Report to the South Australian Parliament

Study Tour

People's Republic of China

Geoff Brock MP
Member for Frome

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Executive Summary

South Australia’s trade with China (source DFAT www.dfat.gov.au)

- China is South Australia’s 2nd largest trading partner after the United States
- Total two-way merchandise trade was worth 1.8 billion in 2007/08
- China is South Australia’s 4th largest goods export destination after the United States, Japan and the United Kingdom
- South Australia's goods exports to China were worth 816million in 2007/08 and have grown by an average 9% per year over the past decade

South Australia’s top 5 exports to China in 2007/08 were

- Iron ore $315m
- Copper $ 97m
- Wool $ 96m
- Alcoholic Beverages $ 32m
- Liquefied propane/butane $ 26m

Services Exports:

South Australia’s top services exports to China were education and tourism. In 2007 South Australia hosted over 8000 Chinese students and received around 15000 visitors.

Areas with export potential include Education Services for learning English as a second language

Goods Imports:

China is South Australia’s 2nd largest goods import source after Singapore with imports from China valued at $997m in 2007/08.

South Australia’s top 5 imports from China in 2007/08 were

- Clothing $ 66m
- Fertilizers $ 62m
- Furniture $ 59m
- Toys, games & sporting goods $ 55m
- Motor vehicle parts $ 38m
From Monday 10th August to Friday 21st August I travelled to China for a two week study tour.

I was assisted with the arrangements for this trip by Mr Malcolm Peters from Malcren Pty Ltd and Mr Aaron Duff, the Business Development Manager from the Commercial Representative Office of the Government of South Australia in China.

During this visit I toured Shanghai, Tianjin City, Beijing and Tanguu Province. I was accompanied during most of the visit by Mr Malcolm Peters of Malcren Pty Ltd, who made the trip at his own expense.

Mr Peters is the sole director of Malcren Pty Ltd, which is a consulting, facilitating and trading company. The company was incorporated to bring together information and build trade relationships between Australian and Chinese companies. Relationships have been built on cooperation, trust and honesty over many years. South Australia is firmly the favourite location for co-operative business ventures. Currently Malcren Pty Ltd exports Australian butter and margarine to China.

Malcren Pty Ltd is also working towards projects for South Australian rural regions to secure clean water and utilization of green energy products. Partly due to water and power shortages, many large companies will not move to regional cities and towns. Encouraging large factories to relocate to a rural city or town, will also encourage smaller feeder companies to relocate, thereby creating employment and boosting regional economy.

This visit was undertaken with the support of the Government and the Opposition and in accordance with Parliamentary Guidelines.
Objectives

The objectives of this trip were to meet with private and government enterprises to observe, investigate and gain a greater understanding of a range of new and available technology associated with water security, renewable energy, wind farms, solar power, geothermal power, desalination plants, water harvesting and water recycling, and any other viable opportunities for South Australia.

With the assistance of Mr Malcolm Peters, the tour was planned and arranged to take advantage of a number of opportunities, which included:

- Meeting with staff from China office of the Commercial Representative Office of the Government of South Australia (CRO).
- Visit to Expo 2010 Exhibition Hall in Shanghai.
- Tour of Shanghai to observe refurbishment and construction projects, super highways, flyovers, road construction and new constructions.
- To meet with and visit various businesses in Beijing, Shanghai, Tianjin City and Tanguu Province for an exchange of information, site visits and presentations, including:
  - Tianjin Eagle Investment Development Company Limited
  - Tianjin Wind & Energy Association (TWEA)
  - Tianjin Soda Alkaline Factory
  - IDE Technologies Limited
  - Kenli Economic Development Zone of Shandong Province
  - Ever Source Co Ltd (Tianjin)
  - Rechsand Science & Technology Group
  - Shanghai Solar Energy Science & Technology Co.Ltd
Commercial Representative Office (CRO) of the Government of South Australia (Shanghai)

The Commercial Representative Office (CRO) of the Government of South Australia in China assists South Australian companies in forging new relationships with Chinese partners, marketing products more effectively and establishing operations. They provide cultural training, business matching and networking, and logistical support for business trips. The CRO provided assistance with my proposed itinerary and provided an overview of further potential contacts that could be made during my visit. The CRO met me upon my arrival in China, and provided invaluable cultural advice and support.

The CRO hosted my visit to the Expo 2010 Exhibition Hall in Shanghai. This is a large exhibition to be held in May 2010 for six months. Australia will be participating in this Exhibition. Construction of the Australia Pavilion has begun. Hundreds of thousands of attendees are expected. An extract from the website details this event as follows:

"Expo 2010 Shanghai China will be a great event to explore the full potential of urban life in the 21st century and a significant period in urban evolution. Fifty-five percent of the world population is expected to live in cities by the year 2010. The prospect of future urban life, a subject of global interest, concerns all nations, developed or less developed, and their people. Being the first World Exposition on the theme of city, Exposition 2010 will attract governments and people from across the world, focusing on the theme "Better City, Better Life." For its 184 days, participants will display urban civilisation to the full extent, exchange their experiences of urban development, disseminate advanced notions on cities and explore new approaches to human habitat, lifestyle and working conditions in the new century. They will learn how to create an eco-friendly society and maintain the sustainable development of human beings.

Expo 2010 Shanghai China will centre on innovation and interaction. Innovation is the soul, while cultural interaction is an important mission of the World Expositions. In the new era, Expo 2010 Shanghai China will contribute to human-centred development, scientific and technological innovation, cultural diversity and win-win cooperation for a better future, thus composing a melody with the key notes of highlighting innovation and interaction in the new century."

Staff from the CRO also took me on a 5 hour tour of Shanghai. This tour showed immense activity, including refurbishing of current residential and commercial buildings, erection of new shopping centres, construction of numerous super highways, flyovers and general road construction.

With the assistance of the CRO, I travelled from Shanghai to Beijing. This entailed a 2½ hour drive to the Shanghai airport followed by a 2½ flight to Beijing. After being collected at the airport by representatives from the Tianjin Eagle Investment Development Company Limited, it was another 3 hour drive to Tianjin City! This entire day was spent travelling. The Tianjin Eagle Investment Development Company Limited generously provided the services of two interpreters for the duration of my visit at no cost. The company also hosted a social dinner that evening, at which discussions were of a social nature and familiarising with the translators and cultural customs.
Tianjin Eagle Investment Development Company Limited

The Tianjin Eagle Investment Development Company Limited;

- construct and develop large commercial and residential projects in China, with a focus on sustainable growth to provide future clean air and water;
- are a major contributor of the design and development of the largest desalination plant being constructed in Tianjin;
- have plants that treat industrial waste water with the resultant clean water recycled and the solid waste disposed of environmentally; and
- own several subsidiary companies in construction, trading, green technology and geothermal products.

I gave a detailed presentation which principally included an outline of current mining activities, proposed expansions of the mining region and the subsequent impact of these expansions throughout the Upper Spencer Gulf and Frome Electorate. It was explained that the mining companies need to research alternative supplies of water and power to supplement the expansions. An emphasis was placed on the importance of these proposals and their impact upon South Australia, its economy, its environs and the need to ensure viability of these resources for the future.

After the presentation, the discussion centred on how China and South Australia could work together to supply and construct plant, equipment and infrastructure for the mining industry. The logistics for the delivery of housing and accommodation needs to the mining region were also discussed. South Australia, and in particular the Frome Electorate can provide the logistical requirements of road, rail and sea, as well as tourist and recreational centres. As an entire package for business and relocation opportunities, the Frome Electorate has it all.

The development of industrial warehousing and manufacturing infrastructure was discussed in detail. The logistics of this include supply of all materials from China to be shipped to Adelaide, transported by rail to Port Pirie, stored, assembled and delivered to the mining region from Port Pirie. This would require appropriate factory assembling facilities, warehouse and storage facilities and provision of appropriate transport. The benefits of Port Pirie were discussed, and it is to be noted that:

- the location is ideal for delivery to all interstate areas, and travel is easily available north/south/east/west for both train and road transport;
- cost effectiveness for warehousing, assembly and storage in Port Pirie rather than in Adelaide;
- there is a sea port in Port Pirie.

Tianjin Wind & Energy Association (TWEA)

The Tianjin Wind & Energy Association (TWEA) is the first professional wind energy local association in China, which was set up in February 2008 and now has 85 member enterprises.

An introduction to this company taken from their website is as follows:
Tianjin Wind Energy Association (TWEA) is the first professional wind energy local association in China and set up on February 16, 2008. And TWEA is supported by Tianjin High-Tech Industry Park.

Tianjin Wind Energy Association has 85 member enterprises at the present, including High-Tech Holding Group, Tianjin Benfei machinery electric holding group Ltd., Jineng, Gamesa, Siemens, Suzlon, Dongqi, Mingyang, SERI, Xinnao Xinfei and Hebei University of Technology are the backbone members of the Association, and also include LM, Winergy, Repower, Concord, Jingcheng Machine Tool, Fengtong and TBEA and so on some well-known Chinese and foreign enterprises. It's a professional association with strong specialty and coverage and also impact a wide range.

I gave a presentation to TWEA and some representatives of their member enterprises in a similar manner as given to Tianjin Eagle Investment Development Company Limited.

**Gamesa Corporation Tecnologica**

I met with Gamesa as a result of my meeting with the TWEA. Gamesa also gave a presentation of their operation. I learned that they are one of the main wind turbine manufacturers in the world.

I was unable to obtain a copy of their presentation. However I then was given a tour of their factory in Tianjin to see the assembly of the generators and gear boxes and their testing facilities. I was advised that the blades of each turbine are delivered directly to the site, and were not part of this tour.

*The Gamesa Corporation Tecnologica and their work places are certified according to ISO9001. They are well positioned to provide renewable energies for the next revolution of humanity.*

An excerpt from their website says:

*"Gamesa is a company specializing in sustainable energy technologies, mainly wind power. Gamesa is the market leader in Spain and is positioned among the most important wind generator manufacturers in the world. Gamesa has installed more than 16,000 MW of its main product lines in 20 countries spread out over four continents. The annual equivalent of this production amounts to more than 3.45 million tons of petroleum (TPE) per year and prevents the emission into the atmosphere of over 24 million tons of CO2 a year. With a portfolio of more than 21,000 MW of wind power being promoted in Europe, America and Asia and branches in 13 countries, Gamesa is well positioned as one of the world's most important companies in the promotion and development of wind farms."

Further information about Gamesa extracted from their website:

*"Gamesa is one of the main wind turbine manufacturers worldwide and leader in Spain in the sector of the manufacture, sale and installation of wind turbines. In 2008, it was ranked third worldwide in wind turbines supplied, with more than 16,000 MW installed and with an accumulated market share of 14% (BTM Consult ApS). Gamesa has its own extensive design and technological development capability for wind turbines, as well as the largest integral production capacity, comprising the manufacturing of blades, root joints, blade moulds, gearboxes, generators, converters and towers, besides assembling the wind turbines (manufacturing facilities in US, Europe and China). Gamesa offers a wide product range with two platforms of a respective rated power of 850 KW and 2.0 MW which include several models. The main characteristics of Gamesa's wind turbines are their robustness, adaptability, reliability and maximum performance on all types of sites and in all types of winds."*
The marketing and maintenance of Gamesa equipment is undertaken on a global basis, through the trust and peace-of-mind provided by proximity to the customer. Gamesa has already supplied wind turbines to the Germany, Argentina, China, Korea, Cuba, Ecuador, Egypt, Spain, France, Greece, Hungary, India, Ireland, Italy, Japan, Morocco, Mexico, Poland, Portugal, Taiwan, Tunisia, United Kingdom, United States and Vietnam, and has an extensive marketing network which includes sales offices in Germany, Bulgaria, China, Italy, Denmark, United States, Greece, Hungary, Portugal, France, United Kingdom, Romania and Poland, and branch offices in Mexico, Morocco, Egypt and Tunisia.

Tianjin Soda Alkaline Factory

This factory uses "clean" water to produce soda and alkaline products. The company developed technology for a water treatment process to produce "clean water" for use in the manufacturing process. Water is sourced from the sea and a local reservoir containing rain water and run off water from various locations, including waste water from an old, but functioning industrial area. This sourced water is similar to the water that is currently being disposed of by the Nyrstar Smelter at Port Pirie.

I gave a presentation of the opportunities in Regional South Australia and also reinforced the State Government’s policy on renewable energy and the opportunities.

I met Zhang Hui, General Manager and Guo Qiang, Vice General Manager & General Engineer.

The water goes through two stages of a reverse osmosis (RO) process.

**What is Reverse Osmosis?**

To answer this question it is first necessary to understand what Osmosis is.

Osmosis is a natural process that occurs in all living cells. Water permeates through a membrane that excludes suspended solids, dissolved salts and larger organic molecules. These semipermeable membranes have pores of approximately 0.0005 microns in size.

Water molecules have a stronger tendency to escape from pure water than from a salt solution. Water flows through the semipermeable membrane from the pure solution to the salt solution in an effort to equalise the osmotic pressure of the two solutions.

The Osmosis process may be reversed by applying pressure to the salt solution. In Reverse Osmosis, water from the salt solution is forced back through the semipermeable membrane to the pure solution. The process stops when the osmotic pressure of the increasingly salty solution equals the applied pressure.

In practice the salt solution must be continuously replaced before the osmotic pressure rises significantly. This is achieved using a cross flow mechanism where the surface of the semipermeable membrane is continually flushed. Therefore, commercial membranes have an inlet stream and two outlet streams. The inlet is known as the Feedwater and the outlets are the Permeate (pure water) and the Concentrate (reject water).
The process:
The water is pumped into the factory from the reservoir and goes into a holding tank. From there, it is fed into a membrane where an RO process occurs. It is then fed into a second holding tank and then onto a second set of membrane for a further RO process to remove more contaminants. This final product is then sent to storage tanks and fed through to the factory for use.

This original water source has a 1200 TDS salt component. This process can produce 8,200 MTPD (metric tonnes per day) of useable water for production. This water is then reduced further to a distilled water standard, then 350 MTPD would be produced.

I believe that the technology and processes explained to me and viewed by me during this tour could be beneficial for the cleansing of the water currently disposed of by Nyrstar Smelter in Port Pirie through their Process Effluent Treatment Plant (PETS). I will be having further discussions with the designers and manufacturers of this process to ascertain the suitability for a similar operation at the Port Pirie Nyrstar Smelter.

The original water mixture to be processed was held in a large reservoir about 11km from the factory (1 hour drive). Remembering that the water has a 1200 TDS salt component, it is also used for the breeding of fish! Before using the water for the factory process, as another value added component, the company use the reservoir for breeding and harvesting fish for sale to seafood wholesalers. Approximately 100,000 tonne of fish per produced per annum.

Whilst viewing this reservoir, I was advised of a marine aquaculture breeding facility nearby where the breeding and cultivation of seafood was conducted in above ground tanks within buildings. I was very interested in this, as there could be potential for this kind of operation in the Frome Electorate, particularly Port Broughton and Port Pirie. It was recommended that we visit the site and contact was made with the company who were delighted to have international visitors inspect their operation.

**Tianjin Jinshui Ocean Resources Development Co. Ltd**

This visit was not programmed however after a phone call they were very interested in having an International Visitor, in particular, a Politician, visit and inspect their premises and operation.

After an uneasy but polite conversation with Vice President Youyi Zheng and other members of the management, who did not exchange business cards, we were invited to join them for lunch.

The translators found it difficult to understand the representatives as they spoke a different dialect. However, I gave a verbal presentation only of the opportunities in Port Pirie and Port Broughton for a similar operation. They were very impressed with the potential opportunities shown to them. This was an ad hoc visit, and therefore I was only able to give a verbal presentation. However, this opportunity will be followed up with more information to be exchanged by relevant parties, to enable the company to properly consider the opportunities.
available to them in this region and for a potential delegation to visit South Australia.

**IDE Technologies Limited**

I visited the offices of IDE Technologies Limited (20 minutes from factory) at Hamatechet Street, Hasharon Industrial Park, Tianjin.

I met with Avshalom Felber, CEO and President of IDE Technologies Limited. The Head Office and R&D Facilities are in Israel, where Mr Felber is based. Two engineers from IDE also met with us.

I had facilitated this visit as I was aware from discussions with the Nyrstar Smelter in Port Pirie that they wanted to treat and re-use their discharged water in their Smelter Operation. They are currently considering how best to do this. One of the main objectives of this visit was to observe processes that would be similar to that required by Nyrstar.

I had held many discussions with Nyrstar and the Port Pirie Regional Council about the options available to Nyrstar. I understood that a membrane desalination with a modular reverse osmosis process was the best option for the Nyrstar Smelter Operation.

To assist with this, Nyrstar had provided me with a list of the contaminants in the water that is being discharged to the sea and other relevant information.

I understand that IDE Technologies Limited are a pioneer and world leader in the designer and manufacture of sophisticated water treatment solutions and able to produce the type of equipment that Nyrstar may require. IDE develop, design, manufacture, install and maintain plants for saline water desalination and effluent concentration for both industrial and domestic applications. They can produce membrane desalination or thermal desalination.

I gave a presentation on the Nyrstar Smelter operation in Port Pirie. I explained that once sea water had been used by the Smelter in its operation 700mL of water is currently being released back into local waters, with the approval of government agencies, including the Environment Protection Authority.

It should be noted, that the Nyrstar Smelter and the Port Pirie Regional Council have approached State Government for funds for a water treatment plant to treat this water. Included in this project is treatment of the final sewer water discharged at the effluent treatment plant of SA Water in Port Pirie. This request was denied by the State Government. Instead, the State Government advised that they would allow more water allocation from the River Murray. Considering the continued lack of water supply to this area, and clear deterioration of the River Murray, the PPRC and Nyrstar did not believe this was the best option for themselves, or South Australia. Therefore, at this stage, production of water treatment plant as part of the Nyrstar Smelter Operation would be funded by the company alone.
An excerpt from their website details:

"IDE Technologies is a world leader in the delivery of sophisticated water solutions, designs and manufacturing of plants for saline water desalination

Membrane Desalination
Water Treatment and Reverse Osmosis desalination plants are used for treating a wide variety of water compositions, be they tap, brackish or sea water. These Reverse Osmosis (R.O.) plants combine the accumulated know-how and experience that have kept IDE a market leader for the past forty years. In 2005, IDE completed the construction and start up of the world largest SWRO plant in Ashkelon, Israel, with an annual capacity of 100 Million cubic meters (80 MGD).

Osmosis
When two aqueous solutions of different concentrations are separated by a semi-permeable membrane, water will diffuse through the membrane into the concentrated solution. This phenomenon is called osmosis. The semi-permeable membrane allows water to pass through it, but prevents the passage of salts (ions) and other molecules from the concentrated solution.

Osmotic Equilibrium
The osmotic flow continues until osmotic equilibrium is reached. The resulting pressure differential between the diluted and concentrated solutions is called the osmotic pressure.

Reverse Osmosis
When a pressure higher than the osmotic pressure is mechanically applied to the concentrated solution, pure water will flow through the membrane to the diluted solution, leaving dissolved salts and impurities behind. This phenomenon is called reverse osmosis.

Features of the IDE Reverse Osmosis Process:
- Pure water can be extracted from tap, brackish and seawater
- Superior reliability and availability
- High quality processed water
- Optimal selection of Reverse Osmosis membranes
- Compact plant design and reduced initial investment
- Low cost desalination with reduced energy consumption
- Short delivery and installation time
- Easily expandable modular design
- Simple operation and easy maintenance
- Minimal environmental pollution

Established in 1965, IDE Technologies Ltd. is internationally recognized as a pioneer and leader in the delivery of sophisticated water solutions.

IDE specializes in research and development of saline water desalination processes, concentration and purification of industrial streams, wastewater treatment, heat pumps and ice/snow machines.

IDE develops, designs, manufactures and installs sophisticated equipment for industrial and domestic applications throughout the world. Our equipment and plants are based on self-developed processes and state-of-the-art technology. In addition IDE provides post-sales maintenance and support for plants delivered to our customers.

We work together with our customers, responsive to their needs and requirements, thus creating strong and lasting relationships. In this way we are able to tailor solutions that best meet the customer's needs, with maximum benefit to all parties. IDE's ongoing commitment to providing optimum solutions and quality service has earned us the trust and satisfaction of our customers."

Kenli Economic Development Zone of Shandong Province

I was met by the Mayor of the Shandong Province and other officials from the Governing Council of the Kenli Economic Development Zone. I gave a very comprehensive presentation on the Upper Spencer Gulf, including the mining and renewable energy opportunities for the north of the State. I also gave a presentation on the City of Port Pirie and surrounding areas which included the lifestyle and opportunities for renewable energy. From this discussion it was
evident that this Province, in particular, were not fully aware of the vast mining opportunities that are forthcoming in the north of our State. I explained that the necessary requirements for growth opportunities in the resource sector hinged on water availability.

After presentation and luncheon I was taken to the fish breeding facilities. This was a 2 1/2 hour drive to a location very similar to the western part of the City of Port Pirie. This area commenced approximately 2 years ago, and all power requirements are provided by renewable energy, being solar power and wind turbines. These operations included dredging from the nearby ocean which is approximately 5km away from the site, and they then established very large dams which were utilised for various forms of fish for breeding. Intriguingly the first lot of dams included the cultivation of sea cucumbers which take approximately 3 years from planting to cultivation. These are grown completely under the saline water and they are a delicacy with the Chinese people of the region. Also I had the opportunity to look at the other breeding ponds which would have numbered approximately 40 and would have covered a location of maybe 40 hectares and these are in their infancy with the roads leading and around are being established. Eventually this whole area will have accommodation for the many workers that will be required for these projects. This new infrastructure will not only house the workers required for the fish breeding opportunity but also will open up for tourism opportunities for this region.

This project could be beneficial for fish breeding opportunities on the western part of the City of Port Pirie. This area is low lying, useless for any other development in particular current agriculture production, however it could be utilised for dredging from the Spencer Gulf to ponds for fish breeding. The only requirement would be utilising renewable energy, whether that is wind turbines or solar power. Discussions will be held with the Port Pirie Regional Council and the Barunga West Council and also the Southern Flinders Ranges Development Board in this regard.

This facility “Dongyingshiandaishengtaiyuyezonghefuwuquxiaokantu” is completely owned by the Government of the People’s Republic of China and as such there were no business cards to be obtained.

**Ever Source Co Ltd**

We had a non-site inspection at their factory and I gave a presentation of the opportunities in the Upper Spencer Gulf and Port Pirie. From there I was shown the actual heating and cooling process of the building.

An excerpt from their website details:

_“Geothermal Heating & Cooling_

In the Renewable Energy House, geothermal energy is used in the form of a geothermal heat pump with 2 vertical borehole heat exchangers (“vertical loops”) each 115 m deep. During winter the heat pump is used to heat the back building offices and conference rooms. The design of the radiators in the back building secure a typical maximum supply temperature in the order of 35-40 °C and in any case below 55 °C. The maximum heat load for the back building is 25 kW. The heat pump transforms energy from a lower temperature level into heat at a high temperature level where it can be used for heating._
purposes. The heat pump used in the Renewable Energy has a maximum heating output of 28.3 kW. The geothermal system is not only used for heating but acts also as a heat sink for the excess condenser heat of the solar absorption cooling system in summertime. Not only does the design of the borehole heat exchangers have to account for the heat load but also for the excess heat injection from solar cooling in summer. The 2 borehole heat exchangers are installed by drilling inside the interior courtyard of the building that is being utilised.

The ground water is extracted and put through the "exchanger" which converts to either "cooling" or "heating" and this is then vented through the existing ventilation systems that the building may already have. The water can be of any quality – brackish – saline – or any suitable water. This water after being extracted is returned to the "reservoir" and can be reused for the process to continue.*

From the information given by the demonstrators, the ongoing costs after the initial installation will be approximately 25% of the previous operating costs. From discussions the company wants to install a demonstration site in South Australia, and as a result it was agreed to endeavour to place the demonstration plant in Port Pirie.

Discussions have taken place with Port Pirie Regional Council and the required details have been forwarded to Ever Source Company Limited for their evaluation regarding the suitability of providing the Port Pirie Regional Council building facility to be utilised as a pilot plant for Australia and South Australia. I am awaiting a response from this company and the Port Pirie Regional Council to allow further progress for this great opportunity.

This process may also be suitable to Tomato Glasshouse operations specifically in the Clare and Gilbert Valleys Council areas.

**Xinjiang GoldWind Science & Technology Co., Ltd.**

An invitation was extended to me from representatives from **Xinjiang Goldwind Science & Technology Co** as a result of my presentation to the TWEA.

Therefore, upon my return to Beijing from Tinajin City I arranged for a driver and motor vehicle to take me to their turbine assembly plant and was given a very comprehensive tour of their operations and gave a further presentation to the assembly plant management. Present at this presentation was Mr SUN Linjin and also Ms XU Xiaoli (Susanna) Manager, International Turbine Production.

Whilst they do not manufacture all the parts of this plant, the company works with other wind turbine manufacturers with all the parts coming into this location where they are checked and tested under the appropriate conditions for the wind turbine locations internationally to ensure their capability and endurance. I was very impressed with the excellent layout of the production line and the cleanliness of the facility.

Details from the company's overview:
“Xinjiang GoldWind Science & Technology Co., Ltd. engages in the development and manufacture of wind turbine generators in the People’s Republic of China. The company offers wind turbine generators ranging from 1,500 kilo watt (KW), 1,200KW, 750KW, to 600KW. It also provides professional services for wind power generation systems and customers wind farm construction, as well as related technical services. The company was founded in 1998 and is based in Urumqi, the People’s Republic of China. Tianrun is the international investment arm of GOLDWIND and was founded in April 2007.”

From information provided to me, I learned that this company:

- Have assets totalling over 1.9 billion RNB.
- Have projects in China, America and Canada. They have also set up an office in Sydney in 2008 with 4 staff.
- They joined the Australian Clean Energy Council in September 2008 and are currently looking to establishing a demonstration wind farm with a capacity of 30MW, worth AUS$100million in Australia.
- **At the time of my visit to China the company were only looking at New South Wales.**
- **However, due to my visit, the company are now considering other opportunities within South Australia and in particular the Northern region of SA.**
- **This demonstration plant will be the first stage of Tianrun’s 3 year plan to build and install 500MW worth of wind power towers and to gain 15% of Australia’s market share.**
- The preliminary planning calls for all components and key parts to be shipped from China due to the very high cost of being manufactured and cast in Australia.

**Rechsand Science & Technology Group Co Ltd**

Another opportunity arranged by Aaron Duff from the CRO in Shanghai was to speak with **Rechsand Science & Technology Group Co Ltd.** I met with members of this organisation. The founding Chairman of **Rechsand Science & Technology Group**, Professor Qin Sheng yi attended the presentation. It was a great honour to have the founding Chairman meet and talk with us.

Also at the meeting was **Mr Qin Shengyi General Manager, Mr Ken Longing Chief Executive Commercial Department and Cassie, Assistant to Chief Executive Officer.** Mr Qin was in Australia recently, at the invitation of the Chinese Government Representative Office and met with Uni SA, investigating the potential for utilising South Australian sands for their products.

The company creates pavers that are strong, versatile, heavy and come in various sizes. The pavers are made using drift sand similar to that found in Saudi Arabia. The sand used must contain specific elements to ensure the characteristics of the pavers. These pavers have been used in Tiananmen Square (approximately 100,000 m²). To describe their use, water comes through the top of the paver, through the porous brick, which then acts as a filter. The water can then be collected and re-used.

This type of paver could be used in housing developments, to save water and recycle water. I understand that Mitcham council are trialling a similar product.
The company also developed another brick to put in sewer systems and septic tanks. The brick filters the off flow, which is not drinkable, but however is suitable for garden use. The solids are diverted and used for fertilizer.

Their R&D team are also working on sea water filters, so that filtered sea water could come through as drinking water. The final result from this R&D should be available in the next 2-3 years.

Some information regarding this company is as follows:

"Beijing Rechsand Science & Technology Group Co., Ltd (short for Rechsand) is a high-tech enterprise integrating with science, industry and trade, headquartered in Shangdi information industry base of Haidian District in Beijing. Until now, Rechsand owns 6 subsidiary companies, 1 research institute, and 3 manufacture bases.

Since founded in 1993, Beijing Rechsand Science & Technology Group Co., Ltd (originated from Beijing Changcheng New Casting Technology Development Co., Ltd) has devoted itself to continual innovation, established a perfect independent-innovation system and a special management pattern, formed a management system integrated with science, industry and trade, developed creatively a sand industry.

Until now, Rechsand sand industry has three kinds of sand products, as follow.
1. ZFS: A new precision casting material in mechanical manufacturing.
2. FSS: A new prop pant for Fracturing Treatment and Sand Control in Oil Exploitation Industry.
3. STS: A new ecological environment-protective construction material applied in municipal construction, landscaping, sports ground and water conservation.

Rechsand has been certificated by ISO 9001, ISO 14001 and OHSAS 18001, so the quality of the products can be guaranteed. Rechsand is a worldwide leading company in sand industry, supplying not only sand products but also problem solutions."

Shanghai Solar Energy Science & Technology Co Ltd

I met with Zhang Zhong Wei, General Manager and Daisy Xu, Manager of Imports and Exports and other members of Management. I gave a presentation regarding the opportunities in regional South Australia, including the State Government's policy and renewable energy.

I was given a tour of the manufacturing plant and was very impressed with the layout and the cleanliness.

The buildings that house their operations are covered by solar panels, this coverage is on all walls and the roof area. From this they are providing their total power requirements and are producing in excess of their needs, this excess is then transferred to the "grid" and payment from the power authority is returned to the business side of their operations.

This company is always investigating new opportunities and technologies through new innovative ways.

They work with many of the world's leading companies, constantly improving all-round and long time technologies and equipment to enhance their growth and create many opportunities for further renewable energy directions.
They also currently own dozens of patents across the world. I was very impressed with the dedication and preparedness of this company to not only explore new directions but also to work with other leading industries.

From the company overview:

"The company produce Solar cells which are an energy conversion device converting sunlight into electrical energy which is called "photovoltaic". When sunlight hit the surface of diffused semi-conductor (wafer), a P-N junction is formed, and electricity comes out from the electrode printed on both front and back surface of the solar cells.

After years of research and development, this company has developed terrestrial PV modules with dozens of specifications in two major series of monocrystal silicon and polycrystal silicon. This company can also research and manufacture solar models of different specifications and other relevant products to accommodate each customers varying needs.

The company's modules can be constructed into various off grid and on-grid PV systems. Since the establishment of the company they have constructed the "bright engineering" project in Tibet, which produces and supplies electricity to the far west provinces and so far have completed more than 300 stations, including all off-grid and grid-connected PV systems."

I visited a number of other companies that I have chosen not to detail in this report, as the operations observed and visits made were of a similar nature to those already described in detail. All presentations given by me were of a similar nature and referred in detail to the opportunities available within South Australia to the technologies continually being developed by the People's Republic of China. However, with some visits translation was difficult on both parts due to differing dialects.
Summary of Recommendations

- To meet all Local Governments within the Electorate of Frome to facilitate discussions regarding this visit.

- To meet with all Regional Development Boards within the Electorate of Frome to facilitate discussions regarding potential opportunities.

- To meet and lead discussions with members of the Upper Spencer Gulf Common Purpose Group regarding the potential opportunities for the resource activities in the north of South Australia.

- I have extended an invitation to all of the Companies, Business and Associations visited to visit South Australia and in particular the Electorate of Frome. I have and will continue to follow up these invitations over the coming months.

- To hold discussions with Premier and Deputy Premier regarding the potential opportunities and to report some “short comings” that became evident to me during my visit.

- To meet with Nyrstar Corporation regarding various opportunities that may be relevant to their business, particularly from the Soda Alkaline Company and IDE Technologies.

- To continue discussions with the Port Pirie Regional Council regarding geothermal opportunities with Ever Source Company to set up a pilot plant for their operation in Australia.

- To monitor the R&D of Rechsand Science & Technology Group regarding their bricks and pavers, especially with respect to filtering sea water.
Conclusion

The Chinese advances in technology are astounding, and there seems nothing that cannot be achieved. The Chinese people have clearly identified their ongoing need for renewable energy and recycling and harvesting of water. This was demonstrated to me throughout my visit - the opportunity for the everyday use of renewable energy and resources.

The South Australian Government should consider increasing representative numbers to the People’s Republic of China, particularly in the outer provinces. It was very evident during my visit that these regions do not have an awareness of the variety of opportunities available in South Australia, and in particular Northern South Australia.

South Australia should continue to monitor progress and technology of renewable energy and the ongoing research and development being established throughout the various regions of China and Asia.

As a result of this trip I have a better understanding of the wide range of technology associated with renewable energy, wind farms, solar power, geothermal power, desalination plants, water harvesting and water recycling. I have been able to observe first hand how the Chinese people utilise and apply these technologies to their everyday lives.

I have made numerous contacts during my visit, and I intend to develop these relationships. The issues of renewable energy and water security are critical to our State’s long term viability and sustainability. Development of relationships with the contacts made during my visit should continue to facilitate discussions regarding the technology available in China, and the opportunity to develop and utilise these technologies in South Australia.

This visit to the People’s Republic of China increased my knowledge and awareness of the numerous opportunities available for renewable energy, both solar and turbine power, desalination plants, water harvesting, geothermal power, fish breeding - to name a few. I now have a greater perception of what can be achieved if we look beyond our own back yard.

I thank the staff of the Commercial Representative Office (CRO) of the Government of South Australia in Shanghai for their outstanding support and advice during my visit. I would also like to thank the Tianjin Eagle Investment Development Company Limited for their provision of two interpreters for the duration of my visit at no cost. I was assisted with the arrangements for this trip by Mr Malcolm Peters from Malcren Pty Ltd who made the trip at his own expense and whose knowledge of local customs and businesses was invaluable.

Finally, I would like to thank the Government and the Opposition for their support of this trip. I believe I have harnessed a wide range of information that could be invaluable to the future of South Australia.

NB: Relevant photographs will be posted on the Frome website in the near future.
Contact Details for Entities & Individuals

Commercial Representative Office (CRO) of the Government of South Australia

Mr Ken Xu, Chief Representative
Mr Aaron Duff, Business Development Manager

Commercial Representative Office, Shanghai
Government of South Australia
Tel: +86 21 6473 2323
Fax: +86 21 6415 5867
Mobile: 13774445149

Room 3203, 32nd Floor, Huaihai Plaza
1045 Huaihai Middle Road
Shanghai 200031, P.R. China

Email: ken.xu@sagov.org
E-mail: aaron.duff@sagov.org
Website: www.sagov.org

Tianjin Eagle Investment Development Co. Ltd

Mr Youyi Zheng, Board Chairman
Mr Kemo Che, Deputy General Manager
Ms Mchristol Wang, International Department (and interpreter)
Ms Linda Hao, International Department (and interpreter)

11th Floor Block C
Hi-Tech Information Square
No.Huatian Road
Huayuan Industry Area
Nankai District
Tianjin  China  300384

Tianjin Wind Energy Association (TWEA)

Mr Changgui Wang, General Secretary
Mr Fengzhu Wang, Senior Engineer

Room 308A
Huake Business Center
No 3 Kaithua Road
Huayuan Industrial Park
Tianjin City  China  300384
Tianjin Soda Alkaline Factory (Tianjin Soda Plant)

This company is completely owned by the Government of the People's Republic of China. As such there were no business cards to be obtained.

No 87 Xinhua Road
Tanggu
Tianjin China 300450
Web: http://tjsoda.en.alibaba.com

Tianjin Jinshui Ocean Resources Development Co. Ltd

Mr Youyi Zheng, Vice President
34 Kaixiang Gardening Villa
Shuishang North Road
Nankai District
Tianjin China 300191

IDE Technologies Ltd

Mr Avshalom H Felber, C.E.O. & President
Hamatechet Street
P.O.B. 5016
Hasharon Industrial Park
Tianjin

Ever Source Co Ltd (Tianjin)

c/- Mr Youyi Zheng, Board Chairman

Tianjin Eagle Investment Development Co. Ltd

11th Floor Block C
Hi-Tech Information Square
No.Huatian Road
Huayuan Industry Area
Nankai District
Tianjin China 300384
Kenli Economic Development Zone

The Kenli Economic Development Zone is part of the Shandong Province and is completely owned by the Government of the People’s Republic of China. As such there were no business cards to be obtained.

Xinjiang Goldwind Science & Technology Co. Ltd

Ms Xiaoli Xu (Susanna Xu), Goldwind International, Sales Manager
Mr Sun Linjun, Technical Support, Goldwind International

19 Kangding Road
Economy & Technology Development Zone
Yizhuang
Beijing China 100176

Rechsand Science & Technology Group

Mr Qin Shengi, General Manager (and founding Professor)
Mr Ren Longing, Commercial Department

No 9 3rd Street
Shangdi,
Haidian District
Beijing China (100085)

Shanghai Solar Energy Science & Technology Co Ltd

Mr Zhang Zhong Wei, General Manager
Ms Daisy Xu, Manager of Import & Export Division

555 Shen Nan Road
Xin Zhuang Industrial District
Shanghai
Indoor marine aquaculture breeding facility - Tianjin Soda Alkaline Factory

Drinking water from Tianjin Soda Alkaline Factory after the reverse osmosis process.

Giving presentation to IDE Technologies regarding Nyrstar operations

Kenli Economic Development Zone of Shandong Province – Plans of fish breeding and residential facilities.