PROCEEDINGS OF THE NATIONAL CONFERENCE ON SUSTAINABILITY MALAYSIA 40%: LET'S GET DOWN TO BUSINESS

Advancing Carbon Intensity Reduction Towards Combating Climate Change in Malaysia

Faculty of Science, University of Malaya, Kuala Lumpur
25 May 2010

Malaysian Environmental NGOs
May 2010

Acknowledgement

This one day event, the National Conference on Sustainability Malaysia (SM2010) – 40%: Let's Get Down to Business was organised by Malaysian Environmental NGOs in collaboration with University of Malaya. The conference was hosted by Faculty of Science, University of Malaya.

We would like to express sincere and heartfelt thanks to Yang Berhormat Tan Sri Datuk Seri Panglima Joseph Kurup, Deputy Minister of Natural Resources and Environment for officiating the opening of the conference. We especially acknowledge the financial contributions made by the Ministry of Natural Resources and Environment, Danish International Development Assistance (DANIDA), British High Commission, SHELL Malaysia, Telekom Malaysia and Technip GeoProduction (M) Sdn. Bhd., without which it would not have been possible to hold the conference.

Special thanks also to all the speakers, panelists, moderators and facilitators for their support and participation. In particular, we would like to acknowledge the contributions of Mano Maniam, Prof Dr Nik Meriam and her team, Melissa Chin, Dr Sundari Ramakrishna, Awang Muzaiddin and Adelaine Tan.

It was our intention that the presentations and discussions would contain much valuable input by identifying concerns of relevant sectors in our efforts towards reducing carbon emissions. Therefore, the discussions were carefully recorded by rapporteurs and these summaries are now available on the MENGO website as well as in these proceedings. I am grateful to Dr. Sundari for her excellent editing of the proceedings that we assembled in the hope that not only conference participants will refer to it, but also a much wider audience.

Finally, I wish to thank all the conference participants, each of whom contributed in their individual way to make this conference a success beyond our greatest expectations.

Dato' Dr. Dionysius Sharma
Chair
Malaysian Environmental NGOs (MENGO)

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Acronyms and Abbreviations

3R	reduce, reuse and recycling
CA	Copenhagen Accord
CER	Carbon Emissions Reduction
CO_2	Carbon dioxide
COP	Conference of Parties
EE	energy efficiency
FRIM	Forest Research Institute of Malaysia
GHG	greenhouse gas
IPCC	Intergovernmental Panel on Climate Change
PPM	Parts Per Million
KP	Kyoto Protocol
LCA	long-term cooperative action
RE	renewable energy
SWM	solid waste management
UNFCCC	United Nations Framework on Climate Change

Summary

The Malaysian Environmental NGOs together with University of Malaya organised the National Conference on Sustainability Malaysia 2010. The conference took place in Faculty of Science, University of Malaya on 25 May 2010.

The conference served as a forum to share information and experience on the topic of carbon emission reduction, which has been attracting wide attention due to its global relevance. The development of carbon emission reduction methods towards combating climate change, the identification of key problems, opportunities and possible solutions to carbon cuts were declared objectives of the conference.

Several conclusions were achieved at the conference and will support the road map towards 40% carbon emissions intensity by year 2020 to be implemented in Malaysia. It has been concluded, that climate change is an issue of wide significance, which has to be tackled within the framework of sustainable development. There is a need for broader and transparent consultations with the public before the road map is finalised.

In general, carbon emissions reduction should focus on three sectors of energy, land use and waste. Holistic and coherent approaches and methods should ensure the integration of all components as well as sectors of significance to carbon emission. These approaches and methods that have been identified and emphasised throughout the conference include improvement of education to increase public awareness and commitment to act, improvement of implementation, monitoring and reporting in the public sector, removal of subsidies for energy, active engagement of private sector, use of green technology with specific focus on renewable energy and energy efficiency.

The conference was accompanied by an exhibition participated by agencies such as Department of Wildlife and National Parks, FRIM, MENGO, which provided further opportunities to understand the role and responsibilities of relevant stakeholders of this important topic.

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1. Introduction

The Honourable Datuk Seri Najib Tun Razak, Prime Minister of Malaysia pledged "*that Malaysia is adopting an indicator of a voluntary reduction of up to 40 per cent in terms of emissions intensity of GDP (gross domestic product) by the year 2020 compared to 2005 levels*" in December 2009 during the 15th Conference of Parties meeting of the United Nations Framework Convention on Climate Change in Copenhagen, Denmark.

Recognising the need to identify key problems in our current road map towards 40% carbon cuts (it's carbon intensity reduction), and more importantly, to address the question: "how do we do this", in relation to all the affected sectors, the Malaysian Environmental NGOs (MENGO) organised the National Conference on Sustainability Malaysia 2010 (SM2010) with University of Malaya in Faculty of Science, University of Malaya on 25 May 2010. The theme of this conference was ***"40%: Let's get down to business".*** The conference brought together about 60 key stakeholders comprising researchers, government and NGOs' representatives, corporate representatives, students and members of the public to tackle Malaysia's emission slashing dilemma.

5 papers were presented in the conference while representatives from government, NGO, private and public sector presented their views on carbon emission (or intensity?) reduction by way of panel discussions. These presentations and panel discussions provided the basis for breakout group discussions. The main objectives of the conference were to:

- Bring key players together to develop CER (carbon intensity reduction) methods
- Provide a forum to share feedback on the barriers and opportunities to carbon cuts and provide possible solutions
- Provide a platform for collaboration amongst stakeholders such as government, private sector, civil society, academia, international agencies and research & development organisations.

This report covers the main proceedings of the conference with syntheses of panel and break-out group discussion sessions as well as short summaries of paper presentations. The Programme of the Conference, the List of Participants with their contact details and the Abstracts of the Papers presented can be found in the appendix. For the full slide presentations or papers, please visit the website: http://www.mengo.org.

2. Welcome Address by Dato' Dr. Dionysius Sharma

Chairman, MENGO and Executive Director/CEO, WWF Malaysia

A very good morning to Yang Berhormat Tan Sri Datuk Seri Panglima Joseph Kurup, Deputy Minister of Natural Resources and Environment Malaysia, Professor Datuk Mohd Sofian Azirun, Dean of the Science Faculty, University of Malaya, members of the media, ladies and gentlemen. Thank you for joining us here today.

It is heartening to welcome such a wide range of stakeholders to the "Sustainability Malaysia 2010" Conference today, including representatives from government agencies and corporations as well as academicians and students. The conference is themed "40%: Let's Get Down to Business" and I am confident that by the end of today, we all would have made good headway in addressing our nation's emissions slashing challenge and identifying priority targets and actions. Certainly the issue of climate change demands our urgent attention.

In this century, climate change is expected to be one of the main drivers of species extinction, especially for animals and plants already threatened by habitat loss, unsustainable development and overexploitation. The Intergovernmental Panel on Climate Change (IPCC) 4th Assessment Report warns that 20-30% of species are at high risk of extinction with global warming of 1.5-2.5°C. Therefore if the global target of keeping global warming within 2°C is not achieved, we could lose a large proportion of our species.

To emphasise this point, please allow me to share a few examples:

80% of world corals may die within decades, eliminating other species that rely on them for survival. This would have a profound impact on local livelihoods through a loss of fisheries and tourism. The latter two effects are highly pertinent for Malaysia as fisheries and marine tourism, especially diving, huge revenue earners through domestic and international consumption, could be seriously impacted by climate change.

Marine turtles have been around for over 100 million years but climate change could be the last straw for rapidly declining populations affected by other human impacts. Rising sea levels and increased storm frequency and severity would damage nesting beaches, nesting sites and eggs. Rising sea temperatures have already caused loss of important foraging grounds through coral bleaching. Moreover, warmer nesting sites can lead to skewed gender ratio of hatchlings and increased hatchling mortality.

On land, both Asian and African elephants will experience a reduction in suitable habitat and lower reproductive success as a result of the changing climate. Reduced habitat will result in increased conflict between wildlife and humans over constantly dwindling resources.

There are numerous other examples of the impacts of climate change on species but I would like to iterate here that, just like any other species, *Homo sapiens* is not immune to climate change and while we humans may still survive longer than the others, climate change will eventually subjugate our species too. Man is as dependent on the earth's terrestrial, freshwater and marine natural resources as other species are and in fact is even more vulnerable given the colossal needs of over 6 billion members of the species.

It is clear that, for the sake of not only our living planet, but also all mankind, we need to start taking steps now to mitigate climate change.

On behalf of MENGO, I would like to end by thanking our co-organiser of this nationwide conference, University of Malaya. We also extend our sincere gratitude to Yang Berhormat Tan Sri Datuk Seri Panglima Joseph Kurup, Deputy Minister of Natural Resources and Environment Malaysia, for officially launching the "Sustainability Malaysia 2010" Conference. I will now pass the floor to Yang Berhormat Tan Sri.

Thank you.

3. Official Opening by Yang Berhormat Tan Sri Datuk Seri Panglima Joseph Kurup

Deputy Minister, Ministry of Natural Resources and Environment

Dr. Dionysius Sharma, Chairman of Malaysian Environmental NGOs (MENGO), heads of government departments, and statutory bodies, conference speakers, moderators, facilitators and participants; distinguished guests, ladies and gentlemen, good morning and Salam 1 Malaysia.

Firstly, let me thank MENGO for inviting me to being part of this National Conference on Sustainability Malaysia 2010. I am also extremely grateful for being given the pleasure being in the company of such distinguished crowd of people with diverse professional backgrounds, from varied industries and sectors — all sharing one vision of creating a more sustainable Malaysia for present and future generations.

I cannot overemphasize the significance of an event like this, especially at a time when the entire world, is feeling the effects of global warming. We as a human race are undoubtedly facing a monumental crossroad — one that can no longer be ignored. Do we continue to be ignorant and choose the easy path? After all, as they say, ignorance is bliss. Or do we take the more responsible route, one that seeks to reduce global warming? I believe the answer is quite obvious. Nevertheless, many of us still fail to see the glaring facts.

Ladies and gentlemen,

Indeed this phenomenon is too real, too important, too far reaching and too time sensitive for our bickering, for our indifference or for our cynicism. Arresting and reversing it should be our topmost priority. We have only one earth - becoming mere spectators of climatic changes as it turns inhospitable for human habitat is not an option. Combating climate change calls for decisive local action and global collective endeavour, the place to act is here while the time to act is now.

Recent years, Malaysia has seen the effects of climate change being brought to its own shores. About two weeks ago, my constituency of Pensiangan, deep in the interiors of Sabah, was hit by flash floods the magnitude of which has never been seen before. Whole villages have been cut off as roads, bridges and homes were washed away. It happened so fast during the night between 1am till 5am that the mostly poor villagers had little chance to save anything but themselves. The affected areas are so far in the interior that help and emergency supplies are only just trickling in. Most folks here in the peninsular are not aware of the severity of this flood because even news teams find the place very difficult to access. I believe this is one of the effects of climate change that even innocent villagers, hardly responsible for emitting greenhouse gases are becoming victims.

Distinguished guests,

In December of 2005, 2006 and again in January of 2007, devastating floods that hit Malaysia with losses estimated at RM4 billion. Climate change not only influences the frequency and intensity of extreme weather events but also has adverse impact on agricultural yields, biodiversity, forests coverage, availability of clean water and increases in diseases such as malaria and dengue fever. At a more extreme level, climate change leads to forced migration of human settlements as sea level rises, coastal and low-lying areas become flooded. In 1999, carbon dioxide emissions in the transport sector alone were at 28%. A further 23% emission is from the manufacturing and construction sector. These are areas where considerable reductions can be made.

The National Policy on Climate Change was approved by the Malaysian Cabinet in 2009 and is expected to be launched soon. The policy aims to facilitate the integration of

climate change considerations into planning and implementation of development programmes and decision-making processes; to foster sustainable economic and human development; as well as environmental conservation. It complements existing policies and takes cognizance of international conventions on global concerns.

Ladies and gentlemen,

It is heartening to note that Climate change is now high on the agenda of national governments the world over and also in multilateral institutions and such as the United Nations, World Bank and the European Union. On the part of Malaysia, the Honourable Prime Minister has pledged to reduce carbon emission level by up to 40% in terms of emission intensity of GDP by the year 2020 compared to 2005 levels.

But who is going to do the job? In this light, I enjoin all of you to be part of this partnership with the government to make the pledge a reality.

I would therefore like to congratulate the organisers and partners of this event for sharing their time and resources in making this year's conference a productive one for everyone. It is my sincere hope that you will take this wonderful opportunity to discuss and map the way forward in reducing Malaysia's emission. This conference can and should yield positive results for the global climate change agenda.

I wish you all the best in your deliberations and on this note, it is with great pleasure that I declare open the Sustainability Malaysia 2010 Conference.

Thank you.

4. Key Note Paper on Moving Beyond Copenhagen: The Way Forward by Dr. Lian Kok Fei

Under-Secretary, Environmental Conservation Division, Ministry of Natural Resources and Environment

This presentation provides an overview on the existing global climate change framework i.e. UNFCCC and Kyoto Protocol that was built on the precautionary principle and principle of common but differentiated responsibilities. Under the Kyoto Protocol framework, there is a very clear dichotomy of responsibilities towards reducing carbon emissions amongst the countries i.e. Annex I Developed Countries and Non-Annex I Developing and Least Developed Countries. However, the recent development of the United Nations Climate Change Conference that was held in Copenhagen, Denmark, 7 – 19 December 2009 has certainly raised a lot of questions on the continued

implementation of Kyoto Protocol in its second phase. A very important outcome from the conference is Copenhagen Accord.

Unlike KP, CA is not a legally binding instrument. It does not impose carbon reduction targets, purely voluntary but places heavier mitigation targets on developing countries. Further, it does not meet scientific consensus to keep current global temperature to no more than 2^0C above pre-industrial levels. In fact, it will increase the temperature by 3.9^0C due to the fact CA only requires Annex 1 parties to provide target that is only about 13% to 19% which is below the IPCC recommendation of 25% to 40%.

More than 110 countries have associated with CA except China, Brazil and South Africa. As a transitional economy, adopting CA will have a slight negative impact on Malaysia since carbon emission is expected to increase at least till year 2020. Any gains from CA are uncertain as negotiation still taking place. Most non-Annex I countries believe that KP is the equitable framework for every country to work together and supports the existing two-track negotiation framework provision under the Long-term Cooperative Action and KP.

At Copenhagen, Malaysia has pledged a voluntary 40% reduction of carbon emission intensity by the year 2020 based on 2005 levels. Although it is subject to technology transfer and adequate financing from Annex I parties, Malaysia has made considerable preparations towards achieving this target. Amongst them are:

- Endorsement of National Climate Change Policy and National Green Technology Policy
- Integration of renewable, energy, energy efficiency and solid waste management in the 10th Malaysia Plan
- Implementation of clean development mechanism
- Development of a road map for 40% reduction of carbon emission intensity
- Voluntary carbon offset scheme involving corporate sector such as MAS.

In conclusions, the importance of two track approach (LCA and KP) in the climate change negotiation must be recognised. There is also a need to clarify the position of CA in the upcoming COP16. Despite of what happens in the global arena, it all comes down to individuals to take actions for the sake of humanity and future generations.

Question & Answer Session

1. Since December 2009, what have Malaysia been doing to fulfil the 40% carbon intensity reduction? Have we finalised the road map?
   Dr. Sundari Ramakrishna, MENGO Support Unit

The road map is being developed but we do have some elements of a road map with us now or else the Prime Minister cannot make the announcement without knowing where the reductions can take place. As a developing country, we will continue to press for development and ensure it is incorporated into the road map. In other words, we accommodate carbon emissions from development necessary for our own survival as opposed to emissions from development for luxury. We must remember that climate change is not purely an environmental issue, it also concerns development in a climate constrained by carbon emission.

Financing and technology transfer is very important for us to move forward with the 40% carbon reduction. If there's no technology transfer, there should be a joint development with countries either bilateral or multi-lateral. However, we fail to make head way because the lack of trust amongst the member countries. Objectivity and leadership are also lacking from advanced countries. Finally, we must take actions that are co-beneficial. For example, the use of sustainable forest management for our forest and the development of feed-in tariff for solar power generation.

2. I agreed that our country has to develop for growth and the government has done a lot for addressing climate change such as the road map for carbon intensity reduction. But are we ready especially sectors like industry, energy, transport and construction? Is there opportunity for technology transfer?
Faizul Bin Haji Ideris, Federation of Malaysian Manufacturers

Readiness is something we have to work on. That is why we are here today to engage with people as well as industrial players. The industries want cost effective solutions but they are also the ones who emit GHG. They need to play their role which is beyond CSR by changing their production processes and cycle. For example, oil & gas industry must go beyond petroleum. Heavy dependence of fossil fuel will only lead to carbon rationing. Having said this, we cannot rely solely on industries to drive the carbon intensity reduction; government intervention through public policy is needed to put everything into actions.

5. The National Green Technology Policy and Government Initiatives in Green Technology by Mrs. Punitha Silvarajoo

Principal Assistant Secretary, Green Technology Sector, Ministry of Energy, Green Technology and Water

The paper focuses on the National Green Technology Policy and relevant government initiatives that address the issue of climate change, particularly mitigation and adaptation. Green technology is cross-functional and sectoral. Hence, the National Green Technology Council – a high level coordination body consists of ministries, agencies, private sector and other stakeholders to overcome jurisdiction problems, was created and chaired by the Prime Minister. There are five working groups led by respective agencies under the Council.

Some of the initiatives to support the development and application of green technology in the country include Green Technology Financing Scheme, Green Townships in Putrajaya and Cyberjaya, green procurement and eco-labelling, electric vehicles, integration of green topics into school syllabus and curriculum, and creation of green jobs. The paper concludes with the challenges and the way forward in green technology. They are educating the public about the policy, changing mindset and habits, lack of expertise, duplication of tasks and jurisdiction, and political will.

Question & Answer Session

1. When the ministry talks about green technology, what is the definition of green technology? Is nuclear energy considered as green technology? Many concern about the recent announcement on Malaysia going for nuclear power. How does the ministry integrate other sectors such as energy, waste, agriculture, etc. under the green technology umbrella?
   Lim Li Ching, Third World Network

   Green technology refers to any technology used to reduce carbon emissions. The ministry's website provides an in-depth explanation on the subject. Although it is claimed that nuclear power is green and clean but personally, I'm not a great supporter. Ideally, green technology would cut across other sectors. For example, rain water harvesting involves the energy and water sectors, which means it involves both the Ministry of Energy, Green Technology and Water as well as the Ministry of Housing and Local government. Integration is a challenge because it's a jurisdiction issue. Therefore, coordination and facilitation between ministries is very crucial.

2. Are there savings for your low energy office? What is the cost for the office? And are there any other government buildings built as low energy office?
   Maria Thomas, ERINCO Sdn Bhd

   Yes, definitely there are savings but I have no exact figures on the savings and the cost. Under the green townships, we are looking at 10% energy savings for all government buildings.

3. Would it be easier to integrate all available standards such as Green Building Index, sustainable cities/township into one common standard that can be translated into carbon footprint?
   BK Sinha, C2C Project Managers Sdn Bhd

   We value the perspective of private sector; currently we are working together with the Association of Town Planners, Institute of Planning and local authorities to develop a common rating tool and guideline for green building.

6. Opportunities of Carbon Emission Reduction in Solid Waste Management by Prof. Dr. Agamuthu P.

Professor (Solid and Hazardous Waste Management), University of Malaya

Most people believe that the contribution of waste sector in global warming is not important as it only contributes about 3% of the total anthropogenic GHG emission. However, the solid waste from landfills and wastewater treatment plants covers more than 90% of the methane emission throughout the globe. A fact that cannot be ignored as methane's absorbing capacity is 25 times more than CO_2. There are many options to mitigate the situation. Applicable strategies are 3R practice, composting, biogasification and biocover application onto landfill.

In Asia, Japan and Singapore have successfully implemented 3R in their countries. Malaysia, however, is still struggling with its target of 40% recycling rate. The current recycling rate is about 5 to10% as most of the waste (95%) still ends up in landfills. Adding to the problem, only 10% or less of the landfills is sanitary and the rest are open dumps without proper gasification and leachate treatment. There are opportunities for Malaysia to explore energy generation from biogas and composting. With the implementation of appropriate strategies, waste sector can certainly play an important role in the reduction of GHG.

Question & Answer Session

1. Do you have any statistics on percentage of organic and inorganic waste in terms of GHG emissions?

   Regina Cheah, Global Environment Centre

   Yes, we have the data and only organic waste emits methane gas.

2. Although we have passed the National Solid Waste Management Act, the segregation of waste is not yet enforced. Why?

Marina Yong, Good Earth Sdn Bhd

The Act is not implemented yet as the Ministry of Housing and Local Government is in the process of developing the subsidiary regulations. At present, one aspect of the Act i.e. source separation at source is being tested at two precincts in Putrajaya. However, the Ministry is not getting reliable data from Putrajaya since the recyclables are stolen before the scheduled waste collection. Nevertheless, the Act is an important milestone in solid waste management.

7. Voluntary Emission reduction for Malaysia – What Does it Mean? By Dr. Abdul Rahim Nik

Deputy Director General (Operational), Forest Research Institute of Malaysia (FRIM)

The paper starts off with sharing the latest emission scenarios which show the concentration of atmospheric CO_2 has increased to 385 ppm in 2008, 38% above the concentration of approximately 280 ppm at the beginning of the industrial revolution. Malaysia has made a voluntary commitment for reduction of up to 40% in terms of emissions intensity to GDP by the year 2020 compared to 2005 level even though it is not mandatory for Non-Annex I party under the UNFCCC and KP. This use of carbon emission intensity as indicator indicates that as long as GDP growth is higher than emission growth, then the carbon intensity reduces over the years.

Dr. Abdul Rahim Nik further explains how GHG inventory initiated by the Second National Communication has helped in formulating the voluntary emission reduction. According to the GHG inventory, energy sector is the main source of emission (66%) followed by LULUCF (13%) and waste sector (12%). Main concern is to reduce the ratio between total carbon emission and GDP. We will need technology and finance to achieve this. That is why a road map for GHG reduction has been approved by the Green Technology and Climate Change Council. Mitigation options concerning three sectors are highlighted in the road map: energy, waste and land use and land use change and forestry.

Question & Answer Session

1. Under the EE initiatives/ roadmap, industrial & commercial are taken into consideration. Why residential is not taken into consideration too?
   Faizul Ideris, FMM-Malaysian Insulation Manufacturers Group

   The road map gives priority to the main sources of emission like industrial and commercial sectors. Nevertheless, we need to cut across to other sectors soon.

2. Based on your presentation, is 40% carbon intensity reduction equivalent to 10% carbon emission reduction? And when can we access the GHG inventory?
   Thayananthan Balakrishnan, Eco Securities Sdn Bhd

   Yes. The Second National Communication is in the process of finalisation and expected to be published and opened to public after July 2010.

8. Panel Discussion on Carbon Emission Reduction: What are the barriers to overcome the carbon emission (intensity) reduction by 2020?

In this session, three speakers from university, NGO and public were invited to share their perspectives on the barriers to overcome the carbon intensity reduction by 2020. Some focused on technology barriers, while others highlighted institutional and individual issues in planning and implementation. The session was moderated by Professor Dr. Nik Meriam Nik Sulaiman.

The session opens with Dr. Yasmin Merican who talks about CO_2 trends in Malaysia and CO_2 intensity. CO_2 intensity is determined by energy intensity as a result from fossil fuel combustion. As a result, energy and environmental policy is important in accelerating the decrease of CO2 emission intensity or decelerating the increase of CO_2 emission intensity. Both the transportation and energy sectors need to reduce their dependence on fossil fuel. Energy inefficiency and our uncaring attitude are among the barriers that need to be addressed. In addition, the challenge is always the implementation of public policy and the issue of corruption.

Since everything is self-declared and non-binding in Copenhagen, Ir. Gurmit Singh thinks that Malaysia's pledge on the up to 40% voluntary reduction could mean nothing as it could be just 1% reduction and furthermore, the voluntary reduction can be retracted if technology transfer and finance are not provided. Overall, we don't have a good track record on how to reduce the energy usage trends in public transport and energy sectors. Renewable energy and energy efficiency road map has been developed for years but it's still not tabled in the Cabinet for endorsement. Bureaucracy is definitely a major barrier.

On the subject of whether the reduction target is achievable through CDM, first of all, carbon credits from the CDM projects are sold to the Annex I countries. Second, CDM will become obsolete if the second phase of Kyoto Protocol is not executed. In addition, subsidies for fuel must be removed in order to save energy. The definition of green technology is too narrow as it main focus on energy sector and should be placed under the mandates of the Ministry of Natural Resources and Environment instead of Ministry of Energy, Green Technology and Water. He remarks that rather than having dozens of policies, what we really need is action plans and some means to monitor them. It's obvious that we are very poor in implementation and worse of all monitoring and reporting never improves. This country will never resolve the problem of carbon emissions unless transparent and meaningful public consultation is present in government decision-making.

In the mean time, absence of commitment at all levels could be due to lack of understanding and awareness amongst politicians, citizens, etc. Holistic approach in tackling environmental issues should be adopted. In short, understanding and then followed by commitment to put everything into action.

Ir. G. Lalchand, on the other hand, addresses the importance of individual's responsibilities in reducing the carbon emissions. He also agrees with the removal of subsidy for energy, let the energy price rise and people will realise the actual price. For example, the low energy office building has a payback of 8 years at the 2001 electricity tariff.At the current electricity tariff, the payback period would be about 5 years.

Effective payback period can be reduced further for the private sector who are eligible for tax incentives (inclusive capital allowance & ITA – Investment Tax Allowance).

The government has lots of good incentives but not many take it up. In 2005, former Prime Minister had committed to 10% energy savings in govt buildings and now we are still targeting at 10%. Actually, energy savings can be achieved through many means. For instance, the insulation of air-conditioning buildings can save energy up to 400 to 450 MW. The cost for green and EE buildings is not too expensive but certification is. Government should lead by example by making commitments such as using EE refrigerators and inverter type air-conditioning and insulate its buildings. Nevertheless, false advertisements on energy saving products should be prohibited by the authorities. The speaker also believes that the younger generation is more aware and committed based on his experience with CETREE, USM.

Question & Answer Session

1. Religion could be one of the means to educate the public on saving our Earth as it's is in line with God's commandments. We should engage the religious scholars to educate our citizens.
   Othman Abdul Rahim, O&L Jurutera Perunding Sdn. Bhd

   Gurmit: There are 2 ways on religion, you can either live it or wear it on your sleeve. What is important is in the heart and what you do. We should explore it through value system. Anyway, I agree that religion is a good tool.

   Lalchand: Protecting the environment is a value that we should internalise ourselves. But I like to remind that talks on religion seem to be taboo in our country.

   Dr Yasmine: When we talk about sustainable development, it's embedded in all religious values. The scholars need to engage the religious department and educate them on climate change. It's also a good idea to use Friday sermons to promote awareness.

2. We are bad at implementation and monitoring. We also like to discuss problems but less in solutions, is it possible for us to improve in the years ahead?
   Asyraf Ahamad bin Basheer Ahamad, Global Environment Centre

   Gurmit: Yes, everything can be improved. Malaysia can certainly improve with commitment by learning from the past, acknowledge the mistakes and ensure we do not repeat the same mistakes.

3. How do we make use of the subsidies removed from energy? Do we tie it to sustainable development? Part of it was supposed to go back to the needy through

cash. The people who cannot afford will be able to afford what they need. Now it is the rich that is being supported.
Cheong Pui Keng, JKR Malaysia

Lalchand: We should channel it to the poor people who need to travel but the current system is supporting rich people instead.

Gurmit: That subsidy money should be channelled in RE and EE or public transport and not to solve government financial problems.

9. Panel Discussion on Models of Development

This panel discussion witnessed two speakers who shared their views and experiences on potential models of development that can be adopted in Malaysia to reduce carbon emission. Mr. Manomaniam, Environmental Protection Society of Malaysia (EPSM) moderated the session.

Mr. BK Sinha reflects and notes that unlike our counterparts around the world who jump at opportunity to save the environment, Malaysians care and do less about the environment as we are spoilt with fine weather, good food, etc. When CO_2 reaches 450 ppm, we will reach a tipping point. It is crucial to teach our children the value of respecting the environment and not be bothered with money as a bottom line. Human behaviour controls the outcome of what is happening to us. We must do something sooner rather than later.

Dato' Dr. Nadzri Yahaya: Under the road map, solid waste management is the third priority programme that requires a 75% reduction of CH_4. A difficult task due to a series of barriers. They are (1) waste collection is not optimised due to badly maintained transportation vehicles, (2) most of the landfills are open dumps and non-sanitary that allows emission of methane gas to the atmosphere, (3) waste to energy treatment plant is almost non-existent, and (4) unsustainable production and consumption pattern that generate great amount of food waste. At the moment, recycling is only 5% and this figure does not include newspaper, plastics, etc. There are three approaches to this problem: 3R practice, transform waste to energy and improve collection system by building transfer stations and federalise the SWM system.

Question & Answer Session

1. With SWM Act, how do you translate it into action particularly the public to separate waste at source? How do the local councils implement the Act?
   Benjamin Loh, Wetlands International

Dr. Nadzri: Waste sorting can be done without the law enforcement. At first, the local authorities were reluctant to surrender the mandates of SWM to federal government as it's one of their main revenue source. In actual fact, SWM in most of the LA are heavily subsidised by the federal government. The Act provides us all the provisions and we will try to implement by end of 2010 or early 2011. Naturally, the Act can't be enforced without subsidiary regulations such as licensing, permits, labelling, etc. A total of 22 regulations are being formulated.

2. Malaysia is atypical compared to other countries. In the case of solid waste, it was the main culprit for GHG emission during the first National Communication and now it has dropped to number 5. All other countries have no solid waste listed as their main GHG contributors. Having this problem and the communities are not working well together, is there any models that Malaysia can use for reducing our waste as well as emissions?
   Dr. Elizabeth Philips, FRIM

   Sinha: Deep reflection is needed. I wonder why the first tranche of government funds are not for comprehensive curriculum called ecological/environmental intelligence. Human being will only change when it's desperate. Small steps of action need changing of mindset which transcends borders. We need serious education for the children who can learn well and perhaps in turn they will teach their parents.

   Dr. Nadzri: It is a culture and education issue. Japan needed ten years to learn and practice sorting. And Malaysia is unique in terms of federalisation of solid waste management.

   Lalchand: There is a general lack of dedication and professionalism. Politicians need education.

3. I heard from an INTAN official, Malaysia has the largest number of documented policies in the world but no one knows how many have been implemented?

   Sinha: Lack of dedication or ethics in professions and contractors that cut corners, goes against all religion. Parents are those needing most education. Not population that need education but politician also. What happens in waste separation, Ministry agencies in Putrajaya have separation bins but they say that the bins are carrots not attractive enough to separate waste according to recyclables. Why don't we teach ethics on sustainable living to our children? Our usage of resources is based on our ethics and habits.

10. The Best Approach to Solving Climate Change: ROI or Financial Approaches to Carbon Emission Reduction (CER) by Mr. Adnan Dato' Dr. Mahmood Merican

Executive Director, MGIP Capital

The paper highlights that return on investment (ROI) as the best approach to solving climate change and explains how an attractive ROI hurdle rate on green investments will result in further resources being invested from the initiating parties as well as competing parties. Green investments include EE, RE and pollution reductions and resource efficiency. EE is one area where the return of investment is above 8% to 15% due to tax exemption for cooling and lighting appliances and transportation. A case study on the use of hybrid cars in MGIP Capital was highlighted. The company has saved about 40% to 50% of fuel consumption per month. The speaker also reveals that there is a government tax exemption for hybrid cars to be lapsed by end of 2010. The presentation concludes with emphasis on individual responsibility to increase demand for green products and services which will reduce the existing price.

Question & Answer Session

1. Does our current infrastructure support long term maintenance of hybrid cars? How long can the battery last?
   Faizul Bin Haji Ideris, Federation of Malaysian Manufacturers

   I can't give you a conclusive answer as my company only replaces the conventional cars 6 months ago. The battery for hybrid car has a warranty of 10 years.

2. Can you cite other examples of tax reduction scheme for other EE and RE products, even the feed-in tariff for RE is not as high as the savings stated in hybrid cars?
   Faizul Bin Haji Ideris, Federation of Malaysian Manufacturers

   The incentives for RE technology are not as clear as hybrid or eco cars.

11. Breakout Workshop

This summary of the papers presented in this breakout workshop is divided into five main topics:

- Green technology – policy measures and a framework for action
- Solid waste management – policy measures to reduce carbon emissions
- Lifestyle choices – a charter for Malaysians on CER and sustainability
- Models for development – land use perspectives
- Models for development – people and community

The participants are required to approach the topics by identifying the overall strategy, barriers or opportunities and solutions, followed by a listing of priority research areas and some discussion on important targets that are achievable within 3 years.

11.1 Session 1: Green Technology

Overall Statement/Strategy	Barriers/Opportunities to Emission Cuts	Solutions	Targets
Reduce energy use (energy efficiency & conservation)	• Electricity/fuel is too cheap. • Remove subsidy for fuel • Use saving for a renewable energy fund and promoting energy efficiency • Construction products e.g. insulation, transportation emissions etc.	• Improve public transport by using more efficient engines • Government should lead by example through buying eco-labeled products and	• Public transportation – develop more facilities and in an integrated manner (measure success by increase in percentage public usage)

Overall Statement/Strategy	Barriers/Opportunities to Emission Cuts	Solutions	Targets
		implementing green systems	• Increased usage of hybrid/electric vehicle • Use higher quality/more efficient fuel
Develop green technology industries (renewable energy)	• Promote commercialization of green technology • Effective and credible eco-labeling		New buildings should attain a certain degree of improvement in energy efficiency
Capacity Building			
Promote and support innovation and research	Prioritize research for technology that addresses immediate environmental issues		Provide incentives and remove perverse incentives for buying new cars
Improve the environment			
Carry out public awareness and education			Implement "green studies" syllabus in primary, secondary school and higher education

11.2 Session 2: Solid Waste Management

Barriers/Opportunities to Emission Cuts	Solutions	Priority Research Areas	Targets
Cost: facilities, manpower, technology	• More participation from industry (technology providers) • Creating market –making money out of waste	Community level composting – how to implement in a sensible manner	3 Community pilot projects – models for effective waste management
Awareness and education ➢ Does not translate into action ➢ Don't know about road map	• Start from young (kindergarten) • Provision of facilities and infrastructure (source separation)	Social study – Malaysian behaviour towards waste	Upgrade 1% (so low or 100%?) of landfill (open dumps) to sanitary landfill
Politics amongst politicians and between federal government and state government	• Enforcement of waste separation • Awareness through stakeholder dialogues	Baseline study – put together all studies and policies on waste	
Legislative – not aware of road map	Integration between policies is needed for various parties		
Lack of public participation and publication – no integration with road maps			

11.3 Session 3: Lifestyle Choices

Overall Statement/ Strategy	Barriers/Opportunities to Emission Cuts	Solutions	Targets
Lifestyle choices must function at all levels – governance, community and individual– and must be based on core values that can govern our behaviour which can enhance sustainability with the intended outcome of lowering carbon emissions and achieving zero waste generation.	• Ignorance • Just not willing to do • Lethargy • "Tidapathy" • Lack of enforcement and reinforcement	Starting Ecological/Carbon footprint calculators for Malaysian homes/houses to benchmark against other countries and to educate ways to reduce their footprint.	Economics outweigh common sense. The target is educating the entire community.
	• Lowering energy usage • Improving public transportation • Sustaining our core values • Creating awareness through education in schools, dissemination of information to focus groups • Revitalise Local Agenda 21 which is already in place in the local Authorities	Laws that can be used to reinforce and to modify behaviours that perpetuate and build a culture within which sustainable living can be made a reality	

11.4 Session 4: Models for Development – Land Use Perspectives

Barriers/Opportunities to Emission Cuts in Forestry/Plantation & Agriculture	Solutions	Priority Research Areas	Targets
Political commitment – legislation, enforcement	Public consultation in decision making	Improve targets	Implement sustainable agriculture
Legal mechanism	Sustainable agriculture for mitigation measures	University student on sustainable issues	
Lack of policy coherence	Move towards sustainable agriculture – reduce emissions, organic agriculture	Increased research on sustainability in all levels	
Comprehensive planning	Small holders to gain access to opportunities to be commercially viable	Mitigation and adaptation at local environment	
Social problems – poor people	Expansion of existing policies – RMK10, integrate climate concerns	Research on biodiversity in agriculture area	
Lack of labour – agriculture – energy	Improving yield and production	Climate change impact on land use	
Loss of biodiversity	Better planning activity or action		
Loss of protected areas	Improve/Strengthen existing policies		
Market driven activity	Integrate climate consideration in agricultural practices		
Subsidies and incentives			

11.5 Session 5: Models for Development – People and Community Show and Tell

Overall Statement/ Strategy	Barriers/ Opportunities to Emission Cuts	Solutions	Priority Research Areas	Targets
The public are key contributors to carbon emissions. We are the culprits and we have to be the ones to solve the problem. Education and awareness has to start from young as it will lead to environmental consciousness. An integrated effort from all sectors (NGO, Academia, Government, Corporate, etc.) should be encouraged to enhance information sharing and action towards carbon emission reductions.	People don't know about GHGs and carbon emissions	Education – school syllabus We should aim to reduce 10-20% of our overall energy consumption year on year. The shaded range would be an impossible target	Environmental education	People should be made aware of the Solid Waste Act and start separating their waste themselves (at source)
	Mindset	Awareness via mass media	Climate change impacts on Malaysia	Plant more trees, don't cement your garden
	Carpool	Religion – use it a tool to educate people and motivate action for the	Human behaviour towards the environment	

Overall Statement/ Strategy	Barriers/ Opportunities to Emission Cuts	Solutions	Priority Research Areas	Targets
		environment		
	Public transport – nationalise it (like Singapore)	Government has to continue to provide funds to advertise in the mass media on environmental issues – need to provide local examples/issues – real facts and figures needed on how it will affect every spectrum of the society		
	Facilities for cyclists and pedestrians	Instil environmental topics within current syllabus e.g. moral, agama, English, BM.		
	Organising ourselves with like-minded people (social clubs)	Environmental education for civil service training		

12. Closing Remarks by Dato' Dr. Dionysius Sharma

Chairman, MENGO and Executive Director/CEO, WWF Malaysia

Good evening and greetings again.

I trust that today's conference has yielded useful insights into the issues surrounding climate change and offered sound strategies on how to tackle Malaysia's emissions reduction challenge. From today's "Sustainability Malaysia 2010" Conference, we hope to gain the following outputs:

Firstly, a strategic vision in carbon intensity reduction by identifying priority targets and actions.

Secondly, the ability to determine priority research areas on carbon intensity reduction in different sectors for academicians and researchers.

Thirdly, the development of final conference proceedings that highlight key players, issues, targets and processes to address carbon intensity reduction.

We thank you all for participating in today's conference and extend our heartfelt gratitude to the distinguished speakers. We represent a wide range of stakeholders, as diverse as 1Malaysia. By pooling our expertise and determination to take action and mitigate climate change, I am confident that we will be able to help towards Malaysia's goal of adopting an indicator of a voluntary reduction of up to 40% in terms of emissions intensity of GDP by the year 2020 compared to 2005 levels.

On behalf of MENGO, I would like to once again thank our co-organiser of this nationwide conference, Universiti Malaya, as well as MENGO sponsors: the Ministry of Natural Resources and the Environment, DANIDA, British High Commission, Shell Malaysia, Technip Geo- Production (M) Sdn Bhd and Telekom Malaysia.

Thank you all and have a good evening ahead.

About MENGO

A grouping of Malaysian Environmental NGOs (MENGO) was formed under the DANIDA-supported programme for environmental assistance to Malaysia. (DANIDA is the Danish International Development Assistance). The Mengo coalition was formed in November 2001.

The objective of the programme is to contribute to the strengthening of the MENGOs and facilitate their impact on the decision making at all levels in the Malaysian society. One of the main strategic aims of the programme is to support and facilitate a more effective interaction between MENGO and the Government of Malaysia on environmental policies.

As part of our strategy in achieving the objectives outlined within the DANIDA-supported programme for MENGO, a MENGO Co-operating Committee (MCC) and a MENGO Support Unit (MSU), as its Secretariat were established.

Appendix A: Programme

Time	Session
8.00 a.m.	Registration of speakers and participants
9.00 a.m.	Welcome Address by Dato' Dr. Dionysius Sharma, Chair of MENGO Official Opening by YB Tan Sri Datuk Seri Panglima Joseph Kurup, Deputy Minister, Ministry of Natural Resources and Environment
9.20 a.m.	Key Note Paper Moving Beyond Copenhagen: The Way Forward By Dr. Lian Kok Fei, Under-Secretary of Conservation and Environment Management Division, Ministry of Natural Resources and the Environment
10.00 a.m.	COFFEE BREAK
10.20 a.m.	The National Green Technology Policy and Government Initiatives in Green Technology By Mrs. Punitha Silvarajoo, Principal Assistant Secretary of the Green Technology Sector, Ministry of Energy, Green Technology and Water
10.50 a.m.	Opportunities of Carbon Emission Reduction in Solid Waste Management By Prof. Dr. Agamuthu P., Professor (Solid and Hazardous Waste Management), University of Malaya
11.20 a.m.	Voluntary Emission Reduction for Malaysia – What Does It Mean? By Dr. Abdul Rahim Nik, Deputy Director General (Operational), Forest Research Institute of Malaysia (FRIM)
11.50 a.m.	PANEL DISCUSSION on Carbon Emission Reduction What are the barriers to overcome the carbon emission (intensity) reduction by 2020? Ir. Gurmit Singh, Chairman of Centre for Environment, Technology and Development, Malaysia (CETDEM) Ir. G. Lalchand, Technical Advisor (Policy Development), RE/MBIPV Project,

	Pusat Teknologi Hijau Malaysia Dr. Yasmine Merican, International Institute of Public Policy and Management (INPUMA), University of Malaya				
1.00 p.m.	LUNCH				
2.00 p.m.	PANEL DISCUSISION on Models of Development Mr. BK Sinha, Founder & Director of C2C Project Managers Sdn Bhd *(Green Star Accredited Professional – Australia)* Dato' Dr. Nadzri Yahaya, Director-General, Department of National Solid Waste Management, Ministry of Housing and Local Government				
3.00 p.m.	Parallel Breakout Workshops				
	Session 1	Session 2	Session 3	Session 4	Session 5
	Green Technology – Policy measures, framework for action	Solid Waste Management – Policy measures, to reduce carbon emissions. Any provisions in the Solid Waste Bills	Lifestyle choices – a Charter for Malaysians on CER and sustainability	Models for Development – Land use perspectives (sectoral approach) – Forestry and Plantation – Agriculture – Energy – Transport	Models for Development – People and community show and tell (stakeholder view points) – Private sector – Public sector – Civil Society
4.00 p.m.	COFFEE BREAK				
4.20 p.m.	Financial Approaches to Carbon Emission Reduction (CER) By Mr. Adnan Dato' Dr Mahmood Merican, Executive Director, MGIP Capital				
4.50 p.m.	Report to Plenary by Five Breakout Groups				
5.40 p.m.	Closing Ceremony Closing Remarks by Dato' Dr. Dionysius Sharma, Chair of MENGO				
6.00 p.m.	END OF CONFERENCE				

Appendix B: List of Participants

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Appendix C: Abstracts of Papers

THE NATIONAL GREEN TECHNOLOGY POLICY AND GOVERNMENT INITIATIVES IN GREEN TECHNOLOGY

Punitha Silivarajoo

This paper is a short overview of the National Green Technology Policy as well as government initiatives in strengthening our green technology agenda. This will undoubtedly touch on the impact it has on carbon reduction. The paper briefly covers elements of the National Green Technology Policy, the pillars in which it rest, the objectives, goals and its strategic trusts. The government has also undertaken several initiatives to support the development and application of green technology in the country. This paper covers some of these initiatives, ranging from the development of green townships, eco-labeling, the use of electric vehicles, integration of green topics into school syllabus and curriculum. Also the integration of green modules into the curriculum of skills training institutes which will enable the creation of green-collar jobs. Besides, the paper also highlights the role of the Malaysian Green Technology Corporation and the Green Technology Financing Scheme (GTFS) being an instrument that stimulates green growth for the country. The objective of this paper is to highlight to the participants the importance of the National Green Technology Policy in providing directions for the future of Green Technology in the country. It is also aimed at sharing with the participants of the Conference the various initiatives undertaken by the Government in this very short span of time to further enhance this Green Technology agenda.

OPPORTUNITIES OF CARBON EMISSION REDUCTION IN SOLID WASTE MANAGEMENT

Agamuthu P. and Fauziah S.H

Among the most obvious impacts of global warming are increase in sea-level, drastic climate change, pest infestation and disease outbreak, salt-water intrusion, desertification, extinction of species, and reduction in productivity. The main greenhouse gases (GHG) culprits are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and F-gases; generated at 49 Gt CO_2-Eq $year^{-1}$ in 2004-2005.Approximately 1.4 Gt CO_2-Eq $year^{-1}$ was contributed by the waste sector which accounted for approximately 3% of the total

anthropogenic GHG emission. As for the contribution by solid waste, namely landfills and wastewater treatment plants, it covered more than 90% of the total CH_4 emission throughout the globe. With CH_4 having 25 times more absorbing capacity than that of CO_2, the increase from 27 million tons in the last 10 year to current level of 5.6 billion tons in the atmosphere today, is very alarming. Appropriate strategies need to be implemented in order to mitigate the situation. One of the opportunities in reducing the GHG emissions is through the implementation of carbon reduction technology. This paper discussed the strategies in the reduction of GHG emission within the waste sector. These strategies include 3Rs practice, composting and Biocover application onto landfill. By preventing materials from entering into the waste stream, 3Rs reduced the waste volume that requires disposal attention. Recycling of one tonne of newspaper and aluminium cans could save 0.69 tonnes and 4.28 tonnes of CO_2-Eq $year^{-1}$, respectively, as compared to landfilling. On the other hand, composting practice reduces the organic matter content in the landfills which may be converted into CH_4 under anaerobic degradation. Composting of one tonne of food scrap saved 0.16 tonnes CO_2-Eq. Biocover application enables the oxidation of CH_4 to CO_2 prior to release of landfill gases into the atmosphere. With appropriate strategies implemented within the waste management sector, the reduction of GHG can be realized, at least partially.

VOLUNTARY EMISSION REDUCTION FOR MALAYSIA – WHAT DOES IT MEAN?

Abdul Rahim Nik

Malaysia, as a Non-Annex 1 party, has no commitment in terms of emission reduction under the current international climate regime comprising the United Nations Framework Climate Change Convention (UNFCCC) and Kyoto Protocol. On the other hand, under the Kyoto Protocol, industrialized or Annex 1 countries have to cut their emissions overall to 5.2% below 1990 levels in the first commitment period (2008-2012). Despite the above, Malaysia was willing to contribute to the global efforts in tackling the threats of climate change. Accordingly, the Prime Minister of Malaysia had announced at COP 15, Copenhagen last year "an indicator of a voluntary reduction of up to 40% in terms of emission intensity of GDP by the year 2020 compared to 2005 levels". Further, this effort is conditional on receiving the transfer of technology and adequate finance from the Annex 1 Parties, in line with Article 4(7) of UNFCCC. In an absolute term, Malaysia has to reduce its GHG emission by about 38 million ton in 2020 compared to a projected total emission of 376 million ton in that year. To achieve the above reduction, three mitigation options have been selected comprising renewable energy (RE), energy efficiency (EE) and solid waste management (SWM). Those three areas are projected to contribute approximately 45 million ton of GHG reduction by 2020, if all mitigation measures were implemented

effectively and efficiently. Detailed Road Map to achieve and implement emission reduction is being prepared.

THE BEST APPROACH TO SOLVING CLIMATE CHANGE: ROI OR FINANCIAL APPROACHES TO CARBON EMISSIONS REDUCTION (CER)

Adnan Merican

There have been numerous efforts to address Climate Change through Carbon/GHG Emissions Reduction (CER). These efforts derive especially from academic and NGO awareness campaigns like Earth Day, Earth Hour as well as Government Green Initiatives like No Plastic Day.

Although these efforts are important, I would like to state the somewhat controversial stance that the **Best Approach to Solving Climate Change is the Return on Investment (ROI) approach**.

The reason is that an attractive ROI hurdle rate on Green Investments will result in further resources being invested from the initiating parties as well as competing parties, which would result in an *increasing positive feedback on committed resources*. Like it or not in our capitalistic society, this provides the market signals necessary for resource allocation towards CER in a *pervasive manner*.

So what is hurdle rate? And what is an attractive ROI hurdle rate?

The hurdle rate can be defined as the minimum ROI required for a commercial organization to decide to allocate its financial and other resources to a prospective investment. It is of course not the sole determining factor for an investment, which amongst other factors can include: strategic business fit; internal core competencies; and brand positioning. However ROI above an attractive hurdle rate is by far the most important for sustaining financial viability of a commercial organization.

If a particular Green Investment can result in a ROI above a hurdle rate of more than 20% in most cases the first major obstacle for investment is removed. This is because a hurdle rate below 5% would in most cases result in no net increase and perhaps even a diminishing of corporate wealth. A hurdle rate between 8% to15% that is stable and predictable would be acceptable to many institutional investors as it would match their typical target dividend yield per annum to their members. Whilst a hurdle rate above 20%

would be acceptable to most companies, as even the best world-class billionaire investor like Warren Buffet has a 23% average ROI maintained for decades.

Now since we have emphasized the overall strategy of going Green in a commercial manner and defined the key terms and parameters in the financial approach, let's go into the Green Investment sub-strategies. The major Green Investment sub-strategies include the following:

- Energy efficiency;
- Renewable energy; and
- Other pollution reduction and resource efficiency like low-emission cement. It is estimated that the manufacturing of building materials like cement add to more than 15% of global carbon emissions.

In the current commercial and regulatory environment, which may change, we believe the low-hanging fruit is in Energy Efficiency (EE), in terms of ease of achieving ROI above an attractive hurdle rate and in terms of its relevancy and applicability in a range of industry sectors.

Renewable energy is dependent on Government mandated subsidisation in say the feed-in Tariffs (FIT) and its sustainability, no pun intended, is dependent on the country's political and economic will.

Other pollution reduction and resource efficiency are dependent on the particular industry concerned and may not be relevant and applicable across industry sectors.

In EE, the case study selection area includes the following:

- Specialised case study – relevant to particular corporate sector;
- Ventilation and Lighting – corporate and individual CAPEX with inherent works delay in retrofitting or new built environment; and
- Transportation – corporate and individual CAPEX with immediate effect on CER.

EE Transportation not only can be an individual lifestyle responsibility but it also has the widest application across industry sectors as well as the immediacy in CER once decision is made to replace conventional petrol engine cars with hybrid electric cars.

In summary, the best approach to solving Climate Change is ROI with the following key aspects in mind:

- attractive hurdle rate preferably above 20% per annum
- in current regulatory and commercial environment EE is the low-hanging fruit in achieving ROI above hurdle rate
- EE Transportation has the widest application across industry sectors as well as immediacy in CER.