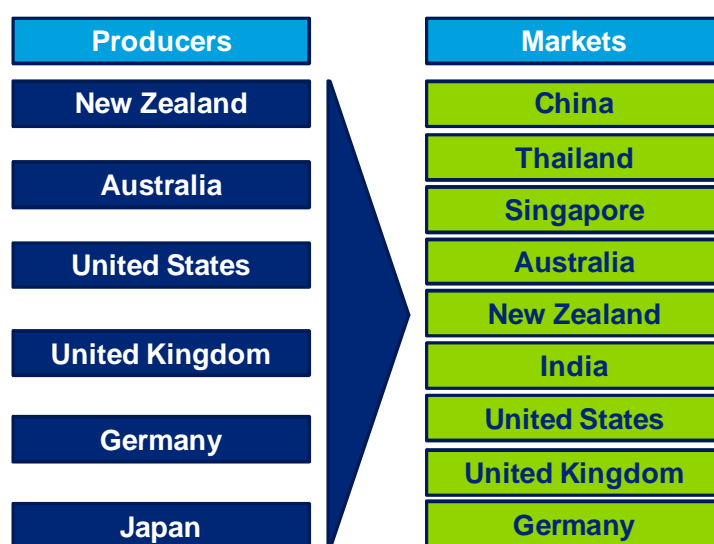


To define the value proposition we must understand what businesses in the sector are looking for, and what factors might most significantly impact the decision to locate development in one location over any other. We then assess New Zealand's capability in terms of meeting those business needs as well as the capability in other countries. Given this information we can then assess whether New Zealand meets the requirements for HVM&S operations, whether it is a feasible location, and if it represents value for money.

In summary, we develop a picture of New Zealand's value proposition to foreign investors by bringing together the threads of qualitative and quantitative research to create a well informed and robust picture of New Zealand's potential in the HVM&S sector.

2.2. Research Scope

New Zealand's location in the South Pacific means that mass-production firms outside the primary sector will always struggle to compete in European and North American markets, simply due to the distance to market. However, for high-value manufactured products, New Zealand based production can be competitive and make a compelling value proposition as we explore in this report. For modelling purposes, several production countries from around the globe were selected, and for modelling purposes, we restrict the markets which products are delivered into, mainly to those in relative proximity to New Zealand.



The research carried out to inform the modelling and analysis involved gathering and collating data from a number of sources. The data collected is a mix of quantitative and qualitative material, with the quantitative data being used for the cost modelling and value for money assessment, and the qualitative data used for investigating the business environment to inform commentary on the viability of each production country as a location for operations.

The following table summarises the quantitative data gathered for the modelling component of the research.

Table 1: Summary of data

Category	Data Type	Description
Workforce and Salaries	Quantitative Salary mid-points as obtained from recruitment, HR sources and statistical bureaus. Please note that the specific	Average salaries by country: General manufacturing staff, design engineer, senior design engineer, chemical/electrical/mechanical

Category	Data Type	Description
	salaries given are approximate national averages – there is considerable variation between regions in some countries.	engineer, and operations manager. The cost of a general manufacturing worker is based on the average wage per year in each country. General manufacturing workers include general factory and administration workers.
Salary on-costs	A percentage on top of total salaries to take into account further salary related costs including superannuation, ACC Levies and other statutory social benefits.	For a full outline of the salary on-costs for each country please see Appendix II.
Overheads	Industrial rental	Average industrial rents per square metre per annum.
	Electricity	Annual cost of electricity per kWh, per square metre of factory space.
	Telecommunications	Annual cost per person for a fixed broadband internet subscription, annual subscription of business telephone services, 300 minutes of calling time per month and associated set up costs.
Taxation	Deloitte International Tax and Business Guides.	Taxation and salary on-cost rates by country.
Freight Costs	Freight costs of shipping a 20 foot container as quoted by Maersk Line and applicable as at 31 March 2011.	Cost of shipping includes basic ocean freight, inland haulage, bunker adjustment factor, currency adjustment factor, handling charges, emergency surcharges, port security charges, peak season surcharges, transit fees, documentation fees and carrier security charge.
Insurance cost	Standard insurance rate as provided by Pacific Atlantic Freight.	Standard US\$0.87 per \$100 of declared insurance value
Foreign exchange rates	2010 12 month average exchange rate data as obtained from	Average exchange rates for 2010

Category	Data Type	Description
	oanda.com.	as compared to \$NZ1 and \$US1.

The qualitative factors included in the research are summarised below.

Infrastructure: Assessing the quality and development of infrastructure within each producing country to understand the extent to which business operations are enhanced or hindered by current infrastructure. This assessment also considers future infrastructure development.

Government and Legal System: This factor outlines government willingness to support business and innovation, as well as foreign investment. We also take into consideration the regulatory burden on companies in the HVM&S sector, and the nature of IP protection.

Commercial Environment: Understanding how easy it is to operate business in each country, the degree of corruption, and the available workforce for HVM&S operations.

Trade Relations: Gaining an understanding of the extent to which each country is engaged in international trade and how well developed and favourable these trade relationships are. Of particular importance is the role of trade agreements between producing countries and markets within the scope of research.

3. Sector Structure & Drivers

Globally, manufacturing is a key provider of wealth and employment, adding value in the region of US\$4.4 trillion annually. With economic trade barriers continuing to erode, reducing transport costs, and the enabling effect of communications technology, the manufacturing sector has become even more competitive, resulting in activity gravitating towards the countries of lowest overall cost. In the case of high-value manufacturing, the additional requirement for skilled and innovative engineers and labour means that the lowest cost option may not always be best.

High-value manufactured products are knowledge-intensive, which is to say that the workforce producing these goods carries a high degree of experience and tacit know-how. Ensuring that this know-how is retained, while at the same time allowing room for innovation is the key to such operations.

3.1. HVM&S Sector Structure

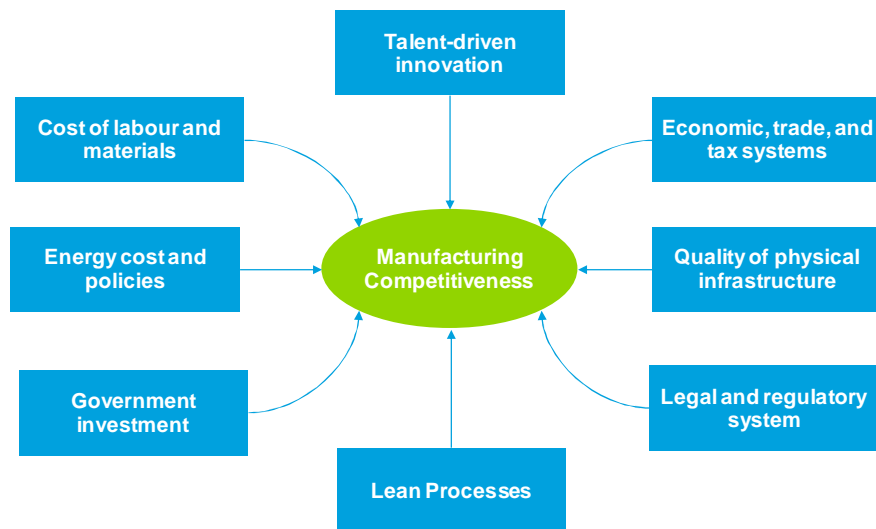
The distinction between manufacturing and services is becoming increasingly blurred as many manufacturers define themselves as providers of a lifetime service around a manufactured product. The key change in the manufacturing environment over the past 20 years has been the increasing rate of globalisation which has created a highly competitive industry. The barriers to flow of capital, goods, labour and skill has led to the manufacturing sector shifting into countries of lower overall cost.

Many global manufacturing companies now run complex international value and innovation networks. This causes countries to compete for investment in their respective manufacturing sectors, and is leading to increased government incentivisation in the form of tax breaks and support both in developed and developing countries.

As organisations expand their manufacturing footprint, they must consider the multiple drivers that underpin the competitiveness of a particular country. The Deloitte 2010 Global Manufacturing Index examines the dynamics of a country's overall manufacturing competitiveness in terms of two inextricably linked forces – market and government. The drivers of competitiveness reflect the interplay between market and government forces.

3.2. HVM&S Sector Drivers

The drivers of manufacturing competitiveness are illustrated in the following diagram. These factors were identified as the most important drivers of global manufacturing competitiveness (Deloitte and US Council on Competitiveness - 2010 Global Manufacturing Competitiveness Index).



Talent Driven Innovation

Worldwide, manufacturing executives and governments consistently view their talented people as their greatest asset. Talent driven innovation encompasses both the quality and availability of a country's workforce. This includes skilled workers, engineers, scientists, and teachers who collectively have the capacity to simultaneously innovate and improve production efficiency.

Cost of Labour and Materials

The relative costs of labour and materials continue to be a critical driver of manufacturing competitiveness between countries. However, many global manufacturers are finding that the outsourcing of production to countries with low-cost labour can diminish longer-term leverage and internal competence needed to sustain commercial advantage. Constraints on the availability of materials are also a significant influence on production costs.

Energy Costs and Policies

Now more than ever, clean and reliable energy is vital to production across all industrial sectors. As countries seek to attain energy security and independence, the cost competitiveness, and country-specific clean and sustainable energy leadership will be a prominent component of manufacturing competitiveness. Increasing demand and limited supply will cause market forces to play a formidable role in the development and diffusion of alternative forms of energy. Government policies which increase energy efficiency and accelerate the demand for cost-effective alternative energy will provide the springboard for countries to leap ahead in competitiveness.

Economic, Trade, and Tax Systems

Appropriate regulations and policies on taxation, trade, banking, and overall financial systems foster the necessary business climate for a country's industrial sectors to thrive. Conversely, regulations and policy which are an unnecessary burden, or non-transparent, can limit the manufacturing sector and form a drag against national competitiveness.

Quality of Physical Infrastructure

The productivity of an industry is directly related to the quality of its physical infrastructure. This includes roads, ports, electricity grids, and telecommunication networks. The infrastructure provides the ability for a high-functioning commercial sector through enabling the movement of goods, energy, and information. A well developed physical infrastructure is essential to integrate local markets as well as cost effectively connecting to international markets, thereby enhancing the competitiveness of the entire manufacturing value chain.

Government Investment

The degree of Government investment in science, technology, and engineering creates the overall national climate for manufacturing innovation. Government investment into research institutes and technological developments fosters knowledge creation and dissemination, and has a strong influence on the growth and ongoing competitiveness of the sector.

Legal and Regulatory System

Regulatory compliance costs, labour laws, IP protection and enforcement have a strong influence on economic growth. Labour laws which protect the interests of both employees and employers and allow for flexibility in deployment of labour, have a positive impact on the productivity and efficiency of operations. The absence of a transparent and well-functioning legal framework can put investments at risk. Similarly a regulatory system with high compliance costs or ineffective IP protection will create an obstacle to growth and profitability of the HVM&S sector.

Lean Processes

As high-value manufacturing has become an increased focus for developed economies, effort has been channelled into creating efficiencies in both manufacturing and business processes. Such efficiencies are created by eliminating the expenditure of resources for any other goal than the creation of value for the consumer or end-user. Within the high-value manufacturing sector, lean practices have led to greater distribution of production, allowing design and prototyping at home, with production occurring closer to geographic markets. New Zealand-based companies are increasingly adopting lean manufacturing principles to improve their productivity, profitability, and international competitiveness.

4. Cost Profiles and Business Environment

We have considered a range of costs across each of the production countries within the scope of research. This research presents the cost data for each country.

4.1. Workforce Salaries and On-Costs

The workforce for HVM&S is typically made up of skilled labour, engineers, designers, and operations managers. To create a meaningful workforce cost comparison it is vital that the same job is compared between countries. To achieve this, salary data was sourced from the 2009 UBS Prices and Earnings report. This report contains survey data on wages, payroll taxes and working hours for 14 separate occupations.

There is a great deal of variation in how manufacturing jobs are classified, and as such we have to make some assumptions about the workforce requirement, largely predicated upon what information is reliably available for all the countries under consideration. The occupations we deemed relevant to HVM&S are: skilled labourers, engineers, and department heads (equivalent to operations managers). The use of these three occupations requires two assumptions:

1. That there is no explicit R&D or design component of the manufacturing process included in the cost exercise
2. That the workforce required to produce a given product can be made up of the three occupations: skilled labourers, engineers, and department heads.

The justification for not including R&D costs is primarily due to the variability in the nature (and by implication the costs) of R&D activities. However, we recognise the importance of R&D in generating high-value manufactured products. Countries that have a high-calibre R&D workforce are better positioned to exploit technological advances. New Zealand R&D makes up only a small proportion of global R&D activities, however the R&D activities which are undertaken here are often high-profile and may be undertaken via a number of agencies including but not limited to, Crown Research Institutes, universities, health agencies, and private firms. The workforce in the R&D sector is highly-competent and well connected to global science and technology networks.

The following table outlines the salary midpoints across countries in each of the three occupation categories.

Table 2: Annual Salaries (USD)

Salaries (USD)	NZ	Australia	Germany	UK	US	Japan
Skilled industrial workers	\$ 32,720	\$ 66,007	\$ 40,650	\$ 50,036	\$ 59,825	\$ 55,235
Engineers	\$ 49,621	\$ 75,495	\$ 69,490	\$ 59,717	\$ 80,475	\$ 68,104
Department heads	\$ 44,753	\$ 110,011	\$ 77,752	\$ 62,980	\$ 88,400	\$ 87,351

The salary data above is exclusive of statutory on-costs particular to each country, for example federal unemployment tax in the US. We have aggregated the compulsory on-costs as percentages of salary. The totals are presented below:

Table 3: Annual Salary On-Costs (USD)

Salaries Data	NZ	Australia	Germany	UK	US	Japan
On-Costs (%)	2.07%	9.00%	21.56%	13.80%	13.85%	14.00%

4.2. Materials and Supply Chain

All manufacturing operations face the challenge of obtaining raw materials – it is a critical component of the business so there is always a focus on ensuring reliable supply at a competitive cost. The location of the manufacturing plant is a vital consideration in allowing businesses to mitigate raw material risks for supply chain continuity.

There are many factors which drive the focus on risk mitigation for raw material supply: globalisation of the supply chain, lean manufacturing processes, process optimization techniques, scalability, and competing demands for the same raw material resources. These risks may be characterised in two ways – systematic risks based on market conditions which affect the majority of raw materials, and specific risks which affect only a segment of raw materials.

The systematic risks are mitigated through ensuring appropriate regulatory procedures are in place, and do not present a greater risk to any one country or type of manufacturer. Specific risks on the other hand, are important to consider for HVM&S where an operation may be dependent on sourcing a particular material but have difficulty ensuring the supply. For example, there are existing supply shortages for helium. Demand in the USA has increased over 80% in the past two decades, and is growing as much as 20% annually in developing regions. The effect of this has been a 45% increase in cost over two years.

Manufacturing operations in New Zealand source their materials mostly from Australia, and in this way are sheltered somewhat from the turbulence that can occur in the Northern Hemisphere. For example, in 2008 the Canadian Potash strike caused huge disruption to supply chains for industrial chemical manufacturers, and subsequently to their customers. The financial implications of supply chain disruption are typically quite severe. There may be scope to mitigate the risk through trading different currencies on the commodity market for materials.

New Zealand is somewhat sheltered from this volatility due to its proximity and relationship with Australia – the major supplier of raw materials for manufacturing.

Given the complex nature of supply chain management in HVM&S, and the highly variable materials costs for certain manufacturing processes, for modelling purposes we have assumed materials costs as being a fixed percentage of overall cost of manufacturing.

4.3. Shipping and Insurance

New Zealand has a high volume of imports and exports and consequently has a well developed ports system, suitable for transport of goods from all major centres.

On average New Zealand's shipping costs to Thailand and Singapore are comparable to those of other source countries. Higher than average costs are incurred when shipping to China, but potentially these are more than offset by the bi-lateral Free Trade Agreement which exists between New Zealand and China. New Zealand is the only one of the researched countries to have negotiated such an agreement with China.

Distance is a main driver of the cost of shipping. New Zealand has the least expensive shipment costs to Australia than from other worldwide destinations due to the close proximity between these two countries. In comparison with the UK, USA, and Germany, the only competitor with New Zealand for shipping to Asian markets is Australia. Again, the distance advantage held by Australia is offset by New Zealand having more favourable trade relationships with these markets.

Table 4: Shipping costs (USD)

Shipping costs		NZ	Australia	Germany	UK	USA	Japan
Destination	China	\$ 1,809	\$ 1,466	\$ 1,295	\$ 1,222	\$ 1,785	\$ 542
	Thailand	\$ 1,896	\$ 1,600	\$ 1,454	\$ 1,380	\$ 2,498	\$ 1,413
	Singapore	\$ 1,718	\$ 1,572	\$ 1,386	\$ 1,313	\$ 2,250	\$ 1,632
	Australia	\$ 1,489	\$ -	\$ 2,932	\$ 4,087	\$ 3,846	\$ 2,774
	Japan	\$ 2,016	\$ 1,993	\$ 1,705	\$ 1,869	\$ 2,198	\$ -
	India	\$ 2,976	\$ 2,675	\$ 2,248	\$ 2,172	\$ 5,192	\$ 2,029
	United States	\$ 2,477	\$ 2,566	\$ 8,518	\$ 8,058	\$ -	\$ 2,440
	United Kingdom	\$ 2,935	\$ 2,793	\$ 115	\$ -	\$ 9,915	\$ 2,476
	New Zealand	\$ -	\$ 1,440	\$ 3,942	\$ 3,191	\$ 3,614	\$ 2,633
	Germany	\$ 3,040	\$ 2,897	\$ -	\$ 1,501	\$ 10,396	\$ 2,579

Insurance costs are modelled at a flat rate. More detailed insurance information is only available when the value of the product is known more precisely, and time of year, weather patterns, and the type of product would be considered in setting the insurance rate. For the purposes of the cost exercise, we have used a flat rate of US\$0.87 per US\$100 of value insured. This figure was provided as a general quote from an insurance provider.

4.4. Overhead Costs

Electricity

A comparison of commercial electricity costs between the producing countries reveals New Zealand's costs to be the highest. This must be viewed in light of New Zealand's ongoing commitment to renewable energy sources.

Table 5: Electricity charges (USD)

Electricity	\$US per kWh	\$US per sq.m p.a
New Zealand	\$ 0.250	\$ 49.97
Australia	\$ 0.041	\$ 8.18
Germany	\$ 0.150	\$ 29.99
UK	\$ 0.135	\$ 26.94
USA	\$ 0.099	\$ 19.78
Japan	\$ 0.065	\$ 12.96

In light of the volatility in global pricing of non-renewable energy, New Zealand is fortunately rich in renewable resources. More than other developed countries, New Zealand already meets much of its energy needs by harnessing the power stored in rivers, lakes, geothermal fields, wind and biomass. Hydropower accounts for 60-70% of electricity generation, depending on the weather, with 6% provided by geothermal generation and the balance mainly from coal and gas thermal power stations.

According to the government's plan to meet its obligations under the Kyoto Protocol on climate change, unveiled in September 2007, as much new electricity generation as possible should be from renewable sources, with the aim of 90% of total electricity generation being derived from renewable sources by 2025.

Telecommunications

Telecommunications are an important consideration for companies with offshore operations. The data used in the modelling incorporate fixed-fee broadband connections, annual business phone connections, and outbound calling costs. We have assumed a per person phone use of 300 minutes per month. The costs for this were obtained from the ITU international telecommunications data and EIU.

Table 6: Telecommunications costs (USD per person)

Telecom costs	Annual Broadband Charge	Annual Business Phone Installation Fee	Annual Business Phone Subscription	Annual Outbound Calling Costs	Total cost
New Zealand	\$ 259	\$ 40	\$ 449	\$ 996	\$ 1,744
Australia	\$ 330	\$ 54	\$ 440	\$ 1,291	\$ 2,114
Germany	\$ 476	\$ 79	\$ 317	\$ 823	\$ 1,696
UK	\$ 278	\$ 164	\$ 276	\$ 717	\$ 1,435
USA	\$ 239	\$ 72	\$ 210	\$ 6,420	\$ 6,942
Japan	\$ 461	\$ 440	\$ 359	\$ 2,070	\$ 3,330

New Zealand's telecommunications sector has been deregulated since the late 1980s. This has created a highly competitive market in New Zealand. The government is committed to rolling out ultra-fast broadband services to 75% of New Zealanders over the next ten years. Up to \$1.5 billion will be invested in fibre-to-the-premises broadband services providing downlink speeds of at least 100 Mbps and uplink speeds of at least 50 Mbps to New Zealand and the rest of the world. Having access to ultra-fast broadband will allow faster connectivity to the rest of the world which will support the growing economy.

Rent

Rental costs are sourced from publicly available data for prime warehouse space per square metre per year. The cost of rental space is highly variable throughout each country so a national average is used in the modelling.

Table 7: Industrial Rental Costs (USD)

Rental (USD)	Cost (sq.m per year)
New Zealand	\$ 67.38
Australia	\$ 99.33
Germany	\$ 88.31
UK	\$ 34.21
USA	\$ 15.62
Japan	\$ 239.16

New Zealand features in the middle of the range for industrial property rental. Australia is by far the highest cost location, due to high demand for industrial warehouse space.

As well as being a low cost location, New Zealand has high building standards – both mandatory and non-mandatory – which are regulated by the Building Control Framework. This framework sets out standards for construction and fit out, and also provides guidance on building eco-friendly offices. Such buildings are becoming increasingly common in New Zealand centres, contributing to environmental sustainability, and providing lower power and water usage requirements.

4.5. Economic, Trade, and Tax Systems

Taxation

Companies operating in the manufacturing sector often take a careful tax position, and for this reason we have not included taxation in the cost modelling because there is no information on revenue. It is possible that the operation will be run by a parent company as a cost centre, thereby using the corporate tax rate in the country of operation to work as an offset against costs.

Table 8: Taxation Rates as at 2012

Country	Tax rate
New Zealand	28.00%
Australia	30.00%
Germany	33.00%
UK	20.00%
USA	39.50%
Japan	39.50%

Another key impact is the result of tax rate changes, as this changes the results only for certain countries. New Zealand will decrease its tax rate to 28% from 30% from 2012, and Australia will decrease its tax rate to 28%-29% from 30% from 2014. New Zealand's tax system is one of the most neutral and efficient in the OECD. Bases are generally broad and rates are moderate. The full

imputation system for dividend payments works to reduce tax distortions for corporate financing decisions, while efficiency in corporate investment decisions is encouraged by the low level of targeted tax incentives.

Foreign Exchange

Consideration of foreign exchange rates are a vital component of the cost modelling as it is typically the most volatile factor in determining location of operations. The New Zealand dollar has fluctuated significantly in relation to the US over the past three years, mainly as a result of the global financial crisis. It reached a post-float high of US\$0.81 in mid 2007, however plummeted through 2008 and the first quarter 2009 due to the downturn and investors moving away from perceived 'riskier' currencies such as the New Zealand Dollar. The dollar bottomed out at around US\$0.50 in early March 2009, but rebounded strongly to reach US\$0.75 in November 2009.

It is well recognised and accepted that New Zealand currency can be highly volatile, often moving around in a fashion unrelated to economic performance. However the volatility induced by speculation does provide market liquidity and is something which must be actively managed by businesses. Exporters who are financially exposed to an appreciating New Zealand Dollar must either actively manage the risk, or sell their product in another currency to different markets. The latter is not often possible and so proactive, disciplined currency hedging policies are required.

Trade Relations

North America

Strong trade links have been created between the US, Canada and Mexico through the introduction of the North American Free Trade Agreement. All duties and quantitative restrictions were eliminated on January 1, 2008 creating one of the world's largest free trade areas. The United States is currently negotiating entry and expansion of the regional, Asia-Pacific trade agreement, known as the Trans-Pacific Partnership (TPP) Agreement. The objective of the agreement is to shape a high-standard, broad-based regional pact to facilitate and encourage trade. Countries included in the TPP negotiations are Australia, Brunei Darussalam, Chile, Malaysia, New Zealand, Peru, Singapore, and Vietnam.

An FTA with the United States has been a top trade policy goal for New Zealand for many years. A comprehensive FTA negotiation between Trans-Pacific partners and the United States offers New Zealand a good opportunity to achieve free trade and stronger investment flows with the United States. The TPP is set to make the regulatory systems of TPP countries more compatible which will facilitate more active participation of small- and medium-sized enterprises in international trade. This will benefit US companies who are wishing to relocate some or all of their operations offshore in New Zealand.

Europe

Trading with European countries offers a number of benefits to businesses, as the 27 member states include some of the world's wealthiest and most productive countries. At the core of EU trade is the single market, a programme of freeing up trade and people movement between EU countries. The

aim of the single market is to allow EU member states to trade with each other without the barriers typical of international trade.

The EU has been a key player in international trade liberalisation negotiations. The latest of these is the so-called Doha Development Round which began in 2001. The aim of these negotiations, held in the framework of the World Trade Organisation (WTO), is to reduce tariffs and remove other barriers to world trade. Following earlier rounds, the EU's average tariff on industrial imports has now fallen to 4%, one of the lowest in the world.

Since 1999 the EU and New Zealand have been parties to a bilateral agreement that aims to facilitate trade in industrial products between the EU and New Zealand by reducing technical barriers, including assessment procedures. It covers around one third of all EU merchandise products exported to New Zealand including medicine products and devices, telecommunication equipment, low voltage equipment, machinery and pressure equipment.

Asia and Pacific Region

Asian markets provide an excellent trade destination with substantial growth and development. China and India are expected to be the world's two largest economies based on GDP by 2050. Australia and New Zealand are well-placed to service this area due to their long-standing relations, favourable free-trade agreements, and close proximity to markets.

Australia has concluded six FTAs and is the only country in the Asia-Pacific region to have successfully negotiated an FTA with the United States. Australia is currently in negotiations with China, Japan, Malaysia, the Gulf Co-operation Council, the Republic of Korea, TPP, Pacific Agreement on Closer Economic Relations, and Indonesia.

New Zealand became the first OECD country to have completed a bilateral FTA with China which came into effect on 1 October 2008. The FTA has facilitated trade in goods, services and investment between China and New Zealand. The FTA provides new opportunities to both countries for mutual economic benefit and reduces barriers between New Zealand and China. The FTA also enhances New Zealand's exporters' and investors' competitiveness in the Chinese market. The FTA will increase New Zealand exports to China by an estimated US\$180 to 280 million per year.

Tariffs will be phased out on 96% of New Zealand's exports to China which will be eliminated in stages through to 2019.

4.6. Physical Infrastructure

A central objective of the New Zealand Government is for infrastructure to be a means to permanently lift the sustainable growth rate of the economy through increased productivity and improved management of Crown assets. As a practical means of delivering this, the government has:

- Established both the National Infrastructure Unit, as a unit within the Treasury, and the National Infrastructure Advisory Board, comprising members outside central government, to advise the Minister for Infrastructure.

- Committed to developing a National Infrastructure Plan presenting a high-level view of New Zealand's infrastructure needs over the next 20 years.

Transport infrastructure is of particular importance to all types of manufacturing operation in New Zealand. To ensure New Zealand's reputation as an exporter of high-quality goods (particularly fresh produce) efficient sea and air port systems are vital. New Zealand's ports are highly efficient with ongoing development focussed on improving productivity. The Port of Tauranga, for example, is the most productive port in Australasia, and in terms of gross crane productivity is 14% higher than Singapore.

The airport infrastructure is well developed, with Auckland International Airport handling over 13 million passenger arrivals and departures each year making it the second busiest airport in Australasia.

4.7. Legal and Regulatory Environment

New Zealand's regulatory environment allows manufacturers to respond quickly to changing market conditions. The legislation is clear and reasonable and maintains high standards while minimising compliance cost for operators. Of particular relevance for manufacturing operations are employment legislation and patent protection laws.

The main facets of New Zealand Employment Law articulate the minimum legal requirements for pay, holidays, breaks, and workplace safety. Information and assistance to meet these requirements is provided by the Department of Labour (DOL). In addition to providing information for employers and employees, DOL also runs a number of government programmes such as the High Performance Working Initiative to provide practical support to firms wanting to introduce high-performance working practices.

Intellectual property issues such as trademarks, patents, and copyrights are managed in New Zealand by the Intellectual Property Office. New Zealand's IP system plays a critical role in fostering innovative and productive firms. Globalisation of R&D has attracted attention of policy makers in New Zealand and across the OECD, as it is well understood that IP rights have a range of functions and complex side-effects. New Zealand's IP policy landscape is targeted at providing innovators with a means to protect their technology and allowing firms to recoup R&D costs by leveraging the value of IP.

The government is very pro-business and supports a number of initiatives which encourage growth among firms in New Zealand and increasing Foreign Direct Investment. For example, NZTE has a programme in place which encourages firms with high growth potential to adopt lean processes. These firms have typically been medium-sized businesses who are actively exporting high value-added products with growth potential in identified markets. Such programmes are an important and ongoing part of the relationship between government and commercial enterprise in New Zealand.

5. Model and Outputs

To understand the dynamics of production costs between countries, we have developed two scenarios which show how the decision-support tool can be used. The scenarios are intended to give a view of production costs for products which are high-value and relatively low volume.

The first scenario looks at a small operation requiring a relatively small workforce; the second considers a larger operation with a larger workforce requirement and higher production volumes.

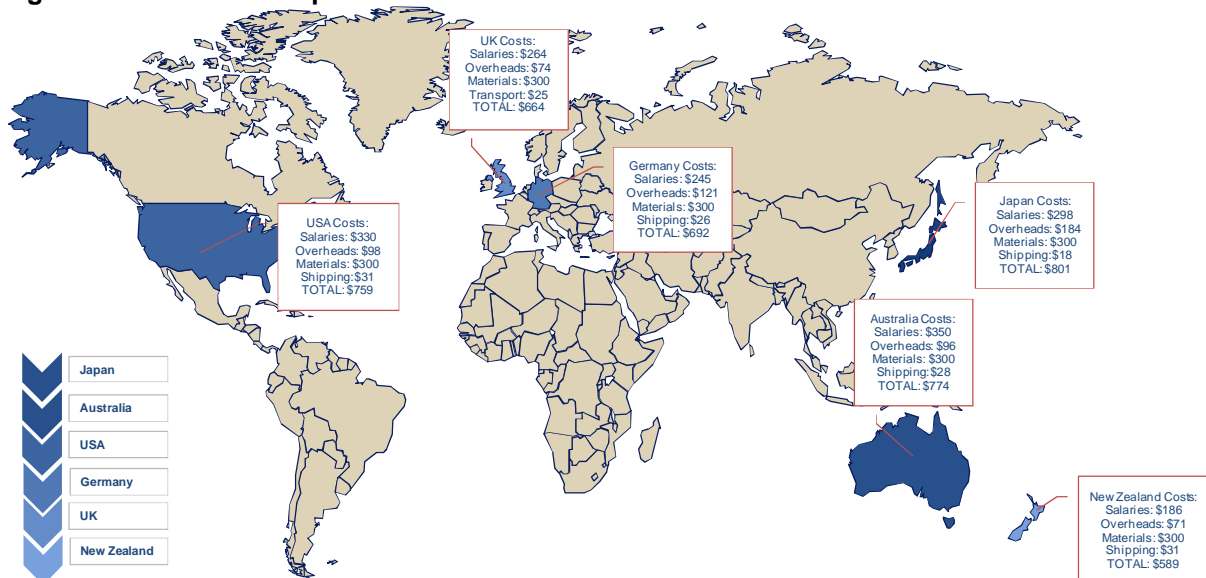
5.1. Scenario One: 50 person operation

This scenario illustrates the landed cost of a product with the following input requirements:

Parameter	Value	Workforce	Number
Market:	China	Skilled workers	36
Market Price:	\$1,500	Engineers	12
Annual Volume:	10,000	Department heads:	2
Items per container	100	Total Staff	50
Material cost (%)	20%		

Generating the model outputs under these conditions yields the following:

Figure 1: Scenario 1 Outputs – Destination China



The model shows New Zealand as the lowest cost location under this scenario with the next lowest being the United Kingdom at 12.7% higher cost. A closer look at the cost breakdown illustrates why this is.

Table 9: Scenario 1 - costs (USD)

Landed Cost (USD)	New Zealand	UK	Germany	USA	Australia	Japan
Total Salaries	\$ 186	\$ 264	\$ 245	\$ 330	\$ 350	\$ 298
Total Salary on Cost	\$ 4	\$ 36	\$ 53	\$ 46	\$ 32	\$ 42
Total Rent cost	\$ 34	\$ 17	\$ 44	\$ 8	\$ 50	\$ 120
Total Electricity cost	\$ 25	\$ 13	\$ 15	\$ 10	\$ 4	\$ 6
Total Telecommunications Cost	\$ 9	\$ 7	\$ 8	\$ 35	\$ 11	\$ 17
Materials Costs	\$ 300	\$ 300	\$ 300	\$ 300	\$ 300	\$ 300
Total Shipping Cost	\$ 18	\$ 12	\$ 13	\$ 18	\$ 15	\$ 5
Total Insurance	\$ 13	\$ 13	\$ 13	\$ 13	\$ 13	\$ 13
Total Cost (USD)	\$ 589	\$ 664	\$ 692	\$ 759	\$ 774	\$ 801

The cost of salaries is lower in New Zealand than any of the other countries, and on-costs are significantly lower. While New Zealand carries higher costs for rent, electricity, and shipping, it is the low cost of salaries and on-costs which cause the landed cost to be the lowest when production is based in New Zealand.

The significant difference between New Zealand and the other countries is in large part due to the foreign exchange rate, the New Zealand dollar being considerably weaker against the US dollar than any of the other countries.

Looking at the cost of production for other destination markets, we obtain the following landed costs:

Table 10: Scenario 1 Landed Cost – all destinations (USD)

Landed Cost (USD)	New Zealand	Germany	UK	Australia	USA	Japan
China	\$ 589	\$ 692	\$ 664	\$ 774	\$ 759	\$ 801
Thailand	\$ 590	\$ 693	\$ 665	\$ 775	\$ 766	\$ 810
Singapore	\$ 588	\$ 693	\$ 665	\$ 775	\$ 763	\$ 812
Australia	\$ 585	\$ 708	\$ 693	\$ 746	\$ 779	\$ 823
Japan	\$ 591	\$ 696	\$ 670	\$ 779	\$ 763	\$ 782
India	\$ 600	\$ 701	\$ 673	\$ 786	\$ 793	\$ 816
USA	\$ 595	\$ 764	\$ 732	\$ 785	\$ 728	\$ 820
UK	\$ 600	\$ 680	\$ 639	\$ 787	\$ 840	\$ 820
New Zealand	\$ 558	\$ 718	\$ 684	\$ 774	\$ 777	\$ 822
Germany	\$ 601	\$ 666	\$ 667	\$ 788	\$ 845	\$ 821

The table shows the variation in shipping costs to Asia and Australia is relatively low from all the production countries.

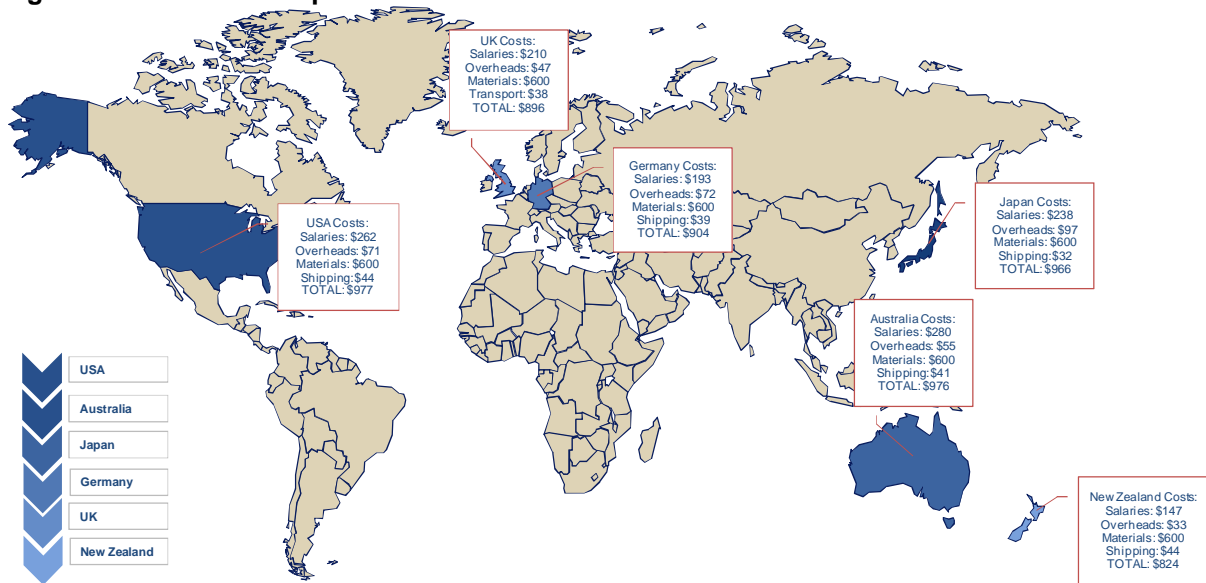
5.2. Scenario Two: 100 person operation

Under this scenario we consider a larger scale operation in which a higher number of staff generate higher product volumes, again shipping to China. We have assumed that the majority of the workforce is in the skilled worker category as follows:

Parameter	Value	Workforce	Number
Market:	China	Skilled workers	75
Market Price:	\$3,000	Engineers	20
Annual Volume:	25,000	Department heads:	5
Items per container	100	Total Staff	100
Material cost (%)	20%		

This parameterisation generates the following outputs when run through the model:

Figure 2: Scenario 2 Outputs – Destination China



This output again shows New Zealand as the lowest cost location, and the percentage difference with the UK has increased to 8.7%. The following table outlines the cost breakdown for each production country.

Table 11: Scenario 2 - costs (USD)

Landed Cost (USD)	New Zealand	UK	Germany	Japan	Australia	USA
Total Salaries	\$ 147	\$ 210	\$ 193	\$ 238	\$ 280	\$ 262
Total Salary on Cost	\$ 3	\$ 29	\$ 42	\$ 33	\$ 25	\$ 36
Total Rent cost	\$ 13	\$ 7	\$ 18	\$ 48	\$ 20	\$ 3
Total Electricity cost	\$ 10	\$ 5	\$ 6	\$ 3	\$ 2	\$ 4
Total Telecommunications Cost	\$ 7	\$ 6	\$ 7	\$ 13	\$ 8	\$ 28
Materials Costs	\$ 600	\$ 600	\$ 600	\$ 600	\$ 600	\$ 600
Total Shipping Cost	\$ 18	\$ 12	\$ 13	\$ 5	\$ 15	\$ 18
Total Insurance	\$ 26	\$ 26	\$ 26	\$ 26	\$ 26	\$ 26
Total Cost (USD)	\$ 824	\$ 896	\$ 904	\$ 966	\$ 976	\$ 977

Looking at the cost of production for other destination markets, we obtain the following landed costs:

Table 12: Scenario 2 Landed Cost – all destinations (USD)

	Landed Cost (USD)	New Zealand	Germany	UK	Australia	USA	Japan
Destination	China	\$ 824	\$ 904	\$ 896	\$ 976	\$ 977	\$ 966
	Thailand	\$ 825	\$ 906	\$ 897	\$ 978	\$ 984	\$ 975
	Singapore	\$ 824	\$ 905	\$ 897	\$ 977	\$ 981	\$ 977
	Australia	\$ 821	\$ 921	\$ 924	\$ 936	\$ 997	\$ 989
	Japan	\$ 827	\$ 908	\$ 902	\$ 982	\$ 981	\$ 935
	India	\$ 836	\$ 914	\$ 905	\$ 988	\$ 1,011	\$ 981
	USA	\$ 831	\$ 976	\$ 964	\$ 987	\$ 933	\$ 985
	UK	\$ 836	\$ 892	\$ 857	\$ 990	\$ 1,058	\$ 986
	New Zealand	\$ 780	\$ 931	\$ 915	\$ 976	\$ 995	\$ 987
	Germany	\$ 837	\$ 865	\$ 899	\$ 991	\$ 1,063	\$ 987

The cost differences between scenarios are diminished in percentage terms due essentially to the increased workforce baseline – the exchange rates, materials costs are held constant. The scenarios are showing the relative differences between countries based on scale of operation, so it is important to note that changes in exchange rate, shipping volumes, etc will have an impact not only on cost estimates but also on the relative cost differences between countries.

6. Defining the Value Proposition

To define the value proposition, we address the three questions presented in the framework at the front of the report. These questions allow us to make an assessment of New Zealand's ability to meet business needs, the feasibility and practicality of operating in New Zealand, and an assessment of value for money.

6.1. Meeting Business Needs

Many offshore businesses perceive New Zealand as being too far away to be considered a realistic option for manufacturing operations. In the traditional trade environment, New Zealand has always suffered the tyranny of distance. However, as the manufacturing sector becomes increasingly globalised and companies seek to move into higher-value manufacturing operations, the problems of distance are giving way to the need for a skilled and reliable workforce, and to operate in a stable and sustainable economy.

New Zealand's economy is largely driven by international trade, mainly with Australia, the United States, China, Japan, and a number of European Union countries. New Zealand has good relations with all its trade partners, and as such is regarded by the OECD and World Bank as a country which is very easy to do business with. It is New Zealand's ability to do business with the world which sets it apart. This, in conjunction with the skilled and innovative workforce, and cost efficiency, make it an excellent location for high-value manufacturing businesses, especially those looking to supply products to Asian markets.

Access to materials and quality of supply chain are a key consideration for all manufacturing operations.

6.2. Practicalities and Feasibility

The cultural barriers to outsourced manufacturing operations are well documented. New Zealand is an English speaking country, and is culturally very diverse making it easier for New Zealanders to work with other cultures on good terms and with successful outcomes.

The New Zealand government is committed to developing the business sector, both domestically, and in opening new trade opportunities internationally, to create an environment which fosters business growth and innovation with as much freedom as possible.

There is very little corruption in New Zealand, and it is the lowest (i.e. least corrupt) ranked country on the Transparency International Corruption Perceptions Index of 2009.

A central objective of the New Zealand Government is for infrastructure to be a means to permanently lift the sustainable growth rate of the economy through increased productivity and improved management of Crown assets. As it stands New Zealand offers a highly functional infrastructural environment for businesses setting up operations.

6.3. Weighing the Costs

Scenario 1: 50 person operation

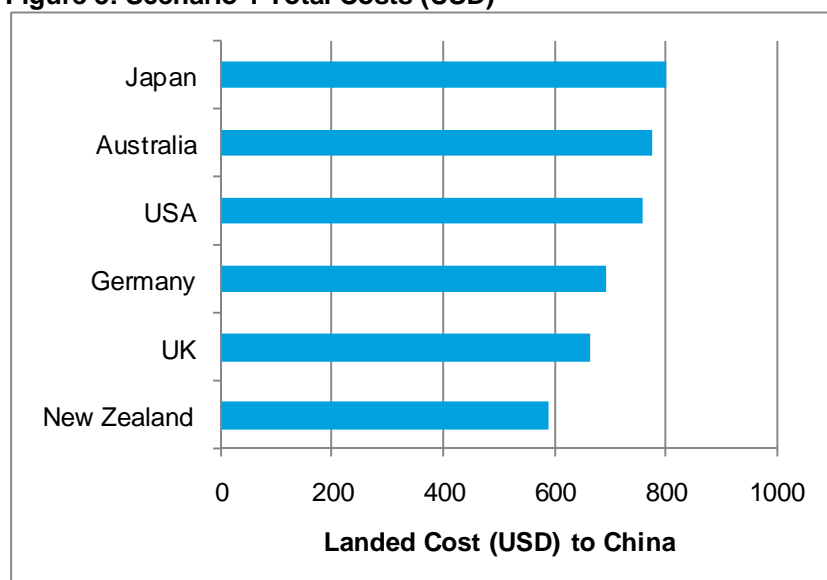
This scenario calculated the landed cost per item for an operation producing 10,000 units a year at US\$1,500 each. The production capacity is met by a 50 person workforce.

Table 13: Scenario 1 Costs (USD)

Landed Cost (USD)	New Zealand	UK	Germany	USA	Australia	Japan
Total Salaries	\$ 186	\$ 264	\$ 245	\$ 330	\$ 350	\$ 298
Total Salary on Cost	\$ 4	\$ 36	\$ 53	\$ 46	\$ 32	\$ 42
Total Rent cost	\$ 34	\$ 17	\$ 44	\$ 8	\$ 50	\$ 120
Total Electricity cost	\$ 25	\$ 13	\$ 15	\$ 10	\$ 4	\$ 6
Total Telecommunications Cost	\$ 9	\$ 7	\$ 8	\$ 35	\$ 11	\$ 17
Materials Costs	\$ 300	\$ 300	\$ 300	\$ 300	\$ 300	\$ 300
Total Shipping Cost	\$ 18	\$ 12	\$ 13	\$ 18	\$ 15	\$ 5
Total Insurance	\$ 13	\$ 13	\$ 13	\$ 13	\$ 13	\$ 13
Total Cost (USD)	\$ 589	\$ 664	\$ 692	\$ 759	\$ 774	\$ 801

Here we see New Zealand positioned with the lowest production cost of the countries considered. The cost increase for the same operation in Australia is approximately 31%.

Figure 3: Scenario 1 Total Costs (USD)



Noticeably, the US is the highest cost location, due to the high salary costs. The US also draws significant salary on-costs. While the US has low rent and electricity costs, the high cost of labour outweighs these. Similarly in Australia, the high costs of salaries make it a more expensive location than New Zealand, despite having lower overhead costs.

Scenario 2: 100 person operation

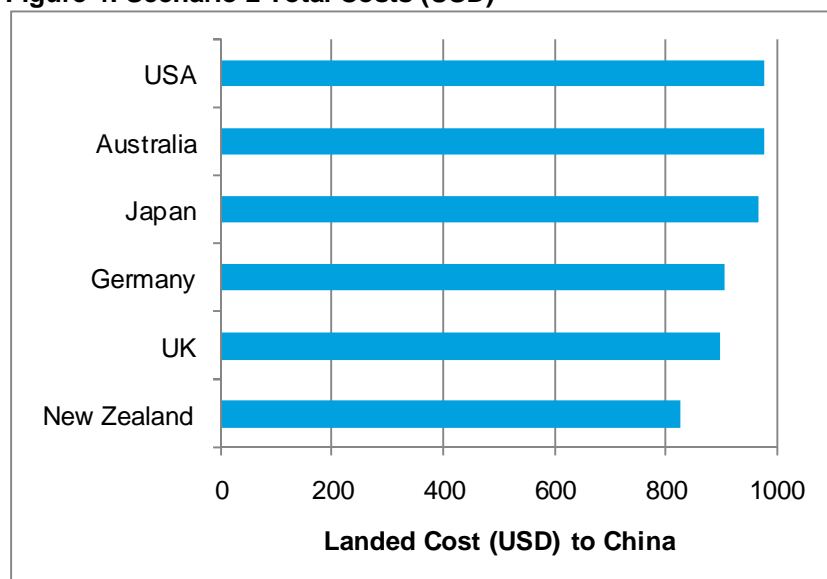
This scenario calculated the landed cost per item for an operation producing 25,000 units a year at US\$3,000 each. The production capacity is met by a 100 person workforce.

Table 14: Scenario 2 Costs (USD)

Landed Cost (USD)	New Zealand	UK	Germany	Japan	Australia	USA
Total Salaries	\$ 147	\$ 210	\$ 193	\$ 238	\$ 280	\$ 262
Total Salary on Cost	\$ 3	\$ 29	\$ 42	\$ 33	\$ 25	\$ 38
Total Rent cost	\$ 13	\$ 7	\$ 18	\$ 48	\$ 20	\$ 3
Total Electricity cost	\$ 10	\$ 5	\$ 6	\$ 3	\$ 2	\$ 4
Total Telecommunications Cost	\$ 7	\$ 6	\$ 7	\$ 13	\$ 8	\$ 28
Materials Costs	\$ 600	\$ 600	\$ 600	\$ 600	\$ 600	\$ 600
Total Shipping Cost	\$ 18	\$ 12	\$ 13	\$ 5	\$ 15	\$ 18
Total Insurance	\$ 28	\$ 28	\$ 28	\$ 28	\$ 28	\$ 28
Total Cost (USD)	\$ 824	\$ 896	\$ 904	\$ 966	\$ 976	\$ 977

Again we see New Zealand positioned with the lowest production cost of the countries considered. However, under this scenario, the cost difference between New Zealand and the Australia has been eroded to 18.4%.

Figure 4: Scenario 2 Total Costs (USD)



This shows that as the size of the manufacturing operation increases, the cost reduction gained by operating in New Zealand diminishes. This will also create a higher exposure to foreign exchange risk. The conclusion to be drawn is that smaller production operations, probably fewer than 200 workers, are more suitable for New Zealand.

6.4. Assessment of VFM

New Zealand has a small and well-educated population, with one of the highest tertiary qualification rates in the world. In the manufacturing sector, staff tend to be more qualified and specialised in their skills, and stay longer in the same job. This suggests that New Zealand is a good location for high-value manufacturing because the workforce emphasis is on skill-level rather than scale.

The HVM&S sector in New Zealand encompasses a large variety of operations, and is characterised by its capacity for innovation and developing tailored processes and practices to create novel and valuable products. Therefore, New Zealand HVM&S operations are more suited to those where the breadth of skill in the workforce can be best used to create high-quality, well designed, and appealing products with a small but very skilled team.

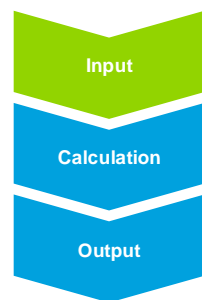
The cost breakdown reflects the trend for large, labour intensive manufacturing operations to be carried out in countries with low cost workforces, such as China. The production countries we have investigated have high-cost workforces, and manufacturing operations based in these countries are actively shifting into the high-value arena.

In simple cost terms, New Zealand clearly represents good value for money across both the manufacturing scenarios outlined in this report. And given the high capability and flexibility of the workforce, there is scope for new companies to operate successfully in New Zealand. Because of these two things, New Zealand is certainly an economically attractive place to do business.

7. Appendix I: Supplementary Information

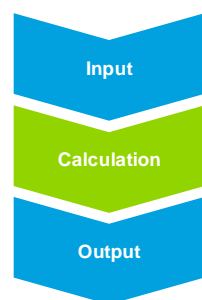
Model Structure and Assumptions

The model follows a simple three-step process:



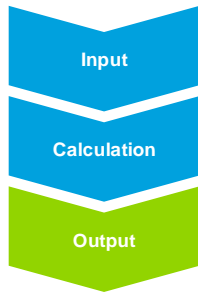
The HVM&S cost model accepts a range of input variables – a breakdown of the staff requirement, an allocation of factory space, materials costs, product retail price and foreign exchange settings.

Foreign exchange is an important consideration as the model outputs are highly sensitive to exchange rate, so it is vital that it is handled appropriately. There are five options for dealing with exchange rate. The default option is using a 12 month average rate as of March 2011, or there is a three-year average, or a five-year average. This may not be appropriate at all times, so there is an override function in which the user can enter their own exchange rate figures and have the model drive outputs based on these. Finally, there is an option to include live rates. This option downloads up-to-date rates from the internet and drives the outputs based on these.



Once the inputs have been entered by the user, the model calls the background data to begin generating the cost profile for each country. Specifically, the model:

- Pulls all the input data together and transforms it into the currency specified in the input, based on selected foreign exchange rates.
- Calculates the salaries based on the number of staff at each level.
- Calculates telecoms costs based on overall staff numbers.
- Calculates electricity costs based on staff numbers and the required area of factory space.
- Calculates rental cost based on staff numbers and the required area of factory space.
- Calculates shipping and insurance costs based on known market rates.



The model outputs are taken from the aggregated calculations of salaries, overheads, and taxation. The summation of all the calculated figures provides the overall cost for each country in the specified currency.

The countries are ordered in terms of cost from greatest to least, and a map of the outputs is automatically generated. This map colours each country based on its position in the ranking, with the darker colours representing higher cost locations.

The call-out boxes for each country contain a breakdown of the costs and the total. These boxes are updated automatically along with the colours.

Finally, underneath the map is a table with a detailed cost breakdown for each country. This map can be exported as a single image – best inserted into documents as an enhanced metafile.

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