

## The Deep End Of the Labor Pool

Malaysia is putting human and other vital resources into the industry sectors it considers essential to making its economy a high-income, must-invest location in the years ahead.

By MARK AREND

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Just nine years remain before Vision 2020 — Malaysia's blueprint for achieving fully industrialized status — is to take effect. Former Prime Minister Tun Mahathir Mohamad set the Southeast Asian nation of 28 million people on the Vision 2020 course in 1991, complete with nine strategic societal challenges to be overcome in order to become fully developed by the end of the decade.

Subsequent governments have crafted plans to expedite Vision 2020 implementation, the latest of which is the Economic Transformation Programme (ETP) launched in September 2010 by current Prime Minister Datuk Seri Najib Razak. ETP seeks not only to bring about industrialization, but to transform Malaysia into a high-income economy, raising per capita income from US\$6,700 to \$15,000 — comfortably above the World Bank's current high-income-nation threshold of \$12,678 — and gross national income to \$523 billion from \$188 billion in 2009. Najib said the economy would need to grow by 5 percent to 6 percent annually to achieve this milestone.

Well before Vision 2020 was introduced, since 1991 and the subsequent emergence of new implementation strategies and against the context of currency unrest in the region several years ago, Malaysia has been deemed by multinationals to be a desirable investment play.

Agilent Technologies consolidated manufacturing operations in nine countries to Malaysia during Yoon Chon Leong's long career at the California-based high-tech company.

"There's little reason to be in Malaysia from a market standpoint, or customer base," says Yoon, consulting partner at Penang-based Business Wise Consulting, who is now retired from Agilent but who served on the team that consolidated that company's manufacturing operations.

"But Agilent has been in Malaysia for a long time, and of all its sites around the world, Malaysia has always been viewed as a consistent performer. It was not the cheapest — Chinese factories were cheaper at the time — and not the most technically advanced. But we could always count on it to deliver. Malaysia has always been a pillar of consistency. If we put a facility there, we knew it would work."

Today, Yoon grows new companies and consults with government entities on ways to attract and retain existing ones. A report he authored, "An Industrial Blueprint for a High Income Economy," makes much the same argument the government makes about the need to transition Malaysia's economy to higher-value private-sector activity.

"Many multinationals are moving their high-volume, low-mix manufacturing to lower-cost countries, and they are substituting them with higher-value-added jobs in their Malaysian operations, such as R&D, supply chain management and customer support," says Yoon. "The net bottom line is that the MNC presence in Malaysia continues to be very significant, and Malaysia continues to see such investments coming in. The net result is a need to transform Malaysia's labor profile from one of non-skilled and semi-skilled to a highly skilled and professional work force. This then is the challenge for the country — to maintain a significant supply of highly skilled people.

"In addition, there is a need to develop a much deeper SME base that will be able to capture some of these higher-income opportunities created by the transforming MNCs, creating an additional pressure point for the demand for highly skilled people."

Can this happen if Malaysia's economy remains dependent on the industry sectors (electronics and assembly operations, among others) that have drawn foreign direct investment for the past 40 years? It cannot, the government maintains, which is why ETP features 12 National Key Economic Areas (NKEA) — 11 industries and one geographic region — identified by the public and private sectors as the chief catalysts for economic growth on the road to 2020 and a high-income economy. They are:

- Education
- Agriculture
- Communications Content and Infrastructure
- Palm Oil
- Healthcare
- Wholesale and Retail

- Electronics and Electrical
- Oil, Gas and Energy
- Business Services
- Financial Services
- Tourism
- Greater Kuala Lumpur/Klang Valley

"We are now very focused in our efforts to attract foreign investment," says Malaysian Investment Development Authority (MIDA) Director General Datuk Jalilah Baba, who completed her term as director general on August 19th. "We are only interested in high-technology, high-value-add projects. Return on Gross National Income is also a high priority, as is a project's ability to transfer technology and increase the capabilities of the Malaysian work force, bringing up the value chain into knowledge-driven industries. We want projects that can pay better so as to increase the income level of the Malaysian work force. One of our targets is to get out of the middle-income trap and to produce a high-income economy.

"For each project that comes in," she continues, "we want the benefit to the country to be more than the cost of hosting them here. That cost will be giving them affordable land and other infrastructure costs, incentives and support facilities we provide."

The government has identified entry point projects (EPP) for each of the NKEAs, 131 in total, that are meant to contribute to the economic vitality of the sector. In effect, the government — specifically, the Prime Minister's office, the Ministry of International Trade and Industry and MIDA — will fast-track these projects when private investors' plans are approved.

More than 90 percent of EPP capital investment is expected to come from the private sector. Examples might include solar and LED projects or new cable systems for expanded e-services in communications content and infrastructure.

A closer look at emerging activities in three sectors — oil and gas, electronics and electrical and ICT — will help illustrate the types of initiatives deemed desirable in Malaysia for the next several years, and therefore will likely be expedited through ETP.

- **Oil, Gas & Energy**

Malaysia is positioning itself as a Southeast Asia regional hub for oil and gas with hundreds of operations from the world's leading companies in the sector already well established. Several ETP projects already have been initiated in such areas as exploration, production and onshore operations. Going forward, MIDA identifies several opportunities in this sector:

For mature fields, operators have started Enhanced Oil Recovery (EOR) initiatives. Design review of existing infrastructure is required to accommodate new equipment for EOR technologies to be deployed.

PETRONAS, Malaysia's national oil company, has identified numerous marginal fields with capacities less than 30 million barrels to be developed.

Beyond shallow-water development that has matured over the years, exploration and production are moving into more technically challenging areas of deep and ultra-deep water development. This opens up vast opportunities for established international players to participate.

Local companies all along the value chain are increasingly able to handle the outsourcing activities of multinationals wishing to operate in the oil and gas sector in Malaysia.

"We participate in suitable conferences in sectors such as oil and gas, attracting investment and familiarizing attendees with our capabilities and how we can help them link with existing local industry," says Datuk Jalilah. "In this sector, we are not talking just production or refineries, but also the services side, such as oil rig construction — the EPCs [engineering, procurement and construction service providers], of which we have a few hundred in Malaysia. Others produce parts and components for oil and gas rigs — engineering companies."

Datuk Jalilah says the sector is maturing rapidly in Malaysia, and may one day soon include an oil and gas trading component.

In line with the developments of the oil and gas (O&G) industry in Malaysia, the Government announced the formation of Malaysia Petroleum Resources Corporation (MPRC). As an agency under the Prime Minister's Department, MPRC's eight-part mandate is to recommend policies related to O&G; recommend changes to business regulations and tax incentives to promote domestic O&G players; and share blueprints and relevant data on O&G services companies. Also, MPRC will actively promote Malaysian O&G services companies in regional and international markets; encourage financial institutions to support domestic O&G companies when applying for foreign contracts; and make Malaysia the oil storage and trading hub for the Asia Pacific region.

On July 1, Schlumberger, a leading supplier of technology, project management and other services to the oil and gas industry, inaugurated the WesternGeco Penang Product Centre (WPPC) dedicated to the manufacturing and support of state-of-the-art marine and land seismic equipment used in energy exploration.

"WesternGeco is creating a paradigm shift in the high-resolution illumination and imaging of oil and gas reservoirs across Asia," said Jamal A. Ainul, chairman, Schlumberger Asia. "With Asian demand for oil and gas on a strong upward trend, the location of manufacturing and sustaining teams in the region enhances operational excellence and enables the efficient development of the solutions needed to match the region's technological challenges." At WPPC, Schlumberger will develop and deploy its WesternGeco Q-Technology for reservoir imaging and monitoring, support the roll-out of its Q-Marine Solid streamer technology and deliver UniQ integrated point-receiver

seismic acquisition systems. By the end of 2012, WPPC will employ approximately 300 people, both local talent and experts with international experience. In essence, these technologies use seismic sensors to map the sub-surface.

Schlumberger moved its regional operation from Singapore to Kuala Lumpur in 1974, when state oil company Petronas was formed, in addition to three other Malaysian locations. Today, the company's entire Asian operations are managed from the Malaysian capital, including those formerly managed from Dubai. "It's more efficient for customers this way," Jamal tells Site Selection. "It's easier to find the expertise we need and to find people that speak English, and it's much more affordable here in terms of housing and accommodations."

The company's new WesternGeco Penang Product Centre illustrates the speed with which new facilities can become operational in Malaysia with support from the right government entities.

"Through MIDA, the Northern Corridor Implementation Authority and some support from Petronas — our main customer in Asia, we were able to set this center up from zero to 100 percent on the land seismic systems side and 75 percent on the marine side in less than six months," Jamal relates, following three months of cleaning the former NEC facility. "We already have hired 200 people, and it's only July. The current plan is to hire up to 350. With the electronics industry there, you can find skilled, English-speaking workers quite easily.

"We looked at Shanghai and Singapore as potential locations for the new center, but the local supply chain and the fact Penang is highly conducive to testing the product led us to locate the center in Malaysia."

In March 2008, Des Plaines, Ill.-based UOP LLC, a Honeywell company, announced that it would establish a natural gas processing design center in Kuala Lumpur to better support the Southeast Asia market. Gas production for Southeast Asia is expected to grow to more than 12 trillion cubic feet by 2015, according to the U.S. Energy Information Administration. The new design center includes engineering, design, process and project expertise, service and sales functions. Natural gas processing consists of separating out impurities from raw natural gas released from underground gas fields in order to meet the quality standards specified by the major pipeline transmission and distribution companies.

The UOP design center focuses on executing projects involving UOP's Separex™ membrane systems, which are used to remove impurities from natural gas streams that can reduce the gas's value and utility as a fuel or petrochemical source. In addition, certain combinations of impurities are highly corrosive and destroy pipelines and equipment unless they are removed.

Managing Director Daniel Weiler explains the rationale behind Kuala Lumpur as the location for the company's natural gas processing design center: "We are purely and

simply a technology company. We rely on protection and development of intellectual property. The products we sell are heavily grounded on technology underneath them."

UOP licenses its technical expertise to the oil and gas industry worldwide, from independent refiners to government-owned refining and petrochemical operations. "We also sell equipment that has our knowledge embedded in it," says Weiler, "such as very high-tech membranes that remove CO<sub>2</sub> from gas."

Naturally, a key site criterion for UOP centers like the one in Kuala Lumpur is highly skilled labor — engineers and scientists. "We look at two things," says Weiler. "One is whether an industry is established in the country, like the oil and gas industry in Malaysia, because we have to hire skilled people. This area has that. The second is the university education system, primarily as it pertains to mechanical and chemical engineers. Malaysia graduates a fairly high number of those annually. That fits very well into our corporate culture. These criteria factor heavily into where we want to establish an office."

## Renewable Energy and LED

A key focus of investment in this sector should now be on renewable energy and LED technology, according to the ETP, in part due to government mandates to reduce carbon emissions by 40 percent by 2020 and widespread concerns about depleting natural energy resources. Solar and LED projects, therefore, are encouraged under the EPP. Four global players — Q-Cells, AUO SunPower, AUO Crystal and First Solar — have established plants in Malaysia. Major LED players in the country are Philips, Osram, Nichia, Globetronics, Ledzworld, Rohm-Wako and Dominant.

Tempe, Ariz.-based First Solar is one of the largest tenants in the Kulim Hi-Tech Park, in the northern state of Kedah, where ground broke in 2007. Thalheim, Germany-based Q-Cells announced in 2008 a \$1.6-billion photovoltaic solar cell manufacturing in the Selangor Science Park II, in Dengkil, in the state of Selangor, near Kuala Lumpur. Also in 2008, San Jose, Calif.-based SunPower Corp. announced plans to build a solar-cell fabrication plant, Fab 3, in Malaysia, expected to generate more than 1.4 gigawatts of annual production capacity. It is a joint venture with AUO Optronics Corp. Why Malaysia?

"Our first two cell factories were finishing their expansions in the Philippines, and our investors desired some divestment of manufacturing locations, thus our global search for a second country site," explains Robert Vinje, who leads expansions. "We have a fairly established process to investigate potential country sites, and we used this process to evaluate China, India, Singapore, Malaysia and the Philippines for additional expansions. We take into account most importantly the people, their education and spirit, and industry background of the country, as well as the country infrastructure and, importantly, the incentive packages that come along with such large expansions and investments in a new country. In the end," Vinje continues, "Malaysia won the business because of a number of things that impressed us: People that were well educated,

English speaking and had a strong background in the semiconductor industry, as well as a very good incentives package.

"But Malaysia also stood out distinctly because of the direct involvement of the government leaders, specifically MIDA and the great leadership of Director General Datuk Jalilah Baba, the progressive leadership and fantastic support from the State of Malacca by Chief Minister Ali Rustam, and most importantly the continuous support by the Prime Minister, Datuk Najib."

Vinje says the Malacca site, on peninsular Malaysia's southwest coast, has been questioned by some as being too remote — the state's capital, Malacca City is 150 km. south of the national capital of Kuala Lumpur. "I think we have picked one of the most strategic positions and sites in Malaysia," he counters. "Malacca has a very progressive and industry-supportive leader in Chief Minister Ali Rustam, along with many other leaders of the state that have supported and driven the development of the Malacca World Solar Valley area. Labor has not been a problem, either. Many have also asked us if hiring would focus on foreign workers. There has been a distinct effort and focus to avoid that, as we came to Malaysia to give Malaysians jobs in a high-growth, technology-driven industry. That is what we will do."

In June, French energy giant Total SA invested nearly \$1.4 billion in SunPower, giving it a 60-percent ownership stake, and giving SunPower capital with which to expand operations globally.

"Malaysia is a key part of the solar supply chain, but SunPower continues to explore the entire supply chain for ways to continue adding value and reducing costs for the end customers," Vinje relates. "Add this to the transformational investment of Total with SunPower, and I believe that Malaysia represents a very strategic role in SunPower's overall expansions and growth plans."

- **Electronics & ICT**

Since the establishment of the first semiconductor plant in 1972, the export-oriented electronics industry has developed rapidly to become one of Malaysia's major industrial sub-sectors within the manufacturing sector and a significant contributor to the country's economy, according to MIDA. The electronics industry today is driven by such key factors as energy efficiency, connected mobile devices, security and health, with an estimated global market of \$1.1 trillion. These translate into eight priority areas where electronics research, development and production will proliferate: automotive, identification, wireless infrastructure, lighting, industrial, mobile, computing and consumer applications.

As electronics migrate to such high-growth segments as smart homes, buildings, cars and grids, Malaysia's status as a leading site for semiconductor testing and assembly will only increase under the ETP. The missing link is research and development, though it is happening in pockets.

"Only a few companies are doing real R&D work here," says Baba. "It tends to get done in places like Singapore, with better R&D support infrastructure."

Building an R&D base in Malaysia is precisely the kind of industrial development that will bring the economy nearer the high-income mark. High-tech researchers and product development specialists clearly command higher salaries than components assemblers. But until a critical mass of R&D workers is in place, it will be a challenge for companies, especially smaller players, to attract those workers from better-known research centers in Southeast Asia and beyond.

That's not stopping Nader Milani, managing director of STEC Technology Sdn Bhd in Penang, from trying. The maker of solid state storage and memory products for various industries began operations in a leased 22,000-sq.-ft. building in 2007. Today it occupies a 210,000-sq.-ft. building on a 6-acre site with room to expand on four additional acres.

"In the last couple of years, we have learned that Malaysia is not just good for manufacturing," says Milani. "There is a lot of talent here that is applicable in a lot of functions — in finance, for instance, sales and marketing support, human resources. These are now being managed here in Malaysia rather than in the U.S. [at the Santa Ana, Calif. headquarters]. People here are very savvy in terms of doing business globally.

"Malaysia is also a good place to expand R&D," adds Milani, "and we are investing heavily in R&D expansion. Our growth here is not just about adding headcount or building buildings, but also vertically trying to do more. Most of the engineers and manufacturing centers here play more of a support role, not design and development. We are trying to elevate the level of activities that will happen. We hope that STEC can help make Penang and Malaysia the center of solid-state design and manufacturing, and with our expansion in the near future, we will be one step closer to that goal."

Milani acknowledges the challenges associated with attracting higher-end engineering talent to a traditionally lower-skilled manufacturing market — Penang — but says the government's ETP will boost his efforts. "Government is trying to work with industry, making it easier for companies to bring Malaysian talent back to the country, for example, helping universities develop programs closer to what industry needs. They are building these bridges."

MIDA's Jalilah Baba expands on this point: "We have incentives in place, such as reduction in income tax, and we are working with local companies to have their R&D take place here. That talent from here goes overseas, because they are paid better. But we are working with universities to make doctoral programs that are industry-related and therefore more valuable to researchers. Also, we are working with companies like Intel, supporting them with grants to help them bring back R&D talent that is now in the U.S.

"We are working with Intel and Western Digital, among others, to tap Malaysian graduates overseas who would not think of coming back because of higher salaries where they are, so they could be sponsored to come back — relocation and training expenses, not in terms of salary. Hopefully in two or three years' time there is a better environment here with which to grow Malaysia as an R&D center."

### The Making of an R&D Capital

"In the meantime," says Milani, "the people we are hiring in the R&D areas find that the level of work they will do here will provide more job satisfaction than what they will find somewhere else."

"With the engineering talent we have built up over time, there is a natural yearning to go into a product company where they can contribute to developing a product — developing it, marketing it and selling it," adds James Chuen, senior vice president, sales and marketing. "This is an area where we can be very attractive [to R&D talent]. That will attract competitors into the area as well, so when that happens, we'll have to be very good at retaining people. A lot of programs are now in place for that."

"There are attractions outside Malaysia for R&D engineers, such as nearby Singapore," says Milani, "and other immigration-friendly countries like New Zealand and fast-growing countries, not to mention China, the U.S. and other places. There is no secret there. The Malaysian government knows that, and how successfully they can implement programs and how quickly, we will see."

"It's about developing an ecosystem to be self-sustainable," says Chuen. "If you don't have that, but you have the talent, then the talent will look outside the country."

Sector participants with a longer history in Malaysia, such as Motorola Solutions with operations in 65 countries, say they still consider their operations there to be strategically important — increasingly so as industry transitions to more knowledge-based functions, including research and development.

"The Asia Pacific region has been a growth engine for a number of years now, and the region offers attractive high-growth markets as well as potential to be a resourcing base, whether it is for skilled manpower, manufacturing expertise or research and development," says Mohd Rauf Nasir, country president of Motorola Solutions Malaysia Sdn Bhd. "Motorola was among the earliest to recognize the promise offered by Malaysia. The country's vision-led development path made it a natural choice for us. The government has been supportive with its policies aimed at developing the country as a knowledge-based economy combined with its clear potential as a resourcing base for global companies such as Motorola Solutions."

Motorola established operations in Malaysia with a manufacturing facility in Penang, in 1974. This facility has grown to become the world's largest two-way radio manufacturing facility, supplying customers locally, regionally and globally. The facility has housed

R&D activity since 1976 and also houses logistics and a supply center. Motorola now plans to consolidate its technical-support center in Penang to deliver 24/7 support to its global customers.

"Our facility in Penang is the one-stop radio communication solutions center for Motorola in Asia Pacific," says Rauf. "It has become home to Motorola's largest R&D and manufacturing site for two-way radio products in Asia with over 30 years of R&D expertise and is recognized as an SEI-CMM® Level 5 organization with the highest level of software maturity.

"This is the realization of our strategic intent and the importance we place in our Malaysia operations, especially in contributing to the broader business of two-way radio production. We have vital investments and significant brain trust that has helped grow our operations in Malaysia from where we serve global markets."

- **Value Chain Management**

Companies are also involved in value-chain management in addition to manufacturing activities.

Cisco Systems (Malaysia) Sdn Bhd operates two offices in Malaysia, a sales office in Kuala Lumpur and the Customer Value Chain Management office in Penang which is responsible for managing the Manufacturing Operations Eco-System (Operational Excellence and Relationship with contract manufacturers in South East Asia Region), as well as engineering services to support the global operations of Cisco.

"We look for partners that have the technology and people capability, global presence and local relationship which aligns well with our footprint strategy and operations goals," says Aznul Shahrim Abdul Karim, general manager, customer value chain management. "We have a history with companies here in Malaysia that can provide that value chain to Cisco."

What does Cisco look for in its value chain participants in Malaysia?

"We look at whether they have the technology with which to produce more complex products and component parts. We look at quality — whether they can keep up with our expectations, because the window of technology is getting tighter. We are stretching the limits of the current capability and moving it to the next level. We also look at overall logistics, whether they are centrally located, in a hub, where they can achieve cost effectiveness in transporting materials in and out."

But there is a subtler, yet paramount requirement Cisco makes known to its value chain partners.

"The global footprint on which Cisco has embarked is in line with that of the partners," says Aznul. In other words, partners that want to work with Cisco in Malaysia should be

very cognizant of Cisco's strategic corporate objectives and should facilitate them, not hamper them. "Due to the longstanding partnership we have with them, it's like operating as one company as we move forward."

In October 2009, Wichita, Kan.-based Spirit AeroSystems Inc., the world's largest independent supplier of commercial airplane assemblies and components, opened its 242,000-sq.-ft. aerospace manufacturing and design facility adjacent to Kuala Lumpur's Sultan Abdul Aziz Shah Airport in Subang — the city's original international airport — adding lift to Malaysia's aerospace industry.

The facility produces composite sub-assemblies for Airbus single-aisle aircraft and includes an in-house design engineering team working on developing assemblies for the latest, state-of-the-art Airbus aircraft, the A350 XWB. Spirit AeroSystems Malaysia Sdn Bhd will occupy a central role in the development of the Malaysian aerospace industry as a whole, and is strategically located at the centre of the Malaysia International Aerospace Centre (MIAC).

Even suppliers need suppliers, and UPECA Technologies Sdn Bhd plays that role with respect to Tier 1 Boeing and Airbus supplier Spirit AeroSystems. UPECA operates three plants in Malaysia and one each in China and Thailand, supplying the aerospace, energy, electronics, medical and other sectors with precision engineered parts and components. The company opened a plant in 2005 specifically for aerospace components and shortly thereafter won a contract from SME Aerospace, for parts destined for Airbus A320 passenger aircraft. Other contracts followed, from customers involved in aerostructures, avionics, aircraft engines and systems, prompting a move into larger quarters. It supplies these and Spirit from a new, 110,000-sq.-ft. operation in Selangor that required establishing a "special process facility" to meet Spirit's stringent supplier requirements.

"Our goal is to be a strategic supplier to key customers," says Eugene E.J. Ang, chief operating officer. "We would like to grow our business with Spirit, for example, to the point where they are 30 percent or 40 percent of our group revenue." Growing with customers is the long-term strategy, which requires a stable and available work force.

"Skilled machine operators in our industry often want to set up their own businesses when they become good enough," says Ang, "so it can be difficult to retain good people. To counter this, we are working with local technical institutes to provide learning resources, and we have our own apprentice program for training workers on new machines as they come in, because there is a gap between what schools turn out and what is demanded by industry. Also, we are strengthening our engineering process such that the skill requirements of the machines will not be that demanding. That way we are resolving our skills shortage."

Aerospace engineers are not particularly common yet in Malaysia, says Ang, so those who are in the region are sought after by UPECA and its competitors. There is a large pool of aerospace engineers in nearby Indonesia, however, with 15 to 20 years of

experience. "We are tapping that pool of workers, and bringing them to Malaysia," Ang relates. "MIDA has allowed a quota for us to bring in foreign skilled labor, because they understand that this industry is short on engineers and skilled labor."

Spirit's entry into the Malaysia aerospace market may be behind the government's realization that far more workers will soon be required by the sector, especially if more suppliers see, like Spirit and UPECA, the opportunity to succeed in the sector in Malaysia. That prompted the establishment of the Universiti Kuala Lumpur Malaysian Institute of Aviation Technology program in Dengkil, Selangor.

"This speaks to the government's seriousness in promoting the aerospace industry as the next growth area," says Ricky K.C. Soo, vice president, group business development, and a UPECA executive behind much of the company's success. "They need to be able to say to foreign investors coming in that Malaysia is a haven for aerospace and other important industries. That means having a pool of people with the skills these industries need."