



AN OVERVIEW OF CHINESE POLICY, ACTIVITY AND STRATEGIC INTERESTS RELATING TO DEEP SEA MINING IN THE PACIFIC REGION

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**DEEP SEA
MINING
CAMPAIGN**

SUPPORTED BY MININGWATCH CANADA | A PROJECT OF THE OCEAN FOUNDATION

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DEEP SEA MINING CAMPAIGN

The Deep Sea Mining Campaign (DSMC) is an association of NGOs and citizens from the Pacific Islands, Australia, Canada, and USA concerned about the likely impacts of DSM on marine and coastal ecosystems and communities.

The DSM campaign is a Project of The Ocean Foundation, supported by Mining Watch Canada, a Partner of Mission Blue/Sylvia Earle Alliance and a Member of the Deep Sea Conservation Coalition.

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ACRONYMS

AIB Asia Infrastructure Investment Bank

ASPI Australian Strategic Policy Group

AUV Underwater autonomous vehicle

CCAMLR Commission for the Conservation of Antarctic Marine Living Resources

CCFZ Clarion Clipperton Fracture Zone

CCP China Communist Party

COMRA China Ocean Mineral Resources R& D Association

EITI Extractive Industries Transparency Initiative

FDI Foreign Direct Investment

IMF International Monetary Fund

ISA International Seabed Authority

LNG Liquefied natural gas

OBOR One Belt One Road

MCC China Metallurgical Corporation

PICs Pacific Island Countries

PNG Papua New Guinea

PRC People's Republic of China

PSV Production Support Vessel

REE Rare earth element

SOE State owned enterprise

SOI State owned industry

SPT Seafloor Production Tool

WTO World Trade Organisation

INTRODUCTION: CHINA AND DEEP SEA MINING

China is one of the most important countries with respect to the emerging seabed mining industry. There are several reasons for this assessment: it is investing heavily in the development of its seabed mining industry and associated technology, it is actively exercising its political power in the relevant international fora and importantly it plays a huge part in the current global market for minerals as both a producer and consumer.

China's seabed mining interests are far-ranging encompassing both activities in 'The Area' and on countries' continental shelves. In May 2017, the International Seabed Authority (ISA) and China Minmetals Corporation signed a 15-year exploration contract for polymetallic nodules in the Clarion Clipperton Fracture Zone (CCFZ)¹. China also sponsors China Ocean Mineral Resources R& D Association (COMRA) in contracts for exploration for polymetallic sulphides in the Southwest Indian Ridge and for exploration for cobalt-rich ferromanganese crusts in the West Pacific Ocean. Additionally, China has also been sponsoring COMRA with the ISA for the exploration for polymetallic nodules in the Clarion Clipperton Zone since 2001. A five-year extension for this license was signed recently between the ISA's Secretary-General Lodge and COMRA Secretary-General Liu Feng. China is the only country in the world that has been granted exploration licenses by the ISA for all three types of deep sea mineral deposits.

China also has interests in deep sea mining in the South Pacific and the exploitation of minerals located on the continental shelves of some Pacific Island Countries (see section below).

China has great ambitions with regard to seabed mining and a good summary of these can be found in an article that appeared in the South China Post that was published in October 2016.²

In the article, Tao Chunhui, one of China's leading oceanographers and senior scientist at the State Oceanic Administration outlines the

exploratory work being undertaken and how China is developing much new technology. He is also reported as having made reference to how commodity prices will be one of the factors that determines whether China will go ahead with seabed mining.

Specifically, seabed mining fits into the broader strategy set out by the Ministry of Land and Resources in September 2016, whereby China would seek to boost its "deep underground, deep sea and deep sky" capabilities in the next five years.

In terms of deep sea technology, China has gone beyond importing and copying foreign technology and is making ever more sophisticated and more capable pieces of undersea technology including autonomous underwater vehicles (AUVs) and manned submersibles.

In October 1999, a milestone conference was convened that laid the ground for China's future deep seabed activities. The specific outcomes of the conference were as follows:³

- (a) to formulate a national strategy for the Area;
- (b) to adhere to the policy of being actively involved in activities in the Area and to strengthen China's status in Area affairs and in the international arena;
- (c) to adopt the policy of "continuously carrying out deep sea surveys, greatly developing deep sea technology, and establishing in due time a deep-sea industry";
- (d) to single out three stages of development for the first half of the twenty-first century: resource prospecting and mining site application, studying and developing the deep-sea technology, and establishing a deep-sea industry.

Since then, China has become increasingly dominant both regionally and globally with respect to the exploration and exploitation of

deep sea minerals. China is viewed as a rival by both India and Japan and this has already had an impact on the political dynamics between these nations. While all three are actively building their capacity to exploit deep sea mineral resource, there are political tensions between them as exemplified by many articles published in the Indian media on the possible strategic motives behind China's interest in exploring and

exploiting resources located in the Indian Ocean.

China's approach to deep sea mining is not the result of a single strategy but is driven and shaped by a number of different strategies and policies and so to understand China's approach it is necessary to look at the broader context in which its DSM activities take place.

2

THE BIG PICTURE – RESOURCE HUNGRY CHINA

The continuing economic rise of China is such that it can be considered the dominant actor in the global economy - its need for energy and raw materials impacting not only developing countries but also the west. Some of the factors that have led to the creation of 'China's economic empire' are identified in a 2013 opinion piece in the New York Times.⁴ Essentially China practices an aggressive state capitalism, backed by huge financial resources much derived from the deposits of billions of Chinese savers, that has enabled it to buy companies, exploit natural resources, build infrastructure and give loans all over the world. China has also become the world's leading exporter and is the biggest trading partner with countries such as Australia, Brazil and Chile. The financial crash has also been a boon to China, facilitating Chinese investment in western economies. Chinese state-owned firms often have a major advantage over their non-Chinese competitors due to the government support they receive through hidden subsidies and cheap financing.

China's access to and acquisition of a sizeable proportion of the world's natural resources is required to keep two of its economic engines – urbanisation and the export sector – adequately fuelled. Although there have been economic warning signs in recent years, overall economic

growth rates have remained high enough to maintain the acquiescence of the Chinese people - the generally accepted belief being that the legitimacy of the Chinese Communist Party (CCP) stems from its ability to continue to deliver high economic growth.^{5,6}

The sheer scale of China's quest for resources and economic power coupled with a perception that China is becoming more assertive in its foreign policy has led to many actors and commentators expressing concern and a degree of fear mongering. Understandably, there are many differing analyses but many credible sources take a less alarmist view. For example, an analysis undertaken for Rabobank on the driving forces behind China's foreign policy which asks the question has China become more assertive comes to the conclusion that ultimately the overarching driving factor behind Chinese foreign policy, and the common denominator to most of China's global activities, is China's own domestic economic development.⁷ Nor, according to this analysis, does China view itself as a superpower or a hegemon.

In their book *By All Means Necessary: How China's Resource Quest is Changing the World*, leading experts, Elisabeth C Economy and Michael Levi surmise China is not trying to secure all the resources it needs by buying up ore

deposits and oil fields - actions that could lead to a stranglehold on vital material - but is actually procuring natural resources mainly through trade.⁸ Furthermore, the authors conclude that “the impact of China’s resource quest on international politics and security has been modest thus far.”⁹ However, given the rapid developments taking place, such as OBOR and the establishment, this analysis may not hold.

The trade for raw materials has led to increased prices for some commodities and more competitive markets. The unprecedented growth in demand for raw materials and metal ores that

came from rapid urbanisation in China in the early 2000s, led to a massive boom followed by a bust when the Chinese economy slowed down.^A This has been dubbed a commodities super-cycle, with global prices mirroring demand in China.¹⁰ While some economists have suggested that the market has adapted to Chinese demand and further price shocks are unlikely, the Financial Times recently reported that the mining index is down more than 13% since touching a two-and-a-half year high in February 2017 due to fears that growth will slow in China.¹¹

3

ENVIRONMENTAL IMPACTS ASSOCIATED WITH CHINESE RESOURCE EXTRACTION

While Economy and Levi’s analysis will allay some fears about the behaviour of the world’s most resource hungry nation, there remain grave concerns about the negative environmental and human rights impacts of China’s relentless drive to access natural resources.

William Laurance, an ecologist who has worked in the Amazon, Africa and the Asia- Pacific region on a number of issues for 35 years says in a 2017 article that he’s ‘never seen a nation have such an overwhelming impact on the earth as China does now’.¹² He points out that China is involved in many different kinds of resource extraction across the globe – mining, logging, building large-scale hydropower dams, - that are devastating biodiversity. Often it is the associated infrastructure such as the building of roads and railways that is causing the greatest damage. Laurance also notes that the scale of Chinese operations is staggering and the rate of change rapid, the result of a highly competitive business culture, a virtual immunity to outside criticism and a single-minded determination.

Chinese foreign investors and companies often predominate in poorer nations with weak environmental regulations and controls, and unlike many western companies are less constrained by laws that determine how they can operate in foreign countries. Chinese companies, just as the colonial powers of the past and some western multinationals today, look after their own self-interest at the expense of the environment and local populations of the countries in which they operate. The Chinese Government allows these companies to continue their damaging practices and create ‘pollution havens’ because the primary concern is their profitability.

David Shinn, a former U.S. ambassador to two African countries - Ethiopia (1996-99) and Burkina Faso (1987-90), has produced a comprehensive analysis of Chinese and African environmental laws and the impact of Chinese foreign direct investment by both state-owned and private companies on Africa.¹³ African countries, he observes, often place environmental protection very low on their agenda and lack capacity to

A. Between 1998 and 2007 China’s GDP grew at an average rate of 9.9 %.

enforce what regulations there are. Many African countries are poor at countering corruption and, as Laurance notes in the previously cited article, Europeans in Africa frequently complain about the lavish bribes paid by Chinese companies to senior African officials.¹⁴ Shinn also notes how difficult it is to enforce environmental guidelines on Chinese companies operating in Africa. This is partly due to government control of the press in China and many African countries and there being few environmental NGOs with those that do exist usually having little political influence and sometimes being subject to intimidation. African officials are reluctant to call out Chinese companies that engage in unacceptable environmental practices lest they jeopardize Chinese investment or good relations with the government of China. Improvement in environmental protection therefore has to come from China, Shinn argues. While China has taken some steps forward in the last decade or so, for example the guidelines adopted by China's Export-Import bank that state that projects that are harmful to the environment or do not obtain environmental approval will not be funded, these are only voluntary. Until such provisions become mandatory they will not be effective. These lessons from Africa are pertinent to the Pacific Island Countries.

China invests in resource development irrespective of the host country's internal politics. In its efforts to access and secure resources, China has adopted the "policy of non-interference" which stems from the "Five Principles of Peaceful Coexistence" adopted in the mid-1950s. This approach explains China's investment in countries that are considered pariahs by The US and other western countries. These include, for example, countries such as Venezuela (especially under the late President Hugo Rafael Chávez); South Sudan; Angola; Myanmar (Burma) and Iran.¹⁵ In the Pacific China has built close relations with Fiji (see section on diplomatic relations between China and the Pacific Island Countries (PICs) below). Chinese investments are seen as economic projects that should not mix with the politics of the county. In many developing countries where Chinese companies are involved in extractive activities there are concerns regarding the poor treatment of workers and violations of human rights. These can be attributed in part to the fact that Chinese companies are simply abiding by the rules and regulations of the host country which are often very weak and in part from Chinese companies' inherent lack of corporate social responsibility; often these companies are operating by similar normative standards to those in their home country.¹⁶

4

POLICIES THAT ARE DRIVING CHINESE FOREIGN DEVELOPMENT INVESTMENT

Some of the drivers for China's huge appetite for raw materials are explained above; additionally, it is important to understand some of the key policies that have helped China sate this appetite.

THE GO OUT POLICY

The *Go Out Policy*, or the *Going Global Strategy* as it is sometimes referred to, was an effort initiated

in 1999 by the Chinese government to promote Chinese investments abroad in order to secure further export markets, equip Chinese companies and investors with experience, expertise and technology which were comparable with Western standards, bring better returns to elite Chinese investors and help protect its economy from sudden financial shocks such as that of the 1997



Asian financial crisis.^{17,18} Since then China has become a significant source of global foreign direct investment (FDI) outflows. According to the U.N. China's FDI increased from US \$ 2.7 billion in 2002 to US \$ 84.2 billion in 2012. China is now one of the world's leading sources of FDI, its outflows in 2015 ranking second globally only to the US. In fact, China's outward FDI now exceeds its inbound FDI, making the country one of the world's net capital exporters.¹⁹

ONE BELT ONE ROAD – THE 21ST CENTURY MARITIME SILK ROAD

Chinese outward investment was given a major boost in 2013 when Chinese President Xi Jinping articulated during a visit to Kazakhstan his own vision for a 'New Silk Road' that would streamline foreign trade, ensure stable energy supplies, promote Asian infrastructure development, and consolidate Beijing's regional influence.²⁰ Since then the New Silk road concept has snowballed into something even bigger and acquired a less poetic name: 'One Belt, One Road' (OBOR). Somewhat oddly, the belt refers to the land trade route linking central Asia, Russia and Europe while the road is a reference to a maritime route via the western Pacific and Indian Ocean, also

sometimes referred to as a '21st Century Maritime Silk Road'. The OBOR initiative is ambitious and provides a means of both bolstering the Chinese economy and, like the original silk road, a way for it to exercise *soft* power over a huge area.

In June 2017 China's National Development and Reform Commission and the State Oceanic Administration released a document titled Vision for Maritime Cooperation under the Belt and Road Initiative.²¹ This expounds the latest thinking from the Chinese Government. The key idea is to designate three "blue economic passages" - the China-Indian Ocean-Africa-Mediterranean Sea Blue Economic Passage; the China-Oceania-South Pacific Blue Economic Passage; and one that will lead to Europe via the Arctic Ocean. According to the document, the China-Oceania-South Pacific Blue Economic Passage would head south from the South China Sea into the Pacific Ocean.

The document is an attempt to put some meat on the bones by the Chinese Government but it is still largely aspirational. Some commentators on the original OBOR had pointed out that it typified the on-the-hoof way macroeconomic policy is often made in Beijing and how once a statement comes from the top, the bureaucracy has then to make something of it.²²

In the Vision for Maritime Cooperation under the Belt and Road Initiative, there is much emphasis of the importance of the blue economy to sustainable development and also the importance of international cooperation and governance. The 21st Century Maritime Silk Road is placed in the context of the United Nations 2030 Agenda for Sustainable Development and the Vision makes mention of both blue carbon and multi-stakeholder involvement including with NGOs. In terms of collaborative governance, the document refers to the China-Small Island States Ocean-related Ministerial Round Table Meeting, the next one of which will be held in Pingtan, Fujian province on 21st-22nd of September 2017.²³

Another forum where the relationship between OBOR and the Pacific has been discussed is the conference titled “Building the 21st Century Maritime Silk Road: Sustainable Development of the South Pacific and China” hosted by the Institute of Ocean Research, Peking University in January 2016.²⁴ The short on-line report of the meeting does not mention either deep sea mining or shipping, but refers to fishing, tourism and agriculture. Attending the conference were various Chinese government officials and others including David Emmett from Conservation International, Singapore.

Various analyses of the possible impacts of OBOR on the Pacific are beginning to appear. Terrence Wesley-Smith of the Center for Pacific Islands Studies believes that at least to begin with, the impacts of OBOR on the Pacific will mainly be commercial and in many ways an extension of the going-out policy.²⁵ Kate Hannan and Stewart Firth also see OBOR as a refurbishing of the going out policy which will result in the continuation and intensification of existing trends in the Pacific Islands.²⁶ This will lead to increased Chinese investment in resource projects, more Pacific exports of bauxite, nickel and other minerals and metals and more Chinese companies building roads and ports. Some of these minerals they point out may be derived from seabed mining.

With OBOR comes the possibility of increased Chinese financing, mainly through the Asian Infrastructure Investment Bank (AIIB).²⁷ China has adopted international norms in its design of the AIIB and it is likely that other Chinese banks including China’s Exim Bank and the China Development Bank will soon adopt a similar regulatory approach. This means that there will be more money that Pacific Islands can access but less flexibility in negotiating terms. However, this extra finance would be less tied to Beijing’s political, strategic, and economic policies.

BLUE ECONOMY

China has historically not been a positive force for conservation in important international fora - for example it, along with Russia held out the longest against the creation of the Ross Sea MPA in the Commission for the Conservation of Antarctic marine Living Resources (CCAMLR). However, it may be turning a corner if the words of Lin Shanqing, deputy administrator of China’s State Oceanic Administration (SOA), are to be believed.

“We are now shifting from paying equal attention to both marine development and protection to prioritizing marine ecosystem protection. Projects that endanger marine ecosystem would not be given the green light,” Lin is reported to have said at the June 2017 UN meeting to discuss Sustainable Development Goal (SDG) 14.²⁸

China has registered five voluntary commitments to SDG 14: strengthen the protection of the marine ecological environment, enhance the international marine cooperation in Asia Pacific region, improve the ability of marine observation and early-warning and disaster prevention and mitigation capacities, strengthen scientific and technical innovation and international cooperation, and develop a sustainable ocean economy.

While such words and aspirations are to be welcomed, it would be unwise to take these words

at face value as there is often a disjunct between rhetoric and action. For example, at the same time as China has implemented measures such as seasonal moratoriums to lessen the impacts of overfishing in its national waters, it has greatly subsidised the building of vessels in its distant water fishing fleet which have taken advantage of poor regulation and lack of enforcement capabilities in waters off West Africa and elsewhere leading to the devastation of fish stocks and so adversely affecting local peoples as well as the marine ecosystem.²⁹

CHINESE CONSUMPTION AND PRODUCTION OF KEY METALS

The Chinese economy is the second largest in the world and according to the latest International Monetary Fund (IMF) forecast is expected to grow at 6.5% in 2017, keeping it in line with national targets ahead of the twice a decade reshuffle of the Communist Party top officials.³⁰ This high rate of growth is attributed to various policy stimuli including providing a deluge of cheap credit from the state run banks.³¹ Chinese manufacturing and construction industries have been demanding raw materials, including copper and other metals, and therefore China has been a large influence on the prices of these commodities for some years.³² According to the IMF, China is the world's main importer of metals, growing from less than 10 per cent of global share in 2002 to 46 per cent in 2014.³³

China's economic policy and expected growth is expected to continue to shape the supply-demand for key metals and according to the International Copper Study Group is likely to drive copper production and demand growth in 2017.³⁴

China is equally important globally with respect to rare earth elements (REEs). Of particular concern to many countries has been the restriction of exported REEs by China. China has one-third of the world's reserves but accounts for more than 80% of current production, having squeezed out other suppliers with low prices in the 1990s.³⁵

China restricted exports to induce foreign technology firms to place operations inside China. During January to June 2011, for example, the quota was cut by 35%.³⁶ The situation prompted the United States, the European Union and Japan to each file complaints about China to the World Trade Organisation (WTO) in March 2012. In May 2015, China revoked its export duties and quotas relating to rare earths, tungsten and molybdenum.³⁷ Most recently, the Chinese government has been improving environmental regulation at rare-earth metal plants, as well as reducing illegal mining and smuggling of the key industrial materials, thereby also shoring up rare-earth market conditions.^{38,39}

China not only dominates the production of REEs but is also the world's largest consumer and domestic demand is set to soar as Beijing focuses on curbing pollution and implements its plan to develop the nation's energy sector during the five-year 2016 to 2020 period.^{40,41} China's National Energy Administration's blueprint document says that the 2.5 trillion yuan (~US\$ 372 billion) being ploughed into renewable power generation by 2020 will create an additional 3million jobs in the sector and be used to fund a mixture of wind, hydro, solar projects as well as nuclear power projects. REEs are crucial to the renewables sector because they are used in permanent magnets in direct drive wind turbines (i.e. those without a gearbox). Permanent magnets primarily use neodymium doped with around 0-10% dysprosium: this improves the magnet's stability at higher temperatures which may reach up to 120 °C.⁴² Similarly, neodymium and dysprosium are also used in the permanent magnets of electric vehicles. Solar photovoltaics also utilise REEs. Leading thin-film products primarily use rare elements such as gallium arsenide, tellurium and indium to create their semiconductor layers at very small scales (1-8 µm).

The geopolitical landscape of the South Pacific is changing and becoming increasingly complex as new powers including China, Russia, Indonesia, Japan and India become more active in the region. Traditionally the most important external powers in the region have been Australia, New Zealand, the US and France, which have long worked together as partners. With the arrival of these new influencers, there are increased opportunities for the South Pacific states, having more choice as to which external power or powers they engage with. According to a recent analysis by The Australian Strategic Policy Institute (ASPI), some South Pacific states appear to be taking advantage of these competing powers in order to access aid, concessional loans, military support and international influence.⁴³

DIPLOMATIC RELATIONS BETWEEN CHINA AND THE PICS

One of the most important developments over the last decade or so in Pacific Island affairs is China's emergence as an increasingly consequential power as exemplified by both increased diplomatic relations and expanding economic links. In November 2014, Chinese President Xi Jinping paid a state visit to Fiji, where he held a summit meeting with leaders of the eight Pacific Island countries that have diplomatic ties with China. During that meeting, Xi and his Pacific counterparts announced their decision to elevate their relationship to the level of a 'strategic partnership'.⁴⁴ The Chinese President also said that their friendly cooperation had entered a fast-track of development and, with reference to the 21st Century Maritime Silk Road, called upon the Pacific Island Countries to take a ride on the Chinese "express train" of development.

FIJI

There have been many other high-level meetings between high ranking Chinese officials and Pacific Island leaders in recent years. The strong connection between the PRC and Fiji is of special significance in part because Fiji is perceived as a fulcrum for influence among the other Pacific Island Countries.⁴⁵ In 2006, after the military coup, Beijing continued to actively engage with the interim government, led by the coup leader Commodore Frank Bainimarama, and in May 2013, the Fijian Prime Minister visited China and met President Xi Jinping and Premier Li Keqiang who promised to engage in further economic, military and diplomatic cooperation.⁴⁶ More recently, Bainimarama announced at the 71st United Nations General Assembly in 2016 that Fiji is in the process of re-evaluating its relationships with the rest of the world, stressing that Fiji will be associating closely with countries that share Fiji's values and basic outlook i.e. those that respect human life and the rights and dignity of their citizens, adhere to the principle of social justice, uphold the rule of law and insist on equality and respect for all human beings.⁴⁷ He also said that this does not indicate a sudden change of direction and will not produce a dramatic change in the international company that Fiji keeps.

PAPUA NEW GUINEA

There are multiple connections between China and PNG and the relationship between the two countries has been evolving in recent years. Historically PNG's strongest relationship has been with Australia but as PNG's economy has grown so it has become increasingly confident and more outward looking.⁴⁸ PNG maintains a non-aligned foreign policy of 'friends to all and enemies to

none' and while it retains a special relationship with Australia both as a trading partner and in matters of national security, PNG's policy towards China is to grow the developing bilateral and regional relationship, in accordance with national interests.

China's interests in PNG are largely commercial, with investment in the mining, construction and retail sectors, with China importing significant quantities of timber, nickel and natural gas. China gives PNG an increasing amount of aid but has limited defence ties with PNG and there are no declared Chinese defence staff based in Port Moresby. There have been Chinese people living in the country since the end of 19th/beginning of the 20th century. Descendants of these early immigrants are the 'Old Chinese' who have become integrated in PNG society (frequently marrying Papua New Guineans) and are especially important in the retail sector and in politics - Sir Julius Chan and his family for example. A further influx of 'Malaysian Chinese arrived in the 1970s and 1980s, and these people are to be found in the retail, mining and construction businesses. Ribinaun Hijau, one of the biggest logging companies in PNG, was founded by Malaysian (ethnic Chinese) businessman Tiong Hiew King.⁴⁹ Lastly there are the so-called New Chinese', who have arrived in the past two decades and can be roughly divided into three categories: those with commercial interests in the mining and construction sectors (largely State Owned Enterprises); and tuna fisheries and employees in those sectors. Migrants (mostly from Fujian province), many of whom stay illegally, often starting 'tuck shops' and other small businesses.

China has some significant commercial interests in PNG:

- China Metallurgical Corporation (MCC) is the majority owner of the Ramu nickel-cobalt mine near Madang and the associated Basamuk processing plant situated on the coast and connected to the mine by a slurry pipe. MCC had extreme difficulties in obtaining permission to mine due to

environmental concerns, including 18 months of litigation to settle with a large number of communities, riots about levels of employment of PNG nationals and being shut down for a period due to allegations of unsafe work practices.⁵⁰ The mine was expected to deliver 31,000 tonnes of nickel and 3,200 tonnes of cobalt per annum for 40 years but according to an April 2017 news report the operation is facing a huge deficit due to declining commodity prices and a shutdown due to a fatality in 2016.⁵¹

- In May 2015, Barrick Gold Corporation (owner of 95 percent of PNG's Porgera Gold Mine) sold a 50 percent stake in its PNG operation to the Zijin Mining Group. Zijin was a small and obscure state-owned enterprise (SOE) in the 1990s that has grown enormously in the intervening years and is now listed on both the Hong Kong and Shanghai stock exchanges and now ranks the 1,200th on the 2017 Forbes Global 2000 list and 3rd among the world's public gold miners.⁵²
- The same year, 2015, saw Guangdong Rising Asset Management, a provincial state-owned enterprise become the most significant investor in the Frieda River copper project at the head of the Sepik River after its hostile takeover of Australia's second-largest copper miner, PanAust which had an 80% share in the mine.
- China also has a standing agreement to purchase 2 million tonnes of liquified natural gas (LNG) per year from ExxonMobil's PNG LNG project, which started production in May 2014. China Petroleum and Chemical Corporation (Sinopec) is one of four regional customers.⁵³
- In March 2012 the Chinese Harbour Engineering Company (CHEC) won the bid for the development of Lae Port. CHEC completed the first phase in December 2014 on time and it is not only PNG biggest

port but has the largest throughput in the South Pacific region. However, the project was inspected by an Australian company (AECOM) in 2015 and found to have significant defects requiring remediation bringing future phases of the project under question. As a result, Kumul Consolidated Holdings (formed by the PNG government to act as the trustee owner and all-encompassing authority for the State-owned assets and enterprises) have admitted that there are defects and announced that they and CHEC would carry out the necessary remediation works.⁵⁴

- Tuna Fisheries as per two-way trade figures

A level of anti-Chinese sentiment exists in PNG, as it does in the Solomon Islands, where this boiled into rioting and looting of Chinese businesses in 2009. In August 2014 five Chinese were injured and machinery damaged in an incident at the Ramu nickel-cobalt mine when locals rose up in protest in partly because of the company's hiring practices and an over-representation of Chinese in its workforce.⁵⁵

Despite this, the relationship between China and PNG appears to be deepening following a visit of Papua New Guinea's prime minister, Peter O'Neill, to China in July 2016.⁵⁶ While there, he signed agreements for direct flights and encouraged further Chinese investment. Coinciding with his visit, PNG Prime Minister, Peter O'Neill announced that his country supported China's claim to most of the disputed South China Sea, a turnaround from what had previously been articulated by his foreign minister, Rimbink Pato.

CHINESE INVOLVEMENT IN REGIONAL FORA

As well as developing its bilateral relationships with Pacific Island countries, Beijing has also actively engaged with a number of regional multilateral institutions. China has been a

dialogue partner of the Pacific Islands Forum (PIF) since 1989, and has shown increasing interest in recent years. In 2000, China also set up the China-PIF Cooperation Fund to support trade, investment, tourism and personal exchange between China and Forum countries. Furthermore, China sponsored establishment of the Pacific Trade and Invest (PTI China) office in Beijing in 2002. This support continues and in 2017, the China - Pacific Islands Forum Cooperation Fund handed over USD\$1.05 million to the PIF.⁵⁷

The PIF is not the only regional group that Beijing has developed a close relationship with. Beijing has relationships with other sub-regional groups, such as the Melanesian Spearhead Group (MSG) whose membership comprises of PNG, Fiji, the Solomon Islands, Vanuatu and FLNKS (the Kanak and Socialist National Liberation, or in French, Front de Libération Nationale Kanak et Socialiste). Indonesia was admitted as an associated member in 2015.⁵⁸ China funded the building of the MSG headquarters in Vanuatu which it handed over in 2007. An important pillar of the MSG is the MSG Trade Agreement and the MSG is seen as a manifestation of growing Melanesian assertiveness.⁵⁹

China also created its own multilateral platform to engage with the region, the China-Pacific Island Countries Economic Development and Cooperation Forum (CPICEDCT), comprised of China and its eight diplomatic partners in the region. In the Forum's first meeting, held in Fiji in April 2006, Chinese Premier Wen Jiabao pledged a total of RMB300 million (~US\$ 46 million) aid over the next three years to the region as well as a number of economic incentives including tariff reductions and debt waiver initiatives. In November 2013, the Forum's second meeting was held in the Chinese city of Guangzhou, during which Chinese Vice-Premier Wang Yang announced an aid package of US\$1 billion to the eight Pacific Island countries and promised to set up a \$1 billion fund to support infrastructure development in the region. At the Forum,

the Pacific officials reaffirmed their adherence to the One-China policy and jointly signed a bilateral economic and technological cooperation agreement.⁶⁰

CHINA – AN INCREASINGLY IMPORTANT PLAYER IN THE PACIFIC DUE TO TRADE AND AID

An overview of the extent of China’s influence in the region appeared on the ABC News site in September 2016.⁶¹ The article highlighted both China’s extraordinary two-way trade figures with the Pacific Islands and the scale of China’s foreign aid in the region.

CHINESE TRADE IN THE PACIFIC

The two-way trade figures almost doubled in a single year from US\$ 4.5 billion in 2014 to US\$ 7.5 billion in 2015. The most growth had been in Chinese exports to the region but the figures also showed the value of various natural resources exported from the Pacific to China including fish, liquid natural gas from PNG and logs from PNG and the Solomon Islands.⁶² Commenting on the figures, David Morris, Pacific Trade Commissioner, expressed concerns regarding the fundamental environmental sustainability of this trade but said that he believed that a ‘tipping point’ was being reached whereby Chinese decision makers were beginning to take these issues on board.

Research by Philippa Brant of the Lowy Institute investigating Chinese-led resource development

projects in Fiji and Papua New Guinea found that it is common for Chinese companies to negotiate access with local actors before “bringing the state with them” to provide grants, and interest-free or concessionary loans and so move their projects forward. Chinese corporations are taking the lead in developing China’s commercial ventures in the Pacific region.

CHINESE AID IN THE PACIFIC

The extent of China’s foreign aid to the Pacific has been mapped by the Lowy Institute for International Policy which has made the data available in the form of an [on-line platform](#).⁶³ As China provides little about its aid programme and most Pacific Island governments do not publicly report the full amount of aid they receive, accurate data are hard to come by. The Lowy Institute project is the first time that these data have been systematically collected, verified, analysed and mapped.⁶⁴

Since 2006, when China stepped up its aid with the 1st China-Pacific Island Countries Economic Development and Cooperation Forum and the introduction of concessional loans, it has given US\$ 1718.2 million to the eight Pacific Island countries it has diplomatic relations with, namely the Cook Islands, Federated States of Micronesia (FSM), Fiji, Niue, Papua New Guinea (PNG), Samoa, Tonga, and Vanuatu, as well as Timor-Leste. The figures show that China has overtaken Australia as the biggest source of aid to Fiji, and may soon outstrip Australia’s contributions to

CHINESE TRADE IN THE PACIFIC	
2005	PNG’s Ramu Nickel Mine: Majority owned by China Metallurgical Corporation (MCC)
2011	PNG’s Pacific Marine Industrial Zone: Nearly 80 per cent owned by China’s Eximbank, Beijing’s concessional loan arm
2012	Fiji’s Bua Bauxite Mine: Owned by China’s Xinfu Aurum Exploration
2015	PNG’s Porgera Gold Mine: China’s Zerjin mining group owns a 50 per cent stake
2015	PNG’s Frieda River gold and copper prospect: An 80:20 joint venture between China’s PanAust and ASX-listed junior Highlands Pacific

Samoa and Tonga as well. China is now a bigger aid donor in the region than both New Zealand and Japan and is on the verge of overtaking the United States.⁶⁵

Chinese bilateral foreign aid is provided in three main forms: grants and interest-free loans administered through state finances (Ministry of Commerce), and concessional loans, the bulk of which are used to fund large infrastructure projects, administered through China Eximbank. Typically, the loans offer a five to seven-year grace period and then an interest rate of 2 to 3 per cent over 15 to 20 years and have been welcomed by many. Others however have been critical as they may contribute to a growing debt burden. For example, Tonga's external debt to China represented nearly a third of its gross domestic product by 2011 causing the International Monetary Fund to issue a warning that Tonga was at high risk of debt distress. China responded by agreeing to defer repayments. However, when repayments start again in 2018, they will reportedly be even higher than before.⁶⁶

PERCEPTIONS OF HOW CHINESE TRADE AND AID ARE ALTERING THE REGIONAL POLITICS

Expanding trade, significant foreign aid provisions and increased political and diplomatic engagements have made the Peoples Republic of China a significant player in the South Pacific such that the South Pacific can no longer be seen as the 'American Lake' (as it was dubbed in the cold war years) or perceived as an area predominately influenced by Australia and to a lesser extent by New Zealand.⁶⁷ Different commentators have very different views of this new reality, with some viewing China's growing involvement as providing important new and potentially long-lasting developmental and economic opportunities for Pacific Island countries. Others fear China's expanding presence and influence may destabilise the region and pose an emerging threat to regional security, especially

as it is playing out against the backdrop of strategic rivalry between Washington and Beijing and China's military build-up in the South China Sea.⁶⁸

A 2015 analysis on China's role in the Pacific Islands region which was included in the book "Regionalism, Security & Cooperation in Oceania" published by the Asia-Pacific Center for Security Studies (APCSS) investigates these different perspectives.⁶⁹ The author suggests that while concerns about China's growing presence abound, fears of Chinese ambitions to dominate the region are unwarranted. However, the author warns that attempts to resist and contain Chinese emergence would likely be unsuccessful and potentially divide countries in the region. The author notes that China's interests in the region are diverse and wide-ranging and largely driven by its economic and trade interests, especially its growing appetites for the region's resources and consideration for South-South cooperation. Furthermore, the author is of the view that China does not necessarily have a well thought out and coordinated grand strategy for the region; rather China's activities in the region are often spontaneous and appear to lack coordination and may even on occasion undercut each other. Jenny Haward-Jones of the Lowy Institute suggests that placing China's activities into a geo-strategic paradigm risks obscuring the bigger and potentially more transformative impacts – both positive and negative – of its commercial and aid activities in the region.⁷⁰

What is clear is that China's approach to the Pacific is very different to that of the west in the way it provides foreign aid. China has what some describe as a 'no strings attached' approach to providing aid, funding much-needed infrastructure like roads, bridges, schools and sporting facilities, stressing development and mutual economic benefits and not attaching political conditions. This is in contrast to Australia and other western governments that have used aid to promote good governance in the region which can sometimes be considered patronising and something of an irritation to Pacific governments.^{71,72}

CHINA'S DEVELOPMENT OF DEEP SEA TECHNOLOGY

Since 2011 China has been ramping up its deep-sea research when it significantly increased funding for oceanography, especially research and development of deep-sea technology.⁷³

The Chinese Academy of Sciences (CAS) appears to be the primary research organisation concerned with deep sea research. So far China has completed 39 oceanic expeditions, the most recent was to the Indian Ocean to conduct oceanic surveys into polymetallic sulphide and sea floor REEs, as well as to take sea water and geological samples.⁷⁴ In May 2016, China opened its first dedicated deep sea research institute, the Institute of Deep-Sea Science and Engineering (IDSSE) located in Sanya, Hainan province.⁷⁵

Much of China's deep research is centred in Qingdao, Shandong province which is home to the China National Deep Sea Centre, the base for the submersible vessel *Jiaolong*, the Qingdao National Laboratory for Marine Science and Technology and other important institutions. The city contains 30 per cent of China's ocean research institutions and is built around three development zones: Blue Valley, a leading hi-tech zone for marine research; the Hongdao Economic Zone, a significant part of China's innovative development strategy; and the West Coast New Area, which is pursuing several goals, including a deep sea exploration logistics base and a centre for international co-operation in the marine economy.

Named after a mythical dragon, *Jiaolong* is China's first manned deep-sea research submersible. It was developed by Chinese designers starting in 2002 and entered service in 2010. The manned submersible has been deployed in the Yap and Mariana trenches – where it made its deepest dive - to 7,062 meters - gathering samples and taking videos. One of the scientists involved is quoted as saying “*such findings will*

serve as valuable references to the design of deep sea mining.”^{77,B}

In June 2017, the *Jiaolong* her mothership, Xiangyanghai 09, returned to its home port of Qingdao after a 138-day expedition to the South China Sea and the north-western Indian and north-western Pacific oceans.⁷⁸ During the expedition, the submersible made five dives each in the Mariana Trench, the world's deepest known trench, and the Yap Trench, both of which are located in the western Pacific Ocean. The expedition included researchers from the State Oceanic Administration, Ministry of Education, Chinese Academy of Sciences and China Geological Survey. The scientists used *Jiaolong* to collect 624.6 kilograms of seabed rocks, 5,968 litres of seawater as well as 2,115 marine creatures in order to better understand the trenches' geochemical and biological conditions. Commenting on the expedition, Yu Hongjun, head of the National Deep-Sea Base Management Center, said the recent expedition would also promote China's efforts in exploring and developing seafloor mineral resources.

Rainbow Fish is another a manned submersible, co-developed by the Shanghai based Rainbow Fish Ocean Technology Company and the Hadal Science and Technology Research Center (HAST) of Shanghai Ocean University, with the capability of diving down to 11,000 meters.⁷⁹ This will enable it to reach the deepest parts of the ocean and the stated plan is for it to descend to the bottom of the Mariana Trench in 2020. The three-man submarine is 10m long with a streamlined outer shell of fibreglass and a super-thick 4cm thick glass window.⁸⁰ Equipped with externally mounted cameras and a mechanical arm, much of the submarine, including the retrieving system, surface control system and optical fibre, is to be manufactured in China. Other components will

B. “submersible” and “submarine” are frequently used interchangeably, although submarine tends to denote underwater craft operated by a human crew, whereas submersible can be used to describe both crewed and uncrewed craft

be outsourced from leading companies around the world to be assembled in China.⁸¹

The collaboration between the Rainbow Fish Ocean Technology Company and HAST is seen as a new development mode that connects scientists and entrepreneurs, utilizing national support and private investments while establishing an open financing platform.⁸² Professor Cui Weicheng, who helped design *Jialong*, is the key figure behind the Rainbow Fish venture. He raised much of the money (~ 500 million yuan/~ US\$ 76 million) from private investors in Jiangsu - China's richest province, where allegedly businessmen are notorious for their prudence.⁸³ The submarine is being rented out to the Chinese Government and the assertion is that that investments will be recovered within a few years. Aberdeen University, Hawaii Pacific University and the Chinese Academy of Sciences have already signed agreements of cooperation with the "Rainbow Fish" project, which the company vision sets out as an open, ambulatory science lab.⁸⁴ The samples and data collected will pave the way for fields of science research, such as biology, ecology, chemistry, marine technology, and marine surveying and mapping. Interestingly Rainbow Fish Ocean Technology Company has also partnered with DeepFlight, a privately held US company that was founded to develop innovative technologies to expand human access into the oceans, to develop underwater tourism.⁸⁵

Zhang Jian is the mother ship for *Rainbow Fish* and was built by Tianshi Shipbuilding Company in east China's Zhejiang province, with a total investment of 200 million yuan (US\$ 30 million).⁸⁶ All the finance for the vessel came from the private sector.⁸⁷ The ship is 97 meters long and 17.8 meters wide, with designed displacement of about 4,800 tons and designed draft of 5.65 meters. Its cruising speed reaches 12 knots with an endurance of 15,000 nautical miles and can accommodate 60 people, with the self-sustaining capacity of 60 days.

Four years of sea trials to check the various components are now underway before the full

descent into the Hadal Zone of the Mariana Trench is attempted.

China is not only busy developing manned submarines but also unmanned submersibles. These include the Qianlong Autonomous Underwater Vehicles (AUVs) designed by the Chinese Academy of Sciences and Harbin Engineering University.⁸⁸ *Qianlong-1*, designed with the capability to travel to a depth of 6,000 meters, dove to 5,213 meters in the eastern Pacific Ocean in 2014. *Hailong 02*, is a remotely operated vehicle (ROV) that can operate at a depth of 3,500 meters and was designed by the Shanghai Jiao Tong University. New tools with even greater abilities are being developed and tested including 3 full-depth 'landers' and a full-depth integrated unmanned submersible that will be used in the Rainbow Fish project. The landers are unmanned devices, a little like underwater elevators, that are tethered to the ship and will be used to investigate fixed spots. These were tested to a depth of 10000m (down to 10890m at maximum) in the Southwest Pacific in December 2016 where they collected samples and produced video footage of the deep-sea environment.⁸⁹

Furthermore, China is planning to speed up a manned underwater laboratory in the South China Sea which will be partly used to hunt for seabed minerals but is likely to also serve a strategic and military purpose as well.^{90,91,C} The South China Sea laboratory will be used to observe conditions in real time and will involve Shanghai's Tongji University and the Institute of Acoustics under the Chinese Academy of Sciences. According to an article published in the Washington Times, Chinese President Xi Jinping told attendees at a national science conference in May 2016 that accessing raw materials found at great oceanic depths was of utmost importance to the nation and that "The deep sea contains treasures that remain undiscovered and undeveloped, and in order to obtain these treasures we have to control key technologies in getting into the deep sea, discovering the deep sea, and developing the deep sea."⁹²

C. The South China Sea is a sea area over which there have been conflicting territorial disputes. In July 2016, an arbitration tribunal ruled unequivocally in favour of the Philippines that there was no legal basis for China to claim historic rights to resources within the sea areas falling within the 'nine-dash line' in the South China Sea and that China had breached environmental laws in construction of the artificial islands.

The effort China is putting into deep sea research is set to increase. In June 2017, Sun Shuxian, deputy director of the State Oceanic Administration announced at a press conference that China will begin a global deep-sea scientific exploration mission with its *Jiaolong* manned deep-sea submersible starting in 2020 that will last an entire year and take it to the Pacific, Atlantic and Indian oceans. The mission will use a new mother ship for the submersible, the construction of which will start soon. The new vessel's displacement will be around 4,000 metric

tons and it will be able to travel at least 11,000 kilometers during each journey, giving it greater capabilities than *Jiaolong's* current mother ship. Sun explained the purpose of the mission which is to strengthen China's capability in surveying and researching the deep-sea environment and resources, thus giving China a bigger say in this field as no other country has such an extensive programme.⁹³

7

CHINA – DEEP SEA MINING IN THE SOUTH PACIFIC

China has various deep-sea mining interests in the Pacific, encompassing both the high seas and the continental shelves of some of the Pacific Island countries. It has already conducted much deep-sea research in the region. Significantly, it is involved through various Chinese companies in Solwara 1 in PNG which is world's first deep seabed mining project to be granted an operating licence.

China has two exploration licenses granted by the ISA for polymetallic nodules in the Clarion Clipperton Fracture Zone (CCFZ) and one for cobalt-rich ferromanganese crusts in the West Pacific Ocean. The Chinese licensed areas for polymetallic nodules in the CCFZ are closest to the EEZ of Kiribati whereas its licensed areas for cobalt-rich ferromanganese crusts are just outside of Marshall Islands' maritime jurisdiction.

China has undertaken many research expeditions to the South Pacific and has a particular interest in exploring the Mariana Trench where it has done much climate-related research and also conducted research into deep sea microbes.⁹⁴

In September 2016, the Chinese deep-sea research ship *Zhang Jian* returned to her home

port in Shanghai after finishing a 74-day scientific research trip to the Southern Pacific, thus completing her maiden voyage.⁹⁵ The trip took the hi-tech research vessel to the New Britain Trench, which is more than 8,000 meters-deep in the Solomon Sea near Papua New Guinea. The ship is the mothership for the newest Chinese submersible *Rainbow Fish* and the trip was used to test scientific equipment, according to Wu Xin, chairman of Shanghai *Rainbow Fish* Ocean Technology Company. An article on ShanghaiDaily.com reported that the vessel was hired by two unnamed mining companies and carried out surveys offshore near two gold mines to assess the influence of mining operations on the environment.⁹⁶ The same report also noted that *Zhang Jian* also carried 15 Chinese deep sea exploration enthusiasts, each paying 100,000 yuan (US\$15,000). During the trip, scientific equipment was tested and samples of ocean water and marine macro organisms were collected at the 8,000-meter-deep New Britain Trench. Generally speaking there is much Chinese deep-sea research available in the public domain.

In 2013 The Guardian reported on the intention

of the Cook Islands to invite applications for exploration licenses for polymetallic nodules within the Cook Islands EEZ. The article noted that talks were already underway with China, as well as the UK, Norway, Korea and Japan.⁹⁷ A year earlier, Paul Lynch, environmental lawyer and Deputy Prime Minister Tom Marster's advisor on deep-sea minerals, attended a Chinese government-funded seminar held in Nanchang City, Jiangxi, which was seen as an opportunity to explore China as a possible future partner in the exploitation of the Cook Islands' deep sea minerals.⁹⁸ Fast-forwarding to 2017 and the Cook Islands is beginning to accrue revenue (~\$900,000 so far) from granting a 'holding right' to the US company, Ocean Minerals Ltd., whilst it prepares for exploration. Commenting in an interview on this latest development, Paul Lynch, now Seabed Minerals Authority Commissioner, points to the possibility that there may be viable deposits of REEs in Cook Island waters and that the United States Department of Defence has granted almost a million dollars to Ocean Minerals to investigate the recovery of the REE from other sources apart from China's resources.⁹⁹

The involvement of several Chinese companies in Nautilus' Solwara 1 project are detailed in the next section. However, Nautilus' interests in the Pacific extend beyond PNG. According to the Nautilus company website it intends to grow its tenement holdings in the exclusive economic zones and territorial waters of Fiji, Tonga, the Solomon Islands, Vanuatu, and New Zealand as well as other areas outside the Western Pacific.¹⁰⁰ Nautilus began research in Tonga's waters in 2008 and it has also conducted exploration work

in Fijian and Solomon Islands' waters. Nautilus currently has an exploration application in New Zealand. While 'bringing on' Solwara 1 is the priority for Nautilus,¹⁰¹ it does not seem unreasonable to assume that if production gets up and running well in PNG, Nautilus will be keen to look for the next best sites in the region and begin to prepare for setting up operations at these new sites: it would make sense therefore for Nautilus to involve those companies that it is already working with such as Tongling.

It is not only the EU that has taken an interest in helping the Pacific Island countries develop a legal framework for deep sea mining, (see the SPC- EU Deep Sea Minerals Project). The 'top Chinese think tank', Guangdong Institute for International Strategies, is funding a research project which is to examine the development of legal framework for deep-sea mining in South Pacific Island States.¹⁰² Two academics from The University of the South Pacific's (USP) School of Law have been given a grant by the Chinese think-tank to examine various aspects of the emerging regimes including the following questions:¹⁰³

- Whether there is any major discrepancy or imbalance between the international and national regimes that will lead to the shift of deep-sea mining operations from high sea areas to areas within national jurisdiction, or vice versa?
- What is the role of the principle of precaution in relation to deep-sea mining?
- Is there any major gap in the way deep-sea mining risks are framed in the various national regimes considered?

INTRODUCTION TO NAUTILUS SOLWARA 1 OPERATION

Solwara 1 in PNG is the world's first deep seabed mining project to be granted an operating licence. Canadian Company, Nautilus Minerals, has a license to mine high-grade copper and gold deposits from the seafloor at a depth of 1,600 metres, 25 kilometres off PNG's New Ireland Province in the Bismarck Sea.

The 20 year license for the Solwara1 project was awarded in January 2011 following a controversial EIA process and an environmental permit awarded in December 2009. Production was initially scheduled to start in 2013 but due to various delays, the starting date is now set for early 2019. The environmental management plan has never been made public despite repeated calls for it to be released.^{104,105} Three important independent reviews are critical of the science and modelling for Solwara 1. The first of these was by Richard Steiner for Bismarck Solomons Seas Indigenous Peoples Council in 2009, the second by Helen Rosenbaum in 2011 and most recently one by oceanographer John Luick for the Deep Sea Mining Campaign.^{106,107, 108}

Amongst the delays experienced by the Solwara 1 project was an extended dispute with the PNG Government over its decision not to complete the agreement whereby PNG optioned to acquire 30% of the Solwara 1 project and would pay its share of development costs for the mine.¹⁰⁹ Following an arbitration process overseen by former Australian Chief Justice, Murray Gleeson, and an award in favour of Nautilus, the dispute was resolved in 2014 when PNG fully funded its 15% interest in the Solwara 1 Project up to first production by paying US\$113 million.^{110,111} The PNG Government still has options for purchasing a further 15%. The current value of the PNG investment is not known.

Despite the resolution of the agreement with the PNG government, technical and financing issues have beset Nautilus with global oil and copper

ore prices also impacting the share price.¹¹² In the summer of 2016 the company was intensively looking for bridge financing as can be seen from this quote from a company press release issued at the time.¹¹³

“Failure to secure bridge financing and/or project financing may result in the company taking various steps aimed at maximizing shareholder value, including suspending or terminating the development of the seafloor production system and the Solwara 1 Project, and engaging in various transactions including, without limitation, asset sales, joint ventures and capital restructurings. The company's independent directors will be looking to engage a financial advisor to assist them in this process.”

Nautilus managed to secure the bridge financing by signing a subscription agreement for its common shares which could see it raise proceeds of up to US\$20million. The agreement was signed with two of its major shareholders-Mawarid Offshore Mining Limited (28%) and Metalloinvest Holding (Cyprus) Limited (17%) and approved at an EGM in October 2016.¹¹⁴ Just a few months before this, Nautilus had announced that financial problems were forcing it to lay off staff.¹¹⁵ Subsequently Nautilus did reduce its staffing levels by some 60%, maintaining only Johnston as president and CEO, as well as VP for PNG operations Adam Wright, in its executive management structure.¹¹⁶

A year later and Nautilus is still desperately seeking further investment in order to complete the Solwara 1 equipment build . It is pursuing a number of avenues for further investment including strategic partnerships, vendor financing, joint ventures, equity and debt.¹¹⁷ However financiers are steering clear of the company amidst litigation by local communities,^D resignation of senior company officials, and the call by the former Attorney General for the PNG

Government to terminate its joint partnership agreement with Nautilus, recoup its 15% stake in Solwara 1 and decline to renew the licences for Solwara 1. Nautilus has itself admitted that there are high risks associated with almost every aspect of Solwara 1. These are catalogued in the Annual Information Forms Nautilus lodges in accordance with Canadian securities requirements. The documents acknowledge that the economic and technical viability of Solwara 1 remain unknown and gives this warning to investors:¹¹⁸

‘There can be no assurances that the Company will be able to obtain the necessary project financing on acceptable terms or at all. Failure to secure project financing may result in the Company taking various steps aimed at maximizing shareholder value, including suspending or terminating the development of the Solwara 1 Project, and engaging in various transactions including, without limitation, asset sales, joint ventures and capital restructurings.’

MINING DEEP SEA VENTS IN PAPUA NEW GUINEA: WHO ARE THE SHAREHOLDERS?

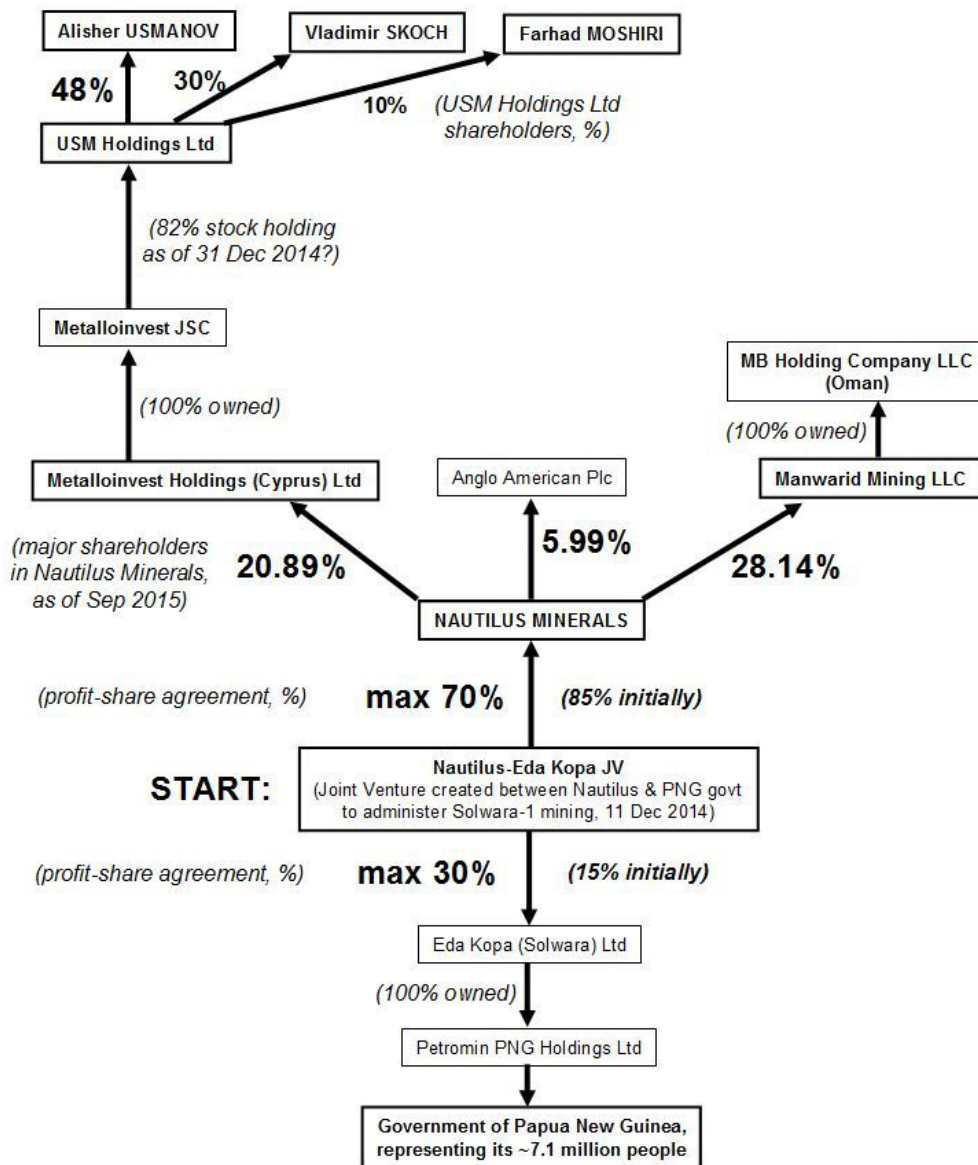


Diagram showing major shareholders in Nautilus Minerals as of September 2015 taken from blog by Professor Jon Copley, University of Southampton 5th October 2015 http://moocs.southampton.ac.uk/oceans/2015/10/05/ventmining_shareholders_contractors/

D. Media release from Sir Arnold Amet, former Attorney general and Chief Justice of Papua New Guinea, The writing is on the wall for Solwara I – PNG should withdraw its investment before it's too late, 17 January 2018 <http://www.deepseaminingoutofourdepth.org/the-writing-is-on-the-wall-for-solwara-1-png-should-withdraw/>

Three large state-owned Chinese companies are key to the Solwara-1 project in Papua New Guinea.

TONGLING NONFERROUS METALS GROUP – PROCESSOR FOR SOLWARA I PRODUCT

Firstly, the product (containing copper, gold and silver) from Solwara I will go to China's Tongling Nonferrous Metals Group - an extra-large scale state-owned complex.^{119,120} It will be imported into China by Tongling and then processed through its facilities in the city of Tongling, alongside the Yangtze River. After production of a copper concentrate, it will be smelted in Tongling's industrial complex.¹²¹ Material from the process can then be roasted to produce gold and sulfuric acid and the remaining calcine may be sold to cement manufacturers or as iron ore fines.¹²²

The original deal with Tongling was struck in 2012 when Nautilus was still suggesting that Solwara 1 would go into production during the last quarter of 2013. Under this initial agreement Tongling was due to purchase 1.1 million tonnes per annum - give or take 20% as part of the agreed range for production variation - for three years on a take or pay basis.¹²³ A clause in the agreement gave an option for an extension of the arrangement if desired. The agreement included a mechanism whereby Tongling would pay 90% of the price upon the product being loaded onto an export vessel in PNG while the final payment would be based on based on the recovery of copper, gold and silver reporting to the copper concentrate with deductions for capped logistics and processing costs, smelter treatment and refining charges, allowances for plant fixed capital recoveries and Tongling's tolling fee on concentrator plant processing

costs.¹²⁴ The price payable for all metals would be set on values determined by the London Metal Exchange (LME) for copper and London Bullion Market Association (LBMA) for silver and gold. In addition, both Nautilus and Tongling hoped to gain further value through a 50%/50% profit sharing scheme based on incremental by-product revenue realised in China, including gold bearing pyrite.

Under this deal Nautilus was to issue a bank guarantee of under \$CAD 11.5 million to Tongling as security for half of Tongling's concentrator investment costs - the plant being built specifically to process the exported Solwara base and precious metal concentrate.

In 2015 this original binding heads of agreement was replaced by a new Master Ores Sales and Processing Agreement (MOSPA). According to Nautilus, 'the MOSPA has simplified the arrangements between the parties in many respects and it now operates as a more conventional material sales agreement where Tongling will pay Nautilus for a fixed proportion of copper, gold and silver in the mineralised material.'¹²⁵ Under the MOSPA the construction of the concentrator will initially be financed by Tongling, with these costs recovered through a fixed plant capital fee payable by Nautilus monthly over the term of the MOSPA. Nautilus shall provide Tongling with a bank guarantee covering 50% of the concentrator capital cost. Both companies believe the new deal represents a win-win situation, with Nautilus gaining a premium payment for gold compared to the 2012 agreement and a reduction in risk and Tongling greater flexibility over the design and operation of the concentrator in order to maximise value from the Solwara 1 product. Additionally, the MOSPA gives Tongling the exclusive right to market or process any pyrite concentrates produced, whereas under the previous agreement the two

companies would share the profits from the pyrite concentrates 50:50.¹²⁶

Tongling Nonferrous Metals Group Co. Ltd is 1,856 on the Forbes 2000 list for 2017.¹²⁷ The company is listed on the Shenzhen stock exchange (00063SZ) and has recently swung back into profit.¹²⁸

FUJIAN MAWEI SHIPBUILDING LTD. & CONSTRUCTION OF THE PRODUCTION SUPPORT VESSEL

The collapse of a planned joint venture between Nautilus and the German shipping group Harren & Partner to own and operate the production support vessel (PSV) for Solwara 1 was a major problem for the deep-sea mining company.¹²⁹ In 2014 Nautilus made an agreement to charter a purpose-built PSV from Marine Assets Corporation (MAC), a marine solutions company based in Dubai which specialises in the delivery of new build support vessels for the offshore industry. Under the agreement MAC, will own and provide the marine management of the PSV and charter it to Nautilus for a minimum period of five years at a rate of US\$ 199,910 per day, with options to either extend the charter

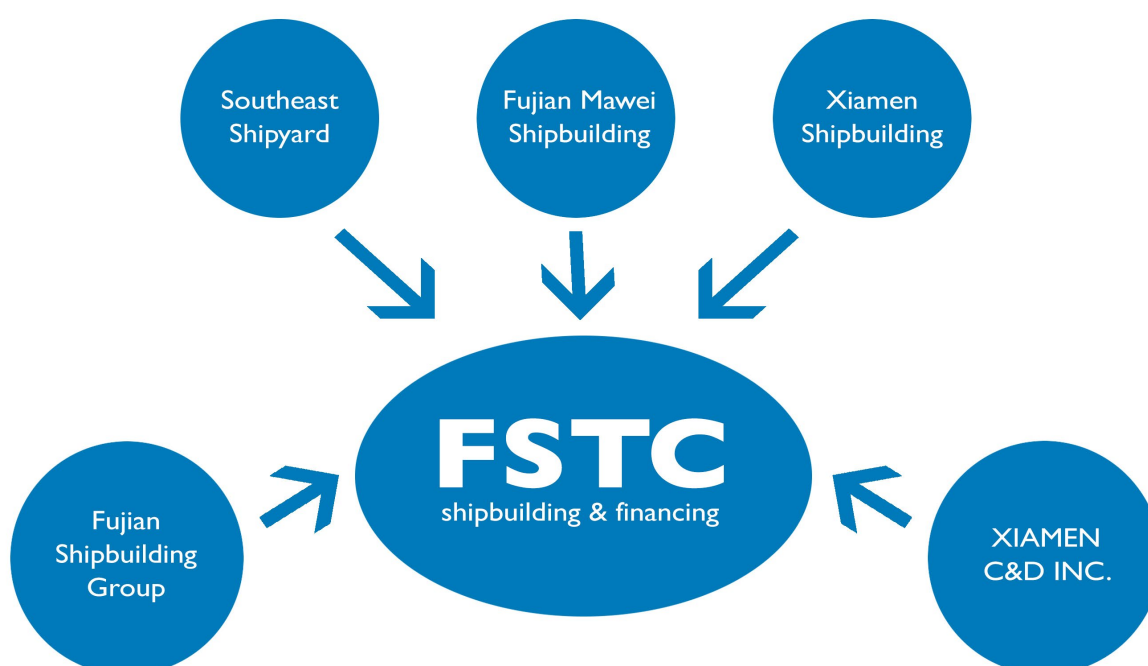
or purchase the vessel at the end of the five year period.¹³⁰

The 227m PSV is currently being built by Fujian Mawei Shipbuilding Ltd., a wholly state-owned enterprise, at its site in Culu Island, SE China.

The build has progressed rapidly and Nautilus reported at the 2017 AGM that it is 64% complete.

The first steel was cut in June 2015, and the keel laying took place in June 2016. In October 2016, the PSV was floated in dry dock to allow the launch of two adjacent vessels.¹³¹ Industry sources report that the thruster rooms have already been lifted into position, as have the accommodation blocks.¹³² The PSV is completed to deck level and is expected to exit dry dock in Q1 of 2018, be delivered in Q4 and be on site in PNG Q1 2019. This schedule, Nautilus notes, is subject to further financing.

While the main build of the PSV is taking place in the Fujian Mawei shipyard, Fujian Mawei has looked to companies outside of China for various elements, including the cranes which have been ordered from UK based MacGregor, the cargo handling equipment from Italy based Bedeschi, engines and thruster packages from UK based



Rolls Royce Marine and the vessel integrated control system (including dynamic positioning and navigation systems) to Norway's Kongsberg Maritime.^{133,134} The supply of the entire electrical installation for the production support vessel has been awarded to Siemens International Trading (Shanghai) Ltd., a wholly owned subsidiary of Siemens AG.¹³⁵ Siemens will supply the entire shipboard electrical installation, extending to all main generators, switchboards, transformers, electrical motors and associated systems for power generation, propulsion, automation and distribution.

The Launch & Recovery System (LARS) for the Seafloor Production Tools (SPTs) has been completed and delivered to the shipyard and ready to be integrated into the PSV. The LARS was built by AxTech (a Norwegian company) on behalf of Soil Machine Dynamics (SMD) and consists of A-frames, lift winches, hydraulic power units, electric power units and deck control cabins.¹³⁶ The system will be used to launch, stabilize and recover the SPTs when they are deployed from the PSV.

Another major element of the Nautilus deep sea mining operation is the ridged riser system which allows the mineralized material produced by the SPTs to be transferred from the seafloor up onto the PSV. The riser tooling and sub-sea skids have been fabricated and undergone factory acceptance testing (FAT) in Poland and the USA respectively. These pieces of equipment together with the subsea slurry and lift pump (being manufactured by GE Oil and Gas) make up the ridged riser system which, if schedules have been adhered to, should have been completed by the end of 2016.¹³⁷

According to an industry report and a Nautilus presentation, all major outstanding contracts for the project will probably be awarded to Chinese companies, including the derrick structure, the dewatering and flotation plants, and flexible hoses.¹³⁸ The first "chunk" of this work is the dewatering plant and derrick which Nautilus estimates will cost about US\$ 50 million.¹³⁹

Fujian Mawei Shipbuilding Ltd (Mawei shipyard which is building the PSV, Fujian Southeast Shipyard (Southeast shipyard) and Xiamen Shipbuilding Industry Co. Ltd. (Xiamen shipbuilding) all fall under the umbrella of Fujian Shipbuilding Industry Group Corporation (FSIGC).¹⁴⁰ Fujian Mawei and Fujian Southeast Shipyard specialise in vessels for the offshore sector, Xiamen in car carriers while the other companies in the group (see diagram), C&D and FSCT, are involved in the financing of the builds and the marketing aspects. Fujian Mawei has a long history, established by the Chinese government in 1866. It has been building vessels for non-Chinese companies since the 1980s. The mother company, Fujian Shipbuilding Industry Group Corporation was established in 1997 and is authorized by Fujian Provincial Government to manage the state-owned assets.¹⁴¹

With more than 40% of China's shipbuilding capacity currently idle, the construction of the PSV at Fujian Mawei Shipbuilding Ltd. is something of a flagship project for the company proving its hi-tech/high end capabilities. The build is expected to cost around \$600 million and generate an annual revenue of nearly \$200 million, with gross profit rate between 10 to 20 percent, according to Zhang Zhitong, chairman of Mawei Shipbuilding.¹⁴² More than 1 billion yuan is being invested to modernise the yard and this is in line with Chinese Government's statements encouraging the industry to increase spending on research and focus on building more high-end products such as offshore equipment with the aim of cornering 35-40 percent of that market by 2020.¹⁴³

In August 2016, Fujian Shipbuilding Industry Group Corporation (FSIGC) announced that it had signed a deal with China Exim Bank to secure a CNY8 billion (USD 1.2 billion) credit line.¹⁴⁴ According to the agreement made between the bank and the company the funds will be used to support the upgrading of facilities and ship exports.

CHINA RAILWAY ROLLING STOCK & SEAFLOOR PRODUCTION TOOLS

A key part of the potential Solwara 1 mining operation are the three seafloor production tools (SPTs) – i.e. the auxiliary cutter (AC), the bulk cutter (BC) and the collecting machine (CM). , These three massive undersea robotic vehicles will excavate and cut the mineral deposits around the hydrothermal vents and collect the cut material by drawing it in as seawater slurry with internal pumps and pushing it through a flexible pipe to the Riser and Lifting System.¹⁴⁵

The SPTs were designed by Soil Machine Dynamics Ltd (SMD), a leading design and manufacturing company of remote intervention equipment for offshore industry. The UK-based engineering company was awarded the contract to design and build the SPTs by Nautilus in 2007. It took eight years for SMD to design and build the SPTs - which collectively weigh over 1000 tonnes – at its Newcastle-upon-Tyne facility. In addition to the three SPTs, SMD designed and manufactured the full spread equipment required to remotely operate, launch and recover the SPTs from the deck of the PSV.

The three mining machines were completed in February 2016 following extensive trials and factory acceptance testing in dry conditions on land at the SMD production facility in Wallsend, North East England. The SPTs were then loaded onto the MV Happy Delta at Swans, an advanced manufacturing site being developed next to SMD's site on the banks of the River Tyne.¹⁴⁶

From there, they were shipped to Duqm Port in Oman to undergo extensive undersea testing in specialized port facilities.^F The wet testing program, (to look at control systems operations and feedback, hydraulic functions, collection system functions and survey and visualization systems) was reportedly being undertaken by the Solwara 1 Joint Venture production team and representatives of SMD, with further logistics and engineering support from United Engineering Services Ltd.¹⁴⁷

In March 2017 the SPTs were shipped to PNG and had arrived in Port Moresby by April.¹⁴⁸ Nautilus vice president Adam Wright, told the

Post-Courier that the SPTs would undergo a series of trials over a four to five month period at an existing facility on Motukea island. A key part of this testing will be seeing how well operators can control and monitor the submerged machines using visualization technology. In the interview, the Nautilus representative said that by conducting these trials in PNG it would enable representatives from Kumul Mineral Holdings, the Mineral Resources Authority (MRA), the Conservation and Environment Protection Authority (CEPA) and the New Ireland and East New Britain provincial governments to fully participate in the trials. A later news report has suggested that the SPT trials are to be conducted during August and the first week of September 2017.¹⁴⁹

In April 2015 Soil Machine Dynamics as per previous page (SMD) Limited, the top holding company of the SMD group was sold for £120 million to Zhuzhou China South Rail Times Electric Co. (CSR Times Electric), Ltd., part of the China South Rail (CSR) group in China, a group primarily involved in railway related manufacturing and engineering but also involved with ship propulsion.¹⁵⁰ The Chinese company approached the UK firm as it was looking to moving into the subsea sector and SMD saw the move as an opportunity to secure increased investment that would enable it to move into new global markets including the Chinese market.¹⁵¹

The deal with Hong Kong Stock Exchange listed CSR Times Electric was approved by SMD's shareholders and option holders, including private equity firm Inflexion which exited the business on completion of the deal. Inflexion's statement on the sale stated that the transaction was signed at an Enterprise Value of £120m, which would represent a return of 2.2 times on completion.¹⁵² Further information on Inflexion's role in SMD prior to the CSR Time Electric takeover can be found on the Inflexion website.¹⁵³ A number of performance and profit targets were set by CSR Times Electric as part of the deal: if these stipulated targets are met, those management sellers that have stayed with the company will share a further £7 million, a move to devised

E. A good overview of the technical side of Solwara 1 can be found here Nautilus (2015). Forging Ahead - The Solwara 1 Deepwater Mining Project. Presentation by Roland Berndt (Engineering Manager for Nautilus Minerals) for Third International Future Mining Conference. November 2015. <http://www.futuremining2015.ausimm.com.au/Media/FM2015/presentations/1620%20The%20Solwara.pdf>

to maintain expertise within the company. Additionally, CSR Times Electric set up an escrow account, opened with the London branch of the Bank of China, in which it deposited £10.1 million which SMD's sellers will be entitled to if profit targets are met in the first two years.

The CSR Times Electric deal has resulted in some changes in SMD but the original management team retained control the day to day running of the business. However, a new board of directors was appointed to take charge of business strategy, investment decision-making, financial monitoring and important decisions related to government and public relations. Importantly, the plan included setting up a Chinese subsidiary to develop the company's presence in the Chinese maritime market.¹⁵⁴ This is in keeping with the ambition expressed by Ding Rongjun, the President of CSR Times Electric, who said *"By opening a SMD subsidiary in China, we want to establish the company as a leading supplier of remote operated vehicles (ROVs) equipment in the national market."*

Following the acquisition of SMD by CSR Times Electric (now CRRC TEG), the parent company of CRRC TEG, China CSR Corporation Limited (CSR), completed a merger with China CNR Corporation, to create China CRRC Corporation Limited (CRRC).¹⁵⁵ In a note to shareholders and interested parties on its website, SMD was positive about the merger and the advantages of having even greater financial backing.¹⁵⁶ SMD is already active in the Chinese market and exhibited at a number of industry events in the latter months of 2017 including the OI China exhibition in Shanghai.

CRRC is 235 on the Forbes 2000 list.¹⁵⁷ The merger that created CRRC resulted in a surge in the share price on both the Shanghai and Hong Kong stock exchanges where the company is listed.¹⁵⁸

10

OVERVIEW OF CHINESE LEGAL FRAMEWORKS

GOVERNANCE OF SEABED MINING IN THE AREA BEYOND NATIONAL JURISDICTION

Deep seabed mining is an emerging industry and the rules and regulations that will govern future exploitation are still being developed. Under UNCLOS the mineral resources located in the seabed area beyond national jurisdiction (the Area) are determined as the "common heritage of mankind" to be administered for the benefit of human kind as a whole. All mineral exploration and exploitation activities in the Area must be sponsored by a State Party to UNCLOS and approved by the International Seabed Authority

(ISA), the sole authority charged with governing the exploration and exploitation of the global seafloor.¹⁵⁹ The regulatory regime for deep-sea mining in the Area is not yet complete. Regulations on exploration have been adopted, while regulations on exploitation are currently being developed. Outstanding issues include the basis on which ISA will levy royalties for deep-sea mining, environmental standards and, in due course, benefit sharing.

The legal requirements of States sponsoring mining entities in the Area under UNCLOS were further explained through a special advisory opinion of the Seabed Disputes Chamber of the International Tribunal for the Law of the

Sea in 2011.¹⁶⁰ The Chamber's opinion advised that sponsoring States were required to exercise a high degree of "due diligence" to ensure that any entity they sponsor complies with UNCLOS and the regulations adopted by the Authority. The Chamber elaborated on what was meant by "due diligence" – stating that, for all the time that they are acting as a sponsor, States must adopt and enforce laws, regulations and administrative measures that are at least as stringent as those adopted by the Authority and no less effective than any other relevant international rules, regulations and procedures for environmental protection. Those rules and standards must give effect to:

the precautionary approach based on Principle 15 of the Rio Declaration, requiring actions where scientific evidence is insufficient but "where there are plausible indications of potential risk"

- best environmental practices (i.e., more than just best available technology)
- technical and financial guarantees by a contractor
- requirements to provide recourse for compensation
- the obligation to conduct an environmental impact assessment

Importantly, to prevent the situations where a group of sponsoring states of convenience (akin to flags of convenience) emerges, the Chamber advised that the due diligence obligation should be the same for developed and developing States.

China is an active member of the ISA with a delegation of at least 16 attending the ISA's 23rd session in Kingston, Jamaica (7th-18th August 2017).¹⁶¹ During the session, China Ocean Mineral Resources R&D Association held a meeting titled 'The Balance between Resource Development and Environmental Protection' which included a proposal for cooperative work on developing a regional environmental management plan. During the meeting the

Centre for Polar and Deep Ocean Development, Shanghai Jiao Tong University of China was granted observer status.¹⁶² The Centre for Polar and Deep Ocean Development helped draft China's law on exploration and exploitation of deep seabed resources.

GOVERNANCE OF SEABED MINING UNDER NATIONAL JURISDICTION

UNCLOS defines waters within 200 nautical miles as the exclusive economic zone (EEZ), where signatory states have sovereign rights over marine resources. UNCLOS also recognises that some states are entitled to a continental shelf beyond this 200 nautical mile limit (up to 350 nm). To claim this, they must submit information on their outer limits to the Commission on the Limits of the Continental Shelf. For mineral deposits under the jurisdiction of coastal states, i.e. within country EEZ or on their continental shelf, there are no uniform rules applicable to marine mining. Consequently, there is a risk that areas under coastal State jurisdiction will have much lower standards than those developed for the Area.¹⁶³ States are subject to a number of obligations in terms of international agreements of global or regional application but these tend to be not very specific and the extent to which they may be applied to regulate deep-sea mining is not clear.

CHINA – REGULATION OF SEABED MINING

A history of China's engagement in the development of the international seabed mining regime and the formation of the International Seabed Authority (ISA) can be found in a presentation by Keyuan Zou, Professor of International Law at the University of Central Lancashire, given to the 3rd Hamburg International Environmental Law Conference in 2016.¹⁶⁴ Over the decades China's relationship with the ISA and its approach to deep sea mining regulation has evolved as the country's economic system has fundamentally shifted from a centrally

planned system to that of a market-oriented economy.

Domestically, the draft Law on Exploring and Exploiting Resources in Deep Seabed Area, drafted by the NPC Environmental and Resources Protection Committee, was included in the Legislative Plan of the 12th National People's Congress Standing Committee in 2014. Two years later the Law on Exploring and Exploiting Resources in Deep Seabed Area of the PRC was adopted February and came into force on 1st May 2016. The new law, which provides the basis for Chinese companies to engage in more activities in the Area, stipulates that exploration and development should be 'peaceful and cooperative'.¹⁶⁵ The law consists of 7 chapters and 29 articles designed to regulate exploration and exploitation activities, promote deep-sea scientific research and technology and resource investigations, protect the marine environment, promote the sustainable use of deep seabed resources, and safeguard the common interests [heritage?] of mankind. The law refers to the 'Deep Seabed Area' instead of using the term 'International Seabed Area' but is referring to the seabed beyond China's or other countries national jurisdiction.¹⁶⁶

The law sets out the administrative rules for any PRC citizen, legal person, or other organization wanting to commence deep seabed mining. Before applying to the ISA, they first have to the competent authority of the State Council. Once approved, they can conduct exploration and exploitation but only after it has signed such contract with ISA. Transfer or any other substantial changes are subject to the approval of the competent authority of the State Council. Additionally, the contractor should, within the reasonable and feasible limits, adopt necessary measures to prevent, reduce and control pollution or other harm to the marine environment arising from its activities in the area of exploration and exploitation. The competent authority of the State Council is responsible for monitoring and inspecting the activities of the contractor.

It includes some environmental provisions: for example, if an operator's activities lead to pollution the operator can be fined up to one million yuan (US\$153,000).¹⁶⁷

OTHER RELEVANT CHINESE LEGISLATION

While the 2016 Law on Exploring and Exploiting Resources in Deep Seabed Area is the most specific piece of Chinese legislation relating to its deep-sea mining activities, other laws and regulations are also relevant.

China's marine regulatory system has been developed over the last sixty years or so, originally through laws and regulations for land-based activities being extended to marine activities. China's ocean legislation at the national level includes laws enacted by the Standing Committee of the National People's Congress and regulations enacted by the State Council or its subsidiary departments.¹⁶⁸ Legislation has been developed both on a sector-by-sector basis (e.g. fisheries law, minerals law etc.) and for particular maritime areas or zones (e.g. the 1992 Law on the Territorial Sea and Contiguous Zone and the 1988 Law on the Exclusive Economic Zone and Continental Shelf). The resulting legal regime is therefore a complicated mixture of various laws, regulations, and regulatory documents, all possessing different legal effect.¹⁶⁹

Among the laws relevant to deep-sea mining are the Mineral Resources Law, enacted in 1986 and amended in 1996 which provides a general legal framework for mining activities in China, the 1992 Law on the Territorial Sea and Contiguous Zone, the 1988 Law on the Exclusive Economic Zone and Continental Shelf, the 2002 Law on Environmental Impact Assessment,^F the 2001 Law of on the Administration of the Use of Sea Areas Environmental Protection Law of the People's Republic of China (EPL revised in 2014), and the Marine Environment Protection Law (MEPL 1982 but amended 1999 and 2016).

The EPL is the basic law for overall environment

F. An interesting explanation of how China intends to ensure EIAs are effective can be found in the China Council for International Cooperation on Environment and Development document: Progress in Environment and Development Policies in China and Impact of CCICED's Policy Recommendations. Pub. 4th December 2015.

protection in China. The General Provisions of the EPL state that “Environmental protection shall adhere to the principles of giving priority to protection, focusing on prevention, conducting comprehensive treatment, engaging the general public, and enforcing accountability for damage.” In addition, that “Environmental protection is a fundamental national policy of the state”.

Meanwhile, the MEPL is the basic law for marine environmental protection in China.

As elsewhere in the world, enforcement of environmental laws and regulations has long been problematic in China. Recently the Ministry of Environmental Protection has established an environmental protection law enforcement task team. In addition, the environmental protection departments at all levels of the local governments are separated from the local government management system and are directly under the leadership of the Ministry of Environmental Protection.¹⁷⁰

A key regulation applicable to DSM is the Administrative Regulation on the Prevention and Treatment of the Pollution and Damage to the Marine Environment by Marine Engineering Construction Projects. This was adopted at the 148th Executive meeting of the State Council on 30th August 2006 and came into force as of 1st November 2006. The Chinese Government highlighted this piece of legislation when reporting on their national legislation to the ISA.¹⁷¹

Under this complex regime different agencies have overlapping and possibly conflicting responsibilities. For example, the Department of Minerals Exploitation Administration and Department of Mineral Resources Reserves of Ministry of Land and Resources have some role in overseeing China’s DSM activities, while Environmental Protection Administration and the State Oceanic Administration (SOA) may have a role in environmental protection aspects.

This complexity is clearly undesirable and there are multiple gaps regarding environmental protection. However, the trend in Chinese

oceans governance appears to be towards greater integration and improved environmental protection, with the Chinese Government seemingly responding to calls for the development of a new ‘Oceans Act’.¹⁷² This momentum is undoubtedly driven by the need to deliver blue growth and forge ahead with the 21st Century Maritime Silk Road. This is exemplified for instance by China actively working with the EU on efforts to improve oceans governance as announced by Mr Li Keqiang, Prime Minister of China and Mr Juncker, President of the European Commission at the beginning of June 2017.¹⁷³

Spurred by the deleterious state of its own waters – the increasing numbers of dead zones, red tides, the loss of 60% of its wetlands and fact that over half its fisheries are overharvested or depleted – China’s Central Committee and State Council have put forward the concept of creating an “ecological civilization”.¹⁷⁴ In July 2015, the Implementation Plan of the State Oceanic Administration for the Construction of Marine Ecological Civilization (2015-2020) was released. This document provides a roadmap and timetable for promoting marine ecological progress during the 13th Five year Plan (FYP) period and importantly describes the system by which ecological red line protection zones (areas mandated for strict protection) will be established and managed.¹⁷⁵ The “ecological civilisation” concept is highly aspirational, intended to ‘deepen the understanding of sustainability and the crucial relations between human and coastal ecosystem, and interrelations among different stakeholders involving economic relations, administrative relations, and social relations.’ Under this concept, environment is supposed to be at the core of both social and economic sustainable development and the idea is encapsulated in the saying ‘*Neither a golden mountain nor silver mountain are worthy of blue water and green mountain*’.

CHINESE STATE-OWNED ENTERPRISES

The section above sets out the array of Chinese national laws pertinent to deep-sea mining which are implemented by administrative regulations issued by the State Council, (the chief administrative authority of the People's Republic of China this should be inserted at first mention of state council above), however there are other rules and guidelines which apply to China's deep-sea mining companies and their operations which under certain circumstances might be useful when trying to change their behaviour.

The three Chinese companies involved in Solwara 1 are State Owned Enterprises (SOEs) and SOEs are subject to specific rules and guidelines, including guidelines relating to investment overseas.

Central SOEs, such as CRRC and Tongling/China Nonferrous Metal Mining Group, are under the supervision of the State-owned Assets Supervision and Administration Commission (SASAC). Senior SOE executives are government appointed, with these positions sometimes acting as a springboard for individuals to enter high-ranking government positions.¹⁷⁶

China has moved away from an entirely centrally-planned economy toward one which embraces market principles. Thus, China has transformed its SOEs to make them more competitive and operate more along the lines of western corporations so that they become profitable and raise revenues. Part of this transformation has been achieved by the appointment of some professional business managers to executive positions in the SOEs.

Over recent years the number of central SOEs has been massively reduced through strategic streamlining and merging. There are now 102 central SOEs including CRRC and Tongling/China Nonferrous Metal Mining Group.^G According to a recent CNBC report about 90 percent of China's SOE's have already completed such restructuring.¹⁷⁷

The strategic thinking can be illustrated by the merger between China CSR Corporation Limited (CSR) and China CNR Corporation which created China CRRC Corporation Limited (CRRC) – (the ultimate mother company SMD which has built the Nautilus SPTs). The resulting mega-corporation, which represents more than 90% of China's railway industry, now has sufficient resources to capture global markets, expand and increase its earnings.¹⁷⁸ CRRC is 235 on the current Forbes 500 list and shares are traded on both the Hong Kong and Shanghai stock exchanges. The restructuring resulting in the creation of the listed giant CRRC is the direct result of China's policy to turn all big companies owned by the central government into limited liability firms or joint-stock firms by the end of 2017.

The state-sponsored capitalism now being practiced by the PRC means that its SOEs are a curious hybrid whereby they are driven by both commercial and political motivations. SOEs are part of the "mixed ownership economy" and under "modern management" but still benefit from strong state support, subsidies and lower taxation. The nature and extent of some of these subsidies to Tongling Nonferrous Metals Mining Group can be found in a 2017 economic analysis of the Chinese Non-ferrous Metals Industry.¹⁷⁹

While able to raise private capital on the Shanghai and Hong Kong stock exchanges the SOEs also tend to have preferential access to credit from China's policy and commercial banks. The China Development Bank and Export-Import (Exim) Bank of China are often the major providers of finance for companies 'going out'.

The Fujian Shipbuilding Industry Group Corporation, the parent company of Fujian Mawei Shipbuilding Ltd., is not a central SOE but rather is authorized by the Fujian Provincial Government to manage the state-owned assets, making it a provincial SOE. Bloomberg has it listed as a private company and so shares are not traded on one of the stock exchanges.¹⁸⁰ As noted earlier, the company has however benefited from a large loan from the China Exim Bank.

G. An English language listing of the 102 SOEs administered by SASAC can be accessed [here](#). China Nonferrous Metal Mining Group (Tongling) is 67 on the list and CRRC is 72.

RULES AND GUIDELINES APPLYING TO CHINA'S OVERSEAS INVESTMENT

A comprehensive overview of the rules and guidelines applying to China's overseas investment can be found in the 2017 campaign guide 'Safeguarding People and the Environment Chinese Investments' published by Inclusive Development International.¹⁸¹ The document explains the roles of the numerous government and regulatory bodies that oversee the outbound investment of Chinese SOEs and private companies. These include the State Council, China's highest administrative authority led by the Prime Minister, the aforementioned SASAC, the Ministry of Commerce (MOFCOM) which has to 'approve' investments in sensitive countries, regions and industries, the National Reform and Development Commission (NRDC), the China Banking Regulatory Commission, the Ministry of Environmental Protection and, of relevance to deep sea mining, the Chinese Chamber of Commerce for Metals, Minerals and Chemicals. The Chinese Embassies are key in helping facilitate overseas projects and also for managing Chinese aid.

Chinese companies and financiers lag behind other countries with regard to environmental and social safeguarding mechanisms but this is beginning to change. Many of the rules, guidelines and enforcement mechanisms, lack detail but because they have been issued by high-up institutions have some weight behind them.

In 2006, the State Council released a set of nine principles related to overseas investment. The Nine Principles on Encouraging and Standardising Foreign Investment include:

Upholding the values of mutual respect, equality and mutual benefit, as well as "win-win cooperation";

- Complying with local laws and regulations;
- Committing to protect the legal rights and interests of local employees;

- Paying attention to environmental resource protection;
- Caring for and supporting the local community and people's livelihood; and
- Creating a friendly environment for public opinion and preserving China's corporate image and reputation.

Key among these is the need to at least comply with the local laws and regulations of the host country and non-compliance with local laws may provide the best way of challenging environmentally or socially destructive activities conducted by a Chinese company operating overseas.

As well as the above principles, there are some more specific guidelines that are important. The ones applicable to deep seabed mining include:

- Guidelines for Environmental Protection in Foreign Investment and Cooperation (2013)
- Guide on Social Responsibility for Chinese International Contractors (2012)
- Guidelines for Social Responsibility in Outbound Mining Investments (2014)
- Chinese Due Diligence Guidelines for Responsible Mineral Supply Chains (2015)

The Inclusive Development International guide provides advice on how the above guidelines can be applied in practice. Furthermore, in January 2017 two documents released by SASAC clarify how the 102 central SOEs should manage their investments. The documents set out SOEs' investment direction, procedures, risk control and accountability in domestic and overseas markets and forbid certain investments such as real estate, iron ore, petroleum and nonferrous metals.¹⁸²

THE EXTRACTIVE INDUSTRIES TRANSPARENCY INITIATIVE (EITI)

The Extractive Industries Transparency Initiative (EITI) is a global standard that aims to promote the open and accountable management of extractive resources - oil, gas and minerals. The EITI Standard requires information related to the different stages of the extractive industry value chain from the point of extraction, to how the revenue makes its way through the government, to how it benefits the public. This includes how licenses and contracts are allocated and registered, the beneficial owners of those operations, the fiscal and legal arrangements, how much is produced, how much is paid, the allocation of revenues, and the contribution to the economy, including employment.¹⁸³ This information can then be used by reformers, policy makers, investors, governments, civil society actors, academics, journalists, and others to understand who is benefitting from resource extraction.

In each country which has joined the EITI, a national multi-stakeholder group comprised

of government, industry and civil society is set up and this group decides how their EITI process should work. At the heart of the EITI is an annual reporting process. Only PNG of the Pacific Island Countries is a member of EITI. PNG has been a member since 2014 and has yet to be assessed against the 2016 EITI standard. PNG EITI has its own website and in 2016 made public the roadmap of how it intends to disclose the beneficial owners of the companies active in the extractives sector.¹⁸⁴ The most recent annual progress report for the year 2016 was published in July 2017.¹⁸⁵ In March 2017 PNG EITI published a report covering the dealings of the Papua New Guinea extractive sector in 2014.¹⁸⁶

China is not a member of EITI but a 2015 review of Chinese companies concludes that they do not stand out either way when it comes to reporting about their overseas activities.¹⁸⁷ It is worth noting that the Ramu nickel cobalt mine reported for the 2014 PNG EITI report and that Solwara 1 is included as a future operation due to come on stream in 2019 in the document.

11

ASSESSMENT OF FUTURE CHINESE INVOLVEMENT IN DSM IN THE PACIFIC AND NAUTILUS/SOLWARA I

China's presence in the Pacific has been growing and this trend will continue, spurred in part by the development of the 21st Century Maritime Silk Road/OBOR. This implies that China does have a strategy for the Pacific and certainly the following remarks by Premier Wen in 2006 support the view that this has been the case for over a decade:

“As far as China is concerned, to foster friendship and cooperation with the Pacific island countries is not a diplomatic expediency. Rather, it is a strategic decision. China has proved and will continue to prove itself to be a sincere, trustworthy and reliable

friend and partner of the Pacific island countries forever.”¹⁸⁸

However, the sea-route to the South Pacific and China's larger ambitions for the South Pacific region are not well developed and, as one Chinese official, Mr. Hao Fang, the Deputy Director from Department of American and Oceanian Affairs of Ministry of Commerce, said in a meeting about OBOR, all the 14 island countries in South Pacific are not well known by Chinese.¹⁸⁹ The South Pacific is still on the periphery of China's global vision; trade with the South Pacific still only represented 0.12 percent of China's total

trade volume in 2014, and China's aid to the sub-region is approximately 4.2 percent of its total outlay.¹⁹⁰

Many observers and commentators in the West, particularly from the US, see China's increasing presence and influence in the region as part of a grand strategy to become the dominant global superpower. However, the primary driver pushing this expansion is the need to maintain the country's economic growth and ensuring a reliable supply of raw resources is essential to this. This overriding imperative will have a major influence on China's decisions with regard to future seabed mining in the region.

It can be expected that China will want to secure supply from undersea mineral deposits including in the Pacific. However, at the moment, China is concentrating on locating where the exploitable deposits are in the global ocean and developing the technology. There is an acknowledgement expressed by various officials including Tao Chunhui, one of China's leading oceanographers and a researcher at the State Oceanic Administration, that exploitation will only start when it commodity prices are such that it is economically profitable to do so, this implies that China is looking to the medium term rather than the short term to start mining.¹⁹¹

No evidence has been found that points to the three Chinese companies that are now integral to the Solwara 1 operation being the result of a coordinated strategy to fulfil a grand policy, strategy or need but rather this convergence of the three Chinese companies reflects their general business strategies.

Marine Assets Corporation (MAC) was awarded the contract by Nautilus to provide the PSV and flowing this MAC made the deal with Fujian Mawei Shipbuilding Ltd., no doubt largely based on competitive pricing and the ability of the Chinese shipyard to expedite the build. The PSV project fitted Fujian Mawei Shipbuilding Ltd.'s business model and the company's stated aim to be a global leader in the manufacture of support

vessels for the offshore sector.

Similarly, the takeover of SMD by CSR Times Electric was to help elevate the Chinese company's technological capabilities and enable it to enter and develop markets nationally and abroad.

Tongling Nonferrous Metal's involvement in Nautilus is just one of its many overseas operations, the Chinese company having pursued its stated aim to try to control more overseas mining assets and gain a greater market share in overseas countries since 2009.¹⁹²

That China now has a major stake in the Nautilus operation through this trio of companies has been noted by various observers: these include the Financial Times which frames the Fujian Mawei Shipbuilding Ltd. construction of the Nautilus PSV as an example of how China is increasingly turning to the ocean to secure control of resources to fuel its high-tech electronics industry.¹⁹³ While China is keen to shore up its position as the dominant supplier of metals to the world and is in the forefront of the race to exploit deep sea mineral resources in the region, (as evidenced by the fact that Chinese companies have three of the 27 licences awarded by the International Seabed Authority for deep-sea mining in the Pacific Ocean), it is not clear what importance the higher levels of the Chinese Government have pinned on the success of Solwara 1 with respect to their larger seafloor mining ambitions.

So far, the big gain for China from Solwara 1 is that it has helped place China at the forefront of deep-sea mining technology, Chinese companies having acquired SMD and undertaking the build of the PSV. As with every country that has invested in developing a future seabed mining industry, China is set to benefit in terms of its DSM knowledge if Solwara 1 becomes operational - Solwara 1 being an experiment not just for Nautilus but the DSM industry as a whole.

If Solwara 1 was to fail both Tongling and Fujian Mawei would suffer financially. Given

they are both SOEs, the two companies would presumably be able to open channels to talk to the relevant Chinese authorities and financial institutes about possible loans, rescue packages or takeovers. How such requests might be met is not at all clear, given that Chinese SOEs are expected to be profitable and commercial considerations will be important. Consequently, the factors that have hindered Nautilus securing the level of investment it requires will also play into any decision making in China.

It is also worth noting that the PSV, if not used for Solwara 1, could be used for DSM operations anywhere around the globe, as it is not tied to the PNG operation. This of course is one of the ‘advantages’ of investing in DSM promoted by the industry – once a deep-sea mineral deposit is exhausted, all the mining equipment can be moved on to the next site.

Importantly, it may be that two documents released by SASAC in January 2017 which clarify how the central SOEs should manage their investments may prevent Tongling or other Chinese SOEs from directly investing in Solwara 1. The political context will also be important in determining whether, where, how and when Chinese deep-sea mining interests expand in the Pacific. While in recent years strong relationships with China have been built by some of the PICs, especially Fiji and PNG, Pacific Governments and leaders are not inexorably bound but able to exercise choice as to which countries they partner with. For this reason, continuing to build on-the-ground opposition to DSM in the PICs and PNG in particular remains crucial.

SUGGESTED APPROACHES FOR THE DEEP SEA MINING CAMPAIGN

The current roles of the Chinese companies involved in Solwara 1, (i.e. manufacturing parts of the mining technology and an agreement to purchase the product), mean that none of the three companies make for an obvious campaign target at this time: in communication terms, it makes sense that the focus remains firmly on Nautilus. Additionally, the difficulties in finding more than minimal information about each of them and their financing, would make it hard to run a Chinese corporate campaign, especially without Chinese expertise/presence in China.

While the research did not reveal any new indications of Chinese intent of expanding activities in Pacific Island waters, the country is well positioned to step in.

The national legal framework which applies to Chinese companies operating overseas is complex and multi-layered, however the two documents released by SASAC in January 2017 which clarify how the central SOEs should manage their investments may provide a useful legal tool should there be indications that Tongling or another Chinese SOEs might be making moves to invest in Solwara 1. Specialist Chinese legal advice would be needed to examine this more closely and give an opinion.

Chinese companies are bound to comply with national laws and regulations so any

transgressions of PNG laws or the laws of other PICs that Chinese companies are operating in, should be noted, acted upon and communicated back to the relevant Chinese authorities.

Additionally, the PNG EITI requirements will mandate companies involved in Solwara 1 will have to report regularly about their operations.

As China continues to pursue global markets and Chinese companies move towards operating along existing global norms, so they are becoming increasingly sensitized as to how they are perceived reputationally. China's involvement in Solwara 1 should be made increasingly public by the campaign such that China is seen to be responsible for progressing a highly environmentally risky and likely damaging operation. This fact should be juxtaposed against the strong statements regarding the protection of the marine environment being made at the highest level by Chinese officials.

Similarly, Chinese companies are now expected to be financially viable and so the risks that make investing in Nautilus such a gamble are the same for any potential Chinese investors and companies that might be tempted to step in. Developing a finance campaign that communicates these risks beyond the Toronto stock exchange so that the message reaches potential Chinese investors would be a good strategy.

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