Made in China 2025

China's Industrial Vision and New Zealand

6th July 2018

Paul Dupont

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1. Executive Summary

The Made in China 2025 (MIC2025) initiative is a state-led plan to comprehensively upgrade manufacturing in China by 2025 in line with the guiding principles of the 13th Five-Year Plan. It encompasses the top ten key strategic industries that the government believes could most benefit from improvements to productivity, national security and environmental sustainability.

The Chinese government instituted MIC2025 to increase labour productivity in manufacturing, limit the growth of debt in state-owned industries (115% of GDP in May 2017) and develop domestic capabilities in strategic sectors where technology must presently be imported (e.g. food, energy, semiconductors and pharmaceuticals).

The government has created industry-specific 'guiding documents' which companies are encouraged to follow through massive financial incentives (e.g. approximately USD 250Bn in R&D stimulus and equity funds for MIC2025 initiatives) and regulatory disincentives (e.g. financial penalties for overly polluting companies). This is supported with state-sponsored industry alliances, research centres and public-private cooperation projects.

The potential rewards for successfully implementing MIC2025 are significant for Chinese industry and government. Enabling state-owned enterprises (SOEs) to be globally influential innovators and manufacturers will boost domestic productivity, create new global Chinese brands and contribute to a shift in a technological balance of power from Western countries to China.

MIC2025 poses multiple risks to the Chinese government. Firstly, the risk of severe social unrest resulting from massive job-losses (1.8m job losses in 2016 in the coal and steel industries) entailed by boosting productivity at SOEs. Secondly, the negative international reaction (particularly from the US) risks damaging China's global trade relations and causing WTO lawsuits for many years to come. Finally, the government risks harming domestic innovation in private companies (such as Alibaba and Tencent) by unfairly subsidising SOEs.

The international community has had a generally negative reaction to MIC2025. The US Government is vehemently opposed to the plan citing the anti-competitive nature of state-sponsored R&D, specifically in sectors where US companies presently have global market dominance. EU governments have expressed muted reactions to MIC2025 though the union's industry bodies believe countries such as Germany with a high dependence on high-tech manufacturing for GDP contribution have most to risk from the plan. These industry bodies have criticised the Chinese government for encouraging its SOEs to acquire European companies to gain access to critical manufacturing IP. The foreign

business community in China has publically expressed support for the plan, but is privately wary of foreign products and technologies losing market share as a direct result of Chinese innovation.

The New Zealand economy depends on manufacturing for 12.5% of its GDP according to Ministry of Business, Innovation and Employment, of which one quarter is considered high-tech. Consequently, the country does not stand to be severely negatively impacted by MIC2025 (as compared to the US or Germany). Conversely, China is likely to increase imports of commodities deemed environmentally unsustainable (when produced in China) such as dairy and timber. To reap the longer-term benefits of the MIC2025 initiative New Zealand companies should look for opportunities to develop IP in collaboration with Chinese companies while exercising appropriate caution and due-diligence. New Zealand should also be aware of up-and-coming Chinese brands in the MIC2025 key sectors looking to export high-tech equipment supplanting existing suppliers from New Zealand's traditional partner countries. Finally, the New Zealand government should be cautious when engaging with MIC2025 at a national level as this could potentially cause controversy with its traditional partner countries including the EU, US and Australia.

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2. Introduction

In 2015, the Chinese government announced the 13th Five-Year Plan (13-5) to address the industrial debt and overcapacity created as a by-product of the country's break-neck economic growth, particularly in State-Owned Enterprises (which contributed approximately 36% of China's GDP in 2017). The Made in China 2025 plan is a key part of the 13-5 designed to improve productivity, national security and environmental sustainability. This report aims to investigate and explain the creation, implementation and impact of the Made in China 2025 plan domestically, internationally and with specific reference to New Zealand.

3. Background: What is the "13th Five-Year Plan"?

To understand the Made in China 2025 (MIC2025) initiative, it is helpful to have context on the Chinese government's overall economic planning process. Every five years, the Chinese government issues a five-year plan. In 2015, it released its 13th five-year plan (colloquially known as the 13-5) to overhaul the domestic economy from 2015 to 2020. Five-year plans typically comprise the blueprints for the country's social, economic and political goals and encompass existing policies, strategic initiatives and regional plans. Additionally, five-year plans communicate the government's vision for future reforms to internal bureaucracies, industry players and Chinese citizens.

The 13-5 specifically refers to improving the economy on these key fronts:

1. Innovate – Make Chinese organisations world leaders in innovation
2. Coordinate – Encourage government bureaucracies and organisations to communicate to ensure economic supply follows demand more closely
3. Go Green – employ new technologies to improve the environmental impact of new and old industries
4. Open Up – Enable foreign investment into previously prohibited market sectors including automotive and finance
5. Share – Actively promote the adoption of Chinese products and technology in overseas markets

The government expects the Chinese economy to grow by 42% between 2017 and 2023 (6.1% YoY) as a direct result of its strategic industrial plans stemming from the 13-5 (including MIC2025).

4. What is "Made in China 2025"?

MIC2025 is an ambitious ten year development plan which was unveiled by the State Council and the Ministry of Industrial and Information Technology (MIIT) shortly after the 13-5 plan was released. MIC2025 is an initiative designed to "comprehensively upgrade Chinese industry". While aspects of MIC2025 are similar to Germany's 'Industrie 4.0' initiative, designed to connect industrial manufacturing with the Internet of Things, MIC2025 has a much broader scope. MIC2025 encourages manufacturers to develop indigenous manufacturing strategies and technologies to transform China from the 'World's Factory' to a manufacturing and innovating superpower.

MIC2025 is headed by a Small Leading Group chaired by Ma Kai, the Vice-Premier in the State Council responsible for overseeing national manufacturing; he is directly accountable to Li Keqiang, the Chinese premier. Below Ma Kai are the ministers of 25 key industrial ministries including Miao Wei, the minister in charge of MIIT.

The guiding principles of MIC2025 are very similar to those of the 13-5:

1. State-owned industry to be innovation driven
2. Optimize the structure of Chinese Industry to ensure supply matches demand
3. Encourage green industrial development to reduce pollution from manufacturing
4. Nurture human talent to create a culture of innovation

Many well-known companies in China such as Alibaba, Tencent and Xiaomi already had a proud, if relatively young, tradition of innovation in line with these principles before MIC2025 was announced. The government aims to extrapolate the innovation pioneered by these companies producing consumer products to nation's 160,000 state-owned enterprises (SOEs) and capital-goods manufacturers. The government has targeted the largely SOE-controlled industries outlined in table 1 (representing 40% of China's industrial value-added output) to improve through indigenous innovation.

Table 1: MIC2025 Target Industries

MIC2025 Industry	Top Company by Revenue	Company Type
Information Technology	Huawei	POE
Numerical Control Tools and Robotics	Siasun	SOE
Aerospace	Comac	SOE
Ocean engineering and marine technology	COES / CSIC	SOE
Railway Equipment	CRCC	SOE
Energy Saving and New Energy Vehicles	State Grid	SOE
Power Production and Management Equipment	State Grid	SOE
New Materials	Sinoma	SOE
Medicine & Medical Devices	Shinva	SOE
Agricultural Machinery	YTO	SOE

Source: NZCCRC Research

The government is presently considering adding the three industries listed in table 2 to the MIC2025 plan:

Table 2: Potential MIC2025 Target Industries

Potential MIC2025 Industry	Top Company by Revenue	Company Type
Home appliances	Midea	POE
Petroleum Refining Equipment	COSCO	SOE
Construction Equipment	SANY	POE

Source: NZCCRC Research

5. Why did the Chinese government start MIC2025?

MIC2025 was designed to create a financially sustainable and competitive indigenous manufacturing industry in China. The Chinese Communist Party (CCP) has driven national development through investment-led projects since the reforms of Deng Xiaoping in 1978. The country has massively improved its domestic infrastructure and talent pool through projects such as the Three-Gorges Dam (USD 24bn), Pudong New Area (est. USD 55bn) and the South-North Water Diversion Project (USD 48bn). SOEs act as the main organisational and financing vehicles behind such large projects and now comprise some of the largest and fastest growing companies in the world. SOES are, however, inefficient, less innovative and less productive when compared to foreign or privately-owned enterprises (POEs) established in China since the early 2000s.

SOEs vs POEs in China

Two contributing factors account for some of the innovation discrepancy between SOEs and POEs:

Competition

SOEs are granted monopolies in certain capital-intensive industries by the state. Consequently, there has been little incentive to innovate cheaper and better products and solutions. Conversely, POEs operating in narrowly defined industries face cut-throat competition from other players, be they domestic POEs, SOEs or foreign companies. This competition drives POEs to innovate and cut costs to secure market share.

Access to Credit

SOEs have access to very cheap credit from state-run banks and have generated a debt of 115% of GDP (as of May 2017). This credit enables SOEs to generate economic growth through investing in expensive, large-scale projects with little or no requirement to create profitable long term returns. Conversely, POEs must meet strict requirements from banks to access credit and face bankruptcy if they are unable to repay (though in recent years the privately operated venture capital industry in China has enabled POEs to access the resources needed to grow rapidly).

The CCP plans to address these structural economic challenges through a combination of financial policies (e.g. deleveraging, promotion of public-private ownership, improve bankruptcy laws) and productivity reforms with the Made in China 2025 plan (e.g. labour, technology, security and cultural reforms):

Labour

Ageing population – A combination of improving healthcare and the one-child policy has created an aging population, 22% of which will be over 60 by 2027. The country will be less able to depend on the cheap supply of labour it enjoyed over the past three decades of economic development.

Periodic disruption to industrial output – The majority of Chinese workers simultaneously take 14 days of holidays for Chinese New Year (in January/February) and Golden Week (in October). Additionally, many workers will change companies during these periods creating unpredictable factory output.

Increasing Labour costs – Increasing labour costs in the 'traditional' manufacturing hubs of Southern, Eastern and Northern China are forcing companies to move factories either in-land (where salaries are lower) or to other countries, such as Vietnam and Indonesia, to remain competitive.

Solution – MIC2025 stipulates that companies in target industries increase their use of automation equipment to reduce reliance on labour and boost productivity. The plan also recommends companies 'nurture talent' (upskill employees) and reduce staff turnover through the education of technical subjects.

Technology

Competition from high-tech countries – Chinese companies are increasingly competing directly with established brands from developed economies (e.g. Europe, USA) in high-tech industries including IT, and aeronautical and automotive design (e.g. Huawei, COMAC and BYD respectively). Chinese POEs have excelled in innovating profitable products for both the domestic and international markets while SOEs have lagged behind.

Solution – MIC2025 proposes all Chinese companies, especially SOEs, develop key technologies to improve productivity. Chinese R&D spending stood at USD 279Bn in 2017 (compared to approximately USD 500Bn in the US). To conduct this R&D, approximately 500k so-called sea-turtles (Chinese students who return to China after studying abroad) joined the estimated 2m science and engineering graduates entering the Chinese workforce in 2016 alone, bringing an unprecedented quantity of talent to domestic companies. In situations where domestic labour cannot develop new technologies quickly enough, companies are encouraged by the state to acquire IP and know-how from foreign companies.

Security

Dependence on imports of food, fuel, medicine and tech products is a national vulnerability – The CCP believes the Chinese economy is extremely vulnerable to foreign powers over imports of semiconductors, energy, medicine and foodstuffs and has placed enormous political emphasis on self-sufficiency in these area.

Solution – Made in China 2025 encourages companies to produce these products domestically when possible or source "secure and trusted" imports when impossible. Chinese companies have been instructed to add value domestically whenever possible.

Environmental concerns – Pollution and other environmental concerns cause significant damage to citizens' health and overall wellbeing. Pollution has caused social unrest due to poor crop-yields and clean-up costs incurred by farmers and food-safety scares in cities. Chinese manufacturers are directly responsible for a large portion of environmental damage due to their activities in extremely polluting industries near agricultural land.

Solution – MIC2025, in combination with other policies, incentivises companies to cut overcapacity and develop or adopt greener, less polluting technologies to reduce the amount of environmental impact caused. The government has recommended some companies source agricultural products from other countries with sustainable supply chains such as New Zealand.

Cultural

Innovation should be a national priority – The CCP believes that the absence of an 'innovation culture' within Chinese companies (particularly SOEs) is a direct cause of low productivity.

Solution – Recommend SOE executives work within companies to "create a virtuous cycle of innovation" and share information with the public to boost national pride.

6. What is the government's MIC2025 Action Plan?

In 2015, MIIT issued an implementation plan to follow the State Council's announcement of the MIC2025 plan. The implementation plan includes formal guidance for companies combining a mixture of financial incentives and penalties along with support from government-led associations and research collaborations:

1. Guidance documents have been created by each of the ministries directly involved in MIC2025 and compiled by MIIT. These documents are collectively referred to as "X+1" (where 1 refers to MIC2025 and X to each of the key industries). These documents outline the specific goals of companies in each sector.
2. Financial incentives have been created by the government to encourage companies to adopt MIC2025 practices. This includes the establishment of both private equity and state-owned investment funds to actively reward companies pursuing a MIC2025 agenda. These include the RMB 20Bn (USD 3.05Bn) Advanced Manufacturing Fund, the RMB 139Bn (USD 22Bn) National Integrated Circuit Industry Investment Fund and RMB 1.5Tn (USD 230Bn) of other government-backed venture funds. SOEs are also given preferential debt relief based on their adoption of MIC 2025.
3. Regulatory measures are being developed and introduced to ensure companies follow newly implemented national standards. These regulations are mostly related to environmental issues arising from large-scale construction projects, the automotive industry and other heavy industries.
4. Industrial alliances have been formed by central government bodies to promote interaction between domestic and foreign companies as well as develop new national standards for technologies. One such organisation is the Alliance of Industrial Internet of which all China's leading internet companies are members. This organisation is chaired by Miao Wei, the minister in charge of MIIT.
5. Central and provincial governments have established 40 national and 48 provincial innovation centres to promote collaboration and innovation between the state and companies nationwide.

7. What opportunities does MIC2025 present for the Chinese government?

The Chinese government aims to create a large number of world-beating Chinese companies in the industries outlined in the MIC2025 plan by 2025. Ideally, Chinese companies will add more value domestically and only import technologies when absolutely necessary, particularly in sensitive industries such as materials, energy and food. In theory, this self-reliance will improve national security and increase the CCP's international political leverage.

SOEs will control the vast majority of domestic business in all ten key industries, enabling the CCP to maximise its control of the domestic economy. This would potentially limit the expansion of private companies such as Alibaba and Tencent into industries traditionally managed by the state.

SOEs will not only be far more effective at creating sustainable economic growth through innovation, but a reduction in overcapacity will streamline global supply chains and improve productivity. The CCP hopes Chinese SOEs will become a role model for governments in other countries to emulate.

Chinese made products in all ten industries will, in theory, be better and cheaper than those made by foreign competitors. This should encourage foreign countries to become increasingly reliant on Chinese-made capital-goods in their supply chains. The CCP hopes this will raise China's global standing to become a global manufacturing superpower.

Finally, new regulations included in MIC2025 will significantly reduce the waste and pollution caused by the manufacturing sector in China.

8. What are the risks of MIC2025?

MIC2025 is an ambitious plan to bring the technologically-inferior Chinese industrial manufacturing sector up to the same standards as those in Western countries. The sheer scale of the challenge presents significant anti-competitive and social risks to government, industrial and foreign stakeholders.

Government & SOE Stakeholder Risks

Productivity gains at SOEs necessitated the laying-off of 1.8 million workers in the coal and steel sectors in 2016, costing USD 23Bn in redundancy packages. The government expects another 4 million jobs to be lost in other state-run sectors. These job losses have already caused social unrest, particularly in the industrial heartland of North East China.

The Chinese government is facing a strong backlash from foreign governments, including a trade war with the US over MIC2025. Other foreign governments are considering adopting anti-China protectionist policies at home, while foreign companies will feel competitive pressure from subsidised Chinese competitors. The Chinese government's desire to raise the domestic content of core components and materials to 40% by 2020 and 70% by 2025 may violate WTO rules potentially causing international disputes for years to come.

Anti-Competitive Risks: Li Keqiang's Ballpoint Pen

In 2016, Li Keqiang shamed executives from the Chinese pen industry for being unable to domestically produce the steel used in ballpoint pen nibs despite owning 80% of the global pen market. After two years of intensive R&D, state-owned Taiyuan Iron & Steel Company (TISCO) succeeding in developing a steel that could be used in place of the imported materials used before.

Whilst this has been hailed as a triumph of MIC2025, the investment required to produce this steel has effectively replaced the foreign oligopoly the government was trying to break up with another, albeit domestic, monopoly directly counter to the government's wishes of nurturing innovation.

POE Stakeholder Risks

Government-backed regulatory and financial incentives risk skewing market forces in favour of inefficient state-backed companies over more innovative POEs. POEs could potentially lose business to less competitive state-controlled players thereby undermining some of the rationale for MIC2025. MIC2025 also perpetuates the inability of POEs to overhaul state-run industries.

MIC2025 will encourage POE leaders to scale their businesses rapidly in order to compete with SOEs, win government support and establish long-term profitability. Additionally, multiple POEs will compete aggressively for market share in newly opened industries (e.g. the ride-sharing, bike-sharing, and food delivery wars). Both goals can be achieved through an investment-led growth model leading to operational inefficiencies and overcapacity – again undermining the rationale for Made in China 2025.

9. What is the international reaction to MIC2025?

The international community has received MIC2025 with a generally negative reaction. Merics, a think-tank based in Germany, has created a chart in its MIC2025 report to show which countries have most to lose resulting from a successful MIC2025 strategy. The chart compares the dependence of a country's GDP on manufacturing against the importance of high-tech industries to GDP. Countries highly dependent on high-tech industries in manufacturing (e.g. South Korea, Germany, Japan) are deemed to have high exposure to MIC2025 while countries with service-based economies (e.g. Luxembourg, Greece, New Zealand) have relatively low exposure.

United States

The US government is showing increasing animosity towards the MIC2025 plan. The US Chamber of Commerce has expressed dissatisfaction over aggressive MIC2025 related acquisitions of US companies and IP, and the White House has demanded the Chinese government abandon the plan altogether or face punitive tariffs worth USD 60Bn. The US government believes the state-led financing associated with MIC2025 will enable Chinese companies to unfairly compete and dominate in strategic industries, especially food, fuel, medicine and semiconductors (where US companies are presently global leaders). On the 6th July 2018, the US government initiated a 'trade war' by placing tariffs on USD 34Bn worth of Chinese goods.

Europe

European leaders have had a relatively muted reaction to MIC2025. Despite the German Chamber of Commerce's welcoming of the improvements to IP management in China recommended by the plan, there are fears that large Chinese companies will hollow out the German manufacturing industry through acquisitions.

Some European industry associations are concerned that MIC2025 will enable Chinese competitors to price-out their members from entering the Chinese market after the policy has been successfully implemented. However, others argue MIC2025 should be used as an opportunity for European governments to demand reciprocal trade and investment agreements with China.

Australia

Australian officials have expressed growing concern over Chinese 'technationalism' and the country's diplomatic activities in the South Pacific. In June 2018, the Solomon Islands reneged on a billion-dollar contract to engage China's Huawei to construct fibre optic internet cabling due to pressure from the Australian government.

Foreign Business Communities in China

Foreign businesses in China have publically expressed positive reactions to the MIC2025 plan. However, many chambers of commerce representing these companies have expressed the concerns of their members over IP acquisitions and market access resulting from the plan.

One point of view worth noting is that of Rolf J. Langhammer, Senior Policy Fellow at Merics:

"China's industrial policies aim to build national champions via acquiring technological knowledge abroad. This goal may be in line with the current worldwide wave of economic nationalism, but it is likely to collide with the strategic aims of increasingly globalized Chinese companies.

Unlike many companies from Western industrialized countries, Chinese foreign investors don't chase the benefits of cheap labour but try to tap the knowledge pool of host countries.

This is in line with the government's strategy of purchasing foreign technology to leapfrog stages of innovation back home in China. The goal is to create national champions who can take on the international competition in China and in other global markets.

But Chinese companies have further-reaching plans. They are willing to create new knowledge outside of China's borders if this knowledge benefits the company's innovation and global expansion.

The recent surge of outward Chinese FDI will strengthen the competitive position of Chinese firms that acquire state-of-the art knowledge in smart manufacturing. But this knowledge will be applied not only in China, but wherever these firms run their business. "

10. How will MIC2025 impact New Zealand?

In the short to medium term (2018 – 2025), MIC2025's most significant impact in New Zealand will likely be a prolonged increase in demand for sustainably produced primary industry commodities due to the country's comparative advantage in these industries, its geographical position and favourable trade relationship with China.

In the long-term (after 2025), export growth in these areas to China may begin to slow as the country develops its own sustainable and green agricultural industry. Additionally, it is likely that Chinese brands in the MIC2025 industries will become adept at marketing and exporting domestically designed and manufactured products globally. New Zealand should expect to see an increase in capital-goods imports from China caused by increased competition from Chinese brands against New Zealand's traditional trading partners.

Below is a break-down of the expected impact from MIC2025 on New Zealand's largest exports and imports with China:

Agricultural Commodities (Dairy & Timber)

Demand for dairy in China is expected to double by 2025, while the growth of domestic dairy production has recently slowed to approximately 1% per year due to environmental and land-use restrictions according to Keith Woodford, Honorary Professor of Agri-Food Systems at Lincoln University. New Zealand is well placed to capitalise on China's decision to limit its environmentally unsustainable agricultural methods.

The Chinese State Forestry and Grassland Administration (SFA) banned commercial logging within China in 2016 until 2025. Timber exports are therefore expected to increase as MIC2025 encourages a smarter and greener woodwork industry, thereby presenting increased opportunities for New Zealand's timber producers.

Added-Value Agricultural Products

MIC2025 presents additional material for discussion in New Zealand's added-value debate. MIC2025 stipulates that the China's agricultural producers must improve their 'green credentials' and build cleaner supply chains. SOEs operating in this space will likely require the know-how of New Zealand (or other foreign) dairy companies in the mass production of added-value dairy products such as butter and cheese in order to comply with MIC2025.

Chinese owned New Zealand companies such as Synlait illustrate one way New Zealand can benefit from China's economic rise – allowing Chinese companies operating in New Zealand to tailor products to the Chinese market.

Other Industries

Chinese companies are increasingly acquiring foreign manufacturers to gain access to IP and know-how critical to improving productivity (but financially unviable to replicate domestically). In New Zealand however, most FDI from China has been in primary industries (45%) and land development (21%), with some notable exceptions such as Fisher & Paykel, Hoyts and Waste Management.

Conversely, Zespri has begun research collaborations with Chinese counterparts to develop new fruit products for the Chinese market. Having production in China whilst retaining the New Zealand brand name will enable Zespri to capitalise on opportunities arising from MIC2025.

New Zealand companies active in the nutraceutical and pharmaceutical industries such as The Honey Lab can expect to see significant interest from Chinese companies in line with the MIC2025 plan and growing demand for new medicines.

Imports

New Zealand's largest imports from China are textiles and machinery. If MIC2025 successfully enables Chinese SOEs to innovate new technologies and products, New Zealand should expect to see increasing competition in lower-cost capital goods imports from Chinese brands. This added competition could however potentially incur disapproval from New Zealand's traditional trading partners.

Increased imports of products in strategic industries from China may enable the Chinese government to exercise greater political leverage over New Zealand's economy by connecting political demands to technology-access.

Standards Development

Chinese companies will increasingly adopt and potentially influence global standards in industries affected by MIC2025. New Zealand companies should conduct thorough investigations into standards compliance when looking to export to China.

11. Conclusion

MIC2025 is an integral part of China's future economic development until 2025 and beyond. Financial incentives and regulatory penalties will encourage companies (especially those which are state-owned) to improve productivity and innovate products considered strategically important to the country's economic and environmental wellbeing.

MIC2025 has created animosity with New Zealand's main trading partners as the financial and regulatory measures adopted by the Chinese government have been deemed anti-competitive by both the US and EU.

If this initiative is successful, the Chinese government will have created a new platform for China Inc. to innovate, compete and expand on a global level.

In the short-term, New Zealand stands to increase its exports from industries with a comparative advantage over China (in terms of productivity and sustainability) including dairy, timber and added-value agricultural products. Chinese companies will also likely begin competing in New Zealand in markets hitherto dominated by New Zealand's traditional trading partners (e.g. IT, agricultural equipment, and automobiles). This could potentially create political friction with New Zealand's partners including the US, EU and Australia.

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About the Author

Paul Dupont is a consultant on Chinese business & industry to the centre. He can be contacted at paul.dupont@vuw.ac.nz or paulhenridupont@gmail.com.

VICTORIA
UNIVERSITY OF WELLINGTON
TE WHARE WĀNANGA
O TE ŪPOKO O TE IKA A MĀUI

New Zealand Contemporary China Research Centre

Victoria University of Wellington
18 Kelburn Parade
PO Box 600
Wellington, 6140
NEW ZEALAND

+64-4-463 9549
chinacentre@vuw.ac.nz
www.victoria.ac.nz/chinaresearchcentre