SPECIAL REPORT ON SINGAPORE

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Innovation, Evolution and Growth

Chemical Industry in Singapore

Boasting an advanced, integrated petrochemicals hub, a range of world-class service providers and an ideal business environment, Singapore has successfully attracted the chemical industry's leading players. As competition increases in the region the country is looking to move further downstream, increase its efficiency and enhance its R&D capabilities.

Singapore is a country that consistently punches above its weight. Despite being the smallest nation in South East Asia with a landmass of only 274.2 square miles and a population of just under 5 million, the island city-state is the 5th wealthiest country in the world in terms of GDP per capita (49,433 USD in 2009). That this astonishing feat has been achieved in a mere 49 years since the country attained its independence from Britain in 1961 is remarkable.

ExxonMobil Chemical's world-scale Singapore Chemical Plant has been operating on Jurong Island since 2001

A combination of factors help to explain Singapore's stratospheric development. At the heart of this growth, and the fundamental driver of the country's economy, is its geographical position. Located in the middle of Asia on the Malacca straights, the island is an ideal shipping point for goods traveling along the east west shipping lines that link Asia Pacific to the West. Since the British recognized its potential in the 19th century, Singapore has developed into one of the world's most important shipping and trading hubs. Today the Singapore Port is the world's busiest in terms of total shipping tonnage and is responsible for a staggering one fifth of the world's container transshipments.

Lacking space and natural resources, the country has cleverly leveraged its unique position. Through importing raw materials for manufacturing and refinement and exporting finished products, the country has succeeded in building up an impressively diverse high-tech manufacturing sector, currently responsible for a quarter of the country's GDP and vital for driving economic growth. Singapore has managed to achieve such impressive growth by investing heavily in infrastructure, taking advantage of the fact that English is the national language, a willingness to adopt new technologies, ensuring strict intellectual property protection and a knack for planning ahead. An innovative mixture of free market and economic planning (the so-called Singapore Model), access to a highly skilled and educated workforce, and a stable, corruption-free government has helped to ensure the right infrastructure and economic conditions for attracting significant foreign investment.

Rated the most business friendly country in the World Bank's "Doing Business 2008" report, Singapore has attracted over 3,000 foreign multinationals from the US, Japan and Europe. With excellent transport and communication links and numerous free trade agreements (16 bilateral and multilateral with 24 trading partners, as of 2009) supporting its location at the centre of Asia Pacific, the country remains a top choice for companies looking to enter or expand in the region.

Through the creation of the Economic Development Board (EDB), responsible for creating solutions to attract investors and companies to Singapore, Singapore has ensured that opportunities are well developed and created a centralized body for speeding up and aiding the investment process. EDB has also developed a range of attractive investment incentive programs.

A fundamental pillar of the country's manufacturing sector, Singapore's chemical industry has been remarkably successful in the last 15 years, experiencing phenomenal growth. The Energy and Chemicals sector contributed 38.6% of total output worth around 97 billion Singaporean Dollars (SGD) in 2008.

With the right measures in place, including a cutting edge 'plug and play' chemical facility at Jurong Island which has attracted over 31 billion SGD of investment, world-class expertise including excellent R&D and training facilities and attractive government incentive packages, the industry is continuing to expand and develop.

The industry is however facing some challenges. As a response to growing competition from India, China and the Middle East, and rising production costs at home, Singapore is seeking to distinguish itself and keep its competitive advantages by developing its downstream production and moving up the value chain, developing its expertise in specialty chemicals and advanced materials.

Two new crackers from Shell and ExxonMobil, due to come on stream by 2011, will increase Singapore's total ethylene output from 2 million tonnes per annum (tpa) to 4 million tpa by 2012, providing the industry with the necessary feedstock to produce specialty and high value chemicals and move further downstream.

The island is also investing heavily to develop its R&D capabilities in a move to make Singapore a centre for new technologies and developments rather than merely a fast implementer. The government has committed to raise investment in research and development to 3.5% of the country's GDP over the next five years.

The industry has suffered the effects of the global downturn. Cumulative output of the chemicals cluster from January to November 2009 contracted 11.5% compared to the same period in 2008, while new projects have been delayed or put on hold.

With Asia expected to account for 50% of the global demand for commodity chemicals by 2015, there is still considerable growth potential for the industry in Singapore, which is looking to capitalize on its impressive past and find the right solutions to ensure future growth.


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Brenntag Asia Pacific Pte. Ltd.
79 Anson Road #08-05/06
Singapore 079906
Phone: +65 6511 7830
Fax: +65 6511 7840
info-sinap@brenntag-asia.com
www.brenntag-asia.com

Interview with Mr. Leo Yip Seng Cheong,

Chairman, Economic Development Board

Today Singapore is one of the top ten petrochemical hubs in the world. Could you outline some of the key factors that have attracted so many companies to Singapore?

Firstly, Singapore is a trusted location, which is something that cannot be over emphasised in my view. When a company builds a cracker plant, it is for the long haul, 30 to 40 years. Security and stability are key considerations.

Secondly, we have painstakingly built up our infrastructure over the years. Jurong Island, the centrepiece of our chemical industry, is a manifestation of this commitment. Our infrastructure excellence is also reflected in the entire of Singapore island, in the physical connectivity and our infrastructure here as a global business city. We have excellent trade connections and have built up free trade agreements with many countries.

Another attribute is the talent pool that we offer. Today we have skilled manpower, people who can create and pioneer the next wave of technologies. Companies like Shell have told us that to get access to the best labour and talent, they come to Singapore.

It is not just for talent that is indigenous to Singapore but also talent from the region and even further away.

Could you share with us some of your strategies for the Chemical industry's future growth and development in Singapore?

The story of our chemical industry has been a story of going up the value ladder. The two crackers that Shell and ExxonMobil are now building are going to help us to move up the value ladder further. The chemistry chain that they will produce will give us the base to move into specialties and advanced materials. We are moving towards high value production, building on what we have already achieved.

At EDB, we also see ourselves doing more to bring in medium sized global companies to Singapore. Previously we have focused more on the big players, but now we also see value for us in enriching the corporate landscape. We are doing more to bring in these medium sized enterprises. We aim to bring in the top two or three niche players in each sector.

Having achieved remarkable success so far, do you have any further expansion plans for Jurong Island?

We see potential to enhance what Jurong Island offers. The whole idea behind Jurong Island is integration, and its 'plug and play' infrastructure. Jurong Island gives us a very good platform to push that integration model to the next level. We are looking at how we can work with all the companies there to build a large system for energy efficiency. Every company can implement energy saving measures but we are going to do this on a large-scale model.

Building new infrastructure continues to be a key part of our industry strategy. We see the need for us to continue building on what we have in terms of the range of companies and scale of activities on Jurong Island. We are not done yet.

With the chemical industry increasingly focussing on growth opportunities in Asia, what role do you feel Singapore can play in this growth?

We see Singapore leveraging what Asia can offer the global economy in terms of market and growth potential. Asia, because of its rise, is going to be a huge market. More importantly, it is going to be a market which requires a unique set of products and services. This will in turn call for companies to adopt business and product strategies that are Asian centric and will allow them to design and customise products and services specifically for Asian consumers.

Chemical companies will expand their presence in Asia. They will grow new product lines to service the Asian market. Increasingly, companies are talking with us about locating global headquarters in Asia. We see Singapore offering value as a location for them, as a global business city with the right infrastructure, connections and talent base where they can manage their business for the region. LANXESS, Huntsman and Mitsui have recently relocated global headquarters for their various business units to Singapore.

How can Singapore support and facilitate companies looking to take advantage of opportunities in Asia?

We see potential for Singapore to offer value in two specific areas. One is innovation and the other is talent. These two buttress our position as a global business headquarters for companies around the world. With the siting of their management team for Asia in Singapore, companies can leverage Singapore as a base to recruit and manage talent for the region. In addition, companies are also creating or commercialising their new technologies for Asia here. So innovation is where we see Singapore offering strong value in. Over the years, we have built up very strong public sector R&D infrastructure.

There is a whole stable of research institutes that have been built up from scratch. Years ago, we also started building up a skilled workforce. One of the icons on Jurong Island is the Chemical Process Technology Centre. It is the first training centre in the world with an industrial scale petrochemical process plant, so training is done in a working process plant.

Where do you see the chemical industry in Singapore in 5 to 10 years time?

Given the pace of this part of the world, we would like to be the leading global chemical hub. We see the industry becoming a lot more complex in terms of types of activities, with a greater focus on adding value and certainly operating on a larger scale than we have today. We would like to be a reference model for the world of what a sustainable chemical hub can look like.

Manufacturing

Chemical manufacturing in Singapore is intrinsically linked to Jurong Island. With 80% of production coming from the island, the hub has attracted a wide range of international manufacturers, from global household names to numerous smaller and specialized players. While the facilities available on the island have certainly been important in influencing decisions to establish operations, a range of other factors and advantages have been equally important in attracting manufacturers there.

In the face of growing regional competition, particularly in commodity and bulk chemicals, Singapore is seeking to distinguish itself through concentrating on high value specialty production. While the recent economic downturn has delayed some projects, the advent of the two new Ethylene crackers and projected growth in demand throughout the region should help ensure further investment.

As a manufacturing base, Singapore offers numerous advantages. Mr. Ian Wood, Managing Director of LANXESS Singapore succinctly sums up some of the key attractions: 'Singapore is a great place to operate. The government is pro-business. They want people to come here and they're very good at analyzing what it takes to be attractive. In addition to the ease of doing business, there is also the predictability factor. Intellectual property protection is another strong attraction. There are softer factors such as efficiency, the quality of education, the availability of a well-educated work force and the logistics infrastructure.'

Given the costs and long-term commitment involved with the decision to build a major chemical plant, one of the main attractions is the country's stability. With a transparent and fair legal system and one of the least corrupt governments in the world, companies can be assured of the security of their investments. Boasting a well-educated, technically proficient, English speaking workforce and excellent infrastructure support, Singapore offers a business environment second to none.

Under the auspices of EDB, Singapore has also been assiduous in courting MNCs by making the investment process as efficient as possible. Attractive financial incentives include a headline tax rate of 17% in 2009, compared to the Asia Pacific average of 27.5%, single tier tax rates and no tax on capital gains. Government support, including a willingness to invest in projects, has been key to attracting manufacturers. As Mr. Ho Chee Sam, CEO of Ethylene Glycols Singapore (EGS), a joint venture, specializing in the manufacture of ethylene oxide, ethylene glycols and ethoxylates between Shell and a Japanese consortium led by Mitsubishi Chemical Corp., confirms: 'Without the support of the government there would not be any petrochemical industry in Singapore. EGS itself is a good example, with originally 50% owned by the investment arm of the government.'

One of the crucial factors in ensuring a steady influx of players is undoubtedly the country's Intellectual Property protection. As Singapore aims to develop its specialty products and manufacturers look to expand in the region, Singapore crucially allows companies to safely introduce advanced proprietary processes and technologies into Asia. In the increasingly competitive world of chemical manufacturing where technological innovation is key, the security offered by Singapore is paramount.

Recognising these advantages, new companies are increasingly choosing Singapore to introduce their latest technologies, both regionally and globally. Newly opened last year, Lucite International, a subsidiary of Mitsubishi Rayon, chose Singapore as the site to open its first Alpha MMA plant. Similarly, as part of the upcoming SPEC complex, Shell has debuted their OMEGA processing technology in their Singapore MEG plant. Other recent additions with state-of-art facilities include Ciba's Irganox plant and Roche's 500 million USD biologics manufacturing centre.

With government support facilitating the investment process, an excellent process industry ensuring quick plant construction and IP protection allowing the use of latest technologies, companies looking to invest can get up and running in less than half the time it might take in other parts of Asia. As Steve Stilliard, Vice President of Huntsman's Performance Products division in Asia Pacific, confirms: "There were two main reasons for our coming here: the security of intellectual property and the speedy execution of the project."

Japanese manufacturers have had a particularly long and productive history in Singapore. Helping to kick-start the industry in the 1980s as an initial investor in PCS, Sumitomo Chemical has continued to invest heavily in Singapore. In March 2008 the company started operation of their third MMA monomer plant and second MMA polymer facility in the city state.

As Mr. Masaki Shima, Managing Director of Sumitomo Chemical Singapore elaborates: "Singapore is our most important centre. The level of the technology is advancing year by year and markets are expanding. The coverage of these markets is very important for us. So Singapore will be the core of the Sumitomo Chemicals' future business expansion, not only for petrochemicals, but for other chemicals also."

The Mitsui Chemicals Group has been actively expanding its business in Singapore for more than 40 years since the Group established itself as an adhesives manufacturer in the country in 1966. In the late 1990s, to support its business operations in Asian markets and meet growing demand, Mitsui Chemicals made large-scale investments in Singapore for phenol, bisphenol-A, and elastomers production facilities. The company attributes its success in the country to Singapore's world-class procurement sources, port facilities, logistics and human resources.

Jurong Island's integrated facilities and services, requiring less initial investment, have also attracted a range of smaller manufacturers. One of the pioneers on the Island was Italian metal stearates manufacturer Faci, who opened a plant in 2000 to serve its growing number of Asia Pacific and Middle Eastern customers. The experience has been overwhelmingly positive for the company, which has chosen to enter into several further phases of investments. Indeed the plant has started production of calcium and zinc stearate water based dispersions and is currently responsible for around 25% of the company's manufacturing business.

Despite so many positives, Singapore is facing significant challenges as a manufacturing destination. With the Middle East diversifying into petrochemical production and both China and India developing their capabilities, the country is no longer the only regional choice. Significant and growing local markets in India and especially China make them strong location choices, while the Middle East, with a ready supply of cheap feedstock, offers considerably cheaper production. Furthermore, as the region industrializes, integrated facilities offering similar advantages to those in Jurong Island, are likely to be introduced.

Recognizing these threats the government is seeking to capitalize on its existing chemical eco-system and infrastructure and play to its strengths. While the country cannot compete when it comes to commodity chemicals, it is aiming to use its advantages to add value and develop its specialty offerings. Minister for Trade and Industry, Mr. Lim Hng Kiang, outlined this strategy in a speech during Jurong Island's reclamation completion ceremony: "We intend to achieve a critical mass of feedstock, move to higher value chemical chains which produce specialty chemicals and advanced materials, and partner companies in developing new chemical products."

Underpinning the government's plans and providing the critical feedstock are the upcoming major new investments from ExxonMobil and Shell. Due for completion early this year, the Shell Eastern Petrochemicals Complex (SEPC) will be the company's largest fully integrated refinery petrochemicals hub. The facility will produce 800,000 tonnes per annum (tpa) of Ethylene, 750,000 tpa of Mono-ethylene-glycol, 155,000 tpa of Butadiene, 450,000 tpa of Propylene and 230,000 tpa of Benzene. Coming on stream next year ExxonMobil's expansion will offer two units producing 650,000 tpa each of Polyethylene, 450,000 tpa of polypropylene, 300,000 tpa of specialty elastomers, 340,000 tpa of benzene from an aromatics unit, a 125,000 tpa oxo-alcohol unit expansion and 80,000 tpa of additional paraxylene.

The net result will be an increase in Singapore's total ethylene output from 2 million tpa to 4 million by next year. Within the integrated context of Jurong Island, the new feedstock will be available for use in a wide range of applications. As Mr. Derk Jan Hartgerink, Manufacturing Director of ExxonMobil's Singapore Chemical Plant observes: "By having a chemical complex integrated with the refinery, we can optimize the value of the refinery streams and we can also optimize the value of the products that the chemical plant makes. The other advantage is that we can integrate all the services we have. So the cost-basis that we have becomes much more competitive due to the large scale of our operations."

The imminent availability of competitively priced new feedstocks in combination with the country's numerous benefits looks set to ensure that manufacturing remains competitive and the location attractive. Indeed, the country has already succeeded in attracting a significant new player. In January this year LANXESS confirmed that it will be building a new butyl rubber facility in Singapore. Producing 100,000 tpa, the plant, located on Jurong Island, represents a 573 million USD investment. In a strong indication that the market is recovering, the company has also committed to complete the project two years ahead of schedule to meet growing demand.

The move is a boost for the government's new strategy and a recognition of the country's importance in the region. According to Singapore Managing Director, Ian Wood: "LANXESS considers Singapore as a cornerstone of its global growth strategy. Butyl rubber is a premium product that fits in with the long-term strategy of Jurong Island in terms of pushing the chemical industry of Singapore up the value chain, from petrochemicals to specialty chemicals."

While production costs alone may be cheaper elsewhere, Singapore can continue to compete competitively when the overall costs are taken into account. With the latest technology in place and an efficient workforce, plants based in Singapore can be particularly efficient. "We believe that the productivity levels seen here are amongst the highest in the world." Confirms Mr. Steve Stilliard, Vice-President of Huntsman's Performance Products division in Asia Pacific.

Establishing a plant in 2007, Huntsman chose Singapore as their manufacturing and regional distribution base for surfactants for the cleaning industries, agro-chemicals and mining as well as polyetheramines for use in coatings and resins. Like many players, the company was attracted by the infrastructure, services and fututre availability of feedstock: "From the point of view of the chemicals industry, a great advantage of Singapore is the integration of the facilities. All our main raw materials are manufactured here, and soon we will have pipeline access to several components – a major safety improvement" continues Steve Stilliard. Mr. Stilliard, however, is keen to point out the dangers presented by the competing countries. With growing investment in the Middle East, attracted by cheap energy costs presenting a threat to Singapore in the long term, Mr. Stilliard cautions that: "Singapore has to be very careful to maintain its competitiveness in terms of integration, infrastructure and overall ease of doing business." Others are not so concerned about the new developments in the region. "With regards to competition from, for example, India and China, I feel that the growth in those countries is so rapid that it may be difficult for them to build facilities at the same speed as their demand increases. So I think those countries give us an opportunity rather than a challenge. Of course the chemical industry in India and China will grow, but there will be a balance between demand growth and facilities in those countries so I think all the facilities that now supply those two countries will still have a good future for quite some time to come" reckons ExxonMobil's Mr. Derk Jan Hartgerink.

As the market for both commodity and especially specialty chemicals grows in Asia Pacific, Singapore's ability to supply to the region cost effectively and efficiently is a growing attraction. With less lead-time, manufacturers can respond quickly to the changing needs of the market.

Singapore's location next to major palm producers is another key advantage for current and future producers. As EGS's Mr. Ho explains: "Our business model focuses on our strength of being strategically located in Singapore and Jurong Island. We are between Malaysia and Indonesia, two of the largest palm oil producers in the world and one of the outlets for palm oil is natural alcohol. When you combine natural alcohol with ethylene oxide you come out with the basic component for the production of personal care products, like, shampoo, body lotions and other specialty chemicals. So we are really in a strategic location."

With fresh momentum provided by LANXESS's recent announcement and the overwhelmingly positive experience of manufacturers already operating in the market, other MNCs are considering taking the plunge or making further investments. Following the success of Evonik RohMax's first Asian manufacturing site, opened in 2008, Evonik is considering further opportunities. "Evonik views Singapore as a potentially interesting place for investments, always finishing among the top sites during internal site screenings" confirms Mr. Peter Meinshausen, President, South East Asia, Australia and New Zealand Region at Evonik. Huntsman and ExxonMobil are also both considering additional expansions.

It seems that Singapore's chemical industry growth is back on track.

The Jurong Rock Cavern project will provide underground oil storage facilities

Jurong Island

The centerpiece of the Singaporean chemical industry, and for many companies the main attraction, is undoubtedly Jurong Island. Formed from seven separate islands, the development lays testament to the Singaporean government's level of investment, foresight and commitment to the petrochemical industry.

Jurong Island is currently home to many of the world's leading chemical producers

Through its provision of innovative integrated services, allowing plants to feed off each other through a centralized service corridor, the island has attracted 96 different companies to date, including a plethora of prestigious international heavyweights. In the face of growing competition from abroad and rising costs, service providers and manufacturers are constantly looking at new ways to increase efficiency such as the island can provide.

With considerable opportunities in mid and downstream offered by the two upcoming crackers from Shell and ExxonMobil, the island is laying down further groundwork in preparation for an influx of new players.

In many ways the history of Jurong Island is that of the entire chemical industry. Mr. Heah Soon Poh, Biomedical & Chemicals Cluster Director at JTC Corporation, the government owned company responsible for the development of the project, explains Jurong Island's history: "It actually started off as seven islands. There were refineries as early as late 60 and 70s, ExxonMobil and SRC, which was a joint venture between Chevron and SPC. Since then we wanted to develop the petrochemical industry. From an economic point of view we saw it to be quite stable and a good base on which Singapore's economy could grow. In 1982 Sumitomo and the Singapore government started the PCS cracker. That was really the start of the petrochemical industry. We had a long-term vision that with a cracker in place we could start developing downstream activities. Jurong Island seemed a natural place to develop the industry, as that's where the cracker and refineries were already based. That's when the government took a very long-term view and had the vision to join the seven islands together."

Considering the lack of players, limited natural resources and considerable technical and financial requirements, the idea was a visionary and bold move. Albeit one which has paid off in the long term. With land reclamation starting in 1995 and the facility officially opening in 2000, last year saw the completion of the land reclamation, in a testament to Singaporean efficiency, 20 years ahead of schedule. From the original size of 9.91 km² land area on the island has been tripled to 32 km².

A list of the current occupants of the island reads like a Who's Who of the global chemical industry. The island has so far attracted a broad range of multinational corporations including: Chevron Philips, Eastman Chemical, ExxonMobil, Huntsman, Akzo Nobel, BASF, Lucite, Evonik RohMax, Mitsui Chemicals, Sumitomo Chemical and Asahi Kasei.

Central to the Jurong island concept and vital for attracting players and ensuring efficiency is the so-called 'plug and play' concept: a series of pipes connect different facilities, allowing companies to feed off each other's feedstock. Integrated utility services additionally pipe in cooling water, steam, hydrogen and provide wastewater cleaning. The island also has comprehensive storage and logistics facilities, allowing end products and source feedstock to be easily stored and distributed.

With such comprehensive services and facilities in place, the advantages for manufacturers are evident. Integrated services and piping require a significantly lower investment, while tight integration creates production synergies, increased efficiency and lower costs. The end result is that manufacturers can afford to concentrate on production.

As Dr. Chockalingam, Chairman of the Singaporean Chemical Industry Council (SCIC) and Shell Process Integrator in Singapore, observes, the system is particularly attractive for smaller players: "Companies can come into Singapore, focus on their main activity and they can get utilities or other services from other providers so that they don't have to invest in everything themselves. This is an attraction to smaller companies that like the connectivity but don't want to carry the full burden of infrastructure. You are able to latch onto a particular feedstock that gives you an advantage and it is cheaper to move products to different parts of Asia than from the Middle East"

Currently three crackers - two owned by the Petrochemical Corporation of Singapore (PCS), a joint venture currently owned by the Japan-Singapore Petrochemicals Company, Qatar Petroleum International and Shell and one from ExxonMobil – supply feedstock to the island. With extra feedstock due to be provided by the upcoming introduction of the two new crackers from Shell and ExxonMobil there is considerable potential, particularly for downstream activities based on C4 and C5 compounds.

Indeed, the advent of cheaper and more varied feedstock offers excellent growth opportunities. "The two crackers will basically double the output. With the existing crackers there are more than 70 companies in Jurong Island that feed on them. So when you double the capacity you may expect another 30 or 40 companies to come on board," predicts Dr. Chockalingam.

Gearing up to meet the growth and increased demand, a plethora of service providers, both local and international, are already providing a range of innovative and cutting edge services on the island. Ensuring a good supply of vital industrial gasses, international heavyweights Air Liquide, under its local SOXAL brand, and Linde Gas both have significant presences. Both companies have made major commitments to Jurong in preparation for new players.

With numerous high purity gas plants throughout Singapore, including two air separation facilities in Jurong Island as well as an HyCo plant, SOXAL has installed extensive inter-connecting pipelines to serve customers. Such levels of integration offer significant advantages. As Managing Director, Mr. Woo Siew Wah explains: "We supply 20 tonnes of product in one single pipe to Jurong. Without that pipe we would have to supply one truck every single hour to provide the same amount. The pipe has allowed companies to save costs as well as energy. Outsourcing allows us to achieve this kind of synergy which is vital for the industry's success in Singapore."

In a sign of continued commitment to servicing Jurong and the sector, the company has recently made two new major investments: J9, a new air separation unit with a capacity well over 1000 tpd which started at the end of last year and J10, a world scale steam reformer which will produce hydrogen for industrial customers in Jurong Island and Tuas. With J10 due for completion this year, the projects reflect a total investment of over 400 million SGD to service Jurong within the space of 3 years.

Sanjiv Lamba
Managing Director of South and East Asia for Linde Gas Asia

Liam Kinsella
Managing Director,
Linde Gas Singapore

Working closely with EDB, SOXAL is extremely confident of Jurong's future and has made a significant commitment in support of this. These new investments, aimed to meet future expansion, have also been designed to maximise efficiency and reduce costs. According to Mr. Woo: "We are investing twice as much as current needs demand. This reflects our bullish outlook for the chemicals sector in Singapore. The rationale is that there is still land on Jurong Island which will be filled. If you build two plants it is going to cost a lot more, take up more space and have a higher carbon footprint. At the end of the day our costs will be lower."

Linde is also highly committed to supporting growth and capturing market share in Singapore. On Jurong the company operates one of the world's largest gasification plants, generating carbon monoxide and hydrogen for the chemical industry as well as liquid nitrogen, liquid oxygen and liquid argon. "On Jurong Island, our main products are carbon monoxide and hydrogen. We supply hydrogen to the refining industry and carbon monoxide goes to the chemical industry. We are in fact the largest supplier of carbon monoxide and also the largest industrial gas producer of hydrogen in Singapore," says Linde Gas Singapore Managing Director, Mr. Liam Kinsella.

Singapore is the world's easiest place to do business

Country	2010 Rank	2009 Rank
Singapore	1	1
New Zealand	2	2
Hong Kong, China	3	3
United States	4	4
United Kingdom	5	6
Denmark	6	5
Ireland	7	7
Canada	8	8
Australia	9	9
Norway	10	10

Source: Singapore Economic Development Board, World Bank

In December last year the company officially opened its first carbon dioxide plant as well as an extensive supply chain facility on the island. The facility will produce 100 tonnes a day of liquid carbon dioxide, effectively doubling the local existing capacity. Again the company, thinking for the long term, has designed a plant that exceeds current needs in Singapore. “In the last two years we have invested some 60 million SGD in our plant in Singapore and will continue to look for opportunities to invest here to serve the growth sectors,” affirms Mr. Sanjiv Lamba, Managing Director of South and East Asia for Linde Gas Asia. With a 125,000 square metre plot on Jurong Island, Linde has considerable room to grow and is considering building two additional facilities.

Home-grown player Sembcorp has also invested heavily on the island, playing a vital role in the provision of plug and play and utility services. Originally providing shipyard engineering and construction, the company was the first utility supplier on the island. Beginning investment in 1995 and operations in 1997 the company has grown from providing utilities to just one company to 41 today. Learning from the needs and challenges faced by customers, the company has also increased the range of services it offers.

As Mr. Atul Nargund, Senior Vice President Business Development & Acquisitions (Singapore & ASEAN) & Deputy Head, Singapore Utilities for Sembcorp explains: “Today, almost everything that a company needs, we can supply from our centralized facilities. This effectively gives our customers a plug-and-play environment to operate in. Our services include supplying energy, water and wastewater treatment, as well as providing a service corridor connecting Jurong Island almost end to end, through which products and raw materials can be transported upstream and downstream. This provides a huge advantage to companies, who can ship their products through a pipeline rather than having to transport it by barge, for instance.” The company has also further enhanced its range of services by building an 800 megawatts and 600 tonnes of steam per hour gas-fired co-generation plant which provides competitive pricing for energy while also safeguarding the chemical industry against capacity fluctuations.

Atul Nargund
Senior Vice President , Business Development and Acquisitions - Singapore & ASEAN, Deputy Head for Singapore Utilities of Sembcorp

Having successfully proved that they can develop, own and operate a comprehensive service package, the company is considering further investments on the island. As Mr. Nargund confirms: “Replicating this (development) in other areas of Jurong Island is something we are looking to do – albeit in different shapes and forms given the new types of industries coming in.”

Power

Sembcorp is not alone in offering integrated utility services to customers in Jurong. Given the high levels of energy consumption required by the industry, local power companies are also starting to focus on opportunities on the island. As Mr. Lim Kong Puay, President and CEO of major energy player Tuas Power observes: “The chemical industry is a big user of energy. In terms of our normal energy production 30-40% of industrial electricity is used by the chemical industry.”

Based on Jurong Island, PowerSeraya, the largest local energy company, is already supplying high-pressure stream to neighbour PCS. “A few years ago we took the strategic direction to become an integrated energy player, which has met with much success. We have moved from just selling electricity into supplying utilities within the area of our influence,” explains CEO Mr. John Ng. This year the company will complete a new 800MW co-generation plant on Jurong Island.

“Co-generation plants bring greater energy efficiency and also help to further reduce our carbon footprint by another 10%. In addition to this, our power station has infrastructure quite common to some of these chemical companies. If a customer requires cooling water we can reconfigure our system to meet the cooling water requirement. If a customer wants compressor air or a fire fighting system we can also easily re-configure to supply to them,” affirms Mr. Ng.

Similarly, Tuas Power has announced the creation of a state-of-the-art multi utilities complex in 2008. The facility will include a cogeneration plant, a desalination plant and waste water treatment and is set to start operations next year in Tembusu, Jurong Island. With a total cost estimated at around 2 billion SGD the complex represents a considerable commitment. By combining services and increasing efficiency to 70% the company aims to lower energy and utility costs for its customers in the cluster.

The influx of new utility services in Jurong Island looks set to offer potential consumers a wider choice of service providers and highly efficient, cost saving packages. As Mr. Lim of Tuas Power explains: "What is important in all these projects is addressing three key factors; security of supply, economics and environmental sustainability. For example, using solely gas would satisfy the latter two of these but we could not guarantee the security of supply."

Despite a government preference for gas power, Tuas's Tembusu project will actually be biomass and coal based. "We are glad to see that the government is starting to recognize the need for us to explore alternatives such as coal," says Tuas's Mr. Lim. The consideration for a wider range of power sources could prove positive for ensuring lower energy costs.

Furthermore, through waste capturing, for example recycling ash for use in the cement production, Tuas Power will be minimizing the environmental impacts of coal.

In a bid to ensure ongoing energy security and competitive costs, the government has also committed to the development of an LNG terminal on Jurong Island. Expected to begin operations in 2013, at an estimated investment of 1.5 billion SGD, the terminal will have an initial capacity of 3.5 million tonnes per annum (mtpa), with provisions for expansion to 6 mtpa or more if required.

With Singapore currently relying on natural gas supplies from Indonesia, the terminal will help to ensure the long-term energy security for the country and industry as well decreasing its reliance on high greenhouse gas emission sources.

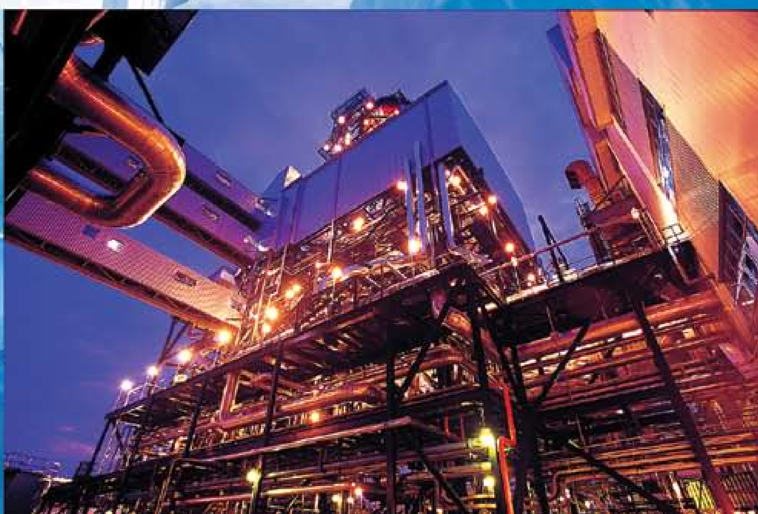
Auxiliary Services

As well as the wide range of utility suppliers, the island is also home to excellent storage and distribution facilities. Vopak and Oiltanking both have extensive facilities on the island, with enough volume to cater to both increased export as well as the import needs of the growing industry. With tank storage a short pipeline away, transportation costs are kept to a minimum. The integration model even extends to distribution. Katoen Natie's Jurong Logistics Terminal provides a total packaging and distribution service for Jurong Island residents, capable of interfacing directly with manufacturers. Two more phases of investment are set to further increase the size and capability


Managed by Petrofac, The Chemical Process Technology Centre provides excellent training facilities for industry workers

of the terminal, amounting to a total investment of 300 million SGD on the island.

A range of additional support services further strengthen Jurong Island's offering. In view of the fact that access to high quality trained staff is crucial for attracting manufacturers, EDB created 'The Chemical Process Technology Centre'. The facility is unique in that it is a live, full-scale plant. "It is not just a training centre, but is a hydrocarbon plant



Katoen Natie offers integrated packaging and logistics support for manufacturers on Jurong Island

which has a training centre connected to it," explains Mr. Phil Costelloe, Asia Pacific director at Petrofac Training Services, the global training services provider that took over management and operation of the facility in 2008.

Working with the Singapore Workforce Development Agency, Petrofac has helped to create a Workforce Skills Qualification for the industry. The company has also used its extensive experience to introduce a more competence based training program to the centre. "The key drivers in the industry relate to competence and assessing and determining competence, especially of skilled labour. This is what most of the clients are asking for and it is not just here in Singapore but worldwide," affirms Mr. Costelloe.

Safety

With chemical spills and leaks presenting a particular danger in Singapore, due to Jurong Island's proximity to the city, safety is of paramount importance. With its own comprehensive range of oil and hazardous response equipment and trained and experience staff, Singapore Oil Spill Response Centre (SOSRC) provides a vital service to safeguard against spills.

Mr. Peter K M, Director of parent company POSH SEMCO, explains: "Our members are guaranteed a service. They are guaranteed a response within two hours at any time of the day or night. They may not call us for five years, but when they call us they will get a quick response. We have a vessel on standby 24 hours a day, the whole year, to respond to oil or chemical spills."

The company also provides additional support services for their members. "We offer training as part of our membership package. If we can offer this to companies, then they are guaranteed to get something back from their investment. It also means that we get to know their facility, so if a real incident happens, we are not going into it blind," says SOSRC manager, Mr. Chris Richards. Although they have successfully dealt with some incidents, specifically container leakages, the company reports that incidents are extremely rare on the island due to the well organized, designed and built terminal and chemical facilities in operation.

Challenges

The result of all this ongoing investment is that today, Jurong Island is one of the most integrated and well served petrochemical hubs in the world. However, with much of this investment being made in preparation for future developments, some service providers, especially the smaller players, feel there is a danger of overextending themselves.

Some companies and consumers also feel that the island could benefit from a wider range of competing providers, particularly with regards to piping and service corridors. "Another issue is the infrastructure around Jurong Island. At the moment, because there is one main player with incumbent pipelines, the opportunity for another player to replicate and create redundant pipelines does not work economically, although having an alternative is important to ensure greater reliability of supply to customers. We have made this point to EDB, they understand it and they are looking into this issue," says Mr. Sanjiv Lamba of Linde Gas.

With the utility and energy sector beginning to open up and a variety of choices among other service providers, Jurong seems to be approaching a critical mass of providers capable of offering a range of different services. This healthy competition should also benefit the end users.

Not content to rest on their laurels, JTC is currently working on a number of projects to further improve the island's efficiency. Aimed to maximise the island's space, the Jurong Rock Cavern is an innovative initiative to create underground storage facilities for liquid hydrocarbons. With a potential storage capacity of nearly 3 million cubic meters and the first two caverns slated for completion in 2013, the project will offer valuable extra storage space as well as possibly freeing up land for redevelopment. Thinking longer term JTC is also considering offshore storage projects.

In a move to speed up the transport of chemicals and goods, plans are also under way to introduce a barge terminal, connecting Jurong Island with the main port, thus negating the need for road transportation. Plans have also been confirmed to build a second road link to the mainland to speed up access.

There's no doubt that the integrated, outsourcing based model that Jurong Island offers has been vital in ensuring that the Singaporean chemical industry is efficient and competitive. With the advent of new feedstock, support and infrastructure investments in place, the island is well served to cater for the expected cycle of new investments. With the arrival of more plants there is also the potential to increase the levels of interdependency of feedstocks, maximise resources and exploit synergies that will be the key for ensuring Jurong Island's continued success.

Linde Gas has invested 60 million SGD in the last two years to support the industry

Process

The process industry plays a vitally important role in supporting Singapore's chemical industry. Responsible for the construction, improvement and maintenance of increasingly complex plants and facilities, the country today boasts a growing, dynamic and technically advanced engineering industry.

The industry has been particularly successful for local firms, producing a plethora of companies from niche players to an increasing number of regional heavyweights. The numerous opportunities in the field have also attracted a growing range of international companies. As a location with a reputation for state of the art facilities, Singapore offers companies the chance to practice and improve their offerings.

Attracting and nurturing a wide pool of service providers, the industry today is extremely competitive and varied. Indeed, major development projects play host to an entire ecosystem of providers, as often working together or subcontracting as competing for the same contracts.

Local engineering service providers (ESPs) have a long history of involvement in the petrochemical sector. For many companies it has been their main catalyst for growth, providing the impetus, support and incentive for them to evolve from basic, specialized contractors to sophisticated, multi-service engineering companies. With such a symbiotic relationship, as the petrochemical industry has become more complex, advanced and consolidated in Singapore, so has the process industry.

At the top end, the local industry is dominated by a handful of major players including PEC, Rotary Engineering, Hiap Seng, Hai Leck and Mun Siong. The sector is also host to a wide range of medium and small players, often specialized in specific areas.

Despite decidedly humble beginnings, the major local players of today have become regional giants. From an initial capital investment of just 15,000 SGD, Rotary Engineering, for example, has an order book worth 1.3 billion SGD today. Last year PEC achieved an impressive 220.3 million SGD of turnover. Indeed, reflecting the scale of business and opportunities in the country, even smaller players, like Shao Fook Engineering, achieved a turnover of 20 million SGD for 2009.

Home grown heavyweight PEC sees considerable growth potential both locally and abroad

Chia Kim Piow
Chairman and Managing Director for Rotary Group

Given the scale and range of opportunities in the industry, local companies have not had the market to themselves. Some of the first new arrivals came from elsewhere in the Asia Pacific region, such as Japanese engineering firms Chiyoda Corporation and UTOC Engineering and Australian company McConnell Dowell.

The country has also attracted numerous western MNCs, including Foster Wheeler, who chose Singapore as the location for their first Asian office in 1989, and Jacobs Engineering, who established a regional headquarters for Asia in the country in 2001. With companies increasingly focussing on Asia for growth opportunities, the sector is continuing to attract leading new entrants, including Hertel who chose Singapore as their base to spearhead expansion into the region in 2007. As the industry has matured, the country has also attracted a range of additional service providers, such as Brunel Energy, offering additional outsourcing and recruitment services.

The Singapore chemical industry's adoption of an outsourcing based model is the key to understanding the wide range of players and ongoing success of the process industry. Through extensive subcontracting, the increasingly large and complex requirements of major projects support a network of specialized small, medium and large players. Subcontracting also allows companies to develop competencies, build up resources and slowly move up the value chain.

With clients usually appointing several key contractors who sub-contract extensively, for many companies, the eventual aim is to gain a larger slice of the pie by being able to offer a comprehensive service package to customers.

Initially starting as a sub-sub-contractor, focussing solely on electrical maintenance in the 1970s, Rotary Engineering, whose main business is now terminal construction, has been able to follow a successful growth strategy through increasing and diversifying their capabilities.

"As the years passed by, we realized that there was other related work which we needed to do, such as civil engineering and piping work, so we progressively got into these other disciplines" explains Mr. Chia Kim Piow, Chairman and Managing Director of Rotary.

"We developed from being sub-sub-contractors to being subcontractors to a multinational engineering companies like GGC or Chiyoda. Originally we were just trying to fill a vacuum, doing the simpler engineering EPC work and then moving into the terminal business. We did not know that this area had so many opportunities and could be so lucrative," continues Mr. Chia.

Maintenance and construction work constitute the main activities for the industry. With plants requiring regular servicing, maintenance offers a lucrative ongoing source of revenue. While maintenance projects used to be offered on a job-by-job basis, as plant sizes and capital investment increase, clients are progressively choosing the extra efficiency offered by longer-term contracts. Some clients prefer to use only one contractor while others split the work between several.

For PEC, the sector, which typically accounts for 30% of the company's sales, is a key part of their business strategy. As Group CEO, Robert Dompeling, explains: "The maintenance services industry is a very important market for us. We provide maintenance services for most of the key plants in Singapore." Maintenance contracts are also a useful means for growing business, enabling contractors to get a foot in the door. "Long-term contracts provide us with an on-going relationship with the client and enable us to develop in-depth knowledge of their facilities," he continues.

Mun Siong also provides a range of maintenance services. The company operates two models. "One is to provide only mechanical, electrical & instrumentation maintenance services to our clients. The other model is to provide integrated maintenance services; besides our core maintenance services we also manage all other trades' services for the client," explains Managing Director, Mr. Vincent Quek.

For Hertel maintenance services are the company's main focus and at the core of its strategy for the region. "Hertel has traditionally specialised in the provision of maintenance services. It is our expertise in this field of activity that forms the cornerstone of our growth plan for Asia," explains Mr. Simon Kramer, Director of Asia for the company.

To support their entry into the market the company has made several strategic local acquisitions including engineering firm Tong Hoi and scaffolding company Kok Chang.

With a range of current and future plants requiring ongoing maintenance, other players are also eyeing the sector. "At the moment UTOC (of Japan) is focused on projects concerning the building of new plants, but increasingly we want to include more maintenance work," says General Manager, Mr. Tan Ngiap Teck. Maintenance work currently accounts for around 6 million SGD of the company's turnover, but it aims to double that figure.

McConnell Dowell is also looking to harness its engineering expertise and expand in the sector. "We are able to combine maintenance and engineering services by looking after a facility and helping to improve its efficiency by taking out the bottlenecks and re-engineering it," affirms Singapore Managing Director, Mr. Murray Dundas.

Given the scale and quantity of recent projects, construction services have been the mainstay for most firms over the last few years. For new plants, companies offer a range of different services covering engineering, procurement and construction (EPC). While specialization helps many companies to win business, the eventual aim is to diversify.

"Project works typically accounts for about 70% of our revenue and is the future growth driver for PEC," says Mr. Dompeling. Projects and construction work has also accounts for over 70% of Mun Siong's turnover over the last few years. "Our services include mechanical and E & I construction, installation of structural steel and piping, equipment installation and other specialized services," says Managing Director, Mr. Vincent Quek.

UTOC Engineering is another company whose specific expertise in steel fabrication and piping ensures a steady supply of contracts: "When it comes to projects, we are one of the favourite companies in the chemical sector because we can provide steel structure works, equipment and piping work in the same project which is cost effective and easy control for our client," observes Mr. Tan Ngiap Teck.

McConnell's offering, meanwhile, stretches beyond plant construction. "Not only do we provide mechanical, electrical and instrumentation works, we also provide civil infrastructure and marine works," says Mr. Dundas. Having worked extensively with Oiltanking and Vopak, the company is the number one player for petrochemical jetties. With a current focus on storage tank construction and installation, Rotary's numerous divisions also offer a wide range of mechanical, electrical and structural services.

Subcontracting is at the heart of Brunel Energy's business model, which supplies highly skilled technical specialists, ranging from project managers to process engineers. The company is active in all phases of a project from inception of design to detailed engineering, procurement, construction on site, start up and commissioning, operations and maintenance. As the company looked to expand in Asia at the end of the 1990s, the maturity of outsourcing in Singapore was a key selling point for the company, who started operations in the country in 1996.

The company's approach is to provide outsourced staff directly to engineering firms and plant owners. "For the execution of a big project no company is staffed up to the level where they can handle everything themselves. This is especially the case if you are talking about new technology where you need to guide it very carefully. So when owner companies commit to a project there is always a requirement for personnel," confirms Mr. Harrewijn, Regional Director for South East Asia.

A range of large scale projects in Singapore over the last few years, such as the upcoming new crackers, have allowed many players in the industry to sustain impressive growth. Last year was UTOC's highest earning for example, with a turnover of 91 million SGD. In the same period McConnell achieved growth of between 10 and 20%.

The process industry in Singapore has, however, not been entirely immune to the recent financial downturn. Due to the nature of the industry it is likely that the sector has yet to feel the full effects. "Obviously Singapore has been affected by a downturn, as has every country in the world. We have seen in late 2008 and 2009 a slowing down of activities. That means that financial investment decisions have been postponed, with projects being put on hold or being cancelled," observes Brunel's Mr. Harrewijn.

With long production times, however, companies are still benefiting from pre-downturn projects. "On the other hand, when you are talking of a project life cycle of anywhere between 18 months and 3 ½ years, these projects do not stop once they are on a roll," continues Mr. Harrewijn. Existing contracts have helped soften the impact for many companies.

The industry is expecting business to slow down in the short term. "With the projects near completion and new projects in the pipeline, but put on hold whilst waiting for the economy to fully recover, we expect to see a fall in available projects in the market", says Mun Siong's Mr. Quek. "From a sales perspective, I see us being kept busy for the first half of this year. For the second half of the year, however, I don't feel the sales prospects will be as promising," confirms Mr. Tan of UTOC.

Nevertheless, companies are confident that the pace will pick up again.. "There are some huge projects on the drawing board. We believe that from the middle of next year when some of the projects starting now will enter fabrication phase there will be a tremendous need for fabrication capacity and Asia will be favoured due to labour rates, availability of yard space and expertise," says Brunel's Mr. Harrewijn.

Louis Harrewijn
Regional Director for Brunel International South East Asia

Mun Siong offers a wide range of different maintenance and engineering services

"I think there are certainly signs that things are starting to pick up. Companies are beginning to consider capital expenditure again. People are talking about big projects once more, especially among the larger players," confirms Mr. Dundas of McConnell Dowell.

Many players are expecting a range of new projects to come on the back the new crackers. "We are hoping that after the Shell and ExxonMobil cracker facilities are completed, there will be an influx of downstream plants in Singapore," says UTOC's Mr. Tan. In the mid and long term players feel the demand will be considerable.

Singapore offers highest levels of skilled labor in Asia and is second to only Switzerland in the world

Country	2009 Rank
Switzerland	1
Singapore	2
United States	3
United Kingdom	4
Ireland	5
Luxembourg	6
Australia	7
Canada	8
Hong Kong	9
Chile	10

Source: Singapore Economic Development Board, World Bank

Talent

In an increasingly competitive and growing market, gaining access to talent is currently proving one of the industry's main challenges. "As family units get smaller less people want their children to become construction workers or even engineers. This, ultimately, leads to shortage of skilled workers and this is occurring in the Singapore market," explains Rotary's Mr. Chia. With a strong workforce vital not just for the success of the process industry, but the entire Singaporean chemical industry, it is a crucially important issue.

Companies are thus recruiting more talent from abroad and investing more in their training programs. Singapore's willingness to allow foreign workers into the country has proved over time to be a considerable asset for the industry. With fluctuating demand based on current projects, labour from the region helps the industry to be competitive and efficient. With a raise on levies paid for importing foreign workers due to come into effect on July 1st this year as part of the government's plan to reduce dependency on foreign workers, the industry may well be negatively effected.

Not every company finds access to talent to be quite such a challenge however. "At UTOC, we do not have the problem of getting skilled staff. My senior managers conduct interviews for new employees and shortlist the suitable ones. The advantage of this is that the employment process is carried out by construction experts and senior managers who have the experience to know what they need and who will be suitable," explains Mr. Tan. With a senior engineer providing support from day one, thorough training is still of vital importance for the company.

For Rotary Engineering, the recruitment and retention of staff is a vital part of the company's strategy. Indeed, the company's expansion has partly been on the back of a desire to retain skilled and knowledgeable workers. "People are assets and if you are not able to retain them you are losing your assets. So from the beginning we have introduced systems to keep our people. We have people who have been with us for 37 years and we manage this by rewarding them not only for seniority but also through a meritocracy," explains Mr. Chia.

Through organizing the business into a range of different subsidiaries including piping, project management and civil engineering, the company employees have more independence. "As your people become more and more capable you need to give them more responsibilities because at a certain point it is not just about the money," explains Mr Chia, who is also an advocate of secondary training to create a more efficient, multi-skilled workforce.

With considerable resources spent on training foreign workers, the company recognizes the value of keeping hold of its staff. "If you bring in a lot of foreign workers when there is work, you then have to send them back when there is no work. To solve this, we have to globalize in order to be able to utilize all our trained people," says Mr Chia. To ensure they have access to the best staff and next generation of talent, Rotary has set up overseas training and test centres in India and near universities in China. With a global workforce of 7,800, Rotary aims to have 10,000 in the next few years.

Diverse strategies

As competition grows companies are relying on a variety of different advantages to gain an edge. Some larger local players, such as Rotary Engineering, PEC, Hai Leck and Hiap Seng have chosen to raise funds by going public. Mun Siong, on the other hand, believes that remaining private and relatively small gives the company an edge. "We have the advantage of enjoying a shorter chain of communications between clients and management, which makes us more "nimble" and able to tailor our services to our clients' requirements more exclusively," claims Mr. Quek.

For PEC, owning a range of essential equipment allows them to move speedily. "We own a range of equipment that is critical to our needs. This enables us to be in control and respond quickly when the need arises," explains Mr. Dompeling. With further investments in technology and through the adoption of industry best practices the company feels that they will be able to raise their productivity.

McConnell's multi-disciplined capabilities allow the company to take on a wider variety of projects. As a result of the downturn the company is currently focussing on government infrastructure projects. The company is also focussing on developing its design capabilities on the back of its engineering strength to be able to offer more consultative services. Another key asset for the company has been the creation of a plant base in Batam, Indonesia.

A modern full process facility, including automatic welding processes, automatic blasting and painting facilities, and testing facilities, offers numerous advantages. "It's cost efficient and we are totally in charge of the all the steps in the process, ensuring quality and limiting any potential delays," says Mr. Dundas. With access to an alternative and experienced talent pool (Indonesians are currently not allowed to work in Singapore), the facility has been a strong selling point that has helped to secure several recent ExxonMobil contracts.

International companies often have the benefit of a global network. As UTOC's Mr. Tan explains: "Our sister company in Thailand provides the opportunity for sharing resources, including the workforce." With major players such as Jacobs and Foster Wheeler, extensive international experience and first-rate international reputations are also key selling points.

For Hertel: "A uniquely important factor we have is that we are able to transfer technology and resources from other parts of the world when needed and without delay" says Mr. Kramer. Drawing on its European experience, the company is aiming to introduce a refined outsourcing model to Singapore. "Our primary objective is to become the market leader in the provision of integrated support services. We will offer a portfolio of services to support our clients. It is not our intention to be the market leader in each of these disciplines, but the market leader in the provision of the combined service package under an integrated management structure" explains Mr. Kramer.

Hertel's expertise and approach to providing innovated integrated services is already proving attractive. The company has recently been awarded the maintenance contracts for the existing Pulau Bukom Shell refinery with the obligation to introduce initiatives based on techniques developed in the UK over a number of years and to continuously improve the means by which the plant is maintained and ensure that uptime is safely maximised.

Locals

Local companies, who have achieved considerable success in Singapore, are increasingly looking at expanding abroad. Indeed many companies feel that their experience in Singapore, working with international players on major projects, puts them in good stead.

Local heavyweights are already active internationally. "Working for these multi-national companies here has raised the performance quality of PEC, and these skills can be 'exported' to other locations overseas," explains Mr. Dompeling. With overseas work accounting for around 40% of the company's revenue, some long-term clients have specifically asked the company to participate in overseas projects.

Rotary Engineering is another company with a strong regional presence. "At the moment we are in China, Indonesia, Malaysia, Thailand, Vietnam, India and Saudi Arabia, with Singapore as our headquarters. We are also looking into other areas, such as South Africa, the Middle East, and more emerging economies," says Mr. Chia.

Mun Siong, having successfully completed short-term work in Malaysia, Indonesia and Thailand, are actively looking to expand in India and Vietnam. With representative offices in Thailand and Indonesia Fao Shook is also keen for international expansion.

While there is considerable potential for overseas expansion, companies need to consider the fact that the chemical industry is generally not as advanced in the rest of Asia as it is in Singapore or as

open to outsourcing. "Many companies in the region are not yet ready to adopt this approach and we hope that this will change in the near future," observes PEC's Mr. Dompeling.

With most infrastructure development occurring in Asia, PEC also feels that there are considerable opportunities for companies to export their expertise and experience to Europe. Both PEC and Rotary are looking at the potential for tank terminal projects in the continent.

Industry Support

The Singaporean government and local industry group, the Association of Process Industry (ASPRI) have been providing the sector, particularly local players, with significant support. Mr. James Goh, president of ASPRI, outlines some of the measures that have been put in place: "The Local Enterprise and Association Development Program (LEAD) is a strategic move to propel the growth of the industry through trade associations such as ASPRI. Some of the initiatives under the LEAD program include outsourcing facilitation, internationalization, training development and establishing a safety standard for the process supporting industry."

Working with the Singapore Workforce Development Agency, the ASPRI has also established the Institute of Process Industry, whose aim is to establish skills and competencies for the process industry. As part of its strategy to raise the industry's profile, the association has also introduced ProcessCEM Asia, an annual international conference on plant construction, engineering and maintenance held in Singapore.

The government has also introduced a range of other programs to help the industry. "We are able to enjoy management training programs launched by SPRING Singapore to help local companies to grow and upgrade their business model. For companies who are keen to explore overseas markets, we have IE Singapore to provide us with all the necessary overseas support and information," observes Mun Siong's Mr. Quek

The association is keen to help the industry to grow abroad. Citing opportunities in the Middle East, Asia, China, Vietnam and Brazil, Mr. Goh feels that the industry could benefit from greater collaboration: "ASPRI members who are like minded and offer complimentary services could form alliances and provide a one-stop maintenance solution to the giant oil and chemical conglomerates out there."

Power Seraya offers integrated utility services to Jurong Island

A view that Rotary's Mr. Chia shares: "When we look at competitors we think maybe we could form alliances with them to be even more capable, increase our capabilities, in terms of skills, know-how and geographical areas."

Looking to the future, players feel there is the potential to further increase efficiency through expanding technical capabilities. As Mr Chia of Rotary explains: "We are trying to automate as much as possible and also systemizing our processes. This is a very difficult and long process, but it is worth it and will help us maintain and improve our efficiency." With the high cost of operating in Singapore and rising employees salaries mechanization looks set to become more widespread in the sector.

With many clients choosing to focus on one or two main contractors, local companies are also keen to raise their international profile. "Sometimes the challenge is simply that the value Singapore companies can offer has not been sufficiently made aware of as a lot of the decisions for multinational companies are centralised and made at the headquarters," feels PEC's Mr. Dompeling. Indeed many local players in the industry feel clients tend to rely too much on international "brand" name engineering firms.

The process industry in Singapore is doing an excellent job in supporting and attracting plant construction. The industry has developed considerable local talent while new players continue to be attracted to the market, many of whom view the country as a cornerstone for future development in the region.

With new projects on the horizon and the prospect of new downstream players coming to Jurong Island, there is definitely excellent growth potential for the process industry.

Innovation

Research and development is a key pillar in the government's strategy for the future growth of the industry. EDB's Assistant Managing Director, Mr. Julian Ho explains: "We need to build a technology engine and be a technology inventor. We are moving from being a fast adopter to becoming a first adopter of technologies. Over time, we hope to also be a creator of technologies." Attracting top scientific talent, the government is investing heavily to support development in the sector and take advantage of the growing number of regional headquarters in Singapore and increased focus on the Asian markets.

Central to the government's initiative is the Institute of Chemical and Engineering Sciences (ICES). The institute has established world-class research laboratories and pilot facilities to support innovation in chemistry and chemical engineering sciences.

"We do hardcore organic synthesis right through to chemical processing. We work on a milligram scale right to kilogram scale. What we have tried to do is to set up an organisation that goes across all of the relevant disciplines and all of the relevant scales," explains Executive Director, Dr. Keith Carpenter. The institute is conducting a range of projects designed to improve the industry's productivity and sustainability. Current projects include how to diversify feedstock for the industry, how to use crude oil more efficiently and finding potential alternatives.

As Dr. Carpenter reveals, the institute also works closely with manufacturers: "We have a whole range of partnerships. They go from relatively short-term problem solving – somebody that has a problem and needs to have some fundamental science to solve

Lawrence Cheung
Country Manager, Dow Singapore and Sales Director for South East Asia, Australia and New Zealand Plastics

Boon Yeow Yee
Head of BASF Singapore and Managing Director of the BASF ASEAN sub-region

it – right to the very long-term – converting biomass to chemicals or making chemicals directly from methane."

Ready access to top facilities and expertise without the need for heavy investments is a considerable attraction for manufacturers. The country's strong IP protection and skilled workforce serve to further increase the country's attractiveness. With growing demand from Asia, the location also offers companies the opportunity to create and test products and solution tailored to the regional market. The government also offers additional tax incentives for companies locating R&D facilities in the country and has committed to invest 3.5% of its GDP in the sector.

As Mr. Ho notes, these investments are beginning to see some impressive returns: "The fact that BASF is here with a large corporate lab looking at nanostructure surfaces, 3M has put a superhub here with research and development for new applications delving into Asia Pacific and that Mitsui has put a catalyst lab here – are examples to us that we are moving in the right direction."

With a long commitment to the country Mitsui has worked closely with ICES. The company set up its first overseas R&D centre in Singapore in 2006, the first in the country from a major Japanese chemical manufacturer. Fellow Japanese giant Sumitomo has also entered into R&D activity in Singapore to support the market. "Nowadays excellent R&D is in play here in Singapore. The market is always pressing us to supply technology to meet its needs. So to meet such requirements we are doing our R&D business here in Singapore," confirms Sumitomo Chemical Singapore Managing Director, Mr. Shima.

ICES is keen to support similar companies. "We can never have the business understanding that companies like Mitsui have, for example, but we can take care of the scientific input. And that is what we look for – a collaboration where we both respect each other's strengths," says Dr. Carpenter.

A variety of players are recognizing Singapore's potential for innovation. The country is also an increasingly popular test bed for, and consumer of, new technologies. "Singapore has in place an ecosystem conducive for companies to engage in high-value manufacturing and R&D activities. This creates an interesting market for our products," says LANXESS Singapore's Managing Director, Ian Wood. "Our engineering plastics business unit, for example, is in the final stage of commercializing its first project with LANXESS' new ECO plastics grade for a customer based in Singapore."

ICES Building - At the centre of the government's R&D strategy

In 2007 Dow decided to create an R&D and technical service centre on the island. Called the Dow Singapore Development Centre, it specializes in bioscience research. "Singapore provides a platform were most international companies can feel quite safe to transfer know-how and technology into Asia. That's why we have our R&D centre here," explains Country Manager Mr. Lawrence Cheung. The company is also aiming to grow and develop the facility in the future.

Evonik is another company that sees opportunities: "Singapore, as one of the world's leading chemical hubs, has in recent years also been establishing itself with increasing success as a global Research and Development hub. As such it is also promising for Evonik's R&D and innovation management. We have begun evaluations on our options in this area, which are efficiently supported by EDB," says South East Asian president, Mr. Peter Meinshausen.

At the other end of the scale, local companies have also benefited from developing their R&D capabilities with government support. "When EPChem started in 2001, the first thing we did was to take advantage of the government Product Development Grant to develop a range of environmentally friendly natural waxes to replace mineral waxes in the candle application," says company CEO, Mr. Seah Cheong Leng. The company is currently looking to develop its in-house capabilities in personal care formulations.

In many ways Singapore's resource limitations have helped the country, as challenges forced companies to innovate. On Jurong Island, for example, space and resource limitations have helped to create an innovative integrated system and service solutions.

The water industry is another example. Limited access to clean water has helped create the market for companies such as Hyflux to develop cutting edge, energy efficient membrane cleaning technology. Today the country has become something of a water hub for companies looking to develop and test new technologies.

As environmental concerns become more important globally, Singapore can again use the challenge of providing for its own needs as a test bed for developing new technology in areas such as recycling and clean energy.

With a growing recognition of the country's R&D capabilities, potential to create innovative solutions for the Asian market and committed support from the government, the chemical sector in Singapore is well on its way to become a leading player in R&D.

The sector should see continued investment, the arrival of more facilities and the development of new products.

Storage and Logistics

Given its location, port facilities and connectivity, Singapore is naturally one of the world's leading logistics hubs. With the growing number of companies choosing Singapore as either a manufacturing base or the location for their headquarters, petrochemicals are an increasing focus for logistics providers, many of whom specialize in the sector. The country has also attracted the leading petrochemical storage providers as well as supporting a growing number of local players.

With markets developing and the global petrochemical landscape changing, the industry is currently undergoing a period of considerable development. Despite increased competition from other countries in the region, Singapore's numerous competitive advantages are hard to beat.

The country's location, in the middle of world shipping lanes and in the heart of the Asia Pacific region is ideal for international and regional shipping and logistics. When combined with world-class infrastructure and access to excellent staff, it is no surprise that the country is the top choice for logistics players. Indeed, Singapore is currently home to 21 of the top 25 third party logistics companies (3PLs), many of whom have chosen the island as their regional headquarters. For many logistics providers Singapore's advantages have long been apparent.

"Right from the beginning of our activities here in Singapore in 1992 we promoted using Singapore as a distribution hub to our clients," affirms Uwe Jacobsen, Managing Director of leading international player Leschaco's Singapore operations. Fellow international operator BDP International also identified the country's potential when it entered into Asia in 1995.

Due to its strategic international location on the major international shipping routes, Singapore's significance for many international players is not merely regional. As Mr. Eelco Hoekstra, Asia President for leading storage giant Vopak, explains: "Singapore is important for us as a location not only in Asia but within the whole worldwide network. There are few big ports and shipping points in the world and Singapore is definitely one of them." Growing production from Jurong Island and increasing demand in the region make the island particularly attractive for petrochemical logistics.

In addition to its location, the same assets that have drawn other sectors to the industry are equally attractive for logistics and storage. "The rule of law, the business environment and numerous regional head offices are some of the attractions of Singapore," continues Vopak's Mr. Hoekstra. Easy access to a skilled workforce is another main benefit for many. "From a human resource perspective, 90% of my team is drawn from the local Singapore resource pool. They are multi-lingual and logistics is proactively pushed as a career within Singapore, which has allowed a very strong skill set to emerge," informs Dino Pertsinidis, Vice President Chemicals Sector Asia Pacific for international distributor Agility.

In keeping with the diverse opportunities Singapore offers, the logistics and storage industries currently operating in the country are populated by a wide range of different players and business models. At the top end a growing number of multinational logistics firms such as Leschaco, Agility and BDP, many of whom specialize in chemicals, are looking to expand their reach into Asian markets and support their international customers's expansion drive in the region. With a history of logistics expertise the local industry has also produced a handful of successful players such as YCH and CWT, with excellent capabilities and impressive regional networks.

Due to the country's long history of involvement in petrochemicals and the unique requirements of Jurong, storage giants Vopak and Oiltanking, who have been operating in the market for 26 and 21 years respectively, have made significant investments. As the industry develops and opportunities in the market grow, an increasing number of smaller, specialist players such as Store + Deliver + Logistics and Eagletainer Logistics, have also appeared.

For the larger multinational 3PLs the focus is on providing a complete range of services to customers. One of the longer established players on the market, german company Leschaco specializes in intercontinental logistic solutions for sea and air freight transportation. With subsidiaries throughout the region, the company is particularly focussing on assisting its existing clients in Asia Pacific.

"We provide the full range of logistics services, including warehousing and tankcontainer maintenance. Our special focus is on regional distribution for our worldwide customers," explains Mr. Jacobsen, Singapore Managing Director. With chemical customers focusing on reducing distribution costs as a result of the economic crisis, the company's supply management services are becoming increasingly sought after. Mr. Jacobsen believes that Leschaco's international background and thorough understanding of the long-term needs of their clients are crucial for effectively optimizing clients' processes and reducing costs. "Companies are looking into their supply chain and really trying to optimize them; these are things they can only do with the international players and not with the local players. They need monitoring of shipping and products all around the world, which local players cannot provide at the moment."

The company is heavily commited to the region with a growth strategy

Local logistics success story and strong regional player, YCH


Uwe Jacobsen
Managing Director
Leschaco Pte LTD

Eelco Hoekstra
CEO for Asia Pacific region for
Royal Vopak

Vopak has recently expanded two of its terminal facilities in Singapore

focussed on strenghening its market postion. Indeed, in a reflection of the increased focus many global logistics companies have on the region, the company now has more people in Asia than in Europe or America. With a growth rate of around 12% in Asia during the crisis, compared to neglibible increases in Europe, the company's focus is understandable. Mr. Jacobsen predicts that the region will account for 40% of business by 2012.

Similarly sized American competitor BDP is also focussed on the region. Peter Barnesby, the company's Regional Director for South East Asia, feels that customers are looking for a more complete service in the region: "I think the difference we find in Asia compared with other parts of the globe is that companies in Asia are after a complete solution and so we find that in Asia we need to be able to provide freight, warehousing, transportation, visibility… a combined total solution." The company believes customers also can benefit from knowledge on growing regulations and free trade opportunities.

Singapore is also crucial for global chemical logistics specialist Agility Chemicals. The country is one of four regional world centres for the group and the company has seen chemical volume management increase substantially. "It has been on a positive trend for the last three and a half years, apart from the glitch in quarter one last year, and we continue to see very strong upturns in Singapore," says Mr. Pertsinidis, Vice President for the Asia Pacific Chemicals Sector.

In addition to procurement and freight management, the company has also developed an in-house consultancy service to help customers improve their supply chains. Mr Pertsinidis also feels that the company's multinational chemical heritage offers valuable experience and expertise.

The trend among global 3PLs operating in Singapore is very much on adding value and providing more consultative services to help global customers expand in the region. Companies are increasingly taking advantage of the country's skilled workforce and connectivity to manage customer's worldwide logistics operations. In addition to its significance in Asia, it seems that Singapore's importance in supporting global logistics operations for companies may well increase.

Unlike its fellow multinationals, Katoen Natie has adopted a strikingly different operating strategy. Having been in Singapore for 12 years, the company works extremely closely with the petrochemical manufacturers. As Mr. Koen Cardon, Managing Director of the firm's Asia operations explains: "As soon as the product is formed within the plant, we work in the engineering, we do the packaging, the reworking, the planning, the mixing within the plants, then get that to the port of Singapore." With the company's activities blurring the distinction between logistics and manufacturing, Katoen Natie is closely integrated with production on Jurong Island, providing a unique and extremely integrated solution for manufacturers.

Indeed, it is a model that has influenced local heavyweight CWT considerably. As Mr. Eric Herman, CEO of CWT Logistics explains: "One of the visions that we had was to really start breaking into the petrochemicals sector. We knew that there were a lot of things going on, but there was only really one company in Singapore offering the complete re-packaging and distribution services."

The company has recently won a lucrative ten-year contract with plastics producer Borouge to operate a strategic packaging and distribution hub for the company. "The reason for this was that they wanted to be closer to the market and be able to better anticipate the fluctuating prices of petrochemicals by offering shorter lead times to their customers," says Mr. Herman.

Building on the advantages offered by existing warehouse space in the country (currently over 9 million square foot) and additional in house expertise, the company has built an annex to handle the packaging of products coming from the Middle East. With growing production in the Middle East looking to supply demand in Asia, there is considerable potential for similar services in Singapore.

YCH is another strong regional player and Singapore success story. From humble beginnings the company today handles 50 billion USD of inventory annually for major international firms. The company services the Asia Pacific region, using Singapore as its main hub and with smaller regional facilities as satellites. Through the provision of an advanced in house IT system, the company provides an entire end-to-end supply chain service and currently has a presence in 32 cities and 12 countries in the region.

While the country supports more established local players, it is also nurturing a new generation of dynamic, successful and ambitious companies. Established in 1997 Store + Deliver + Logistics is a logistics company specializing in chemicals. “Our logistics services include haulage of containers from the port, storage of the chemicals, tracking them with barcode, providing inventory management and the distribution of chemicals within Singapore and the region,” says company Chairman, Dr. Lee Ah Teng. With considerable past experience in the industry, Dr. Lee, foreseeing the growth in the sector, took the astute decision to focus on speciality chemicals.

The company has designed and built a state-of-the-art warehouse specifically to handle specialty chemicals, including inflammables. Ensuring safety is an utmost concern for the company. “Our facility is approved by the relevant authorities and it has all the required safety features and licenses. Our people are trained and we are audited by a third party for all the processes right down to disposal of chemicals (which is a prerequisite for membership of the NACD),” assures Dr. Lee.

With key customers consisting of MNC’s from the US, Europe and Japan, the company anticipates further growth in the market. “MNCs prefer to use Singapore as a logistical hub so there are still opportunities for us in Singapore, especially given the level of infrastructure we have here,” says Dr. Lee. The company is looking to build an additional facility to meet local demand in the next three to five years. As high operational costs force some smaller manufacturers to move to cheaper locations, especially China, the company is also looking to expand operations in the region in the longer term.

Formed in 2006 Eagletainer Logistics, a wholly owned subsidiary of shipping company EagleLiner, is another successful new local entrant to the market. “We saw an opportunity to do business with ISO tanks as there are relatively few operators in Asia. Most of the operators are based in Europe,” explains Managing Director, Mr. Lim Meng Kong. The company focuses on providing logistics solutions based on its fleet of ISO tanks. “We service most of the Asia-Pacific rim for petrochemical companies. We offer a port-to-port service. Depending on our customers requirements we can also provide door-to-door services or whatever other options they require,” says Mr. Lim.

The company has enjoyed impressive growth since its inception. Starting with 80 ISO tanks in 2006, Eagletainer has built up its fleet to over 1300 tanks in just four years.

Working directly with producers, the company has made the most of Singapore’s location close to palm producing countries such as Malaysia and Indonesia to build up a solid base of oleo-chemical players, many of whom are attracted by Eagletainer’s new tank stock. The company also serves many petrochemical customers, who currently account for the majority of business.

Oil Tanking, expecting increased demand for its storage facilities

Demand for the company's services are increasing while the price of the tanks themselves has decreased considerably in the last 2 to 3 years, allowing for further expansion. The growing move towards specialties as well as smaller shipping volumes occasioned by the downturn have both proved advantageous for the company.

"If the volume requirements decrease, ISO tanks are more likely to be used by the shipper. Compared to PARCEL tankers, ISO tanks need a much smaller volume to be financially feasible. With 20 tones in an ISO tank, you are ready to go," says Mr. Lim

For environmental and economic reasons the company has also converted from using drum packaging, while ISO tanks are also becoming more popular in developing countries. "There are a lot of different uses for them. For example, our ISO tanks are used as storage terminals for diesel. We even carry waste oil from India to be refined for reuse," observes Mr. Lim. In ten years time, the company aims to be operating between 4000 and 5000 tanks.

With Singapore's history in oil refining, importance as a chemical distribution hub and growing feedstock requirements for manufacturing, the major storage players have had a long presence in Singapore. Due to the integrated nature of Jurong Island and its associated space constraints, outsourced storage facilities have been critical for ensuring the facilities efficiency.

The world's largest independent tank terminal operator, Vopak, has been operating in Singapore for 26 years. The country is their largest operating base in the region, with 4 different terminals and a storage capacity of over 3 million cubes as well as their regional head office.

"We have recently expanded two of our terminals here to follow the growth of distribution and storage of chemicals in this part of the world and in anticipation of an additional flow of chemicals into Singapore," says Asia President, Mr. Hoekstra in an indication of the company's optimistic view of Singapore's future.

Unlike other sectors, the storage industry has remained stable during the downturn, which Mr. Hoekstra ascribes to the relatively robust position that Singapore has as a manufacturing base and the fact that: "the stimulus packages here in Asia have worked quite well to keep consumption relatively stable so South East Asia has not been as badly affected as other parts of the world."

In a competitive market the company is looking to find the right opportunities for growth, focussing on efficiency, cost-effectiveness and reliability. "We have started a project which is called Operational Efficiency Improvement and it is based on the lean methodology. Basically we look at the terminals, take out a few processes and ask whether we are doing this in the most efficient way. The whole idea is to take 'waste' out of the system," explains Mr. Hoekstra.

Vopak is also working closely with its customers on safety matters, an issue that is of utmost importance to the company. "We have internal programs on auditing, training and investing to ensure that our track record on safety improves. We share this data with our customers openly because we believe that transparency also will lead to a higher level of understanding and joint development." Mr. Hoekstra believes that safety, environmental protection and emission control are likely to become increasingly important for the industry.

Oiltanking also has a considerable presence in the market. The company entered into the chemical market in 2000 and has created a joint venture with shipping firm Odfjell. "The driver is because chemical terminals and chemical shipping are inter-linked from the supply chain point of view," says Mr. Rutger van Thiel, President of Oiltanking Asia Pacific.

Again Singapore is an important location for the company, whose facilities serve both local manufacturing and regional distribution. "Currently we have a large expansion programme that is related to the chemicals storage business in Asia, our largest terminal is in Singapore. The country is a hub for chemical logistics and manufacturing," says Mr van Thiel.

In expectation of further growth the company recently expanded their terminal capacity as well as expanding the segments of the chemical market it caters to. While the company feels investment has slowed down due to the crisis it believes that the situation is now picking up.

Despite growth in India and China and competition from neighbouring countries, companies operating in the market today are more than confident that Singapore will remain the pre-eminent logistics hub in the region.

Despite lower costs in other countries, Singapore's efficiency and effectiveness ensure that it remains competitive.

"To give you an example, we are faster going out of Singapore to Shanghai than it is to go from a bonded warehouse in Shanghai to a local company. This is because of customs formalities – in Shanghai you need up to ten days to get out of the warehouse," says Leschaco's Mr. Jacobsen.

With red tape and customs formalities hindering exports from China and infrastructure development limiting potential in India, Singapore is still in a dominant position. Competition closer to home, in the form of Tanjung Pelepas in Malaysia is also not as compelling. With limited ocean carriers calling at the port, many containers requiring transportation from Singapore and the cost of attracting good staff, the overall costs are not as competitive in Malaysia as they may initially seem.

The main potential challenge to Singapore's position is the advent of new manufacturing from the Middle East and the route those products will take to market. "The huge volumes we expect to see coming out of the Middle East will have an effect on how the product needs to go to market and then the main question is the role that Singapore will play in that," says Vopak's Mr. Hoekstra.

Due to its position and facilities, Singapore could become an important strategic staging post. As Katoen Natie's Cardon observes: "If you are in the Middle East and have to make modifications based on customer requirements in China and India, the lead time is too long. Singapore is in a very good position to push products in this direction, customize it and then feed the market."

The diversity of logistics companies in Singapore ensures a variety of different strategies. While major international players such as Leschaco and Agility are seeking to harness their global experience and offer existing customers a total solution, local companies such as CWT and YCH are choosing to focus specifically on the region while smaller players such as Store + Deliver + Logistics and Eagletainer are currently focussing on more specialized markets.

Some companies, such as Leschaco and BDP, prefer to operate an asset light strategy, believing it gives them efficiency and flexibility, whereas others, such as CWT, Agility and YCH feel that being willing to invest in infrastructure distinguishes them. Companies such as Katoen Natie and CWT are introducing new systems and approaches to the market. As the industry changes, and especially with the influx of new products from the Middle East and rising demand in Asia, there is potential to develop new logistics solutions. When compared to other industries, the chemical industry's supply chain management and logistics are relatively underdeveloped. As products from Europe and the US increasingly get shipped to Asia and companies look to cut costs in the wake of the downturn, logistics and supply chain management will become increasingly important for the industry.

Dino Pertsinidis
Vice President of Chemical Sector for Agility Logistics Solutions

Indeed, according to Mr. Lawrence Cheung, Country Manager of Dow Singapore: "In terms of hubbing, physical inventory or transhipment, Singapore will only get bigger. Judging on capacity, Singapore will be number 1 for many many years to come. For supply chain and hubbing nobody will be as competitive. It is the most efficient port operation in the world."

The future for the logistics sector and Singapore's role in it looks very bright.


Rotary Engineering has worked on a range of recent storage projects, catering to growing regional distribution needs

Distribution

With one of the busiest ports in the world and a well-established chemical manufacturing sector, it is no surprise that Singapore is the leading distribution hub in the Asia Pacific region.

As Mr. Dino Pertsinidis, Vice President of the Chemical Sector for leading international distributor Agility observes: "If you draw a 7 or 8 hour radius you will literally cover all of Asia from Singapore." Indeed most business is even closer. The country's location, supported by an excellent logistics sector and the numerous free trade agreements in place, is ideal for distribution. The presence of numerous global and regional head quarters and manufacturing sites ensures that distributors have access to a superlative range of different products, while the projected growth within the region will ensure an increasing need for them. The city state is currently home to a diverse range of distributors from commodity traders to niche specialty operators. While some companies continue to concentrate on servicing the local market an increasing number of local players are focusing on expanding their services throughout the region.

The regional market is still quite undeveloped with only a few established regional suppliers. As the global focus of the industry shifts towards Asia, larger MNCs are also beginning to recognize the market's potential. Despite challenges, including the recent economic downturn and the region's considerable diversity, there are impressive growth opportunities for the sector.

Broadly speaking distributors fall into three categories. Local SMEs, foreign owned regional players with an established network and multinationals, of which there are currently very few.

Local Players

For many local distributors the size of operations on Jurong Island makes it impossible for them to supply their needs. The focus is instead on serving smaller producers and other industries. In order to remain competitive, many suppliers carry numerous products and cover a wide range of industries.

"The manufacturing base is very wide but not very deep. In China a chemical distributor may only have five products in their portfolio, but this can support them. But if you look at chemical distributors in Singapore, they will have a whole portfolio of different products," says Mr. Nicholas Lim, Managing Director of leading local distributor Unilite Chemicals.

Carrying around 50 commonly traded products at any one time Unilite Chemicals is not alone in focusing on covering a wide area of the market.

"We supply everything from dangerous cargo to general food types and pharmaceuticals. Performance chemicals and polymers are two of our key areas, as well as biotech, the food industry, petrochemicals, cosmetics and photographic chemicals," explains Mr. Sidney Chew, Executive Chairman of leading local and regional player MegaChem.

With some local manufacturing in decline and the market shrinking, distributors are looking to alternative sources of revenue. "About 5 years ago we started to realize that factories are moving away from Singapore. This meant we needed to do more than just distribute; we needed to add more value to the supply chain," says local distributor, Aik Moh's Managing Director, Mr. Roy Keng Hong

Aik Moh's toll blending and packaging facilities currently account for 10% of the company's revenue. Although only currently responsible for 5% of the company's turnover, MegaChem is also looking to expand its contract manufacturing services to account for 30%.

With traditional industries being attracted abroad, sourcing new products and finding new clients is becoming increasingly important. "Singapore is a very small country with a small market, so we have to widen our product range. We are always looking for new products and new areas, otherwise we cannot survive," affirms leading local and regional operator, Fu Yuan's Managing Director, Mr. CJ Teng.

As Singapore attracts new industries, local distributors feel that there are some fresh opportunities. "Newer industries like electronics and water treatment will continue to grow here," says Unilite's Mr. Lim while Mr. Chew of MegaChem believes: "The aviation industry is coming to Singapore, so we expect to see potential growth in this area."

According to Mr. Lim of Unilite: "Environmental chemistry is also something very new, which more and more people are getting in to. There are many environmental companies in the water reclamation, water treatment, energy conservation, alternative energy business."

While some distributors cover a wide range of different products, others have chosen to focus on niche markets. Established in 2001, EPChem International decided to specialize in hydrocarbon, covering the spectrum from synthetic liquid paraffin oil [C8] and semi-solid petrolactum to long chained polyethylene and polypropylene solid hard waxes [C100++] and their derivatives. "Instead of being an insignificant player in a big commodity chemical business, EPChem decided to move to a business domain which is too small for the big boys, but too complicated for the small," EPChem's CEO, Mr. Seah Cheong Leng explains.

Regional Reach

Given the small size of the local market and Singapore's considerable advantages as a logistics hub, many distributors have naturally expanded into the wider region and even further a field. Going international in the early 1990s, MegaChem currently has six offices in South-East Asia, as well as additional offices in China, India, the Middle East and even the UK.

Setting up its first overseas operation in 1989, Fu Yuan currently has offices in Taiwan, Malaysia, Indonesia, Thailand, and Hong Kong, Shanghai, Guangzhou, Chengdu and Tianjin in China. Similarly industrial chemical and polymer player Linkers has offices in 10 countries in South East Asia, South Asia and the Middle East.

With less than 5% of the company's sales in Singapore, EPChem's market stretches from South East Asia, Greater China, Australia and Africa to Latin America.

With continued growth throughout the region, much of it among smaller producers, there is a lot of potential for distributors. China is naturally a huge target for many distributors. Indeed it currently accounts for 40% of Fu Yuan's sales. Other regions have also been performing well.

"Southern Asia is coming up really strongly, with markets like India and Pakistan," says MegaChem's Mr. Chew. Demand is also growing closer to home, particularly in Thailand, Malaysia, Vietnam and Indonesia. For MegaChem the region presents 72% of sales.

Many distributors are also looking further afield. Recognizing opportunities in the Middle East, both Linkers and MegaChem have expanded their operations to cover the region. Linkers is also

Woo Siew Wah
Managing Director,
SOXAL Air Liquide

Mr. Seah Chong Leng
CEO EpChem

focussing on taking advantage of opportunities in Africa, while MegaChem, seeing considerable potential in South America, is looking to set up an operations hub there. With solid distribution networks in place and a growing understanding of market needs and trends, some Singaporean distributors are successfully competing with established regional players.

While still relatively small in global terms, there are also some large regional players currently operating in the market. Founded in 1840 with its holding company in Hamburg, Behn Meyer is one of the older players in the region. With group companies operating in Germany, Singapore, Malaysia, Thailand, Indonesia, Vietnam, Myanmar and Cambodia, the company has a long history and well-established base in the region.

Headquartered in San Francisco and with a Singapore presence since 1970, The Connell Bros. Company is another large player, whose heritage dates back to 1890's Hong Kong. Specializing in servicing Asia Pacific, the company currently has a presence in 17 countries producing a turnover of 150 million USD.

Also started in Hong Kong in the 19th century, Jebsen & Jessen, like Behn Mayer, concentrates on distribution within South East Asia from offices in Singapore, Malaysia, Thailand, Indonesia, Philippines and Vietnam.

In 1997 the company entered into a joint marketing and distribution venture with Evonik Degussa. While this was disbanded in 2008, the company continues to handle much of Evonik's business in the region.

These regional players currently enjoy some advantages over their local competitors. With long histories, they have been able to set up broader and more concentrated distribution networks. As members of larger organizations they are also able to draw on the resources of their parent companies and extended networks. Local competitors are fast catching up however, with larger players achieving similar sales and creating comparable networks.

Global

Even they, however, are dwarfed in comparison to the latest arrival. With the purchase of Rhodia's South East Asian chemical distribution business in 2008, Brenntag has demonstrated a clear commitment to the region. "With Brenntag's experience and stability, the acquisition of the distribution business of Rhodia was a natural step to enter the region. We could build upon a good platform and 20 years of know-how in the market. There is also strong potential for adding value," says Mr. Henri Nejade, CEO of Brenntag's Asia Pacific operations.

With a focus on specialty chemicals, Brenntag is looking to expand and develop their operations and establish an Asia-Pacific distribution network. The company recognizes significant growth potential in China, India and some countries in South East Asia and Mr. Nejade believes the acquisition will open the door for Brenntag suppliers.

The company's arrival is reflective of the growing interest in the region. Furthermore, as Mr. Nejade points out: "While there are successful distributors that have been here for a long time, they only have a local network. We are the first truly global full line distributor." Brenntag is looking to leverage this experience as it aims to become master distributor in the region.

Weaving webs

While the Asia Pacific and South East Asian markets are attractive and potentially lucrative they are also extremely varied and challenging. As Mr. Meinshausen of Evonik observes: "The feature of the region is its heterogeneity. With emerging economies as in Indonesia, Vietnam or Thailand as well as highly developed economies as in Singapore or Australia."

Such regional diversity requires an in depth understanding of the various countries, industries and specific customer needs. In such a varied market distribution is understandably quite underdeveloped when compared with other regions. Producer, trader, agent and distributor roles are often less clearly defined than in mature markets, while distribution is often fragmented along country and product lines. With rapid growth the needs of the various industries in different countries are also constantly changing.

Recognizing these challenges, distributors are opting for a decentralized approach and greater sub-regional autonomy. Behn Meyer, for instance, has no regional headquarters in South East Asia, with each country office acting as an independent entity. Fu Yuan Enterprises also understands the importance of local knowledge. "We believe in having a global perspective but to place importance on localization also. So in our offices we have local people managing the business because they know the market the best and can provide the lines of resources, suppliers and channels," says Sales Executive Mr. Teng Chen Ji.

EPChem, meanwhile, has created independent divisions, focussing on a number of application areas, where: "Each unit is accountable for its sales and profitability and is rewarded according to the unit's performance."

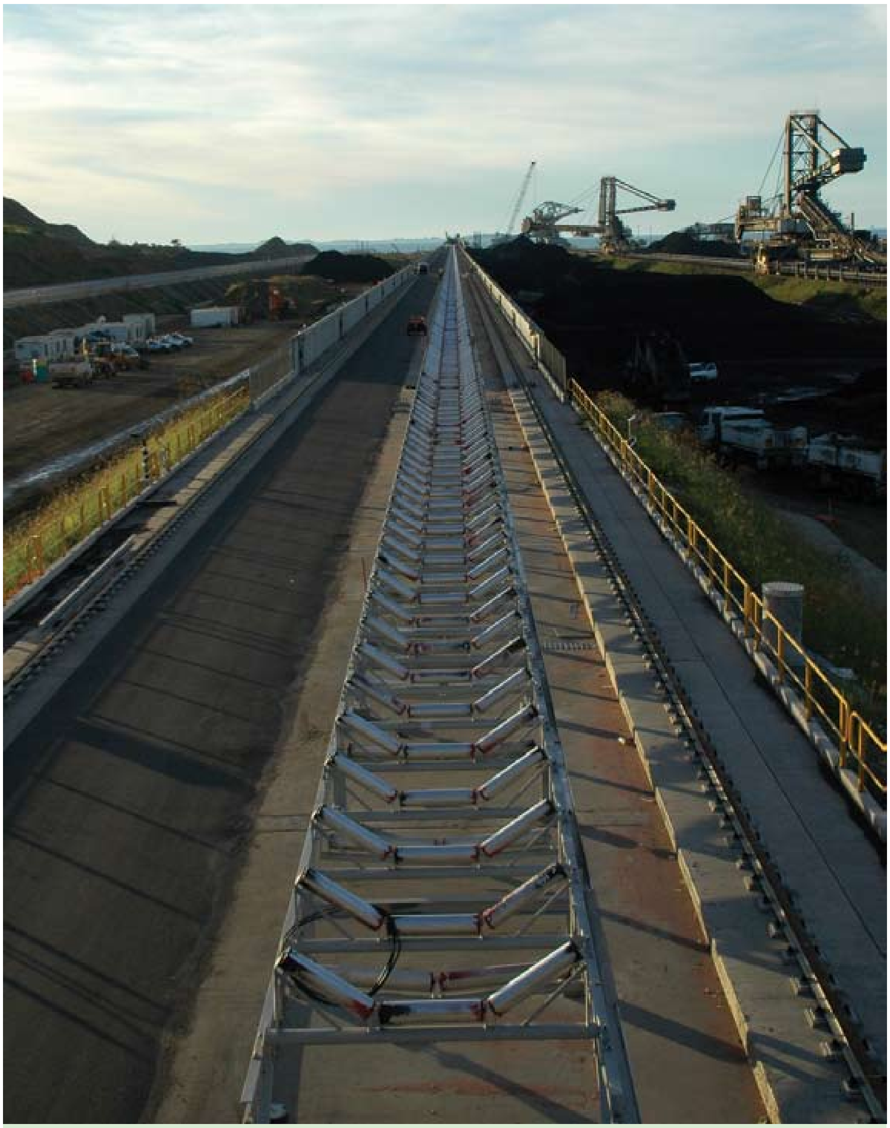
CWT - Preparing for a new role servicing international producers

Riding the storm

Surprisingly, many distributors have been largely unaffected by the recent economic downturn. Indeed, some feel that it has even had a positive effect on their business. For MegaChem the downturn has helped them to acquire new customers and reduced the competition. "We thrive in crisis. The market at the moment is overcrowded and this financial crisis is getting rid of some of the excess suppliers," says Mr. Chew.

Indeed, for many local distributors, covering a wide range of industries and markets has helped insulate them from the shock. "Our business model of diversification in various countries/regions and serving a wide range of customers in different industries has always helped us, particularly in difficult times," explains Mr. Shamsher Zaman, Managing Director of Linkers. With Middle Eastern and African markets largely unaffected, the company has been able to concentrate resources in those regions, resulting in new business.

"Because we are in specialty chemicals, the downturn was not so serious a factor for us," believes Fu Yuan's Mr. CJ Teng. "This year in Singapore we have already recovered – our turnover is slightly higher than last year. Our other markets are the same. The prices have dropped, but quantities are much higher, which compensates for this." Last year saw a 30% annual increase in turnover for the company, which took the opportunity to provide product training to customers and create a new business development unit.



MacDow - Extensive process facilities and a long history in the country

While AIK Moh Paints did see the effect of the downturn, it has largely recovered. "In 2009 we had half a year that was very good and half a year when things went bad. We saw a decline in sales of between 20 to 30% in the worst period, but things are picking up and now we are only 10% below our normal pre-crisis level," said Mr. Roy Keng Hong, speaking at the end of last year. The company also saw continued growth and demand in certain sectors, including pharmaceuticals and water treatment.

Due to EPChem's diversity the company also managed to maintain sales. Mr. Seah Cheong Leng believes that recent downsizing in the industry has created additional opportunities for distributors. "The unintended effect was that knowledge in many special applications has been lost with the departure or earlier retirement of experienced staff in their respective fields. This would also mean that more special performance chemical companies find the need to outsource their sales and marketing to third party distributors."

With government rescue packages helping to stimulate demand in China and elsewhere in the region and new players arriving to the market, the industry's fast recovery is reflective of the region in general.

In the short term demand is likely to increase as manufacturers and producers, having put purchases on hold as a cautionary measure during the downturn, look to restock. The downturn has not been entirely positive, however, especially in the local market where many producers have relocated to China, attracted by the cheaper operating costs and growing local market.

Another challenge, particularly for smaller players is ensuring access to a skilled workforce. With workers attracted by the higher pay scales of the top tiered chemical companies in Singapore, SME's such as EPChem and Unilite find it difficult to attract talent. With the continued strength of the Euro, companies carrying European products are experiencing problems. Although some companies feel the government could provide more support for SME's in the industry, others believe that the right programs are available.

In such a competitive and varied market, distributors rely on a wide range of unique strengths. In addition to the speed advantage of having their own warehouse facility, Mr. Lim feels that Unilite's small size offers them an advantage over their bigger competitors. "As a local SME we are able to move faster. Big multinationals would have a certain process they would have to follow, but here it requires just one phone call to our company."

Fu Yuan's Mr. CJ Teng also believes not being a large multinational helps. "We are more independent, more aggressive, have more initiative to get new business and long-term relationships with our clients." For local distributors being associated with Singapore brand and its perceived quality is also beneficial, particularly as they look to expand further abroad.

EPChem's strength is being one of the major suppliers for a full range of wax products in Asia Pacific. "We have competitors in virtually every product type but have few direct competitors who cover the exact product range as ours," says Mr. Seah.

Larger players see advantages in being able to offer a range of technical support services. With a laboratory in Singapore, Connell Bros can produce examples to show potential clients the benefits of their products. Having invested in heavily in IT data profiling, the company also feels it is better placed to understand and respond to the needs of the market.

Brenntag believes its size and experience gives the company a competitive edge. "What we bring here is our knowledge of the market and of product applications and add it to our logistics expertise. We deliver to our customers at each location where our products are required. We provide a total sourcing solution. We believe you can do this well only if you are a global company," claims Mr. Nejade.

With 50 engineers in South East Asia trained in the company's products and applications, the company feels it can function as a single sourcing point for large chemical manufacturers in the region backed by its considerable global resources.

With Asia expected to be the main vehicle for growth in the chemical industry, there are considerable opportunities for distributors.

Due to its location and facilities Singapore is the ideal location from which to supply the region. With production becoming more sophisticated in India, China and South East Asia, there are numerous opportunities for suppliers, especially those offering specialties. Singapore's move towards higher value production should ensure that distributors will have ready access to a growing range of products, direct from the manufacturers.

Given the diverse, challenging and constantly evolving nature of the distribution landscape, manufacturers are also likely to rely heavily on distributors to gain access to the market.

While total supply solutions from global heavyweights like Brenntag will be attractive for larger manufacturers, the more modest needs of a growing group of smaller manufacturers and producers should also ensure considerable opportunities for smaller distributors.

Acquisition opportunities are also arising as a result of the downturn and there should be a considerable amount of consolidation in the market, which should see the emergence of a group of stronger regional players and market maturation. Following Brenntag's example, other global distributors may well start to focus more closely on the region.

Conclusion

The Singaporean petrochemical industry has enjoyed remarkable success throughout its history. From a series of small islands and a handful of refineries, the country has succeeded in building, literally from the ground up, an innovative world-class petrochemical hub that has attracted the world's leading players.

To do this the country has overcome considerable challenges, not least of which has been the limited resources available. Singapore's ideal geographical location, excellent infrastructure and facilities, use of advanced technologies, skilled workforce and active governmental support have ensured the industry's success.

Integration has been the key. As the Minister for Trade and Industry, Lim Hng Kiang observed: "The success of our chemical industry has been very much anchored on a seamless integration strategy. Working closely together with the industry, we have created an ecosystem that not only achieves a high level of feedstock integration, but also integration through a full spectrum of logistics and utilities services."

With the two new crackers ensuring vital new feedstock, the country is looking to develop its downstream activities while extensive investment in R&D should see an increased focus on innovation.

As the petrochemical industry in Singapore develops further and demand from producers and consumers in the region increases, there are numerous opportunities for manufacturers, distributors and service providers in Singapore. As EDB's Mr. Ho confirms: "If you look around the region, strong GDP growth rates are a reflection of robust demand growth. Asia is a key region where we will continue to see long-term positive growth and Singapore is well-positioned to play a critical role in meeting the region's energy and chemical needs."

A full range of services, the ease of doing business and extensive support from EDB make the country particularly attractive for players looking to enter the region. Indeed, the numerous established players and new arrivals, increasingly choosing to create regional headquarters in the country, reflect the opportunities and advantages the country offers.

In the medium and long term, rising costs and growing competition from China, India, the Middle East and South East Asia present significant challenges for the country. However, by working to increase efficiency, taking advantage of its strengths and concentrating on moving up the value chain, Singapore should be able to ensure that it remains a leading player, not only in the region but increasingly globally.

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Economic Development Board Singapore (EDB)
www.edb.gov.sg

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Mr. Terence Koh
Dr. A. Chockalingham
www.scic.sg

Association of Process Industry (ASPRI)
www.aspri.com.sg

ASPRI is organizing 2nd International Exhibition & Conference on Plant Construction, Engineering & Maintanance for the Process Industry
www.processcemasia.com

SPRING Singapore – Enterprise Development Agency
www.spring.gov.sg

Energy Market Authority - EMA Singapore
www.ema.gov.sg