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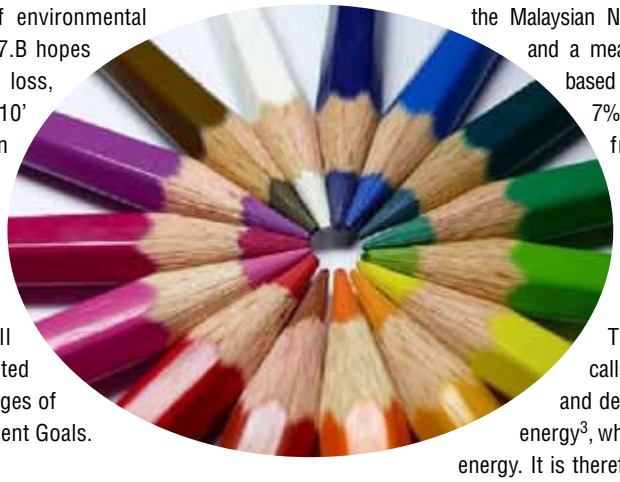
Spearheading a Green Culture

Malaysia's Strategic Green Initiatives

During the rise of Western Europe in the 18th century, the dominant theme of that era was *Industrial Revolution.* It was a groundbreaking theme that revolutionalised Western economies, socio-economic thoughts and contributed to the creation of the term economies of scale in the Western hemisphere. Today, the theme has been gradually substituted by the theme *Green Revolution* which appears to have penetrated almost all sectors of global economies. This occurred consequent to global warming warnings and international environmental efforts carried out by the United Nations and concerted environmental NGOs worldwide.

COMMITMENT TO INTERNATIONAL ENVIRONMENTAL STANDARDS

The United Nations Millennium Development Goals (MDGs) represent an international environmental movement which seeks to achieve eight goals for a better world. One of these goals is to 'Ensure Environmental Sustainability' (Goal 7). Target 7.A strives to 'integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources', while Target 7.B hopes to 'reduce biodiversity loss, through achieving, by 2010' a significant reduction in the rate of loss. Goal 7 is currently being observed and implemented by Malaysia via its green initiatives, to a large extent including all practical measures executed in the implementation stages of the Millennium Development Goals.



THE NATIONAL GREEN TECHNOLOGY POLICY: AN UPDATE

In Malaysia, the government has taken cognisance of Goal 7 above and international green efforts. In April 2009, a new Ministry was established, the Ministry of Energy, Green Technology and Water (KeTTHA)[1]. The primary objective of KeTTHA is to promote high impact research and development (R&D) of green technologies in Malaysia. The Green Technology Financing Scheme was set up by the government towards this end.

The National Green Technology Policy (NGTP) was launched to address the following four main areas of concern: (i) Energy, (ii) Environment, (iii) Economy and (iv) Social Aspects.

Under the NGTP, five main objectives have been defined and have been described in previous issues. The Policy remains a hurdle as Malaysia relies 62.6% on gas, 20.9% on coal within the Malaysian National Grid infrastructure[2] and a measly 9.5% on hydropower-based sources. The remaining 7% is expected to be drawn from renewable energy resources. This is of grave environmental concern.

THE NATIONAL ENERGY POLICY

The National Energy Policy calls for meaningful research and development of critical mass energy[3], which includes nuclear-based energy. It is therefore highly ironical to note that unless there is a better Renewable Energy (RE) option[4], nuclear energy will be anticipated to drive Malaysian energy growth into the next phase of economic advancement by year 2020. The proposal by Malaysia to incorporate the nuclear energy[5] factor as another alternative to current domestic energy demands an anti-thesis towards ASEAN's aspirations to achieve environmental sustainability as reflected in the ASEAN Plan of Action on Science and Technology: 2007-2011[6] and the wider expectations under the UN Millennium Goals.

Continued on page 3

Contents

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From the desk of the Director General

Spearheading a Green Culture

Green is the colour of the next great wave in the affairs of humankind on Earth.

The United Nations Millennium Development Goals (MDGs) seek to achieve eight clearly defined goals for a better world. In particular, Goal 7 seeks to 'Ensure Environmental Sustainability'. This 'environment sustainable' theme now appears increasingly and ever more strongly in every segment of most economies of the world. It is the rising tide of Green Culture. In essence, this Green Culture seriously questions every facet of our current lifestyles and the consumption of products and the use of services that degrade the environment. This culture acts both directly and indirectly to promote a harmonious relationship between humankind and Mother Earth. On Earth Day 2010, 175 countries adopted the 'Green Rule' within the national economic implementation framework. The Green Rule is a theoretical proposition that advocates the imposition of the green factor in the environmental assessment audit in all areas of industrial applications within the now well established environment sustainability matrix. Clearly there is no stopping this tide and its waves are fast approaching our shores and the shores of all other countries too!

In Malaysia, the Government has indeed taken cognisance of Goal 7 vide its various green initiatives. And the pace of such changes must and will be stepped up. It was therefore not a surprise when in April 2009, a new Ministry was established, the Ministry of Energy, Green Technology and Water. The primary objective of this Ministry is to promote high impact research and development of green technologies in Malaysia. The National Green Technology Policy is centred on four areas of concern *viz* Energy, Environment, Economy and the Social Aspects. It is anticipated that these four areas will bear the brunt of the full impact of the approaching green tidal wave. And it is important that we engage this green wave in a manner that allows us to surf on it rather than be engulfed by it. To give a flavour of the far reaching effects of these impending green changes, we have included articles on Green Banking, Green Computing, Green Tourism, Green Energy and Green Alternative products in this issue.

Take green computing for instance. Green computing seeks to improve energy efficiency and reduce waste in the full life cycle of computing equipment. The computing life cycle includes the energy consumed to create the equipment itself, the logistics in delivering it to the consumer, the energy used to run and maintain it and in discarding/recycling of computer equipment at the end of its life cycle. We must all appreciate the benefits to the environment if we succeed in greening the ubiquitous IT industry. It is estimated that worldwide electricity consumption by computers amounts to some 240 billion kilowatt hours per year. Carbon dioxide emissions can be reduced by some 20 million tonnes annually if all computers in the USA incorporate the latest 'sleep technology'. In particular data centres can have a tremendous positive effect on the environment if already available green technology is adopted. Currently, the estimated energy bill for these centres is USD 11.5 billion. At the individual level, we can help out by switching off our computers when not in use, by not mixing and matching our IT equipment, by downloading software instead of purchasing it in packaged disc form and if more of us can opt for working from home.

And going green makes good financial sense. Globally, banking and financial services are moving towards sustainability. Many leading financial institutions have begun to direct their resources and lending decisions towards curbing environmental degradation. In the process of green banking, products and services are being rapidly defined. To qualify as a green banking product or service, the product offered must provide customers a clear incentive to reduce indirect costs of their banking decisions which in turn are linked to carbon emission credits, climate change characteristics, greenhouse gas effects and other weather related criteria. The level of innovation and creativity in creating these products can be rather surprising. For instance, several European and US insurance firms offer 'pay as you drive' insurance cover i.e. the more you drive, the more you pay! And in the Netherlands, if you purchase shares in a green fund or invest money in a green bank product, you are exempted from paying capital gains tax and receive a 2.5 % income tax discount!

And tourism can never be the same again. More and more discerning and concerned tourists are turning green. As awareness of environmental degradation rises, these tourists want holidays to be guilt free. In effect, there is no room within our tourism industry for green washed rooms. Merely paying lip service to 'hip, cool and eco-friendly' will not bring in the tourists or the repeat tourists.

Green, therefore, is not anymore the proverbial colour associated with envy. Green is the colour of a brave new world that is embracing Mother Earth and the Environment. Green is the wave of the future!

Dato' Hajah Rosnani Ibarahim
Director General
Department of Environment, Malaysia

From page 1

The Green Building Index (GBI) Initiative

The year 2009 marked a new chapter in the history of building construction in Malaysia: the establishment of the Green Building Index (GBI) set a new green culture for the building construction industry. Pusat Tenaga Malaysia's building represents a defining example of green culture as it is the first Green Building Index (GBI)-rated building in Malaysia. Putrajaya and Cyberjaya are currently showcased as pioneering townships in green technology for development of other townships throughout the country.

Currently, the construction costs associated with green building are high, and these admittedly remain a barrier to greening the construction sector in Malaysia. Furthermore, there is currently no green Construction Policy and Standard. It is proposed that the government takes into serious account the possible establishment of a Green Construction Policy, Green Construction Standard and Green Construction Code.[7]

Foreign Direct Investments (FDIs) Under Green Technology

As of 2010, Malaysia had attracted almost RM12 billion in investments from the solar photovoltaics industry through FDIs from top companies such as First Solar[8], Sun Power, Q-Cells and Tokuyama. However, these international firms are not keen to impart and transfer critical technologies to local hands due to contentious profit sharing basis and technological know-how transfer issues. This is unfavourable for local green technology and scientific research and development.

Development of Green Transportation

KeTTHA is working hand in hand with the Ministry of Transport and the Ministry of International Trade and Industry to research and develop the use of electric (also known as hybrid) vehicles[9] for use in Malaysian roads. However, this is limited to NGVs and specific vehicles which use biomass as fuels. The re-charge location and slow consumer acceptance rate have led to small, consumer demand and consequently hampered its expansion.

The revised National Automotive Policy 2010 entitled local car assemblers and car manufacturers of hybrid or electric vehicles to a 100% Investment Tax Allowance or pioneer status for a period of 10 years. Such investment tax allowances are limited to tax allowance or pioneer status only for certain industries. It does not apply to consumers who purchase these green/hybrid cars for private use. Parts for hybrid car repairs and maintenance remain unacceptably high compared to other China-made or Japanese car-parts currently available in the auto market.

Green Culture

The 'green' theme now appears increasingly in every segment of most economies in the world giving rise to a Green Culture which has led to serious questions on our current lifestyle and the need for direct and indirect changes in the promotion of a harmonious relationship between mankind and the environment. Earth Day 2010 brought about international co-operation when more than 175 countries adopted the 'Green Rule'[10] within the national economic implementation framework.

Table 1: Corporate/Private green participation

DIGI	1. 'Deep Green' programme as part of its CSR strategy where old equipment is swapped for newer, and more energy-efficient ones. 2. 'Mangrove-saving Project' to preserve mangrove forests in Kuala Selangor.
Sime Darby	'Plant a Tree Programme'.
Canon Malaysia	'Canon Goes Green Campaign'.
Shell Malaysia	1. Offers grants up to RM300,000 for sponsorship of sustainability projects for forest and marine conservation programmes, etc. 2. Actively involved in environment awareness, conservation and preservation.
YTL Group of Companies	Actively involved in environment awareness, conservation and preservation.
Panasonic Malaysia	Promotion of inverter technology is a positive contribution to the Green Culture.
HP Malaysia	Has conducted a similar programme through its green products, services and operations strategy.
Malaysia Airlines (MAS)	1. Moving towards the adoption of green management strategies for its fleet of commercial planes. 2. Introduction of the carbon-offsetting scheme in response to local and international carbon emissions reduction performance targets.

Countries have expressed their commitment to adopt the 'Green Culture' into all realms of the EU economy encompassing carbon emission policy, renewable energy strategies, energy efficiency measures, the creation of green and white biotechnology, green jobs and so forth.

In 2009, Prime Minister Datuk Seri Najib Tun Razak made a pledge at the United Nations Climate Change Conference 2009, Copenhagen (COP-15) to deliver to the world, Malaysia's ambitious carbon emission of 40%. The PM's COP-15's pledge will remain unachievable unless there is real integration and understanding of this green culture between industrial supply realities and the lifestyle demand of Malaysians.

CORPORATE RECEPTION OF GREEN INITIATIVES

Governmental efforts in leading green initiatives will not be successful without private/corporate joint participation. Both Multinational Corporations (MNCs) and the Small and Medium Industries (SMEs) sectors have realised to a certain extent that it is not cost-effective to do business if they exclude green initiatives from their business models and/or business roadmaps at both domestic and international platforms. Corporate Social Responsibility (CSR) movements now require large MNCs to incorporate a CSR component into their corporate Annual Report (Table 1). But this is still optional for SMEs and other small industrial sectors to do the same. It is proposed that the CSR component be made mandatory for all sectors and levels in the Malaysian industrial scene without exception.

STRATEGIC OVERVIEW

There is a serious need to develop a Common Green Platform for all governmental agencies to observe in the drafting of green-related policies, unique to each ministry i.e. Ministry of Human Resources, Ministry of Youth and Sports, Ministry of Tourism (Eco-tourism), Ministry of Rural and National Development, etc. This applies equally to the corporate sector in Malaysia. Public and private sectors must support this Common Green Platform and make green culture part of day-to-day observance in the workplace. There is a need for cohesive co-operation between Federal and State level decision making processes in environmental development along the lines of environmental directions and standards to enhance industrial co-operative ventures.

RECOMMENDATIONS

Strategic Fiscal Thrust

Tax Exemption for Green Consumer Goods and Services

Double tax deduction and tax benefits are granted by the government for Green Tech R&D. However, these are limited only to corporations and companies which adopt and implement green technologies. Regrettably,

the general and public consumers are left out of the picture.

Consumer Green Tax

Minimisation and reduction of tax for general consumer goods must also be taken into serious account, especially for goods and products which are manufactured utilising real green technologies. Currently there is no SIRIM-type Green Standard which can be used as a point of reference.

Re-designation of FDIs for Green Tech R&D

Current reliance on FDIs for green technology R&D needs to be revised. All FDIs received must be channelled and redirected towards domestic critical R&D in green technologies.

- **Local Direct Investments (LDIs) Funding**
  Efforts should be initiated to promote and foster Local Direct Investments (LDIs) apart from FDIs and revamp local industry participation in Green Tech R&D framework.
- **Sukuk Green Financing Instrument**
  Another financing method that appears to work well in facilitating green technologies R&D is the adoption of the Islamic financing instrument, better known as the *Sukuk*, for financing current R&D Green Technologies.

Strategic Legal Thrust

A Review of all Legislative Acts Having Negative Impact on Green Culture

A review of all legislative instruments deemed environmental unfriendly must be undertaken to ensure a cohesive implementation of national economic thrusts.

Revision of Past, Current and Future Scientific R&D Roadmap

Taking into view the discussion concerning strategic legal thrusts above, there is a serious need for a redirection of all current international and local R&D ventures/projects towards a Green Culture Standard in R&D.

Mandatory Green Requirement and Compliance

At this point in time, the theme green remains an obscure word at both industrial and consumer levels in Malaysia. This is because there is currently no Green Product and Services Policy in place and hence, there is no defining Green Standard which can be imposed on all industries in Malaysia. As the enforcement of a Green Product and Services Standard is not a mandatory requirement for all industrial sectors, it is a challenge to inculcate a pervasive and comprehensive green culture in Malaysia.

Introduction and Implementation of a Green Education Policy and Standard at the National Education Level

The inculcation of environmental observance, awareness, attitude, etc or Green Culture can be effectively fostered at an early stage within the national education foundation systems. Governmental engagement to provide a Green Education Policy and Standard (GEPS) is still very much in a capacity-building process. Unless there are clear guidelines at the policy source, implementation from policy stage to a lower level of execution can never be attained.

Strategic Economic Thrust

Incorporation of Environmental Green Culture into Malaysia's Economic Development Policy

Current national economic development does not take into view the environmental factor i.e. the 'Green Rule' as a vital component apart from commercial trade liberalisation demands. This calls for vigorous observance and policy incorporation of strategic conditions. The Environmental Impact Assessment (EIA) requirement needs to be fully complied with within major infrastructural works/projects.

Introduction of a Renewable Energy Policy

The Fuel Diversification Policy identified biomass as the 'fifth fuel' resource which may provide answers to the country's growing energy demand by 2020 and beyond. However, Malaysia has no effective green infrastructure to cater for such absorption.

Fragmented fiscal incentives, limited investment tax allowances and the Small Renewable Energy Programme (SREP)[11] have not produced any desirable results. Malaysia remains a country that depends heavily on carbon-based fuels since independence in 1957.

Green Re-engineering Approach

Reverse engineering and re-engineering efforts towards green engineering and green tech adoption and industrial usage should be permitted under an international patent rights environment.

Re-Generation of Fuel Mix Method

Low carbon targets can be achieved by regeneration of a fuel mix method. This can be achieved by a reduction in gas and coal fuel use and an increase in hydro-power. This includes R&D on other forms of environmentally friendly fuels particularly the Renewable Energies (REs) option.

Active Participation in International Carbon Trading Market

There is a need to develop a carbon trading mechanism in Malaysia to achieve international environmental requirements through a low carbon target development scheme.

Conclusion

Green Culture remains a real challenge in Malaysia from both the bottom-up industrial mainframe and top–down corporate architectural perspective. Sustainability of a Low-Carbon Economy[12] remains a distant reality as Malaysia redirects its drivers of economic growth along the 12 National Key Economic Area (NKEA) tracks under the umbrella of the Economic Transformation Programme (ETP).

The National Green Technology Policy's Statement states that '...green technology shall be a driver to accelerate the national economy and promote sustainable development'. This is to be achieved via the guidance of the Four Pillars[13] implemented under the auspice of the Five Strategic Thrusts.[14] However, the objectives as per the National Green Technology Policy encompassing five selected area of focus namely Industrial Development, Innovation and R&D, Human Capital Development, Promotion and Education, and Transportation will continue to remain on glossy papers unless backed by understanding and active participation by governmental agencies and the private sector on one hand, and public consumer practice of Green Culture on the other hand.

Footnotes

1 "Green initiative", *11 July 2009, at http://biz.thestar.com.my/news/story.asp?file=/2009/7/11/business/4228451&sec=business*

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4 see *http://www.ptm.org.my/index.php/green-technology/green-technology-areas.html* and also 'Green Tech Areas" at also *Malaysia rethinks green technology strategy*, 8 September 2009, *http://www.futuregov.asia/articles/2009/sep/08/malaysia-rethinks-green-technology-strategy/*

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6 See Hanoi Plan of Action component under the ASEAN Plan of Action on Science and Technology: 2007-2011.

7 This is one major area of R&D which the writer is currently engaged in and hopefully the results conducted will be implemented by the government at national level.

8 For details, see *http://www.firstsolar.com/* Quoted from the speech in "Pelancaran Dasar Teknologi Hijau Negara Dan Perasmian Bangunan Baru Pusat Tenaga Manusia", by Dato' Sri Mohd Najib Bin Tun Haji Abdul Razak,24/07/2009, Perdana Menteri Malaysia, Bandar Baru Bangi, Selangor, at *http://www.pmo.gov.my/?menu=speech&newsid=153&page=1676&speech_cat=2*

9 On this aspect, see "DRB-HICOM in talks to manufacture hybrid vehicles",1st Jan 2010, at *http://www.smecorp.gov.my/node/969*

10 The Green rule is a theoretical proposition that advocates the imposition of the Green Factor in the environmental assessment audit in all area of industrial applications within the environmental sustainability matrix. See "Paper Conference Proposal, "Nuclear Energy in Malaysia : Policy & Legal Impact Consideration", Jeong Chun-phuoc, Inter national Nuclear Conference 2009 which will be held from June 29-July 1, 2009 at Putra World Trade Centre in Kuala Lumpur, Malaysia, at *http://online.nuclearmalaysia.gov.my/sems/inc09/*

11 the Small Renewable Energy Programme (SREP) allows direct and ease of connection of small renewable power generation plants to the main national grid (NG). For details, see "Electric Supply Industry in Malaysia Performance And Statistical Information 2007". Suruhanjaya Tenaga,at *http://www.st.gov.my/images/stories/upload/st/st_files/public/Report_Performance.pdf* (Retrieved 2009-05-25)

12 Or also known by the term as or Low-Fossil-Fuel Economy (LFFE)

13 The Four Pillars : ENERGY-Seek to attain energy independence &promote efficient utilisation; ENVIRONMENT-Conserve and minimise the impact on the environment; ECONOMY-Enhance the national economic development through the use of technology; SOCIAL-Improve the quality of life for all

14 1. Strengthen the Institutional Frameworks 2. Provide a Conducive Environment for Green Technology Development 3. Intensify Human Capital Development In Green Technology 4. Intensify Green Technology Research and Innovations 5. Promotion and Public Awareness

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Green Alternatives for Better Living

Nature presents human beings the opportunity to replace many of the man-made products that are either causing harmful effects to their health and environment or should not have been invented in the first place. These green alternatives are usually easily available but many people are unaware of their capability and effectiveness. Often, use of chemicals in household activities such as cleaning, pest control, and personal care and hygiene have replaced those that were inherited over the generations.

The Many Green Uses of Lemon

The Lemon is nature's all purpose stain remover because the acid in lemon works well as a cleaning agent for fabric and cooking utensils. Besides, it is also capable of returning the colour of white fabrics due to its bleaching effect. The lemon can effectively replace liquid detergents, bleach or dishwashing liquid.

Stains from rust or mildew can be removed by rubbing with a paste of lemon juice and salt. For those who have to deal with oil and coffee stains from breakfast or lunch, spraying with lemon and hanging the shirt in sunlight to bleach the stain away can save the day. Even the tough ink blot on shirts can be removed by using a more concentrated portion of lemon juice and salt.

Mothers would be delighted to know that they can now use less cleaning detergent with a mixture of lemon and salt, which can help them remove stained areas on the cutting board and countertops effortlessly. Even metal cooking appliances such as stainless steel utensils and copper pots can be cleaned by applying lemon in salt, or lemon and baking soda.

Garlic as a Pesticide

People used to tending garden know well that garden pests are their number one enemy. Human have depended on the use of pesticides to eliminate pests for years, even though they know well that pesticides are harmful chemicals that have been linked to illnesses and diseases from prolonged usage and exposure, such as skin irritation, conjunctivitis and seizures/ convulsions. It is also possible for pesticide poisoning to occur when chemicals intended to control a pest affect non-target organisms such as human beings and animals.

One of the candidates for a all-natural pesticide is garlic. Garlic belongs to the group named Allium, a bulb type plant that smells. It is effective in getting rid of aphids, cabbage loopers, grasshoppers, June bugs, leafhoppers, mite, squash bug, slugs and whiteflies. Garlic also prevents fungus and has antibacterial properties. A garlic-based pesticide can be made in the form of a solution or a powder by mixing with other ingredients such as water, mineral oil or dish soap. However, since it is a broad spectrum pesticide, it may accidentally kill beneficial insects as well, other than pests. Therefore, spraying of garlic pesticides should be limited to the plant's affected area.

Garlic as a plant can also be used to deter pests, often as an intercrop. Its strong smelling characteristic hides the smell of the crop it is planted with. This plant is beneficial in deterring diamondback moth in cabbage cultivation, and when planted around fruit trees, can repel aphids, fruit tree borers, termites, mice and other pests.

Most deodorants and antiperspirants contain aluminium-based complexes that act to prevent sweat from reaching the surface of the skin. Some scientific studies state that aluminium-containing antiperspirants have been linked to Alzheimer's disease, contact dermatitis and breast cancer. With such a high risk posed by chemically produced deodorants, one can easily find a capable replacement in baking soda (sodium bicarbonate). Mixing baking soda and cornstarch works doubly well, with cornstarch working as a light antiperspirant, and the baking soda as a deodorant.

The cleaning and deodorising ability of baking soda makes it a possible candidate for a oral hygiene product. It can be mixed with a small pinch of salt to make into a paste for brushing teeth, or mixed with a certain amount of water to produce a homemade version of baking soda mouthwash. Besides, its whitening ability can help remove teeth stains from smoking, coffee or aging.

Health is one of the important elements of life, and staying healthy, beautiful and balanced means eating well. People are seeing slimming or dieting as part and parcel of a modern life,

and many of them turn to a dieting pill, or a chemically-formulated slimming concoction as a remedy for fat burning and digestion. There are in fact natural choices that can replace the pills easily because some foods are naturally multi-functioning as fats breaker and burner that help to flush out toxins as well.

Citrus fruits, such as grapefruit and tangerine contain Vitamin C that helps to minimise fats effectively. They work well as food that can break down fats and help in digestion. Other food such as ginger and pepper heat up the body and help to increase digestion, circulation and metabolism. Soybean, peanut and apple have fruit pectin and lecithin, naturally occurring chemicals that are able to keep fat from being absorbed by the cells and flushing them out before the body absorbs.

Conclusion

Humankind can draw on the resources of nature to replace chemical products currently used on a daily basis and mitigate against environmental stress.

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Source
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Green Technology and Green Economy Versus Green Washing

Green Technology is also known as environmentally friendly technology because it reduces adverse impacts on the environment through technology. Technology is application of knowledge to practical human activity for the purpose of enhancement. Therefore, green technology is actually the application of human knowledge to enhance the current practices and lifestyle to prevent, reduce and mitigate impacts on the environment resulting from development processes and consumption patterns.

What is Green technology?

Green Technology encompasses a vast range of technologies and this includes the natural resources we extract, to the waste we dispose off. Some of the green technology applications would include green procurement, green production, green packaging, 'zero waste policy' and many more. In essence, green technology is interrelated and prevails in every aspect of our daily life and behaviour.

There is only one Earth and there will be only one future for us. Therefore, it has become our responsibility as humans to ensure others who share the planet are protected. We are the only ones who can strike the balance between development and preservation via sustainable development. 'Green Economy' now takes a centre stage to convince all levels of society that sustainable development is achievable if we consider the impact of our lifestyle and production decisions on the environment.

Consumers of Green Technology

Now, what is green? Is it the 'green' colour we see everywhere? In actual fact, it is technology that has benign effects on the environment and it is challenging to be green! There are three major categories of consumers. There is an urgent need to focus and bring about a change in the consumption behaviour on the part of these major categories of consumers if the adoption of green technology is to move at a more rapid pace.

The Government

The first and biggest consumer is the Government. The change in government procurement, building, practices and habits of the officers will definitely result in a huge impact. We cannot green a township or an agency before greening the people there. This creates the first wave in a green economy.

Industrial and Commercial Sectors

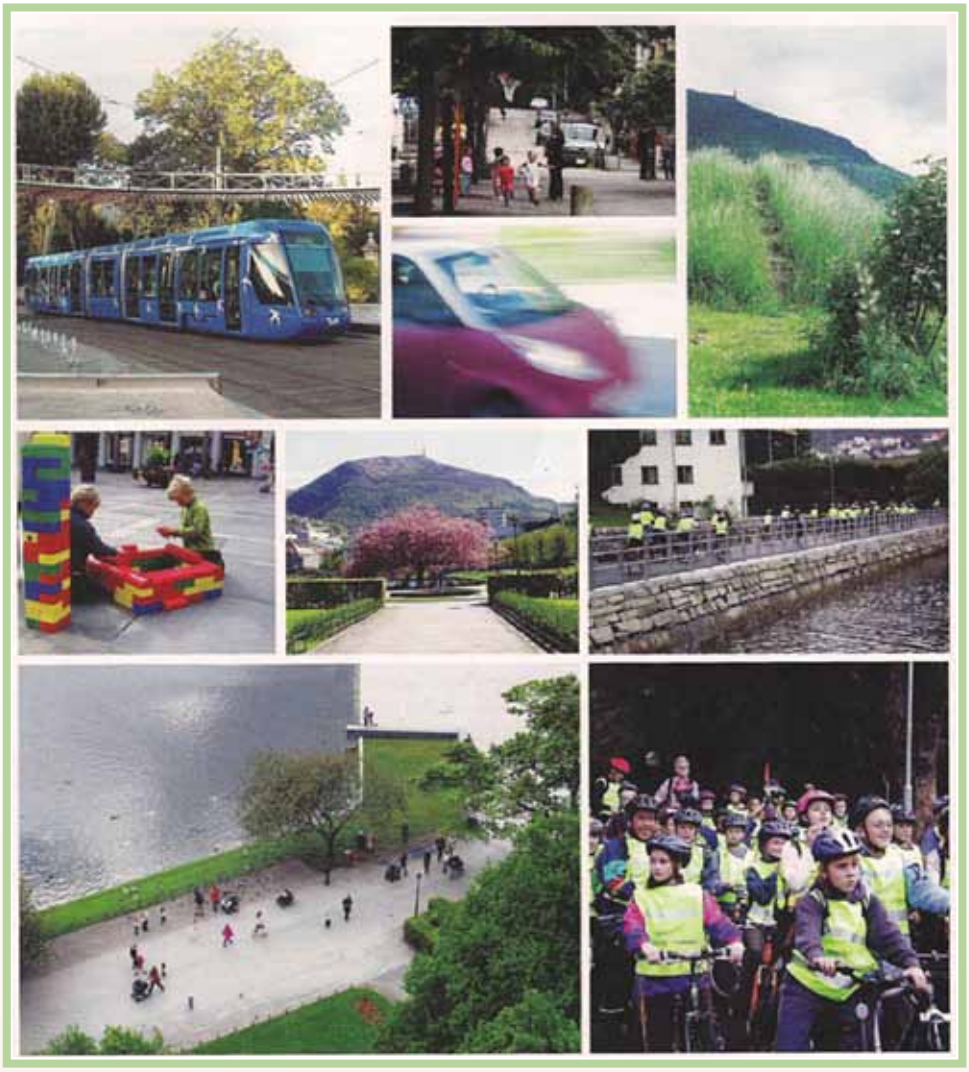
Secondly, the industrial and commercial sectors are consumers too. Can they change their operations to be 'green'? Industries and commercial entities always refer to their Return of Investment (ROI) when it comes to changing their operating method. This requires top management commitment. More often, changing to green practices involves investment but usually it saves a lot of expenditure in the long run. Therefore, the government plays a vital role in producing opportunities for business entities to have equitable ROI.

Domestic Consumers

Finally, we as domestic consumers need to go green as well. Being environmentally friendly can be done through thousands of simple practices. It is inevitable that technology gives direct opportunities for consumers to be 'green'. For example, energy efficient and water efficient products assist consumers to reduce adverse impacts on the environment as well as reduce their bills. But, developing the demand for a 'green' product is not easy. More often, many misleading claims will surface and consumers will end up being cheated. This deters the very move to 'green' the nation.

Policy and Legislation

There should be a clear policy and legislation to support Green Technology. Malaysia has launched its Green Technology Policy but there is no legislation backing it. The Green Technology sector is expected to play a major coordinating and implementation role to move the Malaysian Green Agenda. We need strong legislation to push for 'green labeling' or Eco Label. This can be done through the Life Cycle Assessment (LCA) process. Both Eco Label and LCA are expressions of the ISO 14000 series. Only through valid labeling and data sharing, can we determine the environmental impact caused by manufacturing processes, products or services rendered.



Source: Responding to Climate Change (2010)

But, if the government just continues to focus on attracting Foreign Direct Investment (FDI), Malaysia will develop into a hub of manufacturing and we will not be able to be 'green'. Changing behaviour and putting into place sound green technologies takes time and needs to be developed as organically as possible. Rapid growth will have its negative impacts on the economy, people and nation.

Obstacles

Our first stumbling block is the demand for green products or services. We can have many such products and services in the market but if the people do not buy them, there will be no economic growth and expansion of such products. That is why the government has to plan for technology development, people development and enforcement simultaneously. This is not like upgrading your computer software to a newer version. It takes time, investment and loads of patience.

The country will also need to focus on high quality 'Green Jobs'. If we bring in high end technology into our country, we will need to cater to the industry's need for skilled workers. This will be the second stumbling block. Technology transfers have been proven wrong in our previous experience. Many companies have admitted this. Therefore, we need home grown expertise development to understand the new technology.

The third will be the 'turf fight' between ministries and government agencies as 'Green Technology' is multi-disciplinary and cuts across the roles and responsibilities of several ministries. The operational model to implement Green Technology must be clearly defined. If this is not done, we will not move towards going 'green'.

Source: Responding to Climate Change (2010)

There are many noble environmental efforts being carried out in various agencies. Now, the issue is how do we integrate them to become an important parameter that determines the success of the Green Technology agenda in Malaysia.

Finally, strong stakeholder involvement must be in place. This is to ensure that all parties are consulted to address the range of issues relating to implementation of various 'greening initiatives.' Unilateral decisions and implementation have failed all over the world. Let us be smart and do the right thing from the beginning.

The Role of the 'Rakyat'

We cannot place the whole burden of going 'green' on the government or industry. We as rakyat (common people) have to understand that our daily activities have a direct impact on the environment. It is best that we do our part to support it. First of all, we need to enhance our knowledge about 'Green Technology' or 'Green Economy' as many products claim to be 'green'. Secondly, we can be 'green' by simply practising environmentally friendly habits such as practising 3R, reducing electricity usage, using water wisely, taking public transport whenever possible, etc. Another basic and simple step that we can practice is to buy Malaysian products whenever possible. This is because products that are foreign in origin have a higher carbon emission due to its transportation.

'Green Washing'?

If we switch on the television and radio or read the newspaper, many companies advertise and claim that they are selling 'green' products. That is exactly the state of the matter now. Everybody is being 'green' suddenly. We have also seen many cases of industries taking a 'green' stance to their advantage. For example, we have seen advertisements by direct selling companies to promote their organic cleaning liquid. For instance, the advertisement may show clean water flowing from their product bottle to a beautiful river with a pleasant panorama. This does not define green. Be it organic or non-organic cleaner, if the water is disposed off in large quantities to a water body, it will cause pollution. The carrying capacity of the environment is the one that defines pollution. Hotels too in eco-locations have been accused of green washing practices.

We hope that the government will take serious note of such misleading activities. We need to develop proper legislation and standards to identify products and services that are truly 'green'. The failure to tackle this will cause the consumers to lose confidence in environmentally friendly products in totality. If such a scenario prevails, we will face more obstacles to revive the green agenda.

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Green Computing: Improving Energy Efficiency and Reducing Waste

Green computing is the study and practice of efficient and eco-friendly computing resources. The term is used to denote efficient use of resources in computing. The concerns of global climate change and the energy crisis have led to renewed interest in green computing. There has been a gradual movement by computer companies toward incorporating energy-saving measures in the design of systems and hardware. An example of a green computing system could be the use of energy-saving devices such as a computer partially shutting down during periods of inactivity, but reactivating at the touch of a keyboard. It could play a significant role in eco-friendly computing practice. This article discusses green computing in general, as well as the practices of some Information Technology (IT) companies in relation to green computing.

Brief Overview

One of the first manifestations of the green computing movement was the launch of the Energy Star programme back in 1992. Energy Star served as a kind of voluntary label awarded to computing products that succeeded in minimising use of energy while maximising efficiency. Energy Star applied to products like computer monitors, television sets and temperature control devices like refrigerators, air conditioners and similar items.

Defining Green Computing

Green computing is a general term describing a facet of computing that is interested in improving energy efficiency and reducing waste in the full life cycle of computing equipment. The computing life cycle includes the energy consumed to create computing equipment, get the computing equipment to a consumer, energy used to run and maintain the computing equipment and discarding/recycling of computing equipment at the end of their life cycle (Horvath & Masanet, 2007)

Computing equipment can range from desktop personal computers, laptops, servers, networking equipment, cabling, and more. Green computing is an important realm of the computing sciences because of the significant demand computing requires of resources from the environment.

Green computing generally relates to the use of computing resources in conjunction with minimising environmental impact, maximising economic viability and ensuring social duties. It refers to supporting critical business computing needs with the least possible amount of power or sustainable computing. The computing life cycle includes pollution in the form of carbon dioxide, lead and other toxic materials. The carbon dioxide pollution occurs at power plants where electricity is generated to power computers.

Attention to green computing is growing rapidly especially given its importance in playing key roles in modern IT infrastructure, not only in environmental organisations, but also affecting every aspect of life including services related to health, banking, commerce, defense, education and entertainment. Green computing is very much related to other similar movements like reducing the use of environmentally hazardous materials like Chlorofluorocarbons (CFCs), promoting the use of recyclable materials, minimising use of non-biodegradable components, and encouraging use of sustainable resources.

Some Facts and Figures on Green Computing

It is estimated that worldwide electricity consumption by computers amounts to 240 billion kilowatt hours per year, equivalent to the entire annual consumption of Brazil.

In the USA, carbon dioxide emissions could be reduced by 20 million tonnes per year if all computers incorporated the latest 'sleep technology'.

A typical search (using any of the search engines) generates about 7g of CO_2. Boiling a kettle generates about 15g! When you perform an online activity it is not only your own computer that is using energy, it is somebody else's computer too. Sending an email, visiting a website, downloading a programme or MP3, playing an online game, searching, sending an email and Twittering all use resources on some remote server. And those servers use enormous amounts of energy.

Consider implementing rack-level cooling technologies using either water or forced air. The IBM/Syracuse project converts exhaust heat to chilled water that is then run through cooling doors on each rack. A high-density cooling solution such as this removes heat much more efficiently than a conventional system. A study conducted by Emerson in 2009 calculated that roughly 35% of the cost of cooling the data centre is eliminated by using such a solution.

Energy, Weight and Battery Life of Computers

Energy management has always been an important topic for laptop manufacturers, who have been working on this for years as they struggled to manage weight versus battery life issues. The powerful new laptop with the terrifically beautiful video display might require a more expensive battery technology if the laptop's weight as well as its battery life are to be maintained. Longer battery life always comes with a price, typically a guns-or-butter trade-off between heavier batteries or more expensive battery technologies for every additional minute of battery life.

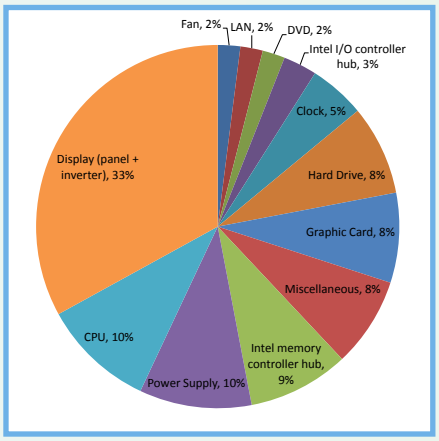

Figure 1: Power consumption in an average laptop. *Source:* Intel-The 'Battery Life Challenge: Balancing Performance and Power.'

An Ecosystem Map

Another view of green computing's architectural complexities is the ecosystem map. Here you can more clearly see the constituent components that collectively come to bear on a green architecture. In a large IT operation, this tree could conceivably span hundreds if not thousands of branches, particularly if it includes multiple business units and data centres located around the world.

You can also get a clearer view of how deeply the architecture for green computing cuts across so many functional roles in an IT operation. Another benefit of this view is that it shows the landscape across a green audit, if it is to be truly meaningful.

It also shows the complex relationships and stakeholders that must be considered. An architectural approach to green computing accounts for these relationships and stakeholders and provides a framework for rationalising how IT can more effectively address the challenges of going green.

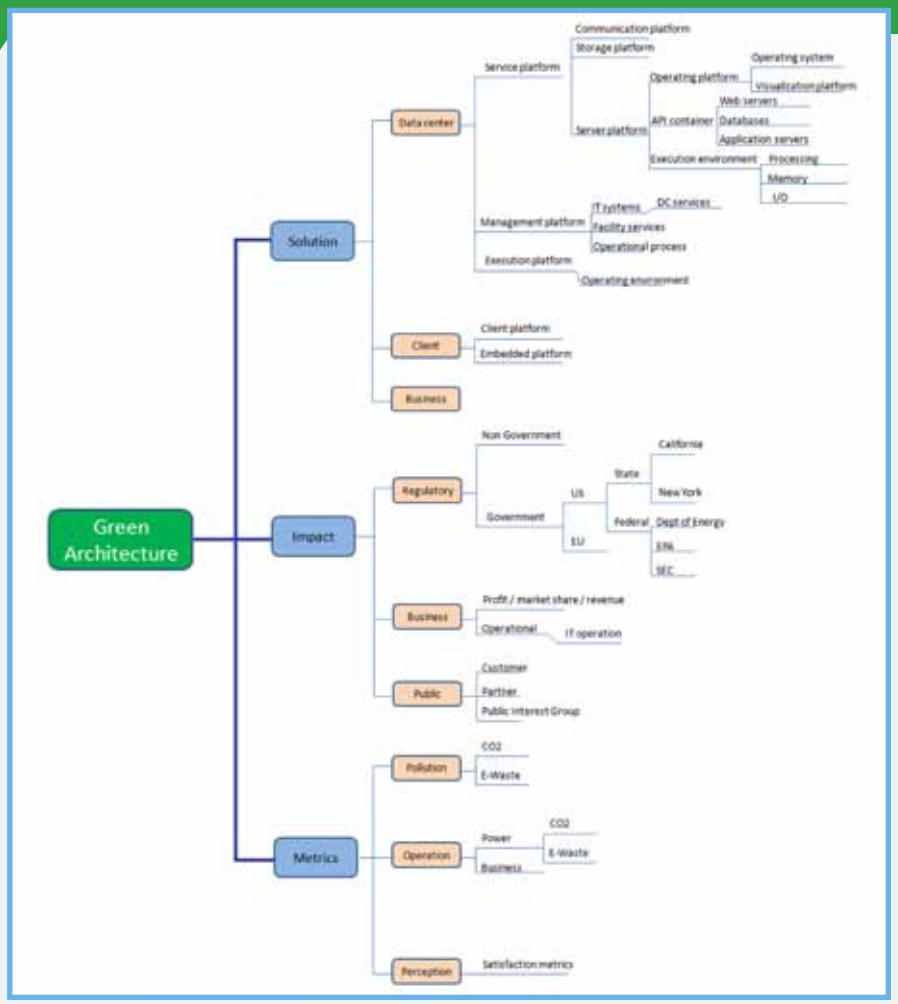

Figure 2: An ecosystem view of green computing's complex architecture.

Statistics on Green Computing

Below are some numbers that speak volumes as to why so many companies should go for green computing.

USD 11.5 billion – That is the total estimated energy bill for data centres come 2010, up from USD 8.6 billion in 2007: then think about this - the installed server base is expected to grow by 16% to as many as 43 million machines worldwide; energy consumption per server will increase by 9% while energy prices have already risen by an average of 4%, according to McKinsey & Co.

25% – The amount of the IT budget at a typical company that goes toward data centre costs. Indeed, the data centre is expensive to operate, with 17% of the costs going to hardware and storage and another 8% going toward the facilities that support those machines.

146 – Among a total of 458 servers at four production data centres, it was found that 32% (146 in all) were running at or below 3% peak and average utilisation. That means nearly one-third of these machines were plugged in, wasting energy to spin and to be cooled - and doing virtually no work!

15% – The amount of cabinet space that can be reclaimed through techniques such as more efficient racking and the removal of servers that have been decommissioned yet still left in cabinets, turned on, according to McKinsey.

Costs, environmental impact, and government interest - what other motivators do you need to realise the urgency of adopting greener IT strategies? (Mckinsey & Co., 2010)

55% – That is the average amount of UPS, cooling, and other facilities that are underutilised in a data centre. It is not just the servers and other IT hardware draining the juice and the bottom line.

74 degrees – The temperature to which cold aisles can be set in data centres. Most data centres are overchilled, which is costly. Adjusting the temperature, along with some inexpensive basic best practices, can put a dent in those cooling bills.

0.3% – The percentage of CO_2 emissions worldwide produced by data centres today.

0.6% – The percentage of carbon dioxide produced by the airlines industry today.

1.0 % – The percentage of carbon dioxide produced by the steel industry today.

170 metric tonnes – The amount of CO_2 that data centres worldwide currently produce per year. (As an interesting point of comparison: that's more CO_2 than the entire country of Argentina produces in a year, which totals 142 metric tonnes).

670 metric tonnes – The amount of CO_2 that data centres worldwide are expected to emit annually by 2020.

Some Practical Tips on Green Computing

If you are not using the computer, switch it off!

This covers computers and all peripherals like printers, scanners, external hard drives and routers. Leaving electrical equipment on standby often consumes as much electricity as when they are in use.

Do not mix and match your equipment

Buying the same brand of computers or same-brand printers means you can cannibalise parts if one breaks down and makes technical problems across the system easier to fix.

Download software

Instead of buying software on disks in plastic packaging, try downloading from the web. This saves the materials, packaging, manufacturing and transport costs of a tangible copy and electronic downloads are often cheaper than their counterparts sold in the shops.

Home office working

With fast broadband connections and sophisticated virtual private networks (VPNs), more people can work from home rather than going in to the office. File sharing over the Internet and teleconferencing software can connect workers from all over the world in different time zones. Home working has a huge environmental payback in saving fuel and cutting emissions as well as cost benefits for individuals and organisations.

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Green Banking: Reducing Indirect Environmental Costs*

The term 'green' is often loosely used on a broad range of social, ethical and environmental practices and products. 'Green financial products and services' now prevail among many diversified financial service providers, asset management firms and insurance companies. Although these financial institutions operate differently, their core business objectives regarding environmental products or sustainability principles, diversity and rapid development of such services indicate a promising drive towards merging 'green' financial products with mainstream banking activity. Globally, the transition in banking and financing activities towards sustainability is surging. Many financial institutions around the world have begun to direct their resources and lending decisions towards curbing environmental degradation.

Environmental Awareness

The relatively high degree of environmental awareness and government support is reflected by an international growing consumer demand for 'eco-friendly' products and services. According to a 2006 Cooperative Financial Services (CFS) study, 54 % of UK citizens would prefer an environmentally-friendly product with no difference in cost for the alternative and 82% would choose to purchase an environmentally-friendly product to personally fight against global warming (CFS, 2006). Recent opinion polls and corporate shareholder actions suggest that a rapid environmental awakening is currently building momentum in the US. This trend of preferences for the environment is rapidly being adopted in many other regions, including rapidly developing countries like China and India.

The Environmental Attitudes and Behavior Project, a 2007 poll conducted by the Yale Center of Environmental Law and Policy, revealed that 83% of Americans consider global warming a 'serious' problem. The study also found that more than ever before, Americans claim to have serious concerns about environmental threats (*Yale Daily News,* 2007). Other environmental issues causing concern include toxic soil and water, deforestation, air pollution and the extinction of wildlife. With respect to climate change, the above study found that 75% of respondents acknowledge that their own behaviour could help reduce global warming while 81% feel that it is their responsibility to take action against environmental challenges. These results suggest that many people want greener products and are prepared to spend money to try new eco-technologies like solar panels and hybrid vehicles.

The Strategic Council Poll (2007) in Canada found that 26% of the population considered environmental issues a priority factor. The Environics Poll reported this figure at 31% while the same figures were 4 and 12% a decade ago. This radical shift in public opinion shows how important the environment has become to the public.

Environmental Regulation and Legislation

Legislative and regulatory policies and actions on environmental issues and the constraints they induce on unsustainable practices and operations can significantly stimulate the demand for 'green' products and services among businesses. Many governments across the world have begun to enact and implement environmental protection policies in different ways.

In Europe, environmental proactive governmental policies such as the European Carbon Emissions Trading Scheme have helped to trigger both demand and development of greener consumer options that have served to reinforce environmental attitudes and behaviour among the general public while establishing a high degree of market certainty for environmental commodities and services. In contrast and specific to climate change, the US's refusal to ratify the Kyoto Protocol and Canada's wavering on meeting its Kyoto targets, slowed North America's momentum in tackling climate change.

Nevertheless, since 2005, the US political scene has undergone a major shift with respect to environmental issues. The mid-term US elections created the circumstances whereby the question is not only when carbon regulatory constraints will be enacted but how soon these will be implemented. Similarly, Canada is also on the brink of enacting nationwide Greenhouse Gases (GHG) legislation and limits on other air pollutants.

Green Banking Products and Services

To qualify as a 'green' banking product or service, the financial product offered must provide customers a clear incentive to reduce

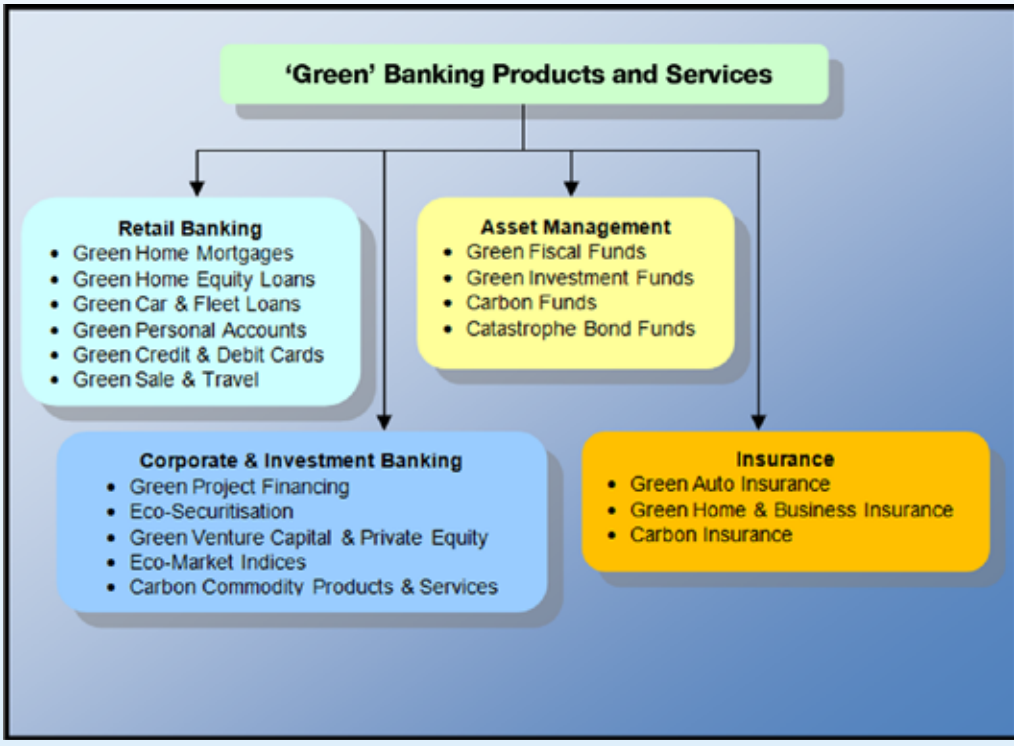

Figure 1: Green banking products and services

**This article draws information from the book 'Green Banking: An Overview' co-authored by Dr Balachandran Shanmugam and Juliana Othman Said, published by IBBM in 2008.*

indirect costs of their banking activities. Normally, green financial products and services have to be linked to certain environmental assessments that can provide initial measurable criteria. Green financial products and services are linked to carbon emission credits, climate change characteristics, GHG offsets and other weather related criteria. However, the overall benefit and sustainable measures require a long period of time to assess expected benefits that can be derived through certain eco-friendly activities. 'Green' banking or financial products and services sector can be divided into the following categories: (i) Retail Banking, (ii) Corporate and Investment Banking, (iii) Asset Management, and (iv) Insurance. Figure 1 illustrates the main categories of green banking/financial products and services with their related financing activities.

Retail banking includes personal and commercial banking products and services designed for individuals, households and small and medium scale enterprises (SMEs). The proliferation of green banking activities has redesigned the retail banking financial products and services into green home mortgages, green commercial building mortgages and so on. Green home mortgages or energy efficient mortgages (EEMs) offer competitively lower interest rates as an incentive to go green. It targets clients who purchase new energy efficient homes or invest in retrofits, energy efficient appliances or renewable power supplies.

In the UK, green home loan providers are encouraged to offer financial incentives that include one or more of the following features: (i) competitive interest rates compared to traditional products; (ii) cash back incentives; and (iii) processing fees exemption on higher loan value packages. Responding to public requests, HBOS and Abbey, UK's largest mortgage lenders, and some building societies have committed to bringing their green products and services online over the coming years. The same is done by Australia's Bendigo Bank (green generation home loan).

In Malaysia, banks have been urged to include environment as a criterion when evaluating home loan applications. In 2007 the former Minister of Natural Resources and Environment, Datuk Seri Azmi Khalid, said building developers must take environmental benefits into consideration in designing new construction projects in order to help the country deal with climate change and global warming.

In Canada, a pilot green loan initiative has been developed to finance energy-efficient equipment and materials that are incorporated in new condominium building projects (Tridel, 2006). In 2007, the Citigroup in US signed a joint marketing agreement with Sharp Electronics Corporation to offer customers an easy accessible, cheap and convenient financing option to purchase residential solar electric systems.

In 2003, Australia's Mecu credit union, created an innovative financial product package for its 'goGreen' auto loan. For each loan, the bank considers a GHG rating associated with the vehicle type and provides a lower interest rate accordingly.

In 2006, Barclays' (UK) launched a 'Currency and Carbon' initiative to encourage customers to offset carbon emissions associated with air travel. Collaborating with carbon offsetting organisations such as Climate Care, Barclays established a co-branded website for the product with funds being used to invest in energy efficiency, forest restoration and renewable energy projects in developing countries (Climate Care and Barclays, 2007).

Since 1995, Dutch banks are benefiting from a government-led 'Green Fund' initiative. By purchasing shares in a green fund or investing money in a green bank product, citizens are exempted from paying capital gains tax (CGT) and receive a 2.5% income tax discount.

'Pay as You Drive' insurance encourages vehicle owners to drive less by tying their insurance premium to actual vehicle usage. This insurance is offered by several European and US insurance firms such as Aviva, Versicherungen and Gerling insurance companies.

The Emerging Opportunities

There is an emerging and rapidly growing opportunity in the development of banking products and services aimed at the green commercial building sector. By the end of 2006, in the US, over 6% of the non residential construction which is equivalent to approximately USD 15 billion was considered 'green', whereas in 2000 this segment was less than 1%. Currently, the US federal government requires new public buildings to meet the US Green Building Council's LEED standards in 15 states and 46 cities. Four out of these 15 states offer incentives to develop certified green buildings.

As in most potential growth markets, banks and financial institutions that enter this sector early can build the credibility, reputation and expertise required to enjoy a competitive edge as this market expands.

Another emerging opportunity in this sector, especially among European and Japanese banks is the Carbon Market. The setting up of emissions trading desks, offering cutting-edge derivative products based on carbon assets, investing and buying credits from CDM projects and minimising and offsetting the bank's own GHG emissions are highly likely to become mainstream banking activity soon among major banks in Europe. As for the other financial institutions around the world, the opportunity exists to capitalise on emissions trading markets by becoming risk takers and market makers in this rapidly expanding regional and global area.

The Impax ET50 Index in the US, which tracks the largest 50 environmental businesses based on market capitalisation, rose to just over USD 120 billion in 2006, up from USD 47.5 billion in 2005. Meanwhile, in 2006, global venture capital and private equity investment in clean technology firms and projects increased by USD 4.4 billion over the 2005 figure. By 2010, New Energy Finance predicts that the growing environmental industry will see approximately USD100 billion in private equity deals around the world.

Conclusion

Green financial products and services reviewed in this article either remain in the nascent stage of development or data related to their success rate has not yet been reported. Due to this lack of experience and data, any rigorous measurement or ranking of these designs would be overly speculative. However, as more quantitative and qualitative track records emerge for these financial products, questions regarding their achievement levels, customer attraction, continuity and awareness impacts would be better understood.

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Greening Tourism: Moving Towards Responsible Tourism

The tourism industry's interest in appearing to be 'green' or 'sustainable' has increased in exponential proportions over the past year. Although tourism is a profitable business (if managed well), the industry is taking its toll on the environment (not to mention the social impact on the local communities).

For many people today, going on a 'green-holiday' is an increasingly central feature of the travel patterns that have spread across the globe. Has the tourism industry's growth throughout the years created an increasing amount of stress on the environment? Are 'eco-tourism' and 'green-tourism' considered sustainable or as being responsible?

As argued by Pleumarom in 1995, in the classic article, 'Eco-tourism or Eco-terrorism?', eco-tourism or green tourism can be just as damaging as honest hedonistic holiday-making. Critics of the green tourism idea regard it as an 'eco-facade', a tactic concealing the mainstream tourism industry's consumptive and exploitative practices by 'greening' it.

Green Tourism or Responsible Tourism

Green tourism is indeed the fastest growing sub-sector of the tourism industry. Similarly, eco-tourism is becoming the fastest growing form of tourism in Malaysia, currently contributing about 10% to the country's tourism revenue (EcoMalaysia, 2010). But there are well-founded concerns that green-washing is instead slowly shadowing the eco-tourism industry whereby this concept of responsible tourism is seen lacking in adequate scientific foundations, and is not viable as a solution to the global environmental problem.

In Malaysia, the prefix, 'eco' which represents 'being green' or 'environmentally friendly' may sound benign but there seems to be an over-use of this term to denote an idea of being 'hip', 'cool' and 'friendly' to the environment. This can lead to some tourism businesses using this label as a marketing tool, merely paying lip service to environmentalism by declaring they are green with no action taken to ensure they are. It is undeniable that green travel has gone from being a trend for the more well-informed traveler to being part of mainstream consumer and corporate culture.

Impacts on Enviroment

Consequently, eco-tourism has had serious impacts on the expropriation of virgin territories which include wildlife parks, national parks or other wilderness areas. Development of mega-resorts, hotels, condominiums, shopping malls and golf courses in natural areas in the name of green tourism or eco-tourism to attract mass tourists is indeed green-washing! Such mammoth artificially landscaped projects tend to irretrievably wipe out the flora and fauna and sometimes even lead to total vanishing of the entire eco-system.

Figure 1: Coral bleaching in Peninsular Malaysia

Malaysia is blessed with breathtaking islands along with white sandy beaches and clear waters, which generate significant tourism receipts for the nation. Tourism growth in Malaysia has been assisted, to an extent, by the abundant and rich coral reefs and shallow tropical marine resources in this region. Recently, the impact of exceeding carrying capacity was seen in some of the major dive sites in the country (see Figure 1). The closure of nine dive sites on the tropical islands of Tioman and Redang until the end of October (*The Star*, 2010) was indeed a wake-up call for all stakeholders to play their part in an attempt to relieve stress on the fragile marine ecosystems. These popular dive sites in the South China Sea were hit by coral bleaching blamed on global warming. The closure would give the coral a chance to regenerate and remove stress caused by tourism-related activities such as scuba diving and snorkeling. Hence, if these dive sites are not serious in enforcing carrying capacity, Malaysia may lose that part of Mother Nature that attracted many eco-tourists to our top diving sites of the world.

Reports from EcoMalaysia (2010) further highlight that although Malaysia has a wide range of natural assets that make eco-tourism a highly beneficial, sustainable and long-term form of tourism, there are enormous concerns for the future of eco-tourism, as many of the well known eco-tourism sites in Malaysia are now over-used. Some of the examples are Wang Kelian in Perlis (limestone, caves and forests), Kenyir Catchments in Terengganu (lake, boating, trekking and fishing), Pulau Kukup in Johor (mangroves, wildlife, and seafood), Lower Kinabatangan River in Sabah (proboscis monkeys and wildlife), Pulau Redang in Terengganu (fish, coral reefs and an attractive marine environment), Pulau Sipadan in Sabah (fish, coral reefs and an attractive marine environment), and many others. One of the best eco-tourism practices have been displayed in the Matang Mangroves Forest in Perak. However, there is still lack of best eco-tourism practices displayed in many of the marine parks in Malaysia.

Understanding the Concept of Responsible Tourism

So, how do we make amends to ensure this biggest industry of the world (tourism) does not destroy the eco-system? One such approach is by understanding the concept of 'Responsible Tourism' whereby the disastrous trail by tourists is reduced by promoting sustainable management practices at the operational level.

As propagated by Wild Asia (2007), a social-enterprise group based in Kuala Lumpur, 'The environment is the resource base for tourism; without protection, the natural attraction that brought the tourists in the first place will be lost. As national knowledge assets and organisational innovation become the key factor in determining

"...today's tourists are people with a genuine interest about their holiday destination and are aware that their presence can have adverse affects on both the lifestyle of the locals and the environment. Responsible tourism provides this guarantee and assures the holidaymaker a guilt -free trip."

economic strength, tourism must learn, adapt and adopt.'

Green Hotels

Similarly, across the globe and now in Malaysia the term 'green hotels' is also mushrooming. It describes hotels that strive to be more 'environmentally friendly' through the efficient use of energy, water and materials while providing quality services (Alexander, 2002). Green hotels conserve and preserve by saving water, reducing energy use, and reducing solid waste. They have seen benefits such as reduced costs and liabilities, high return and low-risk investments, increased profits, and positive cash flows. Identifying these benefits and incentives has allowed the popularity of green hotels to grow. Thus, green hotels should not just appear as a green-washing exercise or a corporate social responsibility but an incentive for cost saving in the long term while doing good for the future generations to enjoy the environment as we do today.

In 2008, ASEAN showed its care and concern about the environment by uplifting its hotel industry standard in the form of the ASEAN Green Hotel Recognition Awards (ASEAN, 2009) (see Box 1) presented to ASEAN properties with outstanding efforts in environmental conservation. In January 2010, 10 Malaysian hotels received the ASEAN Green Hotel Award at a ceremony during the ASEAN Tourism Forum (ATF) 2010, out of the total 155 hotel recipients for the year (The *Malay Mail*, 2010). The Malaysian hotels that excelled in the award include The Andaman Langkawi (Kedah), Shangri-La's Tanjung Aru Resort and Spa (Kota Kinabalu, Sabah), Mines Wellness Hotel (Selangor), Shangri-La's Rasa Ria Resort (Tuaran, Sabah), Renaissance (Kuala Lumpur), Hotel Melia (Kuala Lumpur), Nexus Resort Karambunai (Sabah), Shangri-La's Rasa Sayang (Penang), Shangri-La's Hotel (Kuala Lumpur) and The Frangipani Langkawi Resort and Spa.

The eco-resort, 'Golden Palm Tree Resort & Spa' at Sepang Goldcoast

Box 1: ASEAN Green Hotel Standard – Major Evaluation Criteria

1. Environmental Policy and Actions for Hotel Operation
2. Use of Green Products
3. Collaboration with the Community and Local Organisations
4. Human Resources Development
5. Solid Waste Management
6. Energy Efficiency
7. Water Efficiency
8. Air Quality Management (Indoor and Outdoor)
9. Noise Pollution Control
10. Wastewater Treatment and Management
11. Toxic and Chemical Substances Disposal Management

Conclusion

In conclusion, green tourism under the name of eco-tourism or any other synonym can have the same harmful effects as that of mass tourism if all the stakeholders in the tourism industry do not strictly adhere to the precepts of eco-tourism or responsible tourism. As highlighted by EcoMalaysia (2010), there are increased numbers' of visitors (eco-tourists) to almost all the marine park islands in Malaysia, as a result of increased promotion and green washing done by various parties in the pretext of generating economic revenue. When demand rises, further development implemented in the areas that were previously untouched could cause extensive damage. Once destinations become popular, there is often no way to control development activities.

Thus, environmental destruction becomes irreversible and gradually destroys the natural resources on which the tourism industry actually depends. Hence, all stakeholders must play their role and act now. A Chinese proverb says that the longest journey begins with a single step. Let this be the first step on our journey to a bright, green future.

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Box 2: Golden Palm Tree Resort & Spa, Sepang Goldcoast, Selangor Darul Ehsan.

Golden Palm Tree Resort and Spa stretches out from the Sepang coastline, almost a kilometre into the sheltered waters of the Straits of Malacca with 392 luxuriously constructed sea villas that shape a palm tree. With minimum impact on the environment and touted to be the first eco-friendly sea-hotel in the world, the resort has adopted a balanced management of the environment. Golden Palm Tree is perfect for eco-adventure. The resort has taken serious consideration of the fragility of the environment in its development and the day-to-day operations to avoid any green-washing. Maintaining the environment is critical for the success of the resort. Some of the green-initiatives adopted at Golden Palm Tree include:

- Use of the *alang-alang* thatching in the design of the roof of the sea villas and the resort in general to keep the resort naturally cool with insulation against heat.
- Every villa comes with a ceiling fan and an air-conditioner, so you can opt to use either one. The full-length windows also allow for natural light and ensure one enjoys the different elements of nature like fresh morning sea breeze or the gushing cold wind at night.
- Besides periodic third-party water analysis and immaculate care for waste management using German technology, the developers have taken it upon themselves to maintain the public beach near the resort.
- Herbal or eco-friendly toiletries are used in the sea villas for all guests to avoid any form of chemical pollution.
- Only non-motorised sports are available for all guests at the resort, namely kayaking, wind-surfacing and sailing.
- Bicycles and battery operated buggy are used for all movements within the resort.
- The villas are all erected on concrete stilts without using concrete at the base. By doing so, the seabed is not harmed and will attract more sea habitat and marine life.
- The resort is surrounded by large stretches of mangrove forest formed over time and untouched by man. Guests get to go on eco-tours of these mangroves, fishing trips as well as agro-tours to the nearby plantations.
- The management tries to eliminate excessive washing of towels and linen by leaving notes made from recycled paper encouraging the guest to reuse. All staff name cards are also made with recyclable paper.
- To get the local community involved, surrounding villages around the resort are employed to work at the resort´s food and beverage outlets, at the spa and in the housekeeping department. To also assist economically, dragon-fruit grown in Sungai Pelek and its surrounding areas is used abundantly in the buffet spreads and restaurants here.

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Can Biochar Mitigate Climate Change?

What is Biochar?

Global warming is a critical issue at hand. Prevailing views are that humankind has to move towards adopting a green lifestyle involving green products that will be more friendly and in harmony with the environment. Biochar is touted as one such green product that may have far reaching implications on offering a solution to this problem. How much do we know about biochar and how will it mitigate global warming?

Biochar is the carbon rich residue resulting from thermal decomposition of biomass. The best illustration is the burning of a match stick. After the flame has vanished, the originally yellowish colour match stick turns black - this is biochar. Biochar is an ancient material, but the discoveries of the ever fertile soil in the Amazon which contains mostly more than 3000 years old biochar sparked renewed interest in this material.

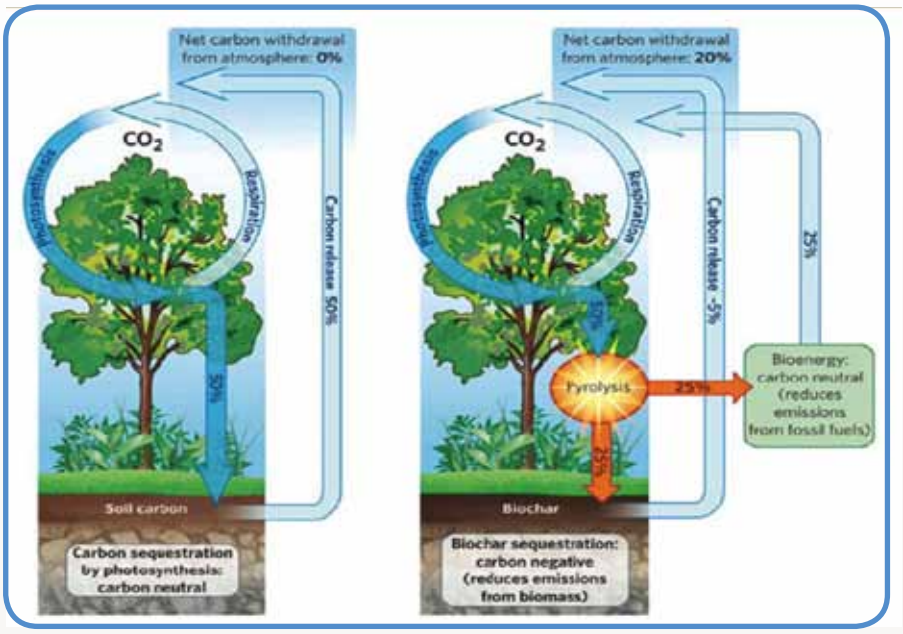

Figure 1: Neutral and negative carbon cycle [1]

The structure of biochar is a complex aromatic-aliphatic compound which differentiates one biochar from another. Depending on the source of the biomass, biochar contains around 20 - 60 wt% carbon. Since char can be produced from thermal degradation of any organic substance including plastic, there is a debate as to what is the limit to biochar definition. Some argue that biochar should be strictly defined as char derived from biomass agricultural waste and the application should only be as a soil conditioner in farming. Others try not to limit the scope of biochar. At present, the former has more support. The main reason is that biochar produced from agricultural waste is apparently free from pollutants in comparison to char produced from say municipal solid waste. The application of biochar in soil results in a negative carbon cycle as opposed to a natural carbon cycle if the char is burned for energy. This is discussed in the paragraph that ensues.

How Does Biochar Mitigate Global Warming?

In Figure 1, the left diagram shows the natural carbon cycle. CO_2 is absorbed from the atmosphere by the plant during photosynthesis to make plant cells. When the plant dies, it decomposes into CO_2 which is returned to the atmosphere in the same amount as originally taken in by the plant. The right diagram shows a model where some of the dead plant material is converted into biochar and stored permanently in the soil. There is an option where some of this biochar is used as energy feedstock to replace fossil fuel and return CO_2 to the atmosphere to result in a natural cycle. Even in this conservative set up, carbon negative will still take place due to the biochar sequestration in the soil. To illustrate: the amount of CO_2 that can be removed from the atmosphere by converting biomass into biochar is equivalent to about 160 million tonnes of CO_2 (about 10% of CO_2 total annual output in the USA in 2005) saved by converting 700 million tonnes of USA annual forest residue into biochar. [1]

How is Biochar Produced?

Biochar can be produced by thermal processing of biomass either by design or nature. Biochar produced from open burning of farm or forest fires are examples of natural biochar production. Thermal processing by design includes the pyrolysis and gasification process where the biomass is heated in the absence of or reduced oxygen. The type of thermal process used to produce the biochar determines biochar output and quality. Slow pyrolysis produces higher amounts of biochar than fast pyrolysis and gasification for the same biomass input. Much research and development work have focused on fast pyrolysis and gasification to maximise oil and syngas output for energy. Slow pyrolysis is limited to production of low grade activated carbon and pretreatment before gasification.

However, among the three processes, the slow pyrolysis process is probably the easiest to scale up due to the fact that a low temperature prevails and the output is largely biochar. Further, the biochar produced in this method is most suitable for agricultural application. Recent findings of the potential of biochar for environmental management will increase demand for it. Therefore, it is important to develop a pyrolysis unit capable of producing a large amount of biochar using green technologies. Furthermore, the country has a vast amount of biomass waste which can contribute to huge green house gas emissions, if left to decay.

Empty Fruit Bunch (EFB) as Feedstock

In the case of Malaysia, we produce large amounts of agrowastes - it is estimated that we produce about 18 million tonnes of palm oil empty fruit bunches (EFB) every year. In a recent collaborative work between Universiti Putra Malaysia and Nasmech Technology Sdn Bhd, the world's first Biochar plant was fabricated to process EFB, with a capacity of 20 tonnes/day. [3] The plant comprises three pairs of ovens and a rotating drum. For the startup, the oven was heated using hot air generated from a diesel burner. When fully operational, the heat was supplied by hot gas generated by a recycle gas burner where the gas produced by the pyrolysis process was combusted. The complete plant is shown in Figure 2. The innovative EFB biochar plant is an example of a green technology with the installation of an energy recovery unit to keep the processing cost and emission low. The stages involved in conversion of EFB into biochar is shown in Figure 3.

The plant is currently operational and able to

supply EFB biochar at a rate of 4 tonnes/day. The analysis of the biochar produced is shown in Table 1 [3]. The carbon content obtained was a lot higher than the biochar from rice husk. [2] The Cation Exchange Capacity (CEC) value was also higher than for rice husk. Normal soils in Malaysia have a CEC value of about 15 Cmol(+)/kg. It was also found that a valuable component, potassium content, was high but nitrogen level was low due to the thermal treatment. The carbon content indicates that the biochar from EFB is good for carbon sequestration. This finding is important as it shows the potential of biochar from EFB for carbon sequestration and also as a soil conditioner. However, it is obvious that more research needs to be done to determine the stability of the EFB biochar, as well as the effect of EFB biochar as a fertiliser, particularly the water holding capacity of the soil. Equally important is the study on plant nutrient intake. It is generally accepted that biochar has promising ability to improve soil quality. With the current EFB generation rate, it appears that Malaysia has a good sustainable supply of biomass feedstock to produce good quality biochar. Based on the estimates, this will save about 40 million tonnes of CO_2 every year from the atmosphere (corresponding to a reduction of 2% of total Malaysia GHG emission). In economic terms, this will translate to €62 million carbon income annually for Malaysia, based on current European Carbon Exchange (ECX) price at €15.50 per mT CO_2.

Table 1. Analysis of the EFB biochar [3]

C	45	%
N	0.32	%
P	626	g/g
K	14200	g/g
Ca	379	g/g
Mg	290	g/g
Mn	442	g/g
BET Surface Area	12.7	m^2/g
CEC	42.85	Cmol(+)/kg
pH	9.66	

Figure 2: The UPM-Nasmec EFB biochar plant [3]

Figure 3: (A) Palm oil fruit bunch; (B) Empty fruit bunch (EFB); (C) EFB biochar; (D) Close-up of biochar [3]

Biochar from Organised Tree Planting

Since the benefits of biochar to the environment and agriculture have been established and with more evidence of biochar benefits on its way, the price of biochar will become attractive, and organised tree planting will take place to provide feedstock for biochar. It can be argued that tree planting will remove CO_2 from the atmosphere. However, a frequent cycle of tree planting and harvesting will damage the soil and the ecology. Until the practice can be controlled in such a way that there will not be negative consequences to the environment, it should not be encouraged. Therefore the focus for the biomass feedstock for biochar production should start from agricultural waste such as EFB.

Conclusion

Biochar has a huge potential for use as a global warming mitigation agent as it produces a negative carbon cycle when it is sequestered in soil. At the same time, it has other benefits such as an increase in the holding capacity of water and fertilisers in soil. The improvement in soil quality will increase crop yield which may result in higher land use efficiency. A smaller use of the land area for agriculture is good for the environment, for example, less forest areas will be changed into agricultural land. At the same time the money saved from carbon trading, which is approximately RM 2.5 billion from EFB biochar alone can be used to enhance technology and agricultural practice.

Biochar produced from agricultural waste such as EFB instead of other organic materials is good for the environment. A green technology developed by UPM in collaboration with a private company has the capacity to process 20 tonnes/day EFB to result in 4 tonnes biochar/day. The green technology and environmentally friendly practices in the production of biochar must be strictly adhered to in order not to undermine its role in sound environmental management. Clearly, the government's role in regulating biochar is equally important for it to become an effective global warming mitigation agent.

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Event Highlights
Department of Environment, Malaysia

July 2010

The 8th Meeting of the ASEAN Working Group on Environmentally Sustainable Cities

The 8th Meeting of the ASEAN Working Group on Environmentally Sustainable Cities was held at Equatorial Hotel, Kuala Lumpur from 21-22 July 2010. The event was hosted by the Department of Environment, Ministry of Natural Resources and Environment, Malaysia and chaired by Ms. Liana Bratasida, Special Assistant to the Minister on Environment Global Affairs and International Cooperation, Ministry of Environment, Indonesia.

The meeting served as a consultative forum to enhance coordination and collaboration among various ASEAN sectoral bodies and dialogue partners in addressing environmentally sustainable challenges in the areas of clean air, clean water and clean land as well as green and blue issues towards achieving liveable cities/urban areas.

The participants comprised 37 delegates from Brunei Darussalam, Indonesia, Lao PDR, Malaysia, the Philippines, Singapore, Thailand, Vietnam, the ASEAN Secretariat and representatives from international organisations.

20th Inter-University Environmental Debate

Organised by the Department of Environment (DOE) in collaboration with the Malaysian Universities Debate Council (MADUM), Dewan Bahasa dan Pustaka (DBP) and Ministry of Higher Education, the 20th Inter-University Environmental Debate saw participation from 24 institutions of higher learning in Malaysia. University Malaysia Terengganu (UMT) in Kuala Terengganu, Terengganu hosted the event from 16-19 July 2010. The two teams that made it to the finals of the 2010 Debate held at Dewan Sultan Mizan of University Malaysia Terengganu were University Teknologi PETRONAS (UTP) and Universiti Sains Islam Malaysia (USIM). UTP emerged the overall winner of the 2010 Debate, receiving the Minister of Natural Resources and Environment Challenge Trophy, a cash prize of RM8,000.00 and a certificate of participation. Mohd Ikhwan bin Rosseli of USIM emerged as the Best Debater and received the Director General of Environment Trophy, together with a cash prize of RM 1,500. YB Dato' Saifuddin Abdullah, the Deputy Minister of Higher Education gave away the prizes. The Department envisages increased participation and better quality of performance from universities and institutions in future years.

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