Towards Sustainable Urban Development (Part 1)

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Introduction

There are many interpretations of what sustainable urban development is. While there is a general consensus that sustainable urban development is a desirable and beneficial condition for development that countries should adhere to, considerable confusion clouds the issue of translating this very broad objective into national and local strategic action plans.[1] The more significant issue remains the need to define clearly how resources are to be managed and allocated or re-distributed to ensure the efficiency in service delivery and hence the sustainability. The responsibilities of the different stakeholders at each level, and the extent to which they are able to mobilize the financial resources and political commitments towards sustainable urban development, also need to be duly considered.

This article provides readers with insights to the concept of sustainable urban development. It begins with a brief overview of what sustainable urban development is and discusses the importance of it. Characteristics and issues to consider when creating a sustainable city are then highlighted. Some case studies on the initiatives carried out in development are also considered. From there, the article goes on to focus on Malaysia and the steps taken so far to achieve sustainability in terms of policy and education. In addition, issues and challenges faced by Malaysia in realizing sustainability goals as well as recommendations made in support of sustainable development are also discussed before the conclusion of the article.

Sustainable Urban Development and Its Importance

In the URBAN 21 Conference held in July 2000 in Berlin, sustainable urban development is defined as:

"*Improving the quality of life in a city, including ecological, cultural, political, social and economic components without leaving a burden on the future generations*".

URBAN 21 Global Conference (Berlin, Germany)

The Global Conference Urban 21 was held to recognize tangible solutions as well as to generate an appropriate vision and action orientated strategies for accomplishing global sustainable development for the 21st Century. This conference is aimed at "habitat professionals" which include experts, practitioners, politicians and non-governmental organizations, who are involved in the development of towns and cities and who support the improvement of standard of living as well as the environmental conditions of building structures in urban regions.

[1]United Nations Report (2001), "Sustainable Urban Development: A Regional Perspective On Good Urban Governance", *Economic & Social Commission for Western Asia*.

Another definition given by Camagni is:

"*The process of synergetic integration and co-evolution among the great subsystems making up a city (economic, social, physical and environmental), which guarantees the local population a non-decreasing level of wellbeing in the long term, without compromising the possibilities of development of surrounding areas and contributing by this towards reducing the harmful effects of development on the biosphere".*[2]

The concept of sustainable development has become a key guide to many communities and it is discovered that conventional approaches to planning and development are creating, rather than solving societal and environmental problems. This concept also symbolizes the belief that the world has finite resources and subsequently, in order to keep on improving the quality of life for future generations, societies should adopt co-coordinated approaches to the planning and policy making that involves individuals and the public at the local and international level.[3]

Urban areas in rapidly growing economies will be competing for resources and it is up to the urban governments to provide the opportunities for economic, social and cultural well being. Cities offer more than just jobs and shelter, as they are repositories of human interaction and exchange as well as places for relaxation and rejuvenation. They also play a vital role in the facilitation of sustainable development on a local and international scale. According to Joel Cohen[4], *"If half the urban infrastructure that will exist in the world of 2050 must be built in the next 45 years, the opportunity to design, construct, operate and maintain new cities better than old ones is enormous, exciting and challenging*".

The concept of sustainable urban development has been around for some time. There has been concern among economists, ecologists, city planners and other social scientists for many generations regarding the relationships between the ecological and economic systems in a highly populated and resource-hungry world. Based on findings given by Marashi, it can be seen that there would be competition for resources, such as water; food, power and green space and this will eventually strain the communities' ability to provide for its citizens in a fair and equitable way. Sustainable urban development addresses these issues and emphasizes the need for:

- Long term strategies by adopting a flexible, forward-thinking approach.
- Systems thinking with the understanding of environmental, economic and societal links.
- Systems for equity and fairness by ensuring the rights of the poor and future generations.

Characteristics of a Sustainable City in the Context of Urban Development

During the Ontario Roundtable on Environment and Economy, Nigel Richardson presented a report which compared the strategies and characteristics of sustainable development, with a focus on the lack of sustainability based on behavioral patterns, resource consumption and policies. Table 1 below illustrates summary findings of his report.

[2]Camagni, R., (1998), "Sustainable urban development: definition and reasons for a research program", *International Journal of Environment and Pollution*, Vol.10, No. 1, pp. 6-27.
[3]Introduction to Sustainable Urban Development; http://www.sister-cities.org/www/sci/pdf/SustainableDevelIntro.pdf
[4]Cohen, J., (2005), "Human Population Grows Up", *Scientific American*.

Table 1: Cross Comparison between Perceived Strategies and Characteristics of Sustainability

More Sustainable	Less Sustainable
Compact forms of residential development	Low density, spread out residential development
Mixed land use, home, jobs and shopping in close proximity	Segregation of land uses, homes, jobs and shopping separated into uniform concentrations
Employment based primarily on education and skills	Employment based primarily on environment
Movement on foot and by bicycle and transit	Heavy dependence on private cars
Wind and solar energy	Thermal and nuclear energy
Tertiary treatment of sewage; use of natural means of sewage treatment	Discharge of sewage into water bodies or water-courses untreated or with low level of treatment
Protection and use of natural hydrologic systems	Hard surfaces preventing infiltrations, channeling natural water-courses
Natural open-space, protection of wetlands, woodlands, stream valleys, habitat, use of manure, compost, integrated pest management, etc.	Destruction of natural landscape, "manicured" parkland with exotic species, heavy use of chemical fertilizers, herbicides, pesticides
Reduction of waste, recovery, re-use and recycling of waste materials	Landfills, incinerators

Source: Sustainable Communities Resource Package- Regional Environmental Centre for Central and Eastern Europe, http://www.rec.org/REC/Programs/SustainableCities/Characteristics.html

The findings imply that much change is needed in the approach to the adoption of sustainable concepts, against what is commonly perceived as being conventionally "acceptable" sustainable concepts and practices.

Issues to Consider in Order to Create a Sustainable Urban City

1. Urban Sprawl

The development of urban areas that are unchecked would result in the inefficient use of resources as well as the degradation if inner cities.[5] "Single-use developments" i.e buildings used for business/office purposes and retail parks are generally located far, if not totally isolated from transportation services, thus encouraging the usage of private vehicles. Therefore, the issue of urban sprawl can be addressed through city and regional planning processes by focusing on the regeneration of suburban/inner city areas as well as putting forth the idea/concept of multifunctional development.

[5]European Commission Community Research Report (2001): "EU Research For Sustainable Urban Development and Land Use", Sustainable Urban Environment.

2. Redevelopment of Industrial Sites

One of the main elements of a sustainable urban plan are the commercial sites which offers work and services to support the local communities. However, industrial sites deep within the cities are generally small and encircled by residential zones with out-dated infrastructure, and may be abandoned when companies decide to expand in out-of-town industrial estates. Thus, abandoned and derelict sites can be reused, but new tools are required to define strategies for their sustainable redevelopment.

3. Regeneration of Brownfield Sites

The reduction of urban sprawl and the enhancements of the inner city environment can generally be achieved through the reuse of 'brownfield' sites. However, most of the abandoned sites are contaminated and dangerous, and cleaning them up is costly. Due to the risks, private developers are deterred from redeveloping these areas, and municipalities cannot afford to rehabilitate them. Many of these 'brownfield' sites therefore linger on in a disused state. Thus, it is important to come up with new, cheaper technologies and ways of efficiently managing such critical revitalization.

4. Sustainable Construction

In general, construction processes are noisy, disruptive, and wasteful and many buildings are still inefficiently using energy and resources. "*Better technical solutions abound-the problem is to get clients and designers to specify and use them*". However, sustainable construction methods are often viewed as expensive luxuries and hardly a necessity. It is therefore important that both the economic and environmental advantages of new techniques are demonstrated on a larger, more persuasive scale.

5. Green Space

The issue of green space is important because it is a fundamental element for sustainable cities by providing people the environment and space for recreation, i.e. rest, exercise and socialization. It is important to integrate green spaces into development plans, by maintaining existing parks and other outdoor facilities that are incorporated with the surrounding districts.

6. Regeneration of District Neighborhoods

"*Deprived areas are both a symptom and a cause of inner city decline*". Proper planning will help to revitalize rundown urban areas at a number of areas. However, planning for sustainable development is complex and complicated as it involves accounting for the environment and social structures that go hand in hand with economic factors. Last but not least, planning should also incorporate the views of local residents and businesses.

Case Studies of Sustainable Development Concepts

(A) Reduction of CO2 Emissions in the City of Sapporo, Japan[i]

The city of Sapporo has a stated goal of 10% reductions in CO2 emissions per capita by 2012 (relative to 1990 levels). This is consistent with Japan's overall 6% emissions reduction target under the Kyoto Protocol. However, Sapporo's emissions in 2000 were 16% above 1990 levels, meaning a substantial reduction will be required in the future (a situation typical of virtually all Kyoto Protocol signatories).

[i] Martinot, E., (2004), "Renewable Energy Information on Markets, Policy, Investment, and Future Pathways", *Case Studies from the Solar Cities Congress held in Daegu, Korea*, *November 14-18,*

The city groups its activities to promote sustainable development into four categories: (1) public awareness (called "sense of crisis"), (2) measures aimed at stimulating citizen initiative (called "movement"), (3) incentives (called "propagation to citizens and business operators"), and (4) city-sponsored activities (called "initiatives of the city government").

So far, the city has undertaken a number of projects. Notable are several large cogeneration projects utilitizing waste heat from turbines powered by locally-produced natural gas, yielding up to 70-80% energy utilization efficiency as part of an "urban redevelopment plan." The city has purchased 55 low-emissions vehicles for its use, including 34 natural-gas cars and garbage trucks. There are five solar power demonstration projects in schools (typically 10kW size, providing 7-8% of school's power consumption), as well as other public facilities like the zoo. As for private development, one suburban residential complex with 500 homes to be constructed by 2008 is expected to have 1500 kW PV (3 kW per home).

(B) Incentive Approach in Adoption of Sustainable Energy Technology in Oxford City, United Kingdom[ii]

The Oxford Solar Initiative began in 2002 as a partnership between the city, Oxford Brooks University, and the local community. Officially launched in July 2003, it has three main goals: (1) to add a sustainable energy element to urban planning strategies; (2) to set targets, conduct baseline studies, and develop long-term scenarios; and (3) to develop sustainable urban energy technologies.

The primary target of the initiative is for 10% of all homes in the city to have solar energy by 2010. There are also short-term (two-year) targets for installation of specific numbers of energy efficiency measures, solar hot water systems, and solar electric systems. The short-term targets are visible to the public, lending a community participation element to achieving the targets. The initiative also includes CO2 reduction targets and capacity building for the local government.

An extensive array of subsidies and incentives are available to homeowners for improving the energy efficiency of their homes and installing solar hot water and solar electricity. For energy efficiency improvements, the grants cover typically 60-100% of the full cost of wall and loft insulation, hot water tank insulation, condensing boilers, heating controls, and efficient light bulbs (which are provided free of charge). For renewable energy, the grants cover up to 50% of the full cost of solar electric systems. The Oxford Solar Initiative web site explains the basics of energy efficiency, solar hot water, and solar electric technologies, and explains the various subsidies and incentives available to homeowners and how to apply for them.

As part of the initiative, Oxford has been conducting analyses of the CO2 emissions of its built environment using a geographic information system (GIS) to predict baseline energy use for each house. The analysis employs 95 parameters for each dwelling. Some parameters were obtained from the GIS, while others were obtained from a physical walk-through of the city, in which building characteristics were recorded for each home (dwelling type, building fabric, ventilation, heating system, etc.). The walk-through took an average of 30 seconds per home, with data entered on a hand-held PDA.

Previously, Oxford pioneered a "solar street" in which all the homes on one street have solar hot water and power, and are connected to the electric grid via a "power gate" that allows the community to obtain Renewables Obligation Certificates (ROC) from the utility for the power generated. The extra income generated by the ROCs offsets some of the added costs of the solar systems.

[ii] Similar to Footnote i.

(C) Sustainable Design Concept: The Creation of a Symbiotic Housing Complex - Setagayaku Fukusawa Project, Tokyo, Japan[iii]

Sustainable development concepts need not necessarily apply exclusively to the development of new projects alone, but can be incorporated into the re-development of community housing. An example here is the Setayaku Fukasawa "Symbiotic Housing Complex" in Tokyo, which was completed in 1997. The incorporation of a number of sustainable development factors within its design, planning and implementation resulted in the project being awarded the coveted World Habitat Award in 2001.

This project was a community housing refurbishment project centered around 70 pre-existing dwelling units, complete with day-care centre and community facilities, which covered an approximate land area of 7,400 sq m. The primary objective was to refurbish a social housing project for a mixed symbiotic community.

The incorporation of various sustainable design concepts was utilized, such as:-

1. Ample buffer zones for better quality of life and less environmental loadings and passive sunshine control,
2. Daylight lighting and ventilation voids,
3. Suitably located flora and fauna as sun visors
4. "Biotope Gardens" to exacerbate lower temperatures in certain locations within the community,
5. Rooftop greenery to alleviate dramatic rises in temperature.

(D) Maximising the Use of Natural Resources in Green Design – Institute for Global Environment Strategy (IGES), Yokosuka, Japan[iv]

Over the past decade, the utilization of green design in sustainable development has been most apparent in the construction of commercial buildings. A prime example is the Institute for Global Environment Strategy (IGES) Building in Yokosuka, Japan, which incorporates sustainable energy concepts such as the use of natural energy for internal power, lighting and ventilation. The building consists of various offices and guest rooms spread out over a site area of 20,974sq m., with a gross floor area of 6,992sq m.

Green design concepts and technologies include:-

1. The incorporation of an underground gallery serves as a cooling and heating system for indoor air-conditioning,
2. Rooftop solar collector for production of warm water,
3. Strategically located 50 Kilowatt and 5 Kilowatt Photovoltaic solar panels for the purposes of generating sufficient energy for indoor lighting,
4. Rooftop greenery to control internal building temperature,
5. External wind power generator to supplement internal energy needs, and
6. Ecologically intensive (biotope) surrounding landscaping to minimize overall negative environmental impact.

[iii] Based on presentation by Prof. Kazuo Iwamura, from Musashi Institute of Technology, Japan, "Market Transformation Towards Green & Sustainable Built-Environment" for the Asia Design Forum: Symposium on Green Design at the E&O Hotel, Penang on the 18th of January

[iv] Similar to Footnote iii.

Other state-of-the-art technologies (which are utilized in tandem to facilitate the utilization of natural resources) incorporated into the building includes:-

1. Micro-gas turbines,
2. Gas absorption chiller/heater with auxiliary waste heat recovery,
3. 25 Kilowatt Sodium-sulphur batteries,
4. Ice thermal storage units,
5. Brine heat pump chiller (producing 264 Kilowatts or 7741Mega Joules of electricity per day), and
6. The use of ecologically friendly materials such as bio-climatic timber for structural support

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Part 2 of ***Towards Sustainable Urban Development*** *will be published in the July 2008 issue of the Penang Economic Monthly. Part 2 of the article will focus on the issues and challenges of sustainable development in the Malaysian context.*

The Penang Automation Industry as a "New Growth Sector"

When considering the history and development of Penang's manufacturing sector as a whole, the importance of sectors like the semiconductor and E&E industries are rightfully given greater emphasis and prominence. This is in view of the fact that these industries have functioned as the 'cornerstone' area right from the early years in the 1970s, the decade which marked a shift in focus of the State economy from a primarily agricultural base to a manufacturing and industrial orientation. This tangential shift in the structure and focus of the Penang economy was of course, facilitated by the healthy inflow of foreign direct investment from American, European and Japanese MNCs keen to set up platforms that would capitalize on the State's supply of lower cost but sufficiently skilled labour, reliable infrastructure and favourable growth potential vis-à-vis the national and regional economies.

Thus, while it is tempting at surface level to think of the vibrant Penang automation sub-sector as a fairly new 'rising star' amidst the State's other economic sub-sectors, it is useful to remember that this homegrown industry has its roots as a spin-off sector born out of the increased industrial vibrancy of the larger manufacturing component of Penang's economy from the 1980s onwards. As the stable of high-flying MNCs set up their local operations, there developed an accompanying need and demand for equipment, parts and components, and an initially smallish enterprise of local automation companies were created to play a 'supply and support' role to these corporate giants.

Over time, a good number of these small automation equipment manufacturers thrived on the synergy generated by this 'supply an support' role, carving out their own growth trajectories that enabled these smallish entities to develop higher quality and often specialized products, expanding and improving in tandem with the growth and input needs of their large 'patron' corporations (i.e., the locally-based MNCs).

In this context then, it may be argued that the Penang automation sector can be envisaged more as a 'new growth sector' with good future expansion potential rather than a 'new sector' per se. A 'new sector' would imply a newly developing sub-sector of the economy; this clearly does not fit the description of the local automation industry, which has more than 2 decades of developmental history as an enclave within the context of Penang's manufacturing sector.

On the other hand, a 'new growth sector' better fits as a label for Penang automation companies, as it is an existent sub-sector that may be growing, but is still in need of further expansion and new growth directions to remain viable and profitable, in the context of the local, national and global economies. The emphasis here is on the aspect of existent and potential new growth areas for the industry, which may be a challenge to identify and outline as a first step towards implementation and facilitation.

This brings us to the question – why is it important for the Penang automation industry, despite being in fact an already established sub-sector, to be further developed as a 'new growth' sector in 2008 and beyond?

While it is probable that this question admits to a lengthy answer, a brief response in summary is that new growth brings vital capability-extension, allowing an existent sector to reinvent itself, upgrade the quality of its products and supply products that are able to keep up with the demand trends of its global clients; in short, cultivating 'new growth' potential helps to ensure economic viability and continued ability to compete and thrive locally and globally.

Moving up the supply chain from a local to global context is an important feature of the blueprint (if one exists) for Penang's automation industry. This is simply because in an increasingly globalized and open environment, being competitive and having the ability to reach global benchmarks is not an option, but more of a necessity. Likewise for Penang's automation cluster, supplying a *global* quality product to a *local* network of clients may not be enough to guarantee growth and dynamism in the long run. It is necessary to fit the Penang cluster into the scheme of the larger regional and global network for a more meaningful assessment of where the local automation industry stands in the medium to longer term.

This review of the current status and growth potential of the automation industry in Penang hinges on the need to take into perspective the sweeping changes seen regionally and around the world, as the forces of competition and increasingly open markets change the face of the international industrial and manufacturing landscape. In a more open and level playing field, there is hardly any room for sectors and industries to cling on to the traditional roles, production methodologies and markets that may have prospered them and strengthened their fundamentals in the early years. The old economic epicentres are in flux, and this brings new opportunities to industries that are able to flow with the trends that favour new locations of growth in the global arena today.

Globally-speaking, while the USA and some European economies remain the major players in the world automation market, the focus and centre of gravity is expected to shift significantly to the Asia-Pacific region in the near future, driven largely by the meteoric rise of the Asian giants China and India. China and India offer the traditional resources like low-cost labour, coupled with economic growth and huge consumer markets brimming with fast-rising buying power, all of which are factors that have already attracted substantial inflows of manufacturing investment funds. China, increasingly considered one of the emerging key global markets in automation, could potentially be the world's largest automation market in the space of 2 decades from now. This projection is made amidst the anticipated growth rates of 9.6% and 6.8% (5-year projection from 2007) in the global market for process automation and discrete automation systems respectively.[6]

This is in tandem with the overall projections for the industry; The global market for discrete automation systems, according to ARC Advisory Group, is expected to grow at a compounded annual growth rate (CAGR) of 6.8% over the next five years. The market was nearly $17 billion in 2006 and is projected to grow to over $23 billion in 2011. Discrete industry automation is forecasted to keep on track of its solid worldwide growth as manufacturing plants and OEM machine builders continue to invest in automation to improve agility and flexibility of operations to meet market demands. Discrete automation products are expected to experience solid growth as they are used across industrial segments, ranging from automotive and electronic & semiconductor to machinery and plastic & rubber industries.

The Penang automation enclave, strategically placed in the Asia-Pacific context, needs to trigger off new growth areas with a transformative element. This new growth should be able to both consolidate existing fortes in the cluster as well as reinvent the industry's role and function. Such growth will entail no less than deep and aggressive 'capability-extension' to supply a product that will meet the benchmarks and demands of the market today. This is all the more critical with the rise of economic powerhouses in the immediate region (Asia-Pacific) which will unleash factors and circumstances that can easily and within a short time consign smaller, unprepared or weakened sectors to irrelevance and oblivion.

If this is the situation in a nutshell, then the question following this is – has Penang been successful in harnessing the 'new growth' potential of its automation enclave, as a first step towards realizing the goals of consolidation and transformation into a competitive regional/global player?

[6]Figures in the projection obtained from the ARC Advisory Group, a research and advisory firm providing supply chain solutions to global manufacturers.

A fair answer would be that while some measures have already commenced and are in progress, there is still much scope for work to be done to expand and fully exploit the new growth areas within the sector.

In general, the local automation equipment manufacturers have developed so-called 'core competencies' or efficient production capabilities in a few key areas, namely in mechanical, electronic & software design, precision fabrication, metal surface finishing and equipment manufacturing, vision imaging & control technology.

With the achievement of quality and expertise in these areas, a few top-performing local automation firms have grown exponentially, supplying high-technology equipment that meet the input requirements of global corporations that source for them locally to complete their production processes. These are local companies that have made good, capitalizing on opportunities to grow and restructure in ways that helped them to break out of the SMI mould, which typically describes the small emergent automation firm in Penang.

In many ways then, the Penang cluster has contributed much to the national automation sub-sector and manufacturing sector, as evidenced by the fact that Malaysia is currently the leading manufacturer and exporter of specialized machinery and equipment for the electrical and electronics industry in the ASEAN region. These specialized machineries and equipments include surface mounting machines, vision inspection systems, tape and reel machines, automatic moulding systems, trim and form machines, laser marking machines, die bonders, auto dispensing machines and other flexible and fully automated manufacturing systems, incorporating intelligent robotics and advanced handling systems.[7]

However, this success story describes only a handful of star performers within the Penang automation enclave. Most local automation firms in the State are still ensconced in the role of supplying medium-tech, customized products to a reliable but limited network of locally-bound clients. In terms of corporate profile, these firms remain as generally smallish companies built on lean resources that tend to struggle with technology and financial crunches internally.[8]

A closer evaluation of these small player automation firms would reveal that most them operate and do business in generally independent ways, pitting themselves with rival firms within the same sphere of competition. Since inter-firm collaborations of any kind are minimal to non-existent, these small automation companies are mostly alone in their struggle to overcome resource, technology and financial limitations.

These limitations are linked to, and magnify the impact of the external barriers facing these small automation equipment makers. Most importantly, and as mentioned earlier in the article, they suffer from a 'captive supply' syndrome, so to speak, as most of the firms concentrate on supplying customized products that meet the specialized needs of only a small client base. In light of this scenario, the value-added growth needed to increase production capacity and reach wider markets is severely curtailed.

Arguably then, it is these firms (forming the majority of the industry players) that are most in need of 'new growth' strategies to break out of their mould, to successfully move further up the sector's overall growth trajectory.

It is proposed that jumpstarting 'new growth' for these firms may be possible if some of the major internal and external barriers, as mentioned above, could be overcome. To begin with, the answer may lie in more affordable technology acquisition for quality upgrades and greater market penetration as well as client-base diversification.

[7]The key strengths and weaknesses of the Penang automation industry are outlined in a slide presentation created by Pentamaster.

[8]The Penang Automation Industry Study is a 2007/2008 survey report commissioned by the Penang Automation Cluster (PAC) and sponsored by InvestPenang. The survey aimed to assess the status of the sector and offer recommendations for strengthening the local automation cluster.

A potential strategy for overcoming some of Penang automation firms' shortcomings emerged in 2005, in the form of an experimental clustering exercise called the Penang Automation Cluster or PAC. The PAC was conceived as a joint government-private sector initiative aimed at creating an alliance of local automation companies, via a platform of collaboration in mutually-beneficial research, production and marketing strategies.

The PAC recognizes that there is strength in collaboration over competition, especially for smaller automation firms that are plagued by chronic shortfalls of independent resources in finance and technology. Technology that individual firms cannot afford to purchase or develop independently may be mutually acquired and shared by an alliance of firms with similar needs. An alliance of automation equipment firms functioning in an alliance may have more scope and resources to develop specialized products of a higher quality, rather than independently attempting to supply a competitive market with a mediocre product developed on scant in-house resources. Also, a cluster of collaborating firms would probably also be able to reach a wider market with a more diverse clientele when supplying products under the aegis of the PAC; this would help the firms to gradually break out of the restrictive network of supplying primarily to a few locally-based MNCs.

Due to the fact that the PAC is a relatively new effort, its full potential as a stimulant of vital 'new growth' for the Penang automation firms is yet unrealized. Furthermore, the initial attempt to bring the automation manufacturers into a working cluster has met with limited success and participation thus far. The reason for this could be the voluntary nature inherent in a clustering exercise such as the PAC, or the generally weak executive function of the cluster to date. Without a clear outline of potential benefits to be reaped, the local automation firms may be slow to integrate into a true working cluster, thereby delaying the onset of tangible benefits that would be generated by such industrial alliances.

In the meantime, the need for the automation sub-sector to enter into a rejuvenating 'new growth' area is pressing and critical, if the automation industry aims to continue being a vibrant niche in the Penang economy. Fostering collaborative alliances via clusters like the PAC (which would hopefully facilitate vital technology upgrades and client base diversification) is just one of the main measures that are needed to guide the future development of the automation industry.

The other key recommendations, as discussed in the Penang Automation Industry Survey conducted by SERI in 2007 include fostering closer working alliances with government and (public) academic agencies to obtain financial, marketing and research-related resources/support. The relevant government agencies at both the State and Federal levels can play their part in facilitating access to incentives and financial assistance to automation firms in the small to medium range (SMI category automation firms), as the smaller firms' access to funds and infrastructural resources is often hindered by red tape and complicated bureaucratic processes. These automation and engineering supporting firms, in order to cushion high operating costs, generally keep their operations small and focused, but this cost-saving strategy has incurred longer-term limitations to growth potential and capability upgrades.

On the external front, the government, in collaboration with public and private institutes of higher learning can also act to assess and redress the growing gap or mismatch in demand and supply of skilled human resources, one of the inputs that functions as an engine of growth for the manufacturing sector on the whole. With regard to the automation sub-sector, the IMP3 has in fact highlighted the need for an increased supply of skilled labour in the specific areas of engineering design, software development, machine assembly and integration and maintenance, machining, fabrication and precision casting.

The expanded supply of skilled labour must accompany any acquisition and implementation of new technology, as manpower and knowledge applications go hand in hand in the quest to upgrade production capacity and product range and quality.

On the part of the automation industry, the local firms should be willing to adopt a more global rather than local orientation, with the aspiration to eventually supply the global market from a consolidated local (Penang) base. This involves eventually expanding their supply capabilities beyond the traditional comfort zones of reliable local client networks, and growing beyond these boundaries through aggressive resource utilization to supply the regional and global markets from a Penang-based location.

The need to rejuvenate and evolve upwards in the value trajectory is not unique to the automation sub-sector, but is in fact imperative for any sector or sub-sector facing the growing forces of regional and global economic competition. With some measure of foresight and planning, the Penang automation sub-sector is well-placed to capitalize on a combination of factors like location, experience and resources to harness new growth in areas that will help to ensure the industry's viability and contribution to the economy.

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International Headlines

US PRODUCER PRICES UP 1.4% IN MAY

Source: excerpt from BBC News online, 17th June 2008

US producer prices jumped by more than expected in May, pushed higher by the soaring fuel and food prices that are hurting economies around the world. Prices climbed by 1.4% - the biggest gain since November 2007, according to US Labor Department statistics.

Further evidence of the strain on the US economy came from separate government numbers showing a 3.3% fall in new home construction during May.

The housing market has slowed over the past year, weighing on economic growth.

As a result, the US central bank, the Federal Reserve, now expects growth of between 0.3% and 1.2% this year, down from the 1.3% to 2% predicted in February.

Yet despite expectations of slower growth, fears remain over higher consumer prices, especially with oil prices setting new record highs of almost $140 a barrel.

The data showed that producer prices were now 7.2% higher than they were a year ago. This was the eighth consecutive month that prices had risen by more than 6% on an annual basis.

The new figures add to worries that producers will soon be forced to raise prices to limit the impact of spiralling fuel and food prices.

Analysts said that firms could only pass on so much to the consumer before having a negative impact on company profits.

OIL EASES AFTER NEW HIGHS NEAR US$140

Source: AFP, excerpt from Channel News Asia online, 17th June 2008

Crude oil prices eased from new highs approaching 140 dollars a barrel on Monday as the dollar fell against the euro and speculation mounted about Saudi Arabia's intention to increase output.

New York main oil futures contract, light sweet crude for July delivery, dipped 25 cents to close at 134.61 dollars a barrel. In London, Brent North Sea crude for August delivery fell 40 cents to settle at 134.71 dollars.

Both futures contracts struck all-time highs in intraday trading - 139.89 dollars in New York and 139.32 dollars in London. The largest oil producer in OPEC is currently producing 9.45 million bpd after announcing an increase of 300,000 bpd last month following a visit by US President George W. Bush

The Saudi increase report came amid growing pressure for more oil from the Organisation of the Petroleum Exporting Countries cartel, which pumps about 40 percent of world output.

Finance chiefs of the Group of Eight industrialised nations warned on Saturday spiralling oil prices threaten global economic growth and called on producers to open up the taps. They also tasked the International Monetary Fund to investigate speculation's role in driving prices skyward.

Oil prices also were underpinned by the dollar's decline against the euro, after record eurozone inflation data lifted prospects of an imminent interest rate hike. Dollar-denominated oil benefits from a declining dollar as investors seek a haven from inflation.

According to Michael Jones of the Riverfront Investment Group, energy subsidies in emerging market economies, especially China and India, have upset the balance of supply and demand in the oil markets and were partly to blame for rallying oil prices in recent years.

The hyperbolic rise in oil prices witnessed thus far in 2008 suggests that speculators now dominate the oil markets. The power of these traders to influence oil prices will only be broken when subsidies are reduced.

INDIA INFLATION RATE RISES TO 11%

Source: excerpt from BBC News online, 20th June 2008

Indian inflation has risen to a new 13-year high, hitting shares and weakening the rupee. The wholesale price index rose to 11% in the 12 months to 7 June, up from the previous week's 8.75%. The inflation rate is now at its highest since 1995.

Rising fuel and food costs are pushing inflation well above the government's target of between 5% and 5.5%. The jump took many analysts by surprise. More interest rate rises are now expected. Unlike most countries, India calculates inflation on the wholesale price of a basket of 435 basic goods, which means actual prices paid by the consumer are much higher. Cooking gas prices have risen by 20% and diesel is up 21%.

In Mumbai (Bombay), India's main Sensex index ended 516.70 points, or 3.4%, lower at 14,571.29. Shares have slumped since the Sensex broke through the 21,000 level earlier this year.

Last week, India's central bank raised short-term borrowing rates from 7.75% to 8%. The unexpected rate increase was the first since March 2007. The Reserve Bank of India is keen to address spiralling inflation.

But there are concerns that interest rate rises will not do anything to curb rising energy prices, which saw India recently cut fuel subsidies and raise petrol and diesel prices by about 10%. This sparked protests in many parts of the country from consumers and transport operators.

India imports nearly 75% of its crude oil requirements, making it heavily reliant on the whims of international oil markets. The government subsidises the cost of domestic fuel products, but even allowing prices to increase slightly can have a massive impact on the living standards of the majority of India's poor population.

NOTES:

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