# My Foresight MAGAZINE



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MALAYSIA ENERGY SUPPLY INDUSTRY

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NO TURNING BACK: MY JOURNEY TOWARDS CLEAN-TECH 14

INTENSIFYING BIOMATERIALS THROUGH GCIP **20** 

THE GREEN JOURNEY





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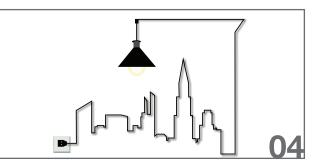
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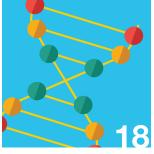
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Its key components to its mission are intelligence, research, competency and community. myForesight® raison d'etre is to accomplish the following:

- 1. Shaping Malaysia's future possibilities;
- 2. Promoting and mainstreaming of foresighting in national, sectoral and corporate planning;
- 3. Identification of key technologies to support sectoral development;
- 4. Identification of key and potential industries from technology perspective.



#### editor's note

# Initial Thoughts



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If we can come up with innovations and train young people to take on new jobs, and if we can switch to clean energy, I think we have the capacity to build this world not dependent on fossil-fuel. I think it will happen, and it won't destroy economy".

-Kofi Annan-

# Greetings and Salutations!

Dear readers, I am glad to note that we are now able to see blue skies and sunshine again after few months of haze. The haze has been disruptive, not only affecting our health but also our daily lives, with schools closing and outdoor activities being cancelled. The reaction to this phenomenon, however, has been rather muted because we have been expecting it. Our annoyance has been more due to its intensity rather than its occurrence. Is an annual haze now a "new normal"?

People I talked to are aware that the causes of the haze could be natural or it could be man-made. For the past few years, efforts are being made to mitigate the haze that occurs naturally. Scientific and technological solutions are being put into action. However, haze caused by human activities are another matter.

Scientific solutions are more geared towards minimizing its impact and consequences. It is unfortunate that in our attempt to be develop and grow economically, we contribute towards the degradation of our environment.

This trend will likely continue as managing growing cities and their supply of resources is a formidable task that places heavy demands on the environment. That is why more emphasis nowadays is put on the development of green technology or clean technology - one of the effective ways to improve and minimize environmental damage.

Kofi Annan, the former UN Secretary General and Nobel Laureate, once said, "If we can come up with innovations and train young people to take on new jobs, and if we can switch to clean energy, I think we have the capacity to build a world not dependent on fossil-fuel. I think





it will happen, and it won't destroy the economy".

The Sustainable Development Summit last September saw UN Member States commit to the 2030 Agenda for Sustainable Development, in which climate change is one out of the 17 Sustainable Development Goals (SDGs).

Climate change and sustainability issues were discussed during the 2015 Global Science Innovation Advisory Council meeting in New York and again during the APEC Chief Science Advisors and Equivalents (APEC CSAE) Meeting. Scientists from all around the world gathered to discuss ways to mitigate and address climate change.

Green growth for sustainability and resilience is also outlined in the Eleventh Malaysia Plan 2016-2020, which describes the need to increase the rate of renewable energy adoption and encourages low carbon mobility and an integrated approach to waste management.

That is why a programme like the Global Cleantech Innovation Programme (GCIP) is of critical importance, as it is one of the programmes that support the greening of the future – facilitating innovation in four technology categories: renewable energy, energy efficiency, waste-to-wealth and water efficiency. GCIP Malaysia is a collaboration between MIGHT, Global Environment Facility (GEF) and the United Nations Industrial Development Organization (UNIDO).

This greening of the future initiative is expected to generate significant growth and create jobs especially in small and medium-sized enterprises (SMEs) in developing countries by seizing a slice of the \$1.6 trillion market opportunity in clean technology\*.

This issue of myForesight is on clean technology or green technology practices - how we can support economic growth while reducing pollution and waste. I hope you'll enjoy our last issue for 2015. We will continue to publish on many other topics in our upcoming issues. As always, we welcome any feedback and article contributions.

Meanwhile, for more news and articles please tune in to www.s2a. gov.my and www.myforesight.my for our latest news and updates.

Rushdi Abdul Rahim







by Datuk Ir. Ahmad Fauzi bin Hasan Chief Executive Officer, Energy Commission

#### Overview of Energy in Malaysia

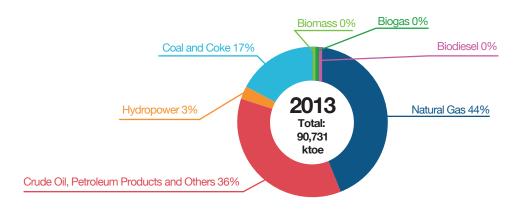
Malaysia is quite well endowed with conventional and renewable energy resources. As at 2014, Malaysia's oil reserves stood at 5.79 billion barrels, 40.4% of which is found in Peninsular Malaysia. Natural gas reserves of the country are estimated to be at 100.6 trillion standard cubic feet with more than 50.0% located in the Sarawak basin. Coal reserves of about 1,938 million tonnes are mostly located in Sarawak and Sabah. Malaysia has quite a vast hydropower potential resources with total capacity of about 29,000 megawatts, most of which is found in Sarawak. Palm oil, wood and agro-industrial wastes are the main sources for biomass.

Malaysia's total primary energy supply was about 90,730 kilo tonnes of oil equivalent (ktoe) in 2013. Natural gas contributed the largest share at 44.1% (39,973 ktoe), followed by oil at 36.4% (33,003 ktoe) and coal at 16.6% (15,067 ktoe). Meanwhile, other resources including hydro provided a minimal share of 3.0% (2,688 ktoe) to the primary energy supply. Malaysia also exports energy products, mainly crude oil and petroleum products, LNG and natural gas totalling 51,899 ktoe in 2013. Malaysia is the second-largest exporter of LNG in the world, and the second-largest producer of crude oil and natural gas in Southeast Asia. In the same year, energy imports stood at 50,968 ktoe.

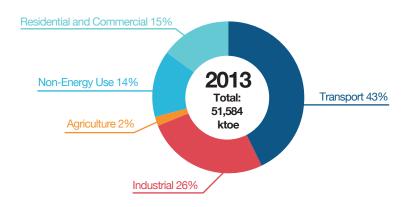
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Malaysia has achieved considerable progress in harvesting its energy resources in line with its National Energy Policy objectives and strategies.

#### Primary Energy Supply by Sector



Final Energy Consumption by Sector



In 2013, Malaysia's final energy consumption reached 51,583 ktoe. The biggest final energy consumer was the transport sector, accounting for 43.3% share of the total final energy consumption (22,357 ktoe), followed by the industry sector with 26.2% share (13,496 ktoe). Non-energy sector was at 14.1%, commercial sector at 8.5%, residential sector at 5.8%, while fishery and agriculture at 2.0% and 0.1% respectively. In terms of fuel type, oil was still the most consumed fuel, particularly for the transport sector, accounting for about half of the total energy demand, followed by gas with 19.5% share, electricity with

20.5% share, and coal with 3.0% share.

#### Malaysia's Electricity Supply Industry

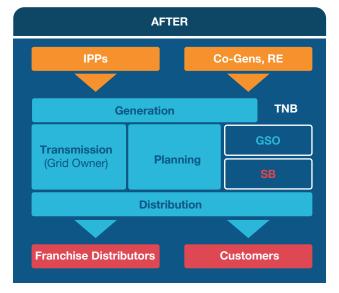
Malaysia's total installed electricity generation capacity in 2013 was 29,748 MW. About 60.0% of the total installed capacity was owned by the independent power producers (IPPs) and the rest by government-linked utilities, self-generation and cogeneration facilities. Total electricity generation was at 143,497 gigawatthours (GWh). Thermal generation, mostly from natural gas and coal, accounted for 93.0% of the total

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Malaysia is the second-largest exporter of LNG in the world, and the second-largest producer of crude oil and natural gas in Southeast Asia.

# IPPS Co-Gens. Generation TNB Transmission (Grid Owner & SOD) Planning (EPD, Planning etc) Distribution Franchise Distributor Customers





power generation, while hydropower accounted for the remainder.

Electricity demand growth is heavily influenced by prevailing economic conditions as industrial and commercial sectors are the largest electricity users in Peninsular Malaysia. In 2014, the largest consumption was by the industrial sector at 42%, followed by commercial sector at 35%, domestic sector at 21% and others, comprising mining, public lighting and agriculture sectors, at 2%. However, the commercial sector is projected to continue growing and will be the largest consumer replacing the industrial sector by 2030.

In an effort to improve industry efficiency, the incentive-based regulation (IBR) framework was implemented effective January 2014. Through this framework, average base tariff for a regulatory period of four years is set based on forward-looking approach of matching revenue requirements with efficient forecast costs.

Under the IBR, there is an incentive for utilities to save cost and

improve the quality of services to consumers. This is based on a set of key performance indicator (KPI) targets for operational and network performance of the utility. Penalties will be imposed for failure to meet the KPIs. likewise utilities will be rewarded if the KPIs have been exceeded by a certain margin. Evaluation of utility performance will be done to determine any savings and variations from forecast costs and revenue. The cost savings then will be shared with consumers in the form of reduced tariff in the next regulatory period whilst cost variations that are uncontrollable will be passed through every 6 months through tariff revision.

Industry structural reform in the nation's electricity supply industry continues to be pursued with the ring-fencing of Single Buyer (SB) and Grid System Operator (GSO) for the peninsular grid system. SB and GSO are responsible to procure power from power producers and operate the National Grid power system, respectively. The ring-fencing of a SB and GSO is to create a level playing field between Tenaga Nasional Berhad (TNB), a government-linked company, and other market

participants such as Independent Power Producers (IPPs).

The principle of ring-fencing entities such as SB and GSO is to functionally separate their businesses from the other business activities of TNB by introducing separation of accounts, independence in decisionmaking, avoidance in sharing of confidential information and segregation of facilities for access in their operations. It is envisioned that ring-fencing the SB and GSO would enhance independence, fair play and transparency in the industry and would result in greater confidence of the market participants and investors. The ring-fencing of SB and GSO commenced in January 2014 coincided with the start of the first year of regulatory period under IBR.

Malaysia has achieved considerable progress in harvesting its energy resources in line with its National Energy Policy objectives and strategies. However, moving forward, there is an urgent need for a multipronged policy response to deal with uncertainties induced by extreme fuel price volatilities.



#### leader's insight





by **Azlan Yaacob**Advisor to GCIP for SMEs in Malaysia

RR

Most people do not want to change, but to continue as if the world will forever remain the same.

# NO TURNING BACKS MY JOURNEY TOWARDS CLEAN-TECH

he moment I graduated from university, I was catapulted straight into a career in Information Technology. My eagerness to accept a job offer with a management consulting firm instantly brought me into a life of endless coding and debugging of systems. The green screen that stared at me from dusk till dawn continued to taunt me in an endless barrage of syntax and machine speaks. And yet, whenever something miraculously worked, there was a sort of euphoria that cannot be described. A taming of the beast, one would say.

In 16 years of living on the edge, I was the focal point when machines meet people. I had an assortment of titles, and usually they had the words

business, program, product, project, marketing and sales combined with development, and then, director, manager or executive; such as business development director or market development manager. I was in a state of perpetual "development".

What made it exciting was that I worked for some of the riskiest high technology companies in the world at the time. I lived and breathed the ethos that the world must change, and I will be the agent to make it change.

One day it dawned on me that perhaps something was not quite right with this world. It was not just one niggle, perhaps a combination of many little niggles. You can see how technology started to change behaviour, sometimes good and sometimes bad. The world changed but, perhaps, it was not changing for the better. Our cities were losing their trees, and in came roads, pavements and concrete buildings. Days were warmer. And the air would sometimes turn hazy.

It was time I did something different. I was still relatively young, a shade under 40.

My first introduction in a new "green" world was akin to being a tourist in an exotic land. I found myself in events and conferences where a new sort of language was spoken. Words like emission reductions, clean development mechanisms and national allowance. And in came a wide array of acronyms



such as UNFCCC, CDM, COP, CER, VER and EU-ETS.

And I continued to 'play' tourist in a different and even more exotic land. This time the words used were empty fruit bunch, decanter sludge and palm oil mill effluent, affectionately known to the natives as POME, my all-time favourite acronym. Yes, even something as disgusting as effluent, can have a cute sounding name.

And finally, I had to learn Latin and Greek. The words in my ever increasing vocabulary included mycorrhiza, pseudomonas, trichoderma and ganoderma. They were soil microbes. It seemed that they were caught in a sort of superhero conflict of good against evil. Ganoderma was the villain fungus that killed off unsuspecting palm oil trees. While the other microbes had miraculous powers that would save the world.

Fast forward 10 years later and I am sort of an old wounded veteran with many battle scars. Compared to the first 16 years in IT, the last 10 years was particularly challenging and disturbing. Most people do not want to change, but to continue as if the world will forever remain the same. And yet I persist, and there is no turning back.

When I was asked to assist in helping develop GCIP, it felt like a breath of fresh air. There is a chance to help a new generation of entrepreneurs to not make my mistakes of the past. While mentoring, it is comforting to see how they are evolving and contributing.

GCIP is a true spirited global effort. If only GCIP started in 2005, the year I started my arduous journey. Perhaps mentors could have helped me, and I may have had a chance to pitch in Silicon Valley. I had no eco-system then, our new Clean-Tech entrepreneurs are truly fortunate.

And in all journeys, we start to explore new lands and new unchartered territories.

I realized that the pathway towards

a low carbon economy will ultimately require ordinary citizens to be aware, and to participate in changing the way they behave collectively. Governments, entrepreneurs and industry can organize themselves in formal relations. But communities would need to figure out how to coordinate volunteers, and to exert peer pressure towards making changes.

In 2014 I attended the annual AGM of my local Residents Association (RA). I did not know anybody, and the crowd were a lot older than me. The meeting brought about a litany of issues, and a new concern was the suffocating urban structures that were mushrooming at an alarming rate. New commercial skyscrapers, condominiums and an elongated MRT track would forever change the township's landscape.

In my admissions form, I wrote a small comment for me to volunteer my time towards helping "green" our township with the blessing of the RA. Like all forms, it was placed in a stack of other forms. And so I left the AGM uncertain whether I could make any difference.

Some months later I was surprised to receive an SMS message. The person introduced herself as being with the RA, and she wanted to see if I could meet the council in their monthly meeting. And so I went to meet the council and I told them my desire to see our township evolve. But they were unsure on the "How".

And I suggested we start with a simple home composting workshop. A local NGO agreed to host the event and showed us how they did their "aerobic" composting. Another invited vendor introduced the concept of "anaerobic" composting. In one short week, we had about 20 households doing composting. After the second workshop, we now had 60 home owners involved in composting. There is also a new chat group to help each other "compost". The number 60, represented 1% of the 6,000 houses in this township.

Our confidence grew, and one of the workshop participants volunteered to set up a special committee called Transition. Transition would focus on transforming our township towards self-sufficiency and resiliency. As a member of the steering committee, I would contribute by leveraging on my relationship with entrepreneurs and organizations, to incubate their ideas and solutions in our township, a living community accelerator unlike anything that we have seen so far.

In less than a year, we have managed to initiate a number of new services and programs. A community ride sharing service, a river care program, an accessibility and mobility study, a transportation study, an e-waste collection service and, most importantly, the formal Transition task force under the auspices of the RA.

Our new goals include urban farming, solar farms on top of houses, water management, increasing walkability and reducing car dependency.

And as such, my journey may have only just gotten started. What I hope to see happen is that I can gradually step back, and to see a new generation of citizens taking responsibility for the world that we live in.

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The pathway towards a low carbon economy will ultimately require ordinary citizens to be aware, and to participate in changing the way they behave collectively.

cover story



by **Yasmin Rasyid**GCIP Steering Committee Member

# SAMOUR FUTURE?

## Is clean technology really the saviour of our future?

Please don't get me wrong. I do believe that clean technology and all the innovations that have evolved with it are fantastic. Yet my heart tells me that something is still not quite right about it. How long will it take before we see more adoption and application of clean technologies, especially in nations that are facing severe environmental issues? How

and when will clean technology be accessible to all segments of society at affordable prices? How can every individual on this planet be empowered to utilize such available technologies and make a global impact on an ailing planet?

#### I am a semi-believer of clean technology; semi because of a few reasons:

One, as much as clean technology helps reduce or minimize the

industry's impact on the environment, clean technology is also a double-edged sword in the making or fabrication of clean technologies also produces occasional negative impact on the environment. An example would be industrial wastes from manufacturing components that are essential for the production and manufacturing of clean technology products.



Take the electric or hybrid car for instance. An amazing innovation aimed at helping mankind reduce their reliance on fossil fuels or natural gas for their transportation needs. Eventually this whole transformation of mobility is aimed at global reduction of carbon emissions which, when accomplished, will help address or reduce the threats of climate change and global warming. All very nicely planned and laid out. However, the process of making electric or hybrid vehicles, its high reliance on lithium batteries and special hybrid car components (many parts of a hybrid or electric vehicle these days are made from rare earth minerals), the impact of manufacturing electric or hybrid vehicles does in turn, impart some negative impacts on the environment. The wastes generated from manufacturing for instance.

Two, if clean technology truly is the future and will make transformational and quantifiable changes on our impact on the planet, then why am I not able to afford it?

Purchasing an EV or hybrid car is not for everyone. Affordability is an issue. In addition, certain components of the EV, such as the battery, do cost an arm and a leg (compared to conventional car batteries of course) when in need of replacement.

So where and how do we draw the line in evaluating the effectiveness and accessibility of today's so-called clean technology revolution?

If clean technology is truly the way forward and will make a significant impact on our lives and the planet's,

forward and will make a significant impact on our lives and the planet's, then why aren't we pouring all our focus and resources to make adoption of clean technology mandatory for all industries and governments; and allow clean technology to be easily affordable and accessible to all pockets of communities?



then why aren't we pouring all our focus and resources to make adoption of clean technology mandatory for all industries and governments, and in addition, allow clean technology to be easily affordable and accessible to all pockets of communities?

Instead we see a proliferation of conferences and dialogues, often dominated by industry players who are more business-centric (market driven, and sales driven) than ecocentric in their approach on clean technology. And, apart from business matching and networking, the high level engagement seems to only involve and benefit a selected group of business persons and companies. The clean technology industry has also attracted the interests of investors who are cashing in to invest on clean technology like solar panel and biofuels. The returns, I believe, is often more on monetary gain rather than social impacts.

Take for example SEDA's (Sustainable Energy Development Authority)
Feed in Tariff (FiT) program. A good comparison would be to compare the differences in the application of FiT between companies and investors and communities (orphanages, places

of workshop, non-profit organizations, etc).

The fact of the matter is that there are still many communities, especially those marginalized with no basic access to water or energy, that are deprived of the benefits of clean technology. As for someone like me, an urbanite, owning a piece of clean technology can be a costly affair. So while the rich and powerful are dominating the clean technology industry, the existing and potential users are still left in the lurch dealing with issues like affordability and accessibility.

Clearly there is a big dichotomy in the clean technology revolution, if we can call it a revolution. On one side, the big companies are rushing in to invest and own, while the actual users are often unable to taste the benefits.

I remember when I started having a discussion with my husband on the feasibility of installing a rainwater harvesting tank at our home, we noticed that the gutter system channels a lot of rainwater directly to our drains. We thought it was such a waste to let all that roof run off go to waste so the idea of having a

rainwater harvesting system (RWH) seemed logical, necessary and simple. After all, we were trying to do our part to be more resilient in times of a water crisis. But, imagine the shock we had when we went scouting for contractors and so called rainwater harvesting system experts. Price ranges for such system vary between RM5,000 to RM20,000. In addition, customization was going to just add additional expenditure.

#### There must be a cheaper solution.

Eventually my husband and I decided that we were going to take matters into our own hands. Armed with a laptop and impeccable internet connection, we explored the World Wide Web and found so many open sourced videos and blue print to make our own RWH. And we did!

With a used oil drum, some power tools, some pipes, and nets and voila, we built our own RWH for under RM500. Of course we did not work on extensive piping because all we wanted to do was collect, store and use the water for outdoor purposes. Proudly, my husband and I started recording the process of making our own RWH and shared



it with friends and family on social media. We were trying to drive home the point that being planet-friendly at home does not necessarily need to cost an arm and a leg and, most importantly, it can be built and constructed with your own effort, minus the middle man, contractor and supplier.

On the flip side, the annual haze situation in Malaysia. It has raised not just eye brows, but anger and frustration on the country's commitment and urgency in addressing solutions to the haze. For one, if all palm oil plantation owners and operators, be it the big boys or the small holders, are all required to abide to stricter guidelines and follow the philosophies of clean technology and plantation best practices, then the haze should technically be nonexistent. Here is a clear and straight example of a clean technology dilemma. The technology is present, the situation beckons the use of such technology, but a serious lack of political will and urgency among governments still remain the two main deterrents to the adoptions and effectiveness of clean technology. In addition, technology and its ramifications are only effective under proper usage and management. The

absence of altruistic ways in clean technology management will only prevent the needy communities from accessing it.

### That explains my "semi"-believing status.

I feel that clean technology, with proper leadership and strong political will, and a robust management and application style, will be able to change the lives of people and the planet if, and if only, these two areas are seriously address:

- Clean tech should be free and open-sourced with flexible financing schemes for communities, and
- Clean tech needs to be made mandatory for all businesses across the globe.

The future of clean tech is very bright, and it is undeniable. The fate of a nation, or our planet for that matter, is still in the hands of man. It takes a strong leader to drive through a nation from one that is polluting the environment to one that heals the planet. It takes an entire Parliament to come to a consensus to pave the way for a cleaner country.

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The technology is present and the situation beckons the use of such technology, but a serious lack of political will and urgency among governments still remain the two main deterrents to the adoptions and effectiveness of clean technology.

However, right now it is not happening fast enough to show that it can make a big difference in the health of our planet. Our leaders need to move fast to adopt such clean tech options and demonstrate the resilience of the country, of its people, and ultimately, of leadership.

We should also be weary of parties that are misusing the term "clean technology" for their own benefit. Last check, Malaysia is working towards constructing its first nuclear plant in the very near future and I have personally heard certain government sectors referring to nuclear technology as green and clean technology compared to, say, burning natural gas or fossil fuels. This is a serious and dangerous ground to be threading on when we are clouding the definition of "clean technology".

Clean technology will be **seen** as the saviour of our future but, really, the real savior is us.

#### viewpoints



by Nik Ahmad Faizul Abd Malek nikfaizul@miaht.ora.mv

# INTENSIFYING BIOMATERIALS through



Global Warming is a world concern. The greenhouse effect – the thinning of the ozone layer and excessive carbon emissions – are seen as the major contributing factors. However, it is still not beyond control, and clean technology/green technology is found to be one of the major and effective ways to mitigate the damage and improve the environment through sustainable consumption and production. The approach leads to the utilization of bio-materials to replace the traditional source, which has not only become increasingly

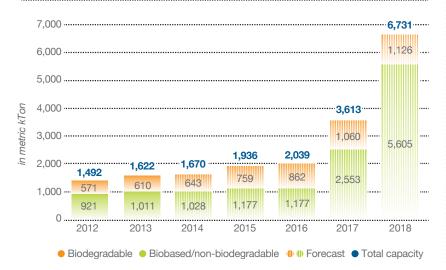
urgent in improving the environment but is opening up new economic opportunities in the green industry.

Europe is leading the way in the demand for bio-materials through bioplastics industry. Today, the European bio-economy sector is worth 1.6 trillion Euros and provides 22,000 jobs, i.e. approximately nine percent of the European Union's workforce.

#### **Bio-Plastics in Europe**

One of the most important and

Global production capacities of bioplastics



Source: European Bioplastics / Institute of Bioplastics and Biocomposites (December 2013)

profitable activities in Europe is the production of bio-plastics which are partly of fully biobased, biogradable, or both

And bioplastics has been designated as a "Lead Market" by the European Commission due to its immense growth since 2010 which will help drive further the evolution of the bioeconomy in Europe. The global bioplastics production is set to grow by 400% by 2018 – from 1,492 metric ton in 2012 to 6,731 metric ton in 2018.

Bioplastics are a broad family of materials with widely varying properties. Today, biodegradable bioplastics are a growing niche market. They are often used in short-lived applications such as biowaste or the packaging of fresh produce. Ultimately, they can find a place in all market segments where conventional plastics are used. In many of these markets segments, bioplastic are already being available and used.

Although EU is the leading producer of bioplastics, Europe does not have the largest production capacities in the world. In 2013, Europe only produced 17.3 percent of the total 1.62 million tons global capabilities. Asia has the largest capacities with 51.4 percent, followed by North America with 18.4 percent. South America has the capacitiy to produce 12.3 percent, and Australia/Oceania 0.6 percent.

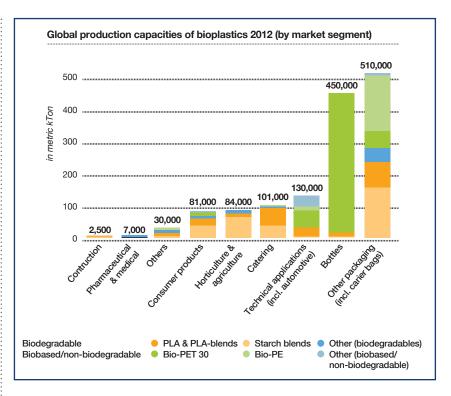
It is projected that the global production capacity will increase to 6.73 million metric tons in 2018 with Asia contributing 75.8 percent, South America 12.2 percent and Europe only 7.6 percent, slightly more than North America at 4.3 percent, and Australia/Oceania at 0.1 percent.

#### Malaysia's Programme

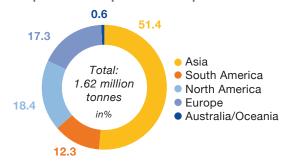
The forthcoming Eleventh Malaysia Plan 2016-2020 includes:

- Pursuing green growth for sustainability and resilience: strengthen governance to drive transformation, establish sustainable financial mechanism, increase percentage of renewable energy adoption, encourage low carbon mobility and integrated approach to waste management;
- Strengthening infrastructure to support economic expansion: strengthen infrastructure to create smart cities, widen and upgrade broadband infrastructure;
- Re-engineering economic growth for greater prosperity: transform services sector, strengthen manufacturing sector and, develop dynamic SMEs/ SMIs;

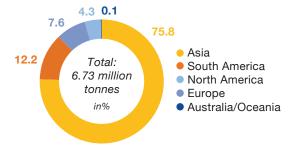
The Malaysian Industry-Government Group for High Technology (MIGHT), in collaboration with Global Environment Facility (GEF), United Nations Industrial Development Organisation (UNIDO) and Cleantech Open US, is currently running the Global Cleantech Innovation Programme (GCIP) with the vision to position Malaysia as the Regional Cleantech Innovation Hub with competitive global status companies delivering solution to mitigate climate change and environment degradation.



Global production capacities of bioplastics in 2013 (by region)



Global production capacities of bioplastics in 2018 (by region)



Source: European Bioplastics, Institute for Bioplastics and Biocomposites, nova-Institute (2014). More information: www.bio-based.eu/markets and www. downloads.ifbb-hannover.de

The objectives of GCIP are:

- Creating investable Malaysian cleantech companies:
- Bridging market, technology and funding;
- Intensify commercialization towards green market access through national programs such as Smart Communities; and
- Continuous support to accelerate GCIP Alumni towards scale-up stage and becoming Regional/ Global Industry Champions.

# GCIP Technopreneurship Pathway

The GCIP Programme is designed not only to provide the early entrepreneurship foundation to technoprenuers (refer to as GCIP 1), but also planning and enabling for their scaling up with the required incubation, business models, ecosystem support and market access (GCIP 2 & 3). For technoprenuers with strategic technologies, there are opportunities for them to gain market positioning as global/regional champions in this infant clean industry (GCIP 4).

GCIP focuses on the strategic content to search for technologies to address the two grand challenges facing cities today namely urbanization and climate change.

The initial market access for these technopreneurs are provided through the National Smart Communities Programme. This objective of this programme is to accelerate the greening of cities through industry driven projects. It is also a platform to commercialise new technologies into the market.

As for GCIP 1, the technopreneurship programme includes:

 National Bootcamp: Equip entrepreneurs with international exposures by bringing in experienced



mentors, understanding the global surroundings and opportunities;

#### Mentoring:

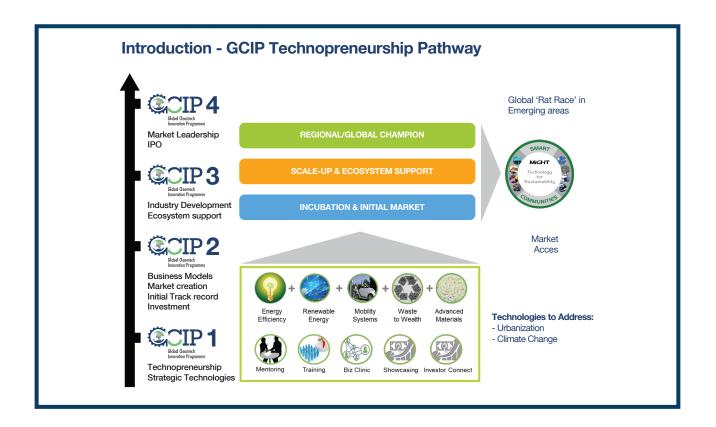
Maximize participant's chances of being a prizewinner, raising investment capital and achieving sustainable commercial success. Semifinalists would be assigned to a mentor who is an experienced professional with proven records of success in either

relevant clean technology industries or innovation start-ups;

#### • Biz Clinics:

Specialist consultancy provided to address the specific areas of interest relating to commercialization. The specialists would lead group sessions as well as conduct one-to-one sessions with entrepreneurs. Specialist mentors are an elite group experts who acts as

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resources during the GCIP Accelerator;

#### Webinars:

A 13-week web-seminar (webinar) session hosted by the Cleantech Open that brings together experts from around the globe as speakers to share their experiences and provide leads to help semifinalists to fill up their worksheets for GCIP Accelerator Programme submission; and

Investor Connect:
 Investor Connect is a platform for investors and entrepreneurs to engage via speed consultations. It exposes the entrepreneurs to the need of elevator pitching, and creates

chances for them to meet and catch the attention of potential investors.

During its inaugural year in 2014, CGIP attracted 54 applicants, 25 of them have qualified as semifinalists with five of them as finalist namely Free The Seed Sdn. Bhd, Thinking Green Sdn. Bhd., Zymeratics Sdn. Bhd., and USM Holdings Sdn. Bhd. Subsequently Free The Seed was announced as the National Winner for 2014.

The clean technologies for the four finalisit are: Free The Seed Sdn.
Bhd. – Padi straw to bio degradable packaging; Thinking Green Sdd. Bhd. – Solar powered kiosk; Zymeratics Sdn. Bhd. – Customized Enzymes for industrial applications; and USM Holdings Sdn. Bhd. – Waste sludge to eco clay for pottery industry.

# GCIP 2014 Winners' Progress

Current efforts by MIGHT is enabling the scaling of these companies into the next levels to GCIP 2 and 3 with the ecosystem support in areas of technology development, upstream feedstock supply, syndicated funding and downstream capacity building.





# Climate change vs clean tech business

Science always fascinates me, and so does entrepreneurship. Ever since I was a kid, I always wanted to be a scientist. I was once a scientist before embarking on this entrepreneurship journey. There was a moment in life when I realized that doing business is something that I want to do in life. I would say that my passion in both science and entrepreneurship has led

me to become a technopreneur. After all, with the thought that I can save the planet through green technology, I can still channel my passion in science and business by doing something that I like.

I strongly believe that technology is the way to help the world get better! Look around and observe, and we will see the benefits if we explore what nature can provide us. Solar panel technology is developed to capture the energy from the sun; water turbine generates electricity from sea wave; and there are many other natural resources such as waterfalls, rain water, plants, etc. that could be utilized to enhance technology. And, at the moment, our company, Zymeratics, is developing an enzyme that can tolerate alcohol to be used as biocatalyst in biodiesel production. Green technology is undeniably a way forward to reduce carbon dioxide emission caused by the burning of fossil fuels.

KK

It is not just about getting investment to fund our startup but, more importantly, building networks and getting to know people who can help clean tech businesses grow.

Currently, the raw materials to produce enzymes have to be imported from overseas at a high cost. This, inadvertently, increases the overall production cost.

#### **Zymmeratics**

We, at Zymeratics, see ourselves as a customized enzyme boutique manufacturer as we tailor-make enzymes based on customers' specific requirements.

An enzyme is a protein that acts as biocatalyst to conduct biochemical reactions or to enhance biological properties. In other words, an enzyme is a raw material that can improve the performance of another product such as in clothes detergent, or speed up an industrial process.

Since industry in Malaysia totally depends on imported enzymes and they are currently being imported from overseas at a high cost, there is a huge need to establish a local manufacturing company to produce industrial enzymes. This is where we come in. We are proud to introduce our locally isolated enzymes to the existing local industrial enzyme users and to the world. We are proud to say that Zymeratics is established to promote the locally isolated enzymes to be used as biocatalysts and raw materials for the local industries. And, we believe that the future of the bioindustry in Malaysia will be transformed by the use of enzymes.

#### **GCIP 2014**

We, Zymeratics, joined Global Cleantech Innovation Programme (GCIP), when we were at our infant stage – a 6-months old startup. Through GCIP, we gained valuable experience and moved faster that we could have imagined. We pivoted our business model based on market validation research, met and interviewed many potential customers among the existing local enzyme

users. We have, indeed, learnt so much from them. Customers, no doubt, are one of the best business gurus. We do not want to end up building products that customers do not want to buy. In addition, GCIP also enables us to meet and mingle with other green-tech entrepreneurs.

Having a good startup ecosystem undeniably helps entrepreneurs to grow and expand their business faster. It is not just about getting investment to fund our startup but, more importantly, building networks and getting to know people who can help clean tech businesses grow. In my opinion, the startup ecosystem in Malaysia is very much saturated with IT and apps-based startups, and not much for biotech-based startups or other area of technologies. Therefore, I would like to congratulate MIGHT for taking the initiative to help green tech and bio-based entrepreneurs through GCIP.

The webinar series really helps to enlighten us on ways to validate the market, identify customer target segments, and prioritise target markets.

Undoubtedly, most startups have their own obstacles that need to be overcome in order to scale up. In our case, we got stuck when it comes to mass production of enzymes due to lack of facility. To set up a full-scale enzyme factory requires huge capital investment. So, we do it traditionally: making small investment to set up the factory part by part. Once we start generating enough revenue, we would pitch for more investment to build up other parts of the factory.

We, at Zymmeratics, would definitely love to mentor new startups. In fact, I have been thinking of setting up my own incubator program that gives out funding to biotech-based startups sometime in the near future.

# ZYMERATICS SDN BHD

Established on 1st April 2014, Zymeratics Sdn Bhd is a homegrown customized enzyme boutique manufacturer that produces high quality enzymes for Malaysian industries. Isolated from the rich Malaysian biodiversity, Zymeratics' enzymes are the products of cutting edge technology in molecular biology, biochemistry and genetic engineering. Enzyme is the biocatalyst that will transform the future of bioindustry in Malaysia.

#### viewpoints



by Ramaness Parasuraman

CEO. Free The Seed Sdn Bhd



I was inspired to start this greenjourney back in 2005 due to a "problem statement", which is Global Warming.

In the course of my professional career as Carbon Footprint Auditor for the United Nation, I observed many catastrophe environmental pollutions and degradations activities by the mankind all over the world, especially the open-burning activities of the agriculture biomass materials that contribute to serious Climate-Change.

In Malaysia, our paddy farmers also practice the same unsustainable way of agricultural practices, that is an open-burning of rice-fields during the post-harvest seasons.

These have triggered me to find and create sustainable yet economically viable solutions for win-win situations to all the stakeholders. This is where the idea to convert agro-waste materials through the extraction of cellulose fibers for the production of biodegradable packaging products came-in.

#### **Just Green**

Just Green is a biodegradable

packaging product that uses a method of delignification of the biomass cellulose fibers, and gratifying the fibers by impregnating with papain protease serene. This is to ensure that our biodegradable packaging products will compost naturally within six months from the time of disposal, in any soil and conditions.

The strength of the idea is the core biotechnology for Just Green to be invented and patented. 100% organic materials are being used to convert the waste biomass materials into high value-added product. It is green-clean-cost saving!

# What are the motivation to pursue the idea?

The initiative is implemented in the northern region of Peninsular Malaysia and involves 1,300 paddy smallholders. Existing stockpiles of rice husks and rice straw are purchased and converted into environmental friendly products.

As these waste stockpiles deplete, so do the incidence of open burning, and the readily compostable nature of the end-product ensures no further addition of harmful waste material into the environment. As the project progresses, the sector will see a stream of direct and indirect benefits in the form of additional income from the sale of paddy waste material, associated pre-processing activities, and the introduction of sustainable standards.

This project will directly impact the lives of 1,300 farmers, and the number is expected to grow to 30,000 as the project goes full steam ahead in 2017. An estimated 47,000 hectares of paddy field is expected to achieve Zero Open Burning, translating into an estimated reduction of 600,000 kg of CO per annum. With these achievements, the paddy crop sector could lead the way, showcasing what is possible through the thoughtful application of technology, and paving the way to establish Malaysia as a low-carbon agriculture production country while remaining sensitive to the needs of farmers. It is also expected that this initiative will catalyze the creation of an entire biodegradable product packaging value chain, the emergence of knowledge workers, and significant economic activity which will have positive impacts on the local and national economy.

The continuous strong technical,

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# JOURNEY

funding and leadership support by the respective Government Ministries and Agencies throughout our entrepreneurial journey since 2005, notably, BIOTECHCORP, CRADLE, SME CORP and, of course, MIGHT's GCIP has motivated us to pursue this challenging journey to achieve the goal and vision of placing Malaysia as one of the Global Hub for Bio-Materials.

#### Our way forward

During the IGEM 2015, a Joint-Collaboration was inked between Free The Seed and the Paddv-Farmers from the State of Kedah. With the great leadership and support from MIGHT and the GCIP Team, we have created a great sense of hope to the farmers and new entrepreneurs, where, under the Farmers Poverty Eradication Program, more than 30,000 farmers would be able to generate additional income by eliminating the open-burning of rice straws and converting them into biodegradable packaging products for the global market. This initiative would generate a new economy and entrepreneurial space for them.

Free The Seed's ultimate vision is still 'To Be The Top-10 Bio-Packaging Company in the World'

with RM1 billion market-capitalization and to mitigate 1% of world's global warming through our product technology.

In five years' time, Free The Seed would have 30 factories in Asia and Europe; which will be realized by ways of IPO and M&A.

#### **GCIP 2014**

GCIP is a great tool for Start-Up SME-companies like us to convert ideas into reality. In our case, it is through this GCIP that we managed to compete and win the worldclass competition which becomes a validation for our business and technology offerings. And, it is through GCIP that we were to fly to Silicon Valley, USA and got connected with conglomerate organization to further accelerate the scaling-up of our business and penetrate the global market. Our vision to become the Top-10 company in the world is made possible by GCIP!

Based on the valuable experience, I would certainly promote GCIP to other start-ups. In fact, we are already promoting to our supplychain of start-ups SME to tap the

# FREE THE SEED SDN. BHD.

is a 100% Malaysian based SME-Startup company, incorporated on 1st December 2009. Its core business is Biotechnology R&D and Manufacturing of Biodegradable Packaging Products under the concept of "Waste to Wealth". With four Microbiologists in its R&D team and couple of Academia-Industry Collaborations, it has managed to attract some of the World's Best 100 Companies as its clients.

vast opportunities of GCIP – which provides two significant platforms; Market Access and Funding Access.

In addition, the coaching and mentoring support provided by Axile Consulting in GCIP is simply superb, productive and resourceful. viewpoints



by Dr Yeoh Fei Yee

Leader, EcoClay® Team

# SLUDGE to ECO-CLAY

ater is an extremely important life resource which is often easily overlooked by people due to its abundant availability. In fresh water processing plants, water sludge which is by-produced as an industrial waste is no longer permitted to be disposed in conventional approaches such as discharging back into water resources or using for landfill due to its metal contents. The Environmental Acts 1974 and 2009 require all sludge to be treated prior to their disposal to prevent metal leaching to the environment. This increases the cost of operation. Other than legal obligations, water processing companies are also driven to invest in water sludge treatment due to increasing environmental concern and improvement of corporate image.

EcoClay® is developed as an ecofriendly solution for water sludge treatment without using synthetic chemicals. It is exceptionally cost effective as it uses only natural materials to achieve its objective for metal immobilisation, complying with the regulations. The name EcoClay® is derived from the clay products resulted from the treatment. It serves as a green material for clay, tile, and ceramic to sanitary ware manufacturers. EcoClay® provides these industrial alternative raw materials with consistent quality, cost effective and eco-friendly. With strong technical support from our R&D team, we are able to replace conventional clay excavated from clay mine, thus minimizing environment degradation and deforestation, and reducing carbon foot print.

Project EcoClay® is inspired by the concern to secure a sustainable environment through providing a solution that benefits two industries – water processing and ceramic. It is a

market driven R&D initiative which was initiated to fulfil the industrial request to university research. However, in order to benefit the entire ecosystem for both industries, it has to be up-scaled through technology commercialisation by technopreneurs. EcoClay® has completed its proof of concept for initial prototype and is moving to the pilot plant stage. Further involvement and collaborative efforts from various parties, especially users such as water processing companies and ceramic industry, investors and funders, as well as regulators will be essential for this initiative to be a success.

#### **GCIP 2014**

EcoClay® was first initiated to develop a clean technology solution for water sludge treatment. It is an industrial request for industrial-academia technology research and development collaboration. With the involvement in GCIP, a tripartite partnership is formed spearheading the initiative all the way towards clean technology commercialisation. Leveraging on GCIP, a cross-disciplinary team has been forged, involving various talent including research scientists, development engineers, product designers and artist, industrial experts, business partners and NGOs, along with helps from a broad base of consultants, coaches, government agencies and officers.

Involvement in GCIP 2014 had laid a very clear commercialisation pathway for EcoClay®. Knowledge gained from seminars and webinars, advices from coaches, facilitation by the organiser enable us to explore numerous possibilities and set a clear direction for EcoClay® for the most optimum commercialisation practice.

#### **EcoClay®**

is established as a project to provide Ecomaterials solution for green technology development. Its core activities include development of advanced and functional materials by value adding industrial and agriculture wastes for various clean technology applications. Turning water sludge from wastes to wealth is one of its contributions to clean technology.



viewpoints



# Empowering Cleantech Innovation

Global Cleantech Innovation Programme (GCIP)

for SME's Development in Malaysia



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"In 2016, the government will focus on SME as the principal target for 3.7% productivity increase. This is possible through acceleration of innovation and entrepreneurship. The Global Cleantech Innovation Programme (GCIP) will be a part of this initiative to expand local SME Cleantech Industry in scaling the regional and eventually the global markets."

Y.B. Dato' Mah Siew Keong

Malaysia took a bold step by pledging a 40% carbon emission reduction by 2020 compared to the emission of 2005. The pledge did not only create a challenge, but an opportunity to develop a fully sustainable future for Malaysia by engaging both the public and private sectors in enculturating green practices and making them a societal norm.

The effect of climate change and environmental degradation is a global concern. The effort to mitigate them is led by the United States of America and China who have agreed to set a target for carbon reduction. Various laws and regulations are being enacted, and initiatives are being created to achieve this target. Through public and private sector collaborations, new business standards and models has been implemented. The productive utilization of renewables

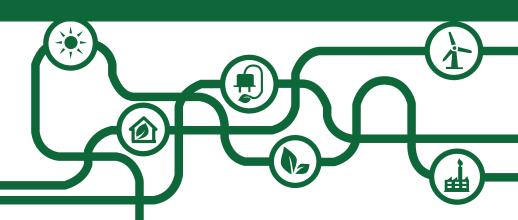
and alternative energy sources are amongst the potentials being explored.

To encourage private participation, a programme – the Global Cleantech Innovation Programme (GCIP) – was developed. It is a global programme introduced under the auspices of the United Nations, specifically under the The Global Environmental Facilities (GEF), together with the United Nations Industrial Development Organization (UNIDO).

Malaysia is fully committed to fostering a sustainable green future. Apart from adopting GCIP as an initiative to promote, commercialise and scale-up clean technological solutions to mitigate climate change and environment degradation through an industry-driven approach, the government has created a ministry – The Ministry of Energy, Green Technology and Water (KeTTHA) – to

RR

The government of Malaysia has created a ministry – The Ministry of Energy, Green Technology and Water (KeTTHA) – to formulate long-term plans and ensure their implementations to facilitate the growth of green technology.



formulate long-term plans and ensure their implementations to facilitate the growth of green technology.

#### **Transforming Cleantech**

CGIP is the largest accelerator programme for cleantech technoprenuers in transforming start-ups towards Global Market Scale-Ups. The programme is currently being implemented in eight countries.

GCIP's mission is to bridge research and development (R&D) and commercialization efforts by becoming an adoptive innovation to the industry and society. In scaling up the capabilities and commercial value of the participating startups, the tech-based accelerator programme combines technical and commercial virtues to deliver a competitive and compelling product to the market.

The programme aims to develop a platform to identify the most promising entrepreneurs across a country, whilst local acceleration programme supports, promotes and "de-risks" participating companies and connects them to potential investors, customers and partners. The GCIP brings together

stakeholders to find, fund and foster entrepreneurs with solutions to address today's most urgent energy, environmental and economic challenges.

#### **GCIP IN MALAYSIA**

Malaysia is the first Southeast Asian Country to roll out the Global Cleantech Innovation Programme (GCIP) for SME Development, which is a part of the ongoing global movement to assist developing countries and emerging economies to adopt clean technology applications.

In Malaysia, GCIP is supported by Malaysian Industry-Government Group for High Technology (MIGHT) which signed a Memorandum of Understanding (MoU) with US-based Cleantech Open to jointly develop and deploy green innovations platform by having a programme that combines the accelerator programme with a competition. The approach will make use of the Cleantech Open platform, together with UNIDO's strong presence around the world, to link Malaysian SME's beyond the Malaysia market.

To achieve this objective, three main platforms have been identified:

- Systemised Technopreneurship program involving Mentoring, Biz Clinics, Webinars, Investor linkage, Pitching, Showcases
   & Scale-up Pathway;
- Bridging Technology to Market and Funding, involving corporate partners and enabling programs;
- Interaction with best global mentors and industry experts from Silicon Valley and other countries, involving them in Inter-country Peer-Reviews

The ultimate objective of GCIP is to produce Malaysian companies that could be global players in the cleantech market. As in the GCIP 2014 competition, 25 companies are selected as semi-finalists for the GCIP 2015. They would undergo mentoring, training, given access to investors, and an opportunity to showcase their activities as part of the GCIP Accelerator Programme offering. The National Winners would represent Malaysia in the Cleantech Open Global Forum, held in Silicon Valley, where they would compete against teams from South Africa, India, Pakistan, Turkey and Armenia. Through this platform, they would be able to access global market funders that support the forum.



In 2014, a start-up company, Free the Seed, that manufactures paddy waste into biodegradable packaging, represented Malaysia. The exposure has created a positive impact for the company. For 2015, five top winners will represent Malaysia at the forum to be held in November.

# THE KEY STAKEHOLDERS

GCIP is driven by Cleantech Open USA and supported by Global Environment Facility (GEF) with implementation through UNIDO. For Malaysia, MIGHT is the implementation agency to create investable Malaysian Cleantech companies.

The Malaysian programme was officially launched in 2013 during the 4th Global Entrepreneurship Summit (GES2013) in Kuala Lumpur by the Datuk Seri Maximus Ongkili, the Minister of Energy, Green Technology and Water (KeTTHA).

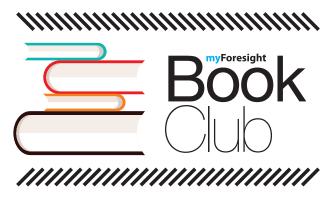
GCIP in Malaysia receives funding from the GEF and supported by several Malaysian entities working together to build the Cleantech Entrepreneurship Ecosystem in the country. MIGHT is playing the leading role as GCIP Secretariat, spearheading the innovation in four technology categories: Renewable Energy, Energy Efficiency, Waste to Wealth and Water Efficiency.

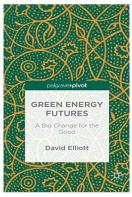
# REGIONAL CHAMPIONS IN THE MAKING

2015 marks the establishment of an integrated Asean Economic Community (AEC), and GCIP will be expending its role to helping develop an integrated and vibrant Cleantech Industry in the region. The target of AEC is to transform ASEAN into a region with free movement of goods, services, investment, skilled labour, as well as a freer flow of capital. This would benefit the participating cleantech industries in terms of economies of scale, markets and pool of skilled labour. The GCIP Regional Cleantech Innovation Initiative will scale up the use of technology, market and funding linkages to nurture and transform regional Cleantech Technopreneurs into competitive global technology companies.

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MIGHT is playing the leading role as GCIP Secretariat, spearheading the innovation in four technology categories: Renewable Energy, Energy Efficiency, Waste to Wealth and Water Efficiency.



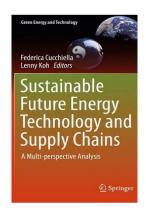


#### Green Energy Futures: A Big Change for the Good

ISBN-10: 11375844424 ISBN-13: 978-1137584427 Author: David Elliott Publisher: Palgrave-Pivot

hat will replace fossil fuel? Is there a way forward using renewable energy sources while avoiding nuclear power?

This book argues that nuclear is unlikely to have much of a role in future, and shows that the pro- and anti-nuclear debate has absorbed too much time and energy over the years. This has been to the detriment of a more relevant, interesting and increasingly urgent debate over what sort of renewable/efficiency mix we need. This book engages in that debate, exploring the implications of shifting to greener, cleaner energy sources. Importantly, David Elliott argues there is no one green future. There is a range of possible options of various types and scales: we need to choose amongst them. This book offers an overview of the technical, economic and environmental issues to help scholars, professionals and policy makers involved in discussing those options.



Sustainable
Future Energy
Technology and
Supply Chains:
A Multiperspective
Analysis (Green
Energy and
Technology)
2015th Edition

ISBN-10: 331902695X ISBN-13: 978-3319026954 Author : Federica Cucchiella

Publisher: Springer

his book provides a valuable resource for anyone who wishes to understand how sustainable use of energy can lead to increased efficiency of industrial supply chains and improved financial profitability. The book is organized around real examples and case studies that can be applied to real-world problems. Furthermore, insight is provided by an international panel of contributors, and the book provides comprehensive coverage of current practice and future developments in the evolution of sustainable supply chains and energy consumption.



The Green
Bubble:
Our Future
Energy Needs
and Why
Alternative
Energy Is Not the
Answer

ISBN-10: 1907794891 ISBN-13: 978-1907794896 Author: Per Wimmer Publisher: Lid Publishing

he fact is, we are hopelessly addicted to energy. It is the thin glue that holds our civilized world together and life without it would be unthinkable. That would be challenging enough in itself, but we have an additional problem. Our drug has unpleasant side effects the emission of greenhouse gases and other pollutants associated with fossil fuels. This book answers the fundamental, urgent question of how do we keep the lights on in 2030, or 2040, or indeed 2050, while keeping our planet alive? Politics drives energy policy as much or even more than economics, and the two don t always pull in the same direction. As a result, speculation and a financial bubble is being created in the green energy sector, as governments offer free money to companies to come up with renewable energy sources.

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#### Happenings

#### MALAYSIA 2050: SCENARIO REVIEW WORKSHOP

Academy of Sciences Malaysia 20 October, 2015





alaysia in 2050, how will it be different from 2015? Will Malaysia enjoy sustained economic growth? If so, will the contribution and distribution be relatively equitable?

For this workshop, myForesight® had developed four scenarios based on drivers of change that will have the most impact on the future of Malaysia, most notably:

- i) leadership and governance
- ii) STI capacity and capability
- iii) talent
- iv) education and training.

These drivers of change will be the basis of scenario development along with the population change, impact of urbanisation, as well values and environment. They were presented and deliberated among stakeholders in order to further identify future opportunities, threats and risks from each scenario before translating them into effective strategies. Keep posted for the scenarios to be shared soon.

# FUTURE OF MALAYSIA PUBLIC SERVICE

Sabah & Sarawak 5-9 October, 2015

he journey continues for the search for plausible scenarios for the Future of Malaysia Public Service. This time the study team covers Sabah and Sarawak in order to obtain a 360° view from the stakeholders, thus contributing to the credibility of the scenario-building process.



The back-to-back sessions took place in Bangunan Sultan Iskandar, Sarawak and Kompleks Pentadbiran Persekutuan, Sabah. This session aimed to move away from a traditional workshop approach and encouraged the use of imagination to predict the future of public service. The result is a comprehensive set of scenarios that is important for understanding the wider range of possibilities and is expected to be an important input for the transformation agenda.

#### 4<sup>TH</sup> FORESIGHT ALLIANCE MEETING AND PREPARATORY WORKSHOP

Academy of Sciences Malaysia, Kuala Lumpur 15 July, 2015

cademy of Sciences Malaysia (ASM) has embarked on an "Envisioning Malaysia in 2050" Foresight Initiative. A core group known as the Foresight Alliance is responsible for this initiative in collaboration with various think-tanks including myForesight®.

Foresight Malaysia 2050 aims to build a strategic vision for Malaysia in 2050 as well as to advocate that foresighting become part of the strategic planning DNA in these organisations.

At this meeting, myForesight® provided a refresher course on Foresight methodologies and how to continuously convene the findings towards the expected end-output of this initiative.

# ©CIP 2014 Success



Free The Seed S/B Bio Degradable **Packaging** 



Thinking Green S/B Solar Powered Kiosk



**Zymeratics S/B** Customised Enzymes for Industrial Applications



**USM Holdings S/B** Waste sludge to Eco Clay for **Pottery Industry** 

# Investors:-











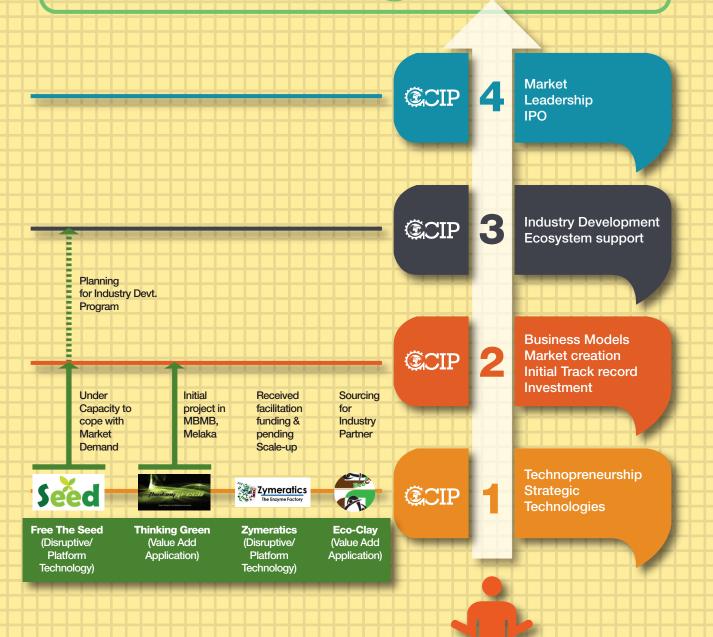
RM 17.0m

Company valuation

**USD 1.0m** 

Potential investment

# ©CIP 2014 Winners - Progress



# ©CIP 2015 Winners - Update



Semi Finalists

Finalists

### **Next Event-**

# Final GCIP 2015 on 4 November 2015:

- Announcement of National Winners
- Launching of
  Ecosystem Connect
  National Bio-Materials Industry
  Development Program

# Nov 2015-Cleantech Open Global Forum

- Networking for 5 finalists
- Pitching by Malaysian
  National Winner

# "Fostering Research and **Technology Capabilities for** Malaysian Aerospace Industry"



## **Factory of The Future**

**Virtual Reality Advanced Machining Composites Manufacturing Aerospace Tooling** 





## Sustainable Aviation **Bio Jet Fuel Bio-Sourced Material**





### **Lead Members**













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