SPECIAL REPORT ON SINGAPORE PART 2

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The Next Leap Forward

Chemical Industry in Singapore (Part 2)

In our first report on the chemical industry in Singapore (Chemical Week, March 22/29, 2010), we examined its current state; some of the issues facing it and the measures that had already been put in place to overcome these. In this follow-up investigation, we look at the future of the chemical industry in Singapore; initiatives, trends, and how Singapore aims to maintain its dominant position in the face of increasing competition from its neighbours.

Singapore has had, throughout its entire brief history as an independent state, the ambition and ability to capitalize on its location on the world's second busiest oil shipping route. It sits squarely on the narrowest choke point of the Strait of Malacca, the Phillips Channel, through which pass an estimated 15 million bpd of oil, representing a third of all global oil shipments.

A newly independent Singapore quickly took advantage of this, going from its first oil refinery set up by Shell in 1961, a few years before independence, to being the third largest oil refining centre in the world by the 1970s. In the past fifteen years, Singapore has achieved the same phenomenal growth in the downstream petrochemicals sector. Since the official opening of Jurong Island in 2000, a remarkable twenty years ahead of schedule, Singapore is now home to one of the top ten petrochemical hubs in the world, with the chemical sector (including biomedical) accounting for 37.4% of the country's total manufacturing sector in 2009, a total output worth $79,786.2 million.

However, to counterbalance Singapore's natural geographical advantages, there are also numerous natural disadvantages. Some, such as the lack of feedstock, have been successfully confronted. The introduction of two new ethylene crackers by Shell Chemicals (which successfully started up last month) and ExxonMobil (due to start up next year) will double Singapore's total ethylene output to 4 million tons per annum (tpa), providing a reliable supply of feedstock for the foreseeable future.

Other restrictions are less easy to overcome. As an island with a landmass of a mere 274.2 square miles (20% greater than in the 1960s, due to ambitious land reclamation projects) and a population of just below 5 million, land and labour costs are significantly higher than the South East Asian average.

These issues become all the more pressing in the face of growing competition, most notably from China, India and the Middle East but also from Singapore's more immediate neighbours. In order to remain competitive and retain its preeminent position in the region, a new leap downstream is called for.

However, the diversification and sophistication of manufacturing capabilities itself presents a challenge to the industry in Singapore. New technology is required, a highly skilled workforce has to be extracted from Singapore's small population and environmental issues become ever more difficult to deal with.

What is more, although the attraction of MNCs will remain essential to Singapore's growth, it is now recognizing the importance of nurturing home-grown talent. Many local companies are expanding overseas, although moving from the comfort of Singapore is not always easy. How Singapore copes with these challenges will be essential to how successful its next step downstream will be and, consequently, its ability to retain its dominant position in the South East Asian chemicals market. If its past record is anything to go by, however, one would not bet against it.

Manufacturing

With the two new ethylene crackers providing the feedstock, specialty chemical manufacturing stands to benefit from all the same advantages that the petrochemical industry already benefits from; an advanced 'plug and play' infrastructure on Jurong Island, intellectual property protection, stable politics and significant help from the government.

The advantages of Singapore as a manufacturing base have already been spelled out in the first part of this report. Beneficial tax rates, excellent infrastructure, an English-speaking workforce and the financial stability provided by a government that has had no public external debt since 1995 all provide an attraction for investment not easily found in other parts of Asia.

Added to this is the assistance that the government, primarily through EDB (Economic Development Board), extends to potential investors. This, for many investors, is more important than any economic considerations. 'As far as the government is concerned, particularly the EDB and the Jurong Town Corporation, it really was the help and advice that they gave us initially when we set up here; right the way through to helping us choose the land to helping us develop our new manufacturing facility,' explains Mr. David E Barraclough, President, Asia Pacific, of Croda, a leading global manufacturer of specialty chemicals in the personal care and industrial specialties fields. His sentiments are shared by many of the companies on Jurong Island, a list which includes such names as Huntsman, BASF, Lucite, Evonik RohMax, Mitsui Chemicals, Ciba and Chevron Phillips. While a look at the list of the 96 companies currently incumbent on Jurong Island will reveal a fair proportion of specialty chemical manufacturers, this is a relatively recent development. Specialty chemical manufacturers achieved growth before the recession of 6.5% in 2007 compared to 5.3% for petrochemicals in the same period.

Croda was one of the earliest specialty chemical companies on Jurong Island, completing their facility in 1999. One of

their primary reasons for moving onto Jurong exemplifies the advantages of the island – easy access to a pipeline of ethylene oxide.

Access to feedstock has been enhanced by the creation of the 'plug and play' system, an innovative integrated service which allows plants to feed off each other through a centralized service corridor. The accessibility of ethylene oxide especially, a basic building block for many downstream chemicals, should increase as Ethylene Glycols Singapore Pte Ltd (EGS) continues to focus on and expand its ethylene oxide production (as opposed to ethylene glycol) in response to consumer demand. It is aiming to increase its current production of 60,000 tonnes by an additional 50% in the next few years.

A larger supply of ethylene oxide will allow Croda to carry out its expansion plans. 'We are looking to add 15 to 20 thousand tonnes of additional surfactant capacity' says Mr. Barraclough. 'Croda is ready to expand its facilities now but the difficulty at the moment is that we are still waiting for further ethylene oxide capacity to come on-stream.'

An increased supply of ethylene oxide will also provide opportunities for one of the newest, and most unique, additions to Jurong Island. Chemical Specialties Ltd (CSL), a joint venture from three American individuals with long a history in the chemical industry in the United States, has recently opened a specialist toll manufacturing facility. The scale and capabilities of this facility make it the first of its kind in Singapore and possibly the whole of the Asia Pacific Region.

Focused primarily on ethylene oxide and propylene oxide as raw materials, Mr. Jeff Melton, Director, says: 'We viewed ourselves as a facilitator of moving blocks down to a finished product and no one else here, to any large extent, was doing that.' Yet again, the decision of CSL to invest in Singapore rather than a neighbouring country, despite all their original studies showing Singapore as the most expensive place in which to build a facility, speaks volumes about the efforts of EDB. 'They have very modern concepts about business here and they know how to attract it. They also have a government that is very financially sound and to us that means great stability,' continues Mr. Melton.

Off Jurong Island, the growing number of specialty manufacturers is even more obvious, with a number of foreign and local manufacturers setting up operations in Tuas or the surrounding areas. Buckman, a company originally hailing from Memphis Tennessee, have chosen Singapore as a base of operations supporting the whole of the region. Talking about the advantages of conducting operations from Singapore, Mr. Leigh Mann, General Manager for Asia and Africa, says: 'I have always been amazed at how efficient Singapore is; well controlled yet efficient, incredibly well managed yet flexible, so you have a capability on this island that is quite remarkable. That is why all productivity statistics always place it as number one or two in the world.'

David E Barraclough
President, Croda Asia Pacific

Focusing on producing specialty chemicals for use in three primary industries – pulp and paper, industrial water treatment and leather – Buckman recorded a record profit in 2009, from global sales of over 500 million USD. The region that Singapore supports and supplies to contributes, from a profit perspective, a significant part of that and is described by Mr. Mann as being 'fundamental' to Buckman's continued global success.

This move towards advanced manufacturing is even evident in the operations of Linde Gas. Their Jurong Island facility serves as the largest supplier of carbon monoxide, carbon dioxide and hydrogen in Singapore and also produces carbon dioxide, liquid oxygen, liquid nitrogen and argon. However, off Jurong Island they are concentrating on more complex production. 'Our Tuas facility serves as the regional hub for our specialty gases supply chain, and involves premium specialty mixtures which are extremely high quality, prepared to specification and largely for export for use in various industries,' says Mr. P W Kinsella, Managing Director, Linde Gas Singapore. Local players are also making a mark. Two companies in particular, Haruna and Asiatic Agricultural Industries, have been at the forefront of developing some very innovative products in their respective fields.

Haruna Paint, a Singaporean SME which began production in 2004, can already boast an annual sales figure of 9 million SGD for 2008, and has attracted a fair amount of media attention along the way. From using photocatalytic technology to produce a 'self-cleaning' paint, to HP Helioguard, a thermal insulating paint or the recent development of an 'anti-stick' paint, Haruna's ability to compete in a market dominated by such players as Nippon Paints or AskoNobel depends on its investment in the development of highly specialized and innovative paints and coatings. 'It is very difficult for us to fight against the giants,' says Mr. Mitsuyoshi Kubota, Managing Director. 'So we have to emphasize our strengths. Our strongest point is this kind of specialty product that only Haruna can supply.'

Asiatic Agricultural Industries is another local SME that focuses on high-value advanced products in order to compete with global giants. As a company specializing on agricultural chemicals in a country that has a negligible amount of agriculture, it has enjoyed success despite this slightly odd situation. Last year it opened a 10 million SGD production factory which has tripled the company's production capabilities to 30,000 tpa.

Manufacturing output of specialty chemicals was hit by the economic downturn, falling 8.2% in 2009, although the high profit margin nature of the market meant that many companies prospered despite this. Croda, for example, announced record pre-tax profits of 106.4 million GBP and Orapi, a French specialty chemicals manufacturer, obtained record sales of 113.4 million Euros worth of sales last year.

In many cases, what has enabled these downstream manufacturers to come through the recession relatively unscathed is the diversity of their portfolios. Orapi, for example, supply over 10,000 different formulas in six main areas of operation. While business for some of their product lines did suffer, others, such as disinfectants during the H1N1 flu, experienced a surge in demand. Croda's success also leveraged upon their more successful product lines, with demand for coatings and lubricant additives falling significantly in the first half of 2009, but the consumer care markets holding steady.

With a wide range of products, the specialty chemical industry in Singapore


Croda's speciality chemicals manufacturing facility was one of the first of its kind on Jurong Island

Jacobs Engineering Singapore offers total solutions to clients such as CIBA Specialty Chemicals (now part of BASF)


Tan Ah Lam Frankie
Chairman & CEO
Hiap Seng Engineering Ltd

stands to gain the same advantages that individual companies do. With the continued growth of Asian demand almost guaranteed in certain fields such as personal care, these pillars can support more advanced manufacturing, giving more specialized products a platform from which to test the waters. Mr. Barraclough speaks for many when he says: 'As far as Asia and the specialty chemicals market are concerned I don't think we have seen the growth yet. I think the real growth will come in the next 3 to 5 years and I think it is going to be an extremely exciting time.'

Services

One of the chief attractions of Singapore for manufacturing investment is its comprehensive network of service industries. However, with the massive Shell and ExxonMobil projects drawing to a close, and some worried about a backlash from the economic recession, companies have to work hard to remain competitive.

Supporting both the traditional petrochemical industry and the emerging downstream manufacturers, Singapore contains a plethora of service industries, covering everything from EPC contractors to a range of more specialist services: staffing solutions, training and project analysis, to name but a few.

Over the years, Jurong Island has attracted many of the global players in engineering, construction, storage, logistics and distribution, many of which were covered in the first half of this report. It has also built up a thriving local industry, with logistical companies like CWT or YCH, EPCs like Rotary or distributors like EPChem all beginning to compete on an international scale.

Further incentive for these related industries has been provided by Singapore's status as one of the first Asian countries to really adopt the outsourcing model. 'We are definitely seeing a trend towards outsourcing, particularly post-financial crisis. Organizations are moving to concentrating on their core business practices,' says Mr. Mark Sparrow, Managing Director of Kelly Services, a company providing staffing solutions to a range of industries, including chemical and pharmaceutical.

Nevertheless, going into the future this thriving service industry stands to face some significant challenges. With a lack of significant investment announced during the recession (with the notable exception of Lanxess' 500 million USD butyl rubber plant), competition stands to become a lot tougher.

Companies are responding to this in different ways. Increasingly, market leaders are offering their clients a 'total solution'. International heavyweights such as Foster Wheeler, Jacobs or McConnell Dowell provide a comprehensive range of services that can cover an entire project lifecycle, from Front End Engineering and Design (FEED) to decommissioning.

Some local companies, particularly those who are now successful enough to compete with the MNCs, have adopted a similar approach. Hiap Seng Engineering, for example, provide a full range of services for a wide range of markets. 'We provide quite a full range of services to the oil-and-gas industry – offshore and onshore, upstream and downstream. We do offshore on an EPC basis, doing design and fabrication of FPSO Topsides in modular form. Our services have also been provided to petrochemical and pharmaceutical industries,' says Mr. Tan Ah Lam, Chariman and CEO.

The Davy Group, a local provider of services to the oil and gas, petrochemical and pharmaceutical sectors, is able to leverage on the specialist knowledge of its companies to provide a diverse range of services.

'We have been continuously diversifying our range of services so that we can provide a total solution' says Mr. A Rajagopal, Managing Director. 'In order to provide this wide range of services, our companies leverage on each others' contacts in the industry, share technical knowledge and share resources.'

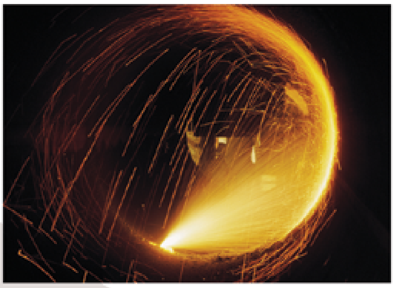
A similar kind of flexibility is offered by Cyclect Holdings Pte Ltd, a successful local contractor in the business of engineering, construction, maintenance in a diverse range of markets. 'We are fortunate as we are diverse. This allows us to be flexible in how we use our resources. If one type of industry is not going so well, we will focus those resources on another type of industry. This is how we can stay afloat; by being flexible and using our resources in different avenues,' says Mr. Tan Ee Wei, Business Development Executive.

Although this diversification came about not by a deliberate strategy on Cyclect's part but simply through adapting to client's needs ('evolution, not revolution' according to Mr. Melvin Tan), it now serves as a major selling point to clients.

'Customers are looking for end-to-end solutions and this requires many levels of innovation. Our ability to create customized novel solutions to meet unique demands is a key advantage.'





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The major advantage that this kind of service diversification offers is stability. 'The chemical industry is vulnerable to highs and lows so in order to have a more stable kind of continuity we decided to diversify into other sectors,' says Mr. Steven Toy Kok Sin, Managing Director of AME International, a local steel fabricator who diversified into sectors like manufacturing and construction during the first recession in 1998. AME International's ability to fabricate virtually any product that an engineer can draw has stood it in good stead to fulfill its Managing Director's ambitions; 'We have the capability to be one of the major supporters of this industry and that is very exciting for us. We hope we can grow in Singapore and also expand overseas.'

Other contractors in the process industry are attempting to retain their specialist expertise whilst using it in a wider range of services. 'We were concentrating just on rotating equipment and we are starting to diversify now into other supporting requirements around rotating equipment in order to meet with the nature of any job that is given to us,' explains Dr. Tan Boon Kiat, Managing Director of Wing Wah Industrial Services, who have spent the last three years investing in restructuring and training in order to build a solid platform from which they can meet the markets changing demands. Given the exacting standards of its international clients, this strategy allows Wing Wah to offer them value in terms of diversity of services as well as the expertise that comes through specialization.

This growing trend towards bigger projects is, for Wing Wah, both an opportunity and a challenge. 'Traditionally the requirements from the customers have been more narrow and focused on particular disciplines,' says Dr. Tan Boon Kiat. 'Now they are starting to give out jobs on a bigger scale. This enables us to play a bigger role in their service requirements. This also means, however, that the requirements at our level have also changed, so the skill level in the company needs to enhance.'


AME International have the capability to fabricate customized steel parts according to your specifications


Mark Sparrow
Managing Director,
Kelly Services

Contract Resources Pte Ltd are another company leveraging on their highly specialized skill set. Focusing, in Singapore, on catalyst handling and DDT (decoking descaling technology), they are capable of providing other services, but believe their strength lies in these two areas.

'Specialization is our way of surviving,' says Mr. Jelmer Bolt, General Manager. 'We focus on two activities that we know we are good at and are recognized as being good at, and if there is an area related to those that our client asks us to do, we can do that for them as well.'

Even companies like Mammoet, who occupy a niche market, see scope for providing additional services. As the leading heavy lifting and transportation company in the world, possessing the top ten biggest cranes in the world, they have, obviously, a captive market. 'If you want to lift a 2000 ton vessel there are only two cranes in the world which can do that, and both of them are in our fleet,' says Mr. Robin Koenis, Commercial Manager, Mammoet.

Nonetheless, Mammoet has plans to add both value-added services and a new department to its existing business in Singapore. 'We have a salvage company which we have started up in Singapore and also we have already started an engineering department in Singapore to service Asia Pacific projects,' says Mr. Koenis.

In another sector of the service industry, Kelly Services has adopted a 'specialized yet diverse' business model. In the business of providing a comprehensive array of workforce solutions and with various specialized divisions, Kelly Services provides selected diverse areas with a specialized expertise. 'Going down the specialization route allows us to polarize networks, capture networks and retain them around a discipline that our clients find valuable,' says Mr. Sparrow, Managing Director.

The growing need for qualified staff in Singapore is one which human resource companies like Kelly Services or Brunel have recognized.

Kelly, for example, provides specialist staff for industry through its division Kelly Engineering Resources while Kelly Scientific Resources can provide research staff for laboratories and R&D centres. Brunel Energy, a provider of highly skilled technical specialists, is similarly proud of its ability to source qualified staff for all phases of a project lifecycle.


Construction of Chemical Jetty


Construction of Cofferdam for Subsea Pipeline Works


Construction of Cooling Water Intake Station


Engineering and Upgrading for Oil Terminal


Jetty Demolition and Dredging Works


Marine Piling for Refinery Modification Works

Leigh Mann
General Manager, Buckman
Africa and Asia-Pacific

Mammoet can cater for all heavy lifting and transportation requirements

With the growing trend towards larger investments and the raised level of expertise required by the more technologically advanced downstream plants, the service industries related to the chemical sector in Singapore are having to adapt. Whether that means capitalizing on its existing skill set or diversifying into new ones is a question that companies have answered differently. What this adaptation does mean, however, is that manufacturers and main contractors now have a huge range of options in their contracting and outsourcing.

Environmental Protection

With environmental concerns growing increasingly important, especially in industry, both Singapore and its incumbent companies are taking 'green' issues increasingly to heart.

No exception to this trend, chemical manufacturers are stepping up efforts to save energy and reduce emissions. Part of this is driven by government regulations. Announcing a 1 billion SGD 'environmental blueprint' in April of last year, Singapore is pouring money into public and private initiatives in order to achieve their goal of a 35% improvement in energy efficiency by 2030. For some companies, however, their concentration on environmental concerns comes about not solely through imposition.

Buckman has a long history of concern for environmental issues. They were the first company that moved away from using heavy metals in their products and their current focus is on using biodegradable materials. Croda is also a prime example of a company meeting self-imposed standards higher than what is actually required of them. With over 70% of their products based on natural products, Croda are making sure that their manufacturing has as little environmental impact as possible.

More than that, however, Croda are investing in R&D specifically to allow their customers to lower their environmental impact also. Their recently developed LoVOCoat range of products allow their customers to substitute solvent with water in coating systems. Promising to have even more of an impact, a recent development is their Cold Process Technology Development. As Mr. Arthur Knox, Regional Vice President, Sales and Marketing for Asia Pacific, says: 'This enables our customers to create emulsions, skin creams and lotions using a cold process as opposed to a heating process. It's our estimation that his could lower their energy requirements by roughly 80%'. With these kinds of technologies, the dilemma often faced of cost versus environment is solved – using these technologies will actually save Croda's customers money.

It is not just the manufacturers, however, who are paving the way in new technology. As part of their business, Cyclect have an Energy Solutions Department looking at alternative energy. One of their recent innovations is their design of solar powered cooling systems. In the air-conditioned country of Singapore, this holds huge potential.

Environmental efforts do not rely solely on technology though. An increasing number of EPCs are looking at how to improve their processes. To this end, HSL Constructor Pte Ltd, a local company focusing mainly on marine work for the petrochemical industry, has commissioned an environmental impact study in order to evaluate what needs to be done. 'We want to come up with a framework where we include this as part of a plan where there is a safety method statement, risk assessment plus – now – environmental studies for every marine project that we do. We are dedicated to minimize the impact on environment by our activities,' says Mr.

Charles Quek, Executive Director.

Of course, despite all of these efforts it is still inevitable that any chemical manufacturer will produce waste once up and running. For the disposal of this waste, there exists a wide diversity of companies, both local and international.

One example of a leading local player is ECO Industrial Environmental Engineering (ECO-IEE). Their services are succinctly summed up by Mr. Benjamin Tan, Director of Sales: 'Basically we have two plants. One is ECO Special Waste Management which is hazardous waste management and the other is ECO Resource Recovery Centre which is handling the non-hazardous waste. With these two plants we are able to provide a one-stop waste management solution to all of our customers.'

ECO-IEE has gone to great lengths to ensure a minimum adverse environmental impact for both their customers and themselves. Before building their facilities, an impermeable membrane was placed underneath their plant facilities in order to prevent soil and groundwater contamination. Their gas emissions go through both a dry and wet scrubber system, their incinerator plant is fitted with a bag filter and alkaline washing and their waste water plant is equipped with wet (acid and alkaline) scrubber units. In addition to this, they monitor all their emissions on a 24 hour basis. As Mr. Tan Keaw Chong, Managing Director says: 'Obviously the industrialization of countries has contributed a big part to global warming. So it is the time now for all industries to look at how they can improve this and make it a better environment for everyone.'

ECO-IEE works closely with their clients to provide the same kind of environmental standards to their facilities as well. With the disposal of waste being an important consideration for any new manufacturing investment, ECO-IEE is often called in by EDB to provide assurances for new investors. From this point, they can work with their clients from the start of construction, enabling them to understand the manufacturer's processes and waste discharge requirements.

Offering a slightly different service is ATEA Environmental Technology. Headquartered in Singapore, but with operations in China and a sister company in Germany, ATEA started out by offering complete turnkey solutions for water treatment systems. However, frustrated by the lack of quality available in the region for tanks, pipes and vessels, they have

ECO Industrial Environmental Engineering can provide a one-stop waste management solution

now branched out into manufacturing these products themselves.

Singapore has now become a recognized global hub for waste water treatment, with its International Water Week (this year being held between the 28th of June and the 2nd of July) drawing in industry leaders, experts and governmental figures from all parts of the globe.

This booming market has encouraged many companies to expand into this sector. Sembcorp, the service provider who created the 'plug and play' system on Jurong Island, have branched out into waste water treatment. Similarly, Advanced Holdings Ltd, although specializing in the design and supply of process equipment, have set up Advanced Water Engineering Pte Ltd, which can already boast two unique, low investment and low maintenance waste water solutions; the Differential Flow Activated Sludge (DFAS) technology and the Upflow Anaerobic Sludge Blanket (UASB) Reactor Technology.

However the market does remain dominated by those companies who specialize in environmental services. Hyflux, with an average turnover of 1 billion SGD, is the dominant local player.

'As a country looking into self-sufficiency in water, Singapore is the right place for us. It is looking at desalination, it is looking to water recycling and it is looking into cheaper and more reliable forms of water treatment. And that is why they are looking at membranes,' says Mr. Sam Ong, Group Deputy CEO and CFO of Hyflux.

The other big player on the market is Veolia. The Veolia Water division both provides technical solutions for manufacturers' water issues and supplies water treatment chemicals. Its chemical range, known as Hydrex, consists of 450 specific formulations designed to target any waste treatment requirements. 'This has been a very strong development in Europe, Saudi Arabia and the USA so we re-launched this segment of activity in Singapore and Asia in 2009. This is going to be a big driver of the solutions business development,' says Mr. Laurent Besson, General Manager, Veolia Water Solutions & Technologies (SEA) Ltd.

While these two players dominate the water treatment industry, a healthy market thrives on finding unique selling points and niche areas. ATEA Environmental Technology focuses not on the treatment, but on building the treatment systems. 'We build the plant, we know the plant and we can do all the calibration and water testing,' says Mr. Christophe Engel, Managing Director, showing the full range of ATEA's capabilities.

This focusing on the services side of the business has served ATEA Environmental Technology very well. In 9 years they have grown to a workforce of 350 throughout the region and a 60 million SGD revenue, with expectations for that to grow to 800 to 1000 employees and a 200 million SGD revenue in the next five years, based partly at least on an increased focus on the manufacturing side of their business. 'We are the only ones in Asia who are manufacturing these products to this level of quality and there are also opportunities in the chemical and infrastructure industries,' says Mr. Christophe Engel.

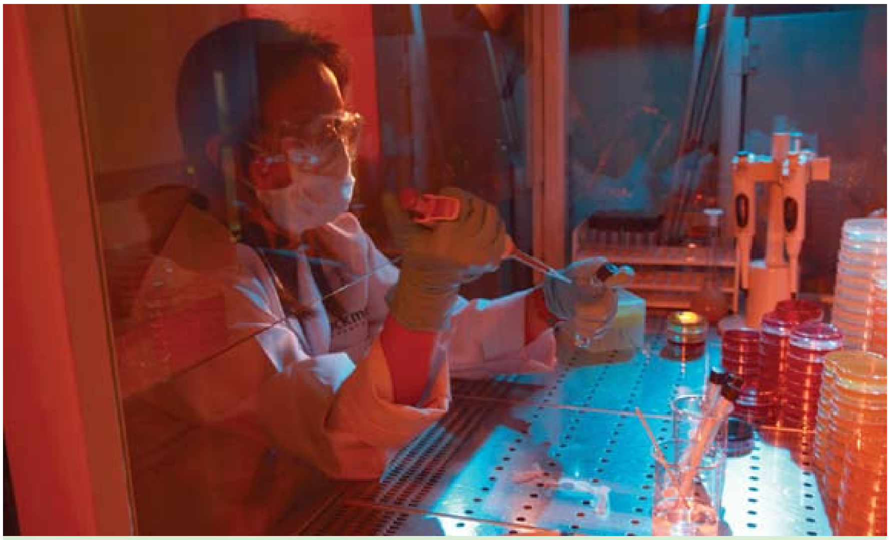
ECO-IEE has taken a rather different approach. Rather than specializing, they have expanded and diversified. 'Over the past ten years we have been developing our own business and technologies so that we can provide the full spectrum of services for a client's waste management needs,' explains Mr. Tan Keaw Chong. This spectrum stretches beyond what even the big players provide. 'We are actually doing a much more difficult type of waste water treatment then other companies. This is more difficult and there are certain guidelines from PUB before we discharge the water back to the system, so insuring that our processes are correct is essential'.

Of course, diversifying manufacturing means diversifying waste types, which presents a continual challenge to even the most established companies. ECO-IEE's laboratory currently analyses about one hundred waste samples a day, both to determine how to treat it and what can be recovered as a recycling service. In order to do this, ECO-IEE is engaged in a continual process of technological development.

'Our R&D team is always looking at new technologies, monitoring incoming waste as well as testing out what would be the different recovery methods for individual waste treatment methods,' says Mr. Benjamin Tan Hee Chian.

Singapore has never had the best reputation for environmental issues. As one of the few Non-Annex 1 countries under the Kyoto Protocol and ranked among the bottom ten of 122 countries rated for environmental sustainability in the 2000 Environmental Sustanability Index (ESI) by the World Economic Forum, it has had a lot to prove. However, with a healthy private market and a dedicated government working towards a common goal, Singapore has gone a long way – and promises to go further – towards silencing its critics.

Melvin Tan, Peter Tan, Ee Wei Tan and Marcus Tan of Cyclet



Buckman is a leading supplier of specialty chemicals for various industries and invests heavily in reasearch and development

Research & Development

Advanced manufacturing requires advanced technology. With EDB's stated aim of transforming Singapore from a fast adaptor of new technology to a creator of new technology, the push to encourage research and development in Singapore is yielding some exciting results.

Despite the recession, the government's drive to promote R&D in Singapore remains on course, with Gross Domestic Expenditure on R&D (GERD) rising 12% in 2008. Although these increases were mainly driven by the private sector, which accounted for 72% of this growth, this investment in R&D is facilitated by the research laboratories, pilot facilities and partnerships established by government agencies such as the Institute of Chemical and Engineering Sciences (ICES).

For many companies, Singapore's role is that of a 'gateway' to the rest of the region. The growing economic clout of the Asian market, especially in the personal care industry, means that manufacturers cannot simply import products developed for the western consumer, but instead must tailor these for the region.

This is not the only purpose of R&D in Singapore, however. Local SMEs are finding that technological quality can allow them to compete in markets where they can not hope to match the quantity of the MNCs. Haruna Paints, already mentioned as a local SME, is a perfect example of this model. As a local SME competing in a market with such players as Nippon Paints and AskoNobel, it is their innovation which has so far allowed them to survive.

Nanotechnology is one area of research were some companies see a lot of potential. Orapi, for example, have just launched the world's first line of lubricants based on nano-particles of Tungsten Disuphite. However, this type of research requires resources and capabilities that many companies are unwilling or unable to invest in, and this reluctance has opened up a gap for local SME, NanoMaterials Technology.

Founded in 2000 NanoMaterials, has built up a strong customer base in the specialty chemicals and pharmaceutical markets by leveraging on its patented High Gravity Controlled Precipitation (HGCP) technology platform. Through this, they are able to do feasibility studies, optimization studies and contract manufacturing for clients including BASF and 3M.

'The technique we developed allows us to design the size and shape of the particles. This kind of control makes you valuable to your customer,' says Dr Jimmy Yun, Managing Director. With the ability to create clear dispersions of up to 70% nanoparticle concentration, which

Fabrice Chifflot
Chief Executive Officer
Orapi Group Asia

Charles Quek
Executive Director
HSL Constructor

could be the first in the world, they offer not just a solution to those companies unwilling to invest in nanotechnology, but an improvement even for those who already have.

Another local company who offers both R&D services and an R&D enabling product is Merlion Pharmaceuticals. Capitalizing on their ownership of the largest natural product collection in the world, Merlion Pharmaceuticals is engaged both in developing its own products and offering contract research and development services and access to its collection to a range of clients, both pharmaceutical and in the specialty chemicals field.

With all these facilities and services available, many companies are looking to set up their own R&D centres in Singapore. 'We have been looking at what the government can offer in terms of research and development capabilities. EDB and A*Star have cleverly set up quite a number of research institutes. The R&D work can be very unique and we have been very impressed with some of the state of the art facilities & equipment,' says Ms. Jenny Yeoh, Managing Director, Arch Chemicals Singapore Pte Ltd.

From doing market-specific tailoring for specialty chemicals to developing highly advanced technologies that can be used the world over, Singapore's R&D capabilities have an impressive scope and ambition. With their R&D intensity (GERD as a proportion of GDP) significantly higher than the OECD average and with a stated aim to raise this to a par with the world leaders Sweden and Finland, Singapore is looking increasingly attractive for R&D investments.

NanoMaterials Technology's High Gravity Controlled Precipitation technology allows a unique level of control over the design of nanoparticles

Local Players

With its reputation firmly in place as an attractive place for investment despite the giant markets surrounding it, Singapore now aims to take advantage of those markets itself, by growing its pool of local talent and exporting its expertise overseas.

From the moment Sir Thomas Stamford Raffles saw its potential as a trading post, Singapore has attracted the interest of the outside world. This trend continues to this day; last year alone there was 11,754 million USD worth of investment commitments in Singapore, 26% of which was in the chemical sector.

However, while Singapore's remarkable growth and success since its independence has been based on attracting investment, it now sees the need to nuture its home grown talent. Some Singaporean companies have already become global names. Rotary Engineering, for example, recently won a one billion dollar contract in Saudi Arabia – a contract that has since become quite famous among the local EPCs. Advanced Holdings Ltd has achieved impressive success in China – 65% of their total revenue comes from their seven China offices – an area in which many international heavyweights have floundered.

With its overseas presence less well established, but with a formidable presence back home in Singapore, Hiap Seng Engineering Ltd has used its 60 year history to establish itself as a major player in the EPC industry. Last year it announced revenue just short of 250 million SGD, a 28.4% improvement from 2008. Building on this success, it is looking at regional expansion

Interview with Mr. Chong Lit Cheong,
C.E.O., International Enterprise Singapore

What is the nature of International Enterprise Singapore's partnerships with both local trade associations and international organisations?

There are about 160,000 SMEs in Singapore and there is no way IE Singapore could reach out to all of them. So we need to leverage on other organisations – multipliers as we call them. Through them we can reach out to different companies and different segments.

Today we have seven MOUs with trade associations and chambers of commerce, such as the Singapore Business Federation and the Singapore Manufacturers' Federation. We have specific work plans with them, detailing how we can support their members. We provide them with grants for overseas missions and trade fairs, and offer training programmes where companies can meet the right people and receive specific briefings on doing business in the different countries. For the international organizations, we work quite closely with the Asian Development Bank and the World Bank. We treat them as partners as these banks fund various projects which we participate in. Areas we work together on include technical collaboration where we provide training programmes for government officials, and consultancy where Singapore companies assist in scoping project requirements. Thereafter, we help bring in Singapore companies to bid for the projects.

According to the World Bank's annual survey, Singapore is judged to be the easiest place in the world to do business. What are the difficulties that Singaporean companies face in overseas expansion?

One of the typical issues they face is financing, especially cross-border financing. There is talk in Singapore now of setting up an import/export bank to provide a guarantee against which companies can obtain loans in other countries. Many countries have this type of institution in place – the UK, the USA, China, etc – but Singapore, which is so dependent on trade, does not.

Other issues are competition and bureaucracy. Singapore companies are used to the transparent business environment here that sometimes they find it difficult to adapt to other countries. In these cases, we will help them find suitable local partners to overcome these challenges. Another issue is the protection of intellectual property and we have assistance programmes to help them.

How important is overseas expansion to the growth of the SME market?

It is important and I think the recent economic crisis has further emphasized that. Our Prime Minister recently mentioned Gross National Product, which is quite a new topic for us. Up until now we have always spoken about GDP, but we are starting to realize that we must deal with GNP as well. This means expanding overseas and accepting that it is inevitable that jobs will be created overseas and not just in Singapore, but it is still overall good for Singapore.

Where would you like to see International Enterprise Singapore and the SMEs you work with in five to ten years time?

Recently we announced our 5 year plan. It included our plan to leverage on the growth of the BRIC countries by doubling our current exports of goods and services to these countries by 2014. China and India will be of particular importance because of their proximity. In the nearer neighborhood we are concentrating a lot on Vietnam and we also see opportunities in Indonesia and Malaysia. Outside Asia, there are opportunities to invest in the Middle East and Latin America. However, we won't neglect the G3 countries, where their transparent business environment makes it easier for us to pursue projects there.

and already has offices in China and a presence in Malaysia, with its subsidiary PT Technic Engineering Sdn Bhd, and Thailand, through two joint-venture companies, Nasco-Hiap Seng Engineering and Logthai-Hiap Seng Engineering.

Mr. Tan Aa Lam, Chairman and CEO of Hiap Seng, views geographical expansion as an essential strategy for growth. 'We have to bring Hiap Seng to the next level. We could still be doing well in Singapore, but we have to look further than that. As we all know, Singapore is a small country, land area is scarce and we could be fully developed by that time so there is not much more we can do here. So we actually have to move and that is why we are looking outwards – looking at Vietnam, looking at China and the Middle East, and bringing our company nearer to the international standard.'

In a similar position is the Davy Group, which provides a range of services through its companies, the biggest of which is Austin Energy. A construction company specializing in thermal insulation, fireproofing and fire protection services, Austin Energy is currently involved in about 95% of all insulation activities in Singapore for the petrochemical, pharmaceutical and offshore markets.

Having established their presence at home, Austin Energy and the rest of the Davy Group are embarking on an ambitious program of expansion. Mr. David Tan, Chairman, explains: 'We are expanding both geographically as well as in discipline. We can provide most services already except for scaffolding, and we intend to acquire a company in this area soon. We intend to open a market in India and we are starting in Indonesia.' Mr Tan has also stated plans to put a company in the Middle East and has already started a project in Australia.

Helping local businesses, especially SMEs, to enter new markets is the prerogative of International Enterprises Singapore (IE Singapore). With the growing importance of overseas markets for local SMEs, IE Singapore has been stepping up its efforts. They assisted 54,000 companies last year, generating total overseas sales of 15 billion SGD. This represents a significant growth since 2008; 30% more companies and four times the amount of support in terms of grants or loans. The crucial element of their support, however, is not simply financial.

'The power of IE is its ability to point us to some of the key people in the government and some of the key plant owners who we would not be able to access otherwise,' says Dr. Tan Boon Kiat, Managing Director of Wing Wah Industrial Services, who were recent participants in the Oil and Gas Business Development Trip to Saudi Arabia, organised by IE Singapore.

IE Singapore's help has greatly aided Wing Wah in its ambition to break into new markets. 'We have already ventured into a few markets – Oman, Vietnam, Indonesia, Malaysia and Thailand' says Dr. Tan Boon Kiat. 'In the next five years, we would like to see these overseas markets maturing and stabilizing'.

IE Singapore is not the only government agency aimed at supporting SMEs. SPRING focuses on growing innovative companies and fostering a competitive SME sector. SPRING's latest initiative, for which it is collaborating with IE Singapore, is 'BrandPact', aimed at using branding as a strategy for business competitiveness. The advantages of this go well beyond simple aesthetics, as Mr. Charles Quek of HSL Constructor explains:

'This is not just a branding exercise but a whole system of aligning our corporate vision, business strategies and objectives for HSL going forward. SPRING support has been instrumental in making this possible'.

Where SPRING really comes into its own though, is in those industries with a high initial barrier to entry. NanoMaterials Technology relied on their help with the large initial capital investment required

Having benefited from government support, Cyclect Electrical Engineering are now in a strong position to explore overseas markets

in their industry, and Haruna Paints, mentioned already as a specialized paint manufacturer, also required a high investment in research and development in order to become competitive. 'Our business model required a significant capital investment in R&D' says Mr. Mitsuyoshi Kubota, Managing Director – an investment provided by SPRING, who still has equity stakes in the business.

The strength of the government's schemes is not in the amount of money that they provide, but in the strategic way it employs this financial support. A small grant from EDB, for example, has now opened up the entire energy solutions business for local engineers Cyclect. The attention of SPRING encourages those companies which show innovation and IE Singapore's efforts show recognition of a widespread trend. 69% of SMEs in Singapore had overseas ventures last year. To ignore this trend would be to ignore the serious reasons behind it, and that is not a mistake that the Singapore government looks likely to make.

Conclusion

The Singaporean chemical sector, built on the back of its strategic location and proactive government policies, has enjoyed incredible growth in the past few decades. However, facing growing competition it can no longer rely on its traditional petrochemical foundation. Its move downstream presents challenges, but also a huge potential.

Singapore's geographical location has given it a head start which it has fully capitalized on. But with investment pouring into its neighbouring countries and the Middle East developing a downstream industry to compliment its massive supplies of raw feedstock Singapore cannot rest on its laurels.

Being Singapore, that is not what it is doing. The government has recognized the challenges ahead, set out to move up the value chain as a solution and, through the various steps outlined in this report, have already embarked on their next stage of development.

There are, as always, growing pains, but so far the years of expertise built up by both foreign and local companies has proved not only adaptable to the changing needs in Singapore, but also to the different needs abroad. As local players increasingly find themselves with expertise or products capable of meeting the stringent requirements of MNCs, confidence is growing that these same products and expertise can be exported.

This confidence has already been acted upon, with a growing Singaporean presence both in the region and globally. From Rotary in Saudi Arabia to Hyflux, who are currently building the world's largest membrane-based water treatment plant in Algeria, Singaporean companies are proving more than capable of holding their own against the more established players. For a tiny island with no natural resources to remain a leading player in the chemical industry is always going to be a challenge, but it is a challenge that Singapore is meeting head on.

GBR would like to thank

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

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

International Enterprise Singapore (IE Singapore)
www.iesingapore.com

Singapore Chemical Industry Council (SCIC)
www.scic.sg

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

This report was researched and written by Global Business Reports:
Ramona Tarta (ramona@gbreports.com)
Barnaby Fletcher (bfletcher@gbreports.com)
Jolanta Ksiezniak (jksiezniak@gbreports.com)