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SIRIMLink

Driving innovation through technology and quality

SPECIAL ISSUE
In conjunction with the Ministry of Science, Technology and Innovation's **INNOVATION DAY**

GREEN WAY FORWARD

SIRIM's Ecology-4-Economy programme leads the way for Malaysia's green agenda.

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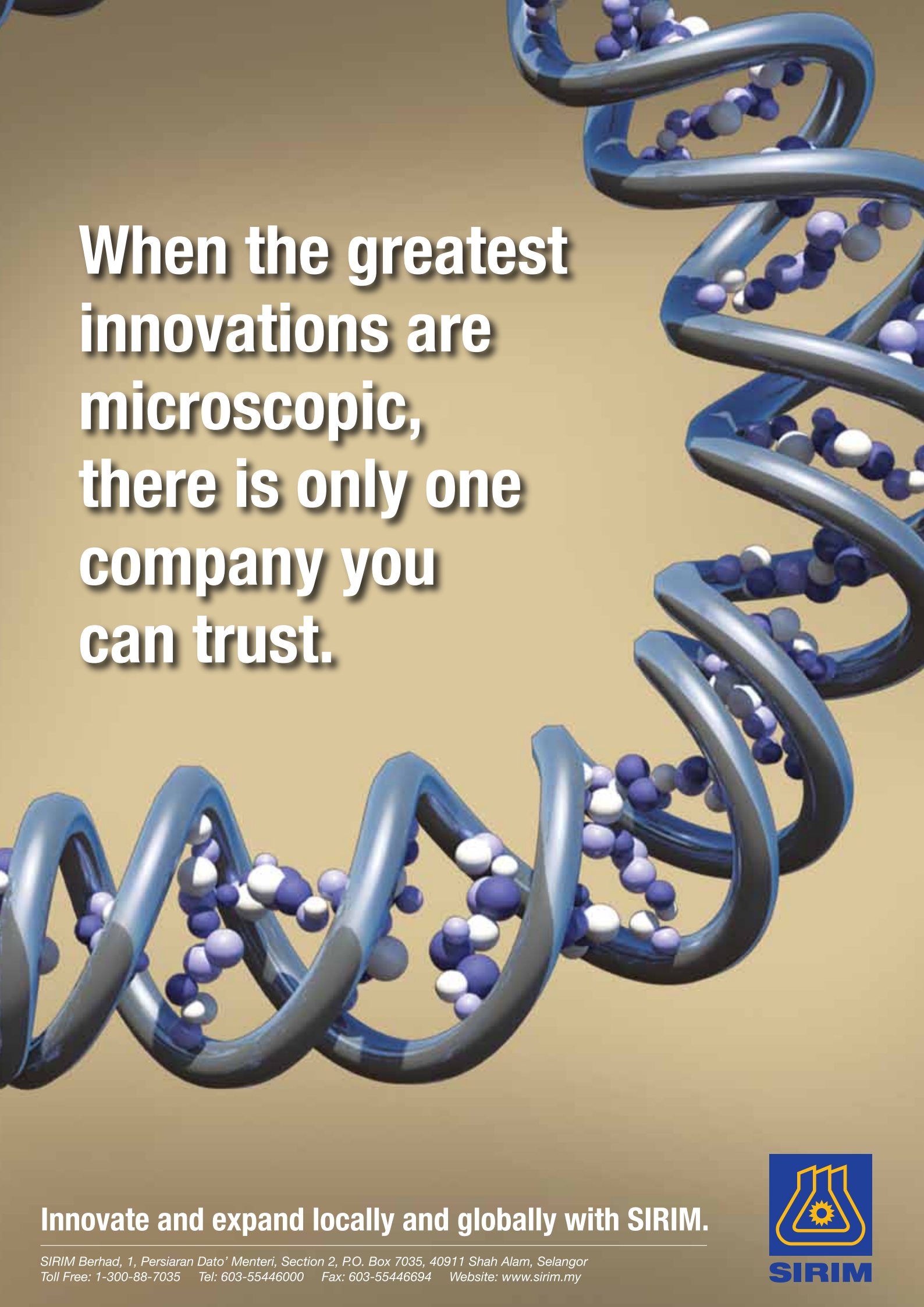

Innovate and expand locally and globally with SIRIM.

SIRIM Berhad, 1, Persiaran Dato' Menteri, Section 2, P.O. Box 7035, 40911 Shah Alam, Selangor
Toll Free: 1-300-88-7035 Tel: 603-55446000 Fax: 603-55446694 Website: www.sirim.my

SIRIM

SIRIMLink
Driving innovation through technology and quality

ADVISOR
Dato' Ir. Hj. Yahaya Ahmad

CHAIRPERSON
Hj. Nor Rashid Ismail

MEMBERS
Noraini Kassim
Rosmina Mustafa
Zurina Mohd Bistari
Abdul Aziz Long
Futom Shikh Jaafar
Ahmad Faizi Mohd Kamil
Dr. Neelam Shahab
Dr. Kartini Noorsal
Azman Hassan
Jamaluddin Tukimin

For any enquiries or further information with regards to the articles featured in this magazine, please contact:

Corporate Communications Section
Group Corporate Affairs Department
SIRIM Berhad
1, Persiaran Dato' Menteri
Section 2, P.O. Box 7035
40911 Shah Alam, Selangor
Tel: 603 5544 6770
Fax: 603 5544 6745
Or email to: publications@sirim.my
www.sirim.my

Published and Printed by:
SIRIM Berhad
1, Persiaran Dato' Menteri
Section 2, P.O. Box 7035
40911 Shah Alam, Selangor
Toll Free: 1300 88 7035
Tel: 603 5544 6000
Fax: 603 5510 8095

Writing, Design and Concept:
Marcus Gomez & Partners Sdn Bhd
Unit 3A-07, Block B, Cameron Tower,
Jalan 5/58B, 46500 Petaling Jaya,
Selangor.
www.marcusgomez.com

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GREEN DAY

THANKS TO THE CONCERTED efforts of policy makers, scientists and eco-conscious consumers the world over, green technology has become one of the most pivotal areas of research and development today.

Once only a secondary research activity among green activists and public entities, green technology has since become a lucrative sub-sector of the economy which generates employment opportunities and investments. This is one of the reasons why the government has established a regulatory framework for the country's green agenda in line with national development goals.

SIRIM has always supported the country's green agenda, of course, and we look forward to commemorating its objectives. With the government's Economic Transformation Programme (ETP) in place, SIRIM is poised to become a catalyst for green change.

SIRIM's "Eco-4-Eco" programme will create wealth all along the economic value chain while reducing the carbon footprints of its participants. Businesses can now not only do their part for the environment, but earn lucrative profits in the process. SIRIM's innovative green technologies can transform the way businesses operate within key industries and help translate the country's national green policies into meaningful results for the *rakyat*.

This issue of SIRIMLink is dedicated to the most successful green technologies at SIRIM to date in the context of SIRIM's Eco-4-Eco programme. We trust you will find the issue enlightening.

Nor Rashid Ismail
Vice President
Corporate Division

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ISSUE 01/2011 "GREEN WAY FORWARD"

SIRIM's green furniture is made out of a composite wood that is tougher and more durable than any other composite wood. It is also exceptionally environmentally friendly. See page 24.

SIRIM wins two gold medals at 10th Malaysia Technology Expo

Seven out of eight entries by SIRIM receive awards at innovation showcase.

From right: Gendang anak Menggin (right) and Ahmad Nazri Said and their SeaHooks, SeaLocks and SeaCuts.

Norazlan Roslani (right) and Fazira Suriani (left) with their gold medal for the Hard Thin Film Coating on Cutting Tools project.

SIRIM RESEARCHERS ONCE again achieved national recognition when researchers walked away with seven medals at the 10th Malaysia Technology Expo (MTE 2011) in February 2011.

The expo celebrated its 10th anniversary at the Kuala Lumpur Convention Centre with the theme "Moving Innovations to Market." As in the past, the event attracted researchers from various research institutions as well as participants from government and private agencies. MTE 2011 served as the perfect platform to showcase Malaysia's most innovative inventions in every aspect of commerce, trade, information and communication.

SIRIM submitted eight innovative inventions for this year's event and seven of them received medals for their projects. All in all, SIRIM inventors won two gold medals, three silver medals and two bronze medals.

SIRIM's project entitled "Hard Thin Film Coating on Cutting Tools" won a gold medal at MTE 2011. This project manufactured high speed steel and tungsten carbide cutting tool inserts through an innovative powder metallurgy technique.

The other gold medal winner from SIRIM was the "SeaHook, SeaLock, SeaCut" project. The project team designed new technologies to assist in the harvest of seaweed off the coast of Sabah. Seaweed farmers can work more efficiently thanks to reusable hooks, rope locks and a state-of-the-art seaweed cutting technique.

Gold medal winner: Hard Thin Film Coating on Cutting Tools, which improves the quality of cutting tool inserts and hard thin film coating by using the Cathodic Arc Physical Vapour Deposition (CAPVD) technique. The resulting nanostructured composite coating enhances the surface property of cutting tools, making them

Bronze medal winner: Etchless Patterning of Organic-Inorganic Hybrid Sol-Gel Material for Planar Optical Waveguides Applications, an innovative technology for creating optical integrated circuits for use in silicon chip manufacturing.

From right: Victor Devadass, Nor Azura Mohamed, Julaiha Adnan and Ahmad Redzuan with a fake leg replica.

Silver medal winner: Semi-Automated Colour Dyeing System for Yarn and Ready Pieces, a machine that simplifies the process of dyeing yarn.

Bronze medal winner: Ammonium Monitoring System for Sustainable Aquaculture Industries, an optical sensor that monitors ammonia levels in aquaculture ponds. The sensor will be used in SIRIM's Green Aquaculture System.

much harder and improving the tools' usable lifespan.

Gold medal winner: Seahook, Sealock, Seacut, a system that vastly improves the efficiency of the seaweed industry. The three gadgets provide an efficient, hygienic and more economically viable method for "planting" seaweed and harvesting it. The system was piloted for the village of Semporna in Sabah, where 650 families rely on seaweed harvests for their livelihood.

Silver medal winner: Chopper Mixer for Making Brake Lining Material, a system for producing material to make brake lining.

Silver medal winner: Semi-Automated Colour Dyeing System for Yarn and Ready Pieces, a machine that simplifies the process of dyeing yarn.

Silver medal winner: Design and Development of Below-Knee Prosthesis Socket using CAD/CAE Optical Digitizing and Rapid Prototyping Technologies, a Computer Aided Modeling and Analysis system that enables the rapid delivery of the best fitting prosthesis sockets for amputees.

Bronze medal winner: Ammonium Monitoring System for Sustainable Aquaculture Industries, an optical sensor that monitors ammonia levels in aquaculture ponds. The sensor will be used in SIRIM's Green Aquaculture System.

Bronze medal winner: Etchless Patterning of Organic-Inorganic Hybrid Sol-Gel Material for Planar Optical Waveguides Applications, an innovative technology for creating optical integrated circuits for use in silicon chip manufacturing.

Malaysian Life Cycle Inventory Database Launched

Database helps local businesses manage environmental impact of their products.

THE MALAYSIA LIFE CYCLE Inventory Database (MY-LCID) was launched recently at the Life Cycle Assessment (LCA) Seminar for Eco Friendly Products and Services, as part of the national effort to assist local industries in becoming more environmentally responsible. The Deputy Minister of Science, Technology and Innovation (MOSTI), Datuk Fadillah Yusof launched the database at a seminar in Shah Alam that was jointly organised by MOSTI, SIRIM Berhad and Japan External Trade Organization (JETRO).

Life Cycle Assessment is a tool for quantitatively assessing the environmental impact of a product or service from cradle to grave. By making use of LCA, businesses can identify the environmental impact of each part of the manufacturing process. This can help them make improvements to reduce carbon footprints and environmental impacts. MY-LCID provides businesses with environmental data to aid them in carrying out these assessments.

Datuk Fadillah said that industries need to provide better and more credible information on the environmental performance of their products in order to meet the needs of the global market. This information includes carbon footprint, content of hazardous substances, water footprint, waste emissions and recyclability of products. "It is the government's hope that industries be committed in addressing environmental issues and strive to design and manufacture eco-products and services," he said, adding that the government will assist industries that show improved environmental performance.

Local entrepreneurs can use eco-labels and environmental declarations to publicise the positive environmental impacts of their products and position themselves as environmental leaders.

Local entrepreneurs listening to a presentation at the seminar at SIRIM's headquarters in Shah Alam.

Businesses that promote the green image of their products and services can gain a competitive advantage over similar products, especially in eco-conscious markets.

SIRIM President and Chief Executive, Dato' Ir. Hj. Yahaya Ahmad stressed that life cycle assessments provide companies with new opportunities for growth. "Businesses can use LCA to find cost-effective and environmentally friendly solutions. The market is now growing more attuned to the concept of LCA. A business that produces a positive LCA will inevitably have a competitive advantage over the rest of the market."

A total of 175 participants attended the one-day seminar, including researchers from public and private sectors as well as lecturers and academicians from universities and colleges. The invited speakers were Dr. Nobuhiko Narita from Nagoya Sangyo University, Japan, Dr. Hongtoa Wang from Sichuan University, China, Dr. Thumrongrut Mungcharoen from National Metal & Materials Technology Centre, Thailand and Dr. Chen Sau Soon from Environmental Technology Research Centre, SIRIM Berhad.

SIRIM hosts networking session for industrial and technological research

Enterprises, agencies and academia share knowledge at the WAITRO-SIRIM Berhad Networking Session.

THE WORLD ASSOCIATION of Industrial and Technological Research Organizations (WAITRO) recently held a networking session for 200 participants from business, government and research sectors. SIRIM successfully hosted the session at the SIRIM Berhad Auditorium, on 10 March 2011.

The networking session brought together 200 participants including representatives from the government, research institutions and academia, small and medium enterprises, the corporate sector, SIRIM Berhad and other standards and regulatory agencies. The session served as a platform for sharing case studies, outcomes of R&D activities and SME collaboration success stories. Additional activities included technology transfer, R&D commercialisation and scientific research funding.

WAITRO is the global association relating to industrial and technological research. SIRIM Berhad has been hosting the WAITRO Secretariat since 2002, and has been the first research institute from a developing nation to do so. For the past eight years, SIRIM Berhad and other Malaysian research organisations have implemented more than 100 programmes and projects, contributing consultants, experts, speakers and project implementers in key roles.

The networking session also saw the signing of an agreement between WAITRO and SIRIM Berhad. With the ongoing support of MOSTI, SIRIM Berhad is privileged to continue hosting the WAITRO Secretariat for another term.

Prominent international speakers from WAITRO member organisations shared their knowledge and experience regarding numerous topics. The keynote speaker, Prof. Dr. R. K. Khandal, the Director of Shriram Institute for Industrial Research, India, the newly appointed

Event participants posing for a group photograph after the event.

President of WAITRO, talked about his experience in competing and staying afloat in today's challenging global economy. Mr. Liaquat Ali Shah, the CEO of Caribbean Industrial Research Institute, Trinidad and Tobago, who is also the First Vice President of WAITRO, related on the challenges faced in research and technology by Latin America and the Caribbean.

Meanwhile, Prof. Chi Renyong, Director of Zhejiang Provincial Institute of Small and Medium Business, Hangzhou, China and the WAITRO Regional Representative for Asia and the Pacific, related on the successful collaborations and relationships between his institute with SMEs. Dr. Eng. Hamad Al Hashemi, the WAITRO Middle East and North Africa Regional Representative, drew upon his experience as the Managing Director of Dubai Technopark to explain how Dubai Technopark creates opportunities in the Middle East.

When asked to provide feedback regarding their experience at the session, participants were very positive. The event helped inform them about advances in technology and provided valuable lessons about the marketplace.

The speakers' presentation materials are available for download from the WAITRO website, www.waitro.org.

SIRIM'S GREEN WAY FORWARD

SIRIM Berhad is preparing itself to spearhead the country's green agenda alongside the government's Economic Transformation Programme. Dato' Ir. Hj. Yahaya Ahmad, President and Chief Executive of SIRIM Berhad, talks about SIRIM's green way forward.

BACK IN THE 1970s, FEW countries cared about the green future of the planet. Nations democratised and industrialised without realising what the long-term ecological impact of their plans would be, knowing only that they had to catch up with the Western world or risk being caught in the third-world economic trap forever.

In Malaysia, however, things were a little different. While the government knew that economic progress and industrialisation were important, it also recognised that the blind pursuit of these goals would have a tremendous impact on the country's energy and environmental resources. After consulting the country's leading experts, the government finally asked SIRIM to lead the country's green technology agenda and to help address the nation's ecological concerns.

Today, SIRIM is considered to be one the region's leading ecological research institutes (although given its head-start in green technologies, this should come as no surprise). The entire organisation is built upon the principles of Sustainable Consumption and Production (SCP), which guide all its key activities in design and engineering and research and technology development. All that knowledge and expertise in green technology will play crucial part in the government's Economic Transformation Programme (ETP), especially given the role that the private sector is expected to play.

"A key emphasis of the ETP is that economic growth must be led by the private sector rather than the public sector," explains Dato' Ir. Hj. Yahaya Ahmad, President and Chief Executive of SIRIM Berhad. "However, this economic growth must be tempered with a consideration for environmental sustainability, which is where SIRIM comes in. We have over 30 years' worth of experience in green technologies to share with the private sector, and we want them to take advantage of it."

Advanced economies today are not only measured in terms of economic output and standards of living, but also for the way they contain their ecological footprint. Research shows that there

FIVE-YEAR GREEN PLAN

SIRIM aims to provide the country economic benefits through ecological sustainability. Broadly, this will involve the following programmes, all of which are set to roll out over the next five years:

- **Ecology-for-the-Economy**
- **Asia as SIRIM's new market**
- **Growing SME's big and green**
- **Value adding the community**

DATO' IR. HJ. YAHAYA: "We have over 30-years' worth of experience in green and environmental technologies to share with the private sector, and we want them to take advantage of it."

is an increasingly co-dependent relationship between green technology and modern economies. Markets are becoming increasingly conscious of the impact of consumerism on the environment, and many governments have prohibited the import of products that are damaging to the environment or are known to have come from poorly-managed natural sources.

GROWING SMEs BIG AND GREEN

On the surface, it might seem like these developments have made business more difficult for SMEs, but Dato' Ir. Hj. Yahaya does not see it this way. He views the global green movement as an opportunity for SMEs to leapfrog existing competition, especially given the growing preference for green products. Consumers no longer mind having to pay more for goods with lower carbon footprints.

"SIRIM's green programmes are aimed at helping SMEs reap economic benefits from these changes," explains Dato' Ir. Hj. Yahaya. "We can equip businesses with green standards, green technologies and green certifications, thus turning them into green companies that will be welcomed in any market in the world."

SIRIM has also roped in the SME Corporation as strategic partner to intensify engagement with SMEs and create new technopreneurs in green-technology businesses. SIRIM will provide SMEs with training in areas like product design and development and help them achieve the quality standards they need to go global.

VALUE ADDING THE COMMUNITY

It is not all boom and bluster at SIRIM though. While the company will no doubt play a key role in the country's larger economic agenda in 2011, it will also remain a close ally of poverty-eradication agencies and maintain several programmes aimed at improving the quality of life of Malaysia's less privileged populations.

"Our immediate target groups are women and rural communities, especially in East Malaysia," says Dato' Ir. Hj. Yahaya. "We want to improve the lot of these folk not by giving them handouts, but by giving them the tools they need to help themselves. We want them to be a part of it."

To this end, SIRIM aims to roll-out several rural electrification projects to help increase the participation of rural Malaysia in the country's economic transformation. These projects will provide these communities with access to better infrastructure, education and industrial opportunities, thus allowing them to raise themselves out of poverty with their dignity intact.

"The whole system will be supported by internal programmes such as Excellence-r-Us, which will address the implementation, safety and service delivery towards achieving operational excellence. The programme will position SIRIM as a sought-after company within the next 5 years by providing excellence services," says Dato' Ir. Hj. Yahaya. "We want Malaysian businesses to join us in making the country a greener, more sustainable economy that will eclipse our regional peers. That is our green way forward."

GROWING A GREEN ECONOMY

SIRIM's new Eco-4-Eco programme is fostering the country's nascent ecobusiness sector while making the economy greener and more palatable to global investors.

BUSINESSES IN MALAYSIA now have good reason to invest in the environment. With the Economic Transformation Programme (ETP), the Malaysian government has redoubled its efforts to promote sustainable development. Visionary businesses now have a real opportunity to reap tangible economic benefits from going green.

The Malaysian government is very serious about changing its approach and view towards climate change and environmental issues. According to Dr Zainal Abidin Mohd Yusof, Vice President of the Research and Technology Development Division at SIRIM Berhad, now is as good a time as any for businesses to go green.

"Our Eco-4-Eco programme streamlines all of SIRIM's green technology projects to focus on their economic benefits," says Dr Zainal. "Our focus on 'Ecology for the Economy' will develop environmentally friendly technologies for local entrepreneurs while supporting green business strategies through assessment and certification."

A LAND OF GREEN OPPORTUNITIES

Sustainable business is a well-established concept in many parts of the world. Japan, for example, is an ecobusiness success story in itself. In the land of the rising sun, recycling is an integral part of daily life. Limited land resources, strong government policies and a healthy respect for nature have all played a part in creating an all-encompassing recycling sector. Within just a few decades, recycling has become a trillion-yen industry in the country.

"People don't think of plastic as being very 'green' because it's not biodegradable," says Dr Zainal. "However, plastic is a fully recyclable resource, as countries like Canada and Japan have shown."

These countries have made recycling a part of daily life. In Canada, 87% of households have access to plastic recycling programmes, while recycling plastic and other materials is mandatory in all of Japan. Since 2006, Japan recycles more than 70% of plastic waste, which includes items such as polyethylene terephthalate (PET) bottles and polyvinyl chloride (PVC) materials. Japan also recycles more steel cans than any other country, with 88% of its steel cans recycled in 2006.

Malaysia has its own unique strengths for green businesses. Although the benefits of recycling and other green technologies are not yet an everyday reality to many Malaysians, we already have local industries with plenty of ecobusiness potential. For example: the country's palm oil industry produces about 500,000 tonnes of methane a year, all of which goes into the atmosphere as a potent greenhouse gas. But if we tap that wasted methane as a fuel source, we could power as much as 16% of our transport sector. In addition, the empty fruit bunches and other waste from palm oil production can be used to power biomass boilers and reduce energy costs. SIRIM has also performed research on palm biofuel technology, where the biomass left over from palm oil production can be converted >>

DR. ZAINAL ABIDIN: "Our Eco-4-Eco programme streamlines all of SIRIM's green technology projects to focus on their economic benefits."

to a blend that can supplement petrol or diesel by up to 20%.

"In the past, Malaysia's rapid development was fueled by its oil and natural gas resources," Dr Zainal comments. "But these oil and gas deposits are dwindling, and it's clear that we have to move on to whatever renewable energy sources we can find."

That's why local entrepreneurs are working hard to take advantage of the country's abundant wind and solar power potential. SIRIM has mapped out numerous locations in both Peninsular and East Malaysia where high wind speeds can be harnessed for energy generation. And, thanks to year-round sunlight, ordinary homeowners as well as hotels, hospitals and other large facilities can utilise solar thermal panels to save on heating costs.

The technologies are all in place. The challenge now is to figure out how to make these technologies viable enough for businesses.

POWERING DEVELOPMENT

Much to the chagrin of both local and international environmentalists, Malaysia's energy tariffs remain inordinately cheap despite rising oil prices worldwide. This artificially cheap energy regime makes it difficult for would-be alternative energy businesses to compete with national power producers on equal terms.

FEED-IN TARIFFS

A Feed-In Tariff subsidises solar energy producers by setting attractive rates for the sale of electricity back into the grid.

For instance, if an indigenous energy producer could sell back electricity to TNB at a rate of, say, RM1.42 per kW, while buying it at RM0.38 per kW, that would be a profit of more than RM1 per kilowatt. Such an incentive would be compelling enough to help overcome the high cost hurdle of solar panels or other alternative energy technology. No Feed-In Tariff is meant to be permanent. Eventually, alternative energy sources pay for themselves.

The problem of artificially cheap fossil fuel energy markets is compounded by the fact that green energy remains much more expensive to produce than fossil fuel-based energy. The energy content of fossil fuels far exceeds the potential energy content in even the most advanced solar panel or wind turbine, thus the energy-conversion ratio in green technologies is nowhere near as efficient as conventional technologies.

For example: it takes only 19 coal, oil and gas power plants to supply power to the greater Klang Valley right now. If the Klang Valley were to switch to green energy, it would require at least 200 biomass power plants, 20,000 high-grade wind turbines or about 16 million solar power plants. You don't need to be a scientist to figure out that the economics just don't work. At least, not yet.

BUYING AND SELLING GREEN

As one of the country's primary authorities on alternative energies, SIRIM understands the predicament of the local energy market only too well. So, while SIRIM is looking into cost-saving technologies like solar panel lamination, the real challenge lies in making green energy cheap enough to compete with regular energy.

"Alternative energy initiatives will only become attractive to entrepreneurs when they can compete with the country's national power grid on equal terms," explains Dr Zainal. "The question is, how can we do that?"

Luckily, this is a question that has dogged many countries, and the best solution that the industry has come up with to date is the Feed-In Tariff (FIT) mechanism.

The FIT works by giving consumers and entrepreneurs a compelling incentive to invest in alternative energy production because it allows them to sell the energy they produce back to the national power producer at a highly competitive rate. Consumers and businesses can thus recoup their investments into solar panels and wind turbines much more quickly while realising substantial savings on their own energy bills.

The Malaysian parliament is already deep in debate over the finer points of the Renewable Energy Bill, which includes an FIT mechanism that will require the national power producer to buy electricity back from consumers and businesses. Once the Bill is passed, the business of green energy will become far more viable for take-up by local entrepreneurs. The availability of green energy will also spur other businesses to embark on their own green technology initiatives.

GREEN INDUSTRIES, GREEN BRANDS

Alternative energy technologies and green certification schemes are both key initiatives within SIRIM's new Eco-4-Eco programme. In truth, however, SIRIM has been doing this kind of thing for ages. For over three decades, SIRIM has been developing more sustainable and energy-efficient pilot projects aimed at supporting local industries and entrepreneurs. SMEs can become cleaner and greener by modernising their operations with up-to-date techniques and equipment provided by SIRIM.

"With these incentives and technologies, the time is right for Malaysian entrepreneurs to build green brands," says Dr Zainal. "Malaysia needs to sell its green competitiveness to the world."

As an internationally recognised certification body, SIRIM is ready to promote Malaysian businesses that meet sustainability standards. "It's easy to have an advertising campaign that says your products are green," says Dr Zainal. "But the value of your green product becomes diluted if people don't think 'green' has any real meaning."

SIRIM's Eco-4-Eco programme provides two such ways to quantify product sustainability: Life Cycle Assessment and the SIRIM Ecolabel.

SIRIM's Environment Technology Research Centre (ETRC) has developed Life Cycle Assessment (LCA) as a tool for determining the overall environmental performance of a product. Since 2003, SIRIM's LCA researchers have studied the greenhouse gas profiles and carbon footprints of products from industries such as agriculture, petrochemicals, plastics, electronics, consumer goods, utilities and transportation. By quantifying the environmental impact of every stage of a product's life cycle, from 'cradle-to-grave,' LCA studies can show budding ecobusinesses where improvement is needed.

To help industries demonstrate the depth of their commitment to sustainability, SIRIM has also developed its International Eco-Labelling scheme. The Ecolabel is a mark indicating that a product has been certified to meet specific environmental standards throughout its life cycle. Currently, there are criteria for 20 product types that can receive the SIRIM Ecolabel; these include packing material, electronic equipment, cleaning agents, recycled paper, fertiliser, shampoo and paint. Locally, the SIRIM Ecolabel has been recognised by the National Green Technology Council as the national ecolabel. On the international stage, SIRIM has been accepted as a member of the Global Ecolabelling Network, which will further boost recognition of the ecolabel.

SIRIM is also an accredited body for verifying and validating Clean Development Mechanism (CDM) projects, as specified under the Kyoto Protocol of 2007. By qualifying for CDM status, businesses can host sustainable projects in Malaysia or other countries in order to earn carbon credits for partners in developed nations.

The current goal for the Eco-4-Eco programme is the increased adoption of all its ecobusiness initiatives. Dr Zainal wants to see a steadily growing number of companies certified by SIRIM QAS International, and several of SIRIM's pilot projects have their own individual measures of performance. It is an undeniably attractive vision: a sustainable environment preserved for our children, a more prosperous economy and more responsible entrepreneurship.

"Eco-4-Eco has a lot of potential, both for growing businesses and for meeting our environmental goals," Dr Zainal enthuses. "The challenge now is to get local industry players on board, but given all the evidence we have seen so far, that shouldn't be a problem. They'd be foolish not to play a role in Malaysia's green agenda."

FISH FARM T

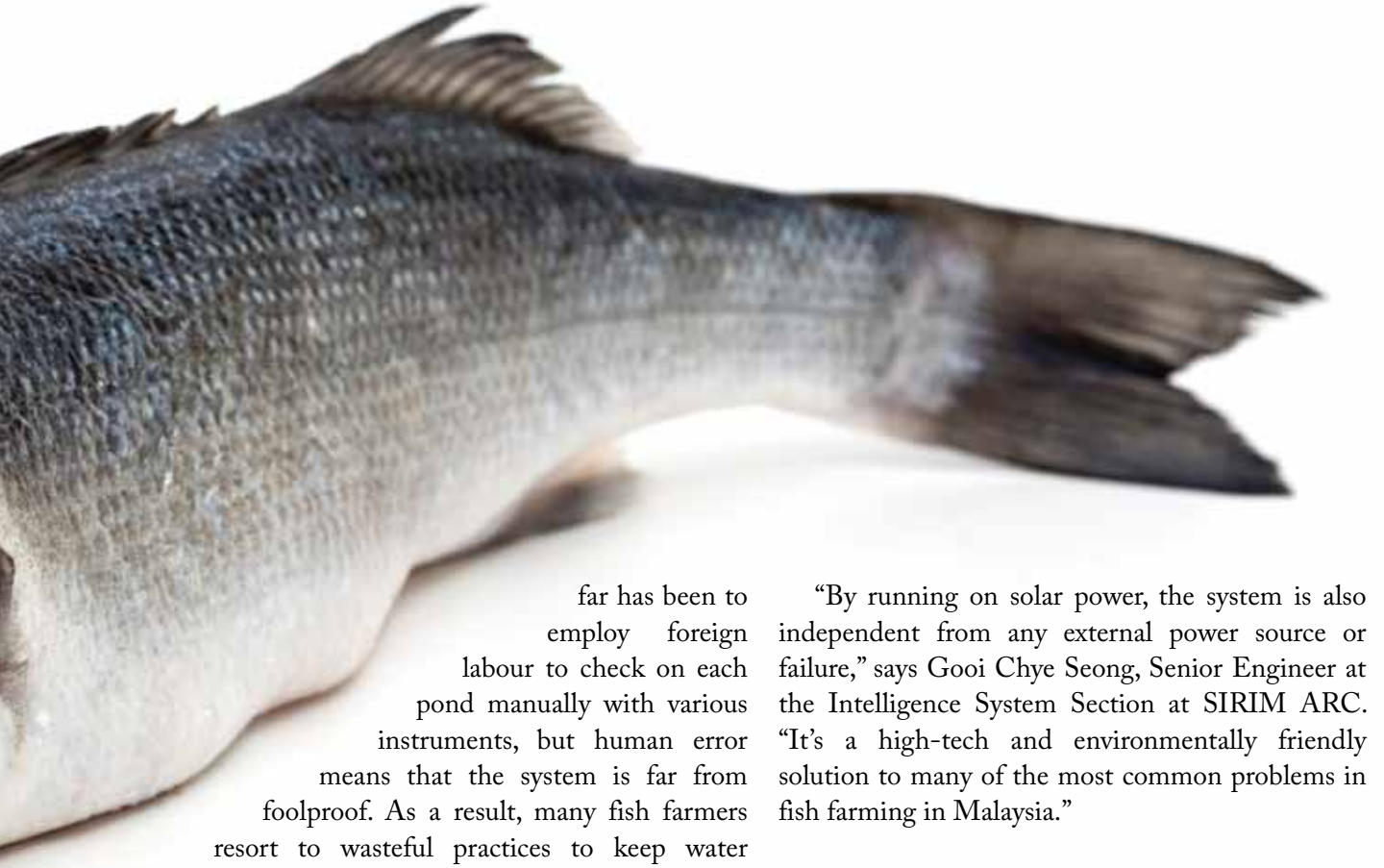
SIRIM has developed a smart technology that fish farming communities will soon find indispensable. Besides boosting fish farm efficiency and safeguarding their stock, the technology will also make the fish farming sector more sustainable.

MALAYSIANS HAVE A HEALTHY appetite for fish. The World Wildlife Fund estimates that Malaysians consume 1.4 million tonnes of seafood yearly, more than any other country in South East Asia. One would think that Malaysia's long coastlines would be enough to satisfy these fishy appetites, but in fact, at least one-third of our seafood is imported. The sad truth is the ocean's fish stocks are severely depleted, and that the only way to keep our fish cutlets on our dinner plates is to start growing our own fish farms.

Commercial fish farming in Malaysia is still a relatively small industry, meeting about one tenth of our fish needs. However, there is still a lot of room to grow, and the Third National Agricultural Policy laid out plans to develop local aquaculture in a sustainable fashion. Fish farms allow farmers to breed and catch a large number of fish in relatively small bodies of water without the hassle of trawlers. But concentrating so many fish in each pond also means that fish waste builds up quickly, thus polluting the water itself. You need a highly efficient system for monitoring the environmental conditions of each fish pond so that you can keep the water sufficiently fresh and aerated while ensuring that the water's acidity and ammonia levels do not get out of hand.

Most fish farmers lack a way of measuring the precise environmental conditions of their fish ponds, a problem that is compounded when you consider that many fish farms have more than one hundred individual ponds. The way around this so

TECHNOLOGY



far has been to employ foreign labour to check on each pond manually with various instruments, but human error means that the system is far from foolproof. As a result, many fish farmers resort to wasteful practices to keep water conditions healthy for their fish stock. Aerators are left to run 24 hours a day, and vast amounts of water are used to dilute ponds with high ammonia levels. All in all, it's a highly inefficient use of electricity and water resources.

PAMPERED FISH

At SIRIM's Advanced Automation & RFID Centre (ARC) in Bukit Jalil, a team of engineers has developed an automated system to manage fish ponds while significantly reducing a fish farm's ecological footprint. The Green Aquaculture System tracks the environmental conditions in fish ponds and intelligently controls aeration and filtration systems.

"By running on solar power, the system is also independent from any external power source or failure," says Gooi Chye Seong, Senior Engineer at the Intelligence System Section at SIRIM ARC. "It's a high-tech and environmentally friendly solution to many of the most common problems in fish farming in Malaysia."

To put the Green Aquaculture System to the test, the system was installed to monitor a test pond filled with sea bass and grouper (locally known as *siakap* and *kerapu*) at SIRIM's headquarters in Shah Alam. These are perhaps the two most popular species destined for dinner tables in Malaysia, and most fish farms in the country have at least one pond dedicated to their breeding. And, being fussy about their living conditions, they are also among the most challenging of all species to breed. In other words, they are the perfect test subjects for the monitoring system.

"Sea bass and grouper are very pampered fish," explains Gooi. "They need a very specific environment or they won't grow, unlike more robust species such as *tilapia* and catfish." >>

GOOI CHYE SEONG: "By recirculating the water within each pond, the farm consumes far less water than usual, making it exceptionally environmentally friendly."

The Green Aquaculture System relies on a floating controller to monitor and report on conditions in the fish pond. The device consists of a wireless controller, a solar power panel and a battery box mounted on a floating raft that resembles an oversized swimboard. A tube protrudes from the bottom of the raft to allow its sensors to pick up information from the water. The floating controller performs its tasks unobtrusively as it drifts freely in the fish pond. The sensors keep track of all the factors that can impact the healthy development of the fish in the pond: temperature, dissolved oxygen levels, ammonia, pH and salinity. When the water conditions drop to dangerous levels, the controller will send out an alert.

Although oxygen levels tend to be lowest from 4am to 6am, fish pond operators normally leave an aerator running all the time – a tremendous waste of electricity. SIRIM's aerator only turns on when oxygen levels slip into the danger zone, at which point the system switches on the aerator with a wireless Zigbee signal. Similarly, a solar-powered waste extractor floats dormant in the fish pond, waiting for the controller to switch it on when ammonia levels get too high. The extractor uses heavy aeration along with a small amount of water to clean the pond of excess ammonia.

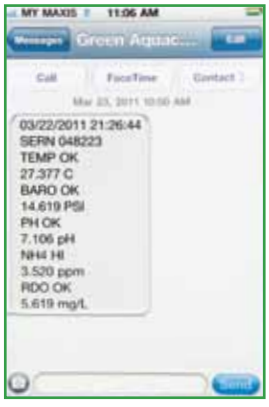
"With this system, you don't need large amounts of fresh water to dilute polluted ponds when environmental conditions get too tough for the fish," says Gooi. "By recirculating the water within each pond, the farm consumes far less water than usual, making it exceptionally environmentally friendly. These pampered fish love it."

GREEN SENTINEL

The Green Aquaculture System's sensors are mostly sourced from other companies, while Gooi's team adds the intelligence to the hardware by programming the firmware for the embedded microprocessors and teaching the system how to monitor water conditions. All controller data is collected at a data centre where a human supervisor can view graphs and statistics of water conditions on a screen. From here, staff can keep tabs on hundreds of fish ponds all at the same time without having to employ dozens of farm workers.

FARMER'S ALERT!

The Green Aquaculture System can send text messages to alert fish farm owners of problematic ponds at any time of the day, thus allowing round-the-clock surveillance even if no one is around. Each message contains the following information:



- **A unique serial number that identifies the fish pond**
- **Water temperature (C)**
- **Water pressure (PSI)**
- **Water acidity or alkalinity (pH)**
- **Ammonia content (NH_4 ppm)**
- **Oxygen levels (mg/l)**

"Since these data centre will likely be located some distance from the fish ponds, we decided to include several wireless communication features in our controller," says Gooi. "This allows farms to use a centralised monitoring system, thus reducing the need for human labour."

Gooi's controller uses the Zigbee communications protocol for transmission distances of up to 300 metres, although a particularly large farm installation may need to use radio frequency (RF) communication, which has a range of up to twenty kilometres. And, if the supervisor or manager is off-site, the system can send reports and alerts via text messages.

"The alerts tells you which pond is in trouble (based on the serial number) by detailing the current temperature, pH, oxygen and ammonia levels," explains Gooi. "Farmers never have to worry about being out of touch with their livestock again, and this will improve yield and reduce wastage due to poor monitoring."

Gooi is also considering making other improvements to the system. By programming the controller with a more intelligent monitoring routine, it will only check on the pond at intervals while it can put itself into 'sleep' mode for the rest of the time in order to save power. Furthermore, since different types of fish have different requirements, he is trying to create a system of configuration that will allow fish farmers to only pay for what they need.

"Fish is generally acknowledged as being a very healthy type of food," says Gooi. "But fresh farmed fish is even better."

POWER TRIP

Gooi Chye Seong and his team have another green invention under their belts that complements the Green Aquaculture System but which is also widely used in other businesses. A Gold Medal winner at the ITEX exhibition in 2010, the Green Circuit Breaker eliminates the need for energy-guzzling uninterrupted power supply (UPS) by automatically diagnosing the cause of power outages and resetting the power supply in a matter of seconds. It will only turn off the power in the event of a serious short circuit.

"When a circuit breaker trips in conventional systems, a backup power unit is relied upon to keep everything running while technicians hurry around looking for the source of the problem," explains Gooi. "These UPS installations are typically designed to last for a few hours, depending on your needs. But what if you don't find the source of the problem before the power in those UPS batteries run out?"

What happens, of course, is chaos: as the UPS batteries run out, the building's facilities start shutting down one after another. Technicians lose their jobs, customers lose their patience, and businesses lose money. Which is a pity, because power outages are frequently caused by nothing more than a lightning strike: it hits, the circuit breaker trips, the danger passes. But technicians cannot be expected to know that without running some basic diagnostics first.

This is where the clever automatic reset feature on Gooi's Green Circuit Breaker comes in useful: it determines what the cause of the trip was and, finding nothing serious, automatically switches everything back on. It saves technicians from the harrowing headache of identifying the source of a problem among thousands of possible suspects. That's why Gooi's Green Circuit Breaker has been installed at mission-critical facilities like the KL International Airport, North Port and the data centre of a major commercial bank.

"With this system, you only need UPSes in critical locations," explains Gooi. "Businesses can save themselves a lot of money in the long run."

CERTIFIABLY GREEN

Eco-friendly businesses can now prove their green-ness with certifications from SIRIM QAS International.

IT'S EASY FOR COMPANIES TO claim to be "green", but everyone knows that that is not good enough. That is why SIRIM QAS International has been tasked with the job of helping businesses with genuine sustainable policies to prove their commitment to the green agenda by having their green activities certified.

As an internationally recognised certification body, SIRIM QAS International offers various green certification schemes. Among these are the Environmental Management Systems Certification and the Validation and Verification of CDM projects offered by the Management System Certification Department. Both schemes offer companies a way to demonstrate their environmentally-conscious business practices.

"The most widely recognised environmental management standard internationally is ISO 14001," says Parama Iswara Subramaniam, Senior General Manager of the Management System Certification Department at SIRIM QAS International. "It sets the guidelines for identifying and managing the environmental impacts of an organization, and is very popular among Japanese and European companies."

Unfortunately, many Malaysian companies particularly the SMEs have not yet realised the benefits of being certified to the ISO 14001 standard. Ever since the ISO 14001 standard was first offered in Malaysia back in 1996, many large Malaysian companies and multinational companies operating in the country have demonstrated their willingness to comply with the requirements of the standard and have obtained certification to it.

"Multinationals tend to have a greater awareness of the importance of certification to this standard," says Parama. "But with Eco-4-Eco, we hope to get more second and third-tier companies on board with ISO 14001, too."

Businesses are also reluctant about incurring the expense and inconvenience of an ISO 14001 audit and certification, even though the exercise generally

PARAMA ISWARA: "With the Eco-4-Eco programme, we hope to get more second-and third-tier companies on board with ISO 14001."

pays for itself several times over down the road with improved business practices, sales and brand value. Indeed, as environmental regulations get stricter worldwide, companies that are ISO 14001 certified will find it easier to achieve compliance and avoid the penalties resulting from non-compliance.

"Getting certified also helps businesses tap into new markets, especially when environmental compliance is a condition for entering that market," says Parama. "For example: some large corporations insist that bidders are certified to the ISO 14001 standard before submitting tenders for projects. If you are ISO 14001-certified, you've already won half the battle which has got to help."

A CLEANER, GREENER WORLD

SIRIM QAS International also plays an important part in the Kyoto Protocol's carbon trading mechanism, where, as a Designated Operational Entity (DOE) accredited by the United Nations Framework Convention on Climate Change (UNFCCC) Executive Board, the company is responsible for validating and verifying Clean Development Mechanisms (CDM) projects. As a DOE accredited by the UNFCCC Executive Board, the company is qualified to perform >>

the validation and verification of CDM projects in Malaysia as well as other countries.

"This scheme allows industrialised nations to meet their obligations under the Kyoto Protocol to reduce their Greenhouse Gas emissions by buying carbon credits as a result of emission reductions achieved by CDM projects implemented in developing countries," explains Aminah Ang, Head of the Sustainability Certification Section at SIRIM QAS. "For the scheme to work, however, the CDM projects must first be registered by the UNFCCC upon validation by a DOE."

Validation involves evaluation of a project design against detailed criteria set by the UNFCCC. After registration and implementation of the project, the claimed emission reductions will have to be verified and certified by an accredited DOE before the claimed emission reductions can be approved by the UNFCCC EB.

SIRIM director Dato' Syed Ahmad Idid Syed Abdullah Idid presenting an ISO 14001 certificate of achievement.

MALAYSIA'S FIRST CDM PROJECT

The TSH Biomass Power Plant in Kunak, Sabah is the first grid-connected biomass power plant in Malaysia. It has a renewable energy purchase agreement (REPA) with Sabah Electricity Sdn Bhd to supply up to 10MW of green electricity for 21 years. The biomass power plant has a total capacity of 14 MWe and 33 tones per hour extracted low-pressure steam.

The TSH Biomass Power Plant is a co-generation plant that generates electricity and industrial steam from empty fruit bunches (EFB), shells and mesocarp fibre. The EC-ASEAN COGEN 3 programme awarded the venture FSDP status (Full Scale Demonstration Project) and a grant of approximately RM2 million. COGEN 3 is a programme that promotes co-generation and facilitate the use of proven, clean and efficient biomass and other technologies. An FSDP-status project is the implementation of proven technology on a full scale basis in order to demonstrate its technical reliability, economic viability, and environmental friendliness.) SIRIM represented the Bangkok-based ASEAN COGEN 3 programme in monitoring the plant's performance after full-scale commissioning.

The TSH Biomass Power Plant qualifies as a Clean Development Mechanism (CDM) project under Kyoto Protocol, and was in fact the first project in the country to be validated as a CDM project. The validation entitles the biomass power plant to Certificates of Emission Reduction (CER), more commonly referred to as carbon credits.

"Among the CDM projects that we have validated or verified so far include projects involving the capture of methane released from the palm oil mill effluent (POME) treatment process, biomass utilization for the generation of electricity or steam replacing fossil fuels, heat recovery in cement manufacturing methane capture from landfills and electricity generation using Wind Turbine Generators (windmill)," says Aminah. "The projects that we have validated and verified so far are located in Malaysia and other countries in the region including Thailand, Singapore, Philippines, Indonesia, Cambodia, India , China and Sri Lanka."

The SIRIM QAS International is also keeping a close eye on the development of the cutting-edge ISO 50001 standard "Energy management systems – Requirements with guidance for use". Set for publication in the third quarter of 2011, the standard gives organisations a systematic approach to identify the main use of energy in their activities. By adopting the standard, an organization can systematically carry out energy-saving efforts, leading to both savings in energy costs and a smaller carbon footprint.

In this connection, the United Nations Industrial Development Organisation (UNIDO) has also taken an interest in supporting energy efficiency initiatives in developing countries. It has initiated a project in Malaysia to promote energy efficiency improvements in the manufacturing sector. Implementation of ISO 50001 and related capacity building activities are integral parts of this project. SIRIM QAS International is also involved in this project and will be building up a pool of resources to audit and certify organizations implementing this standard.

ECO-CONCSIOUS CONSUMERISM

The citizens of the twenty-first century are far more environmentally conscious than their forebears. Environmental disasters, rising global temperatures and increasing awareness have made consumers more conscious about whether or not a product is harmful for the ecosystem. Unsurprisingly, this trend has created a whole new market for goods that are ecologically friendly.

Enter the SIRIM QAS International Ecolabel: a scheme designed to allow consumers to make informed decisions about supporting environmentally sustainable products. And with it, the opportunity for companies to increase their sales and market share.

"Ecolabels serve as environmental management tools as well as marketing instruments," says Dr Chen Sau Soon, Senior General Manager of SIRIM's Environmental Technology Research Centre (ETRC). "Each ecolabel communicates information that matters to today's consumers, such as how much of the product is recyclable, whether it is free of hazardous content and if it consumes less energy."

The SIRIM QAS International Ecolabel is a key part of SIRIM's Eco-4-Eco strategy. When consumers choose products based on ecolabels, green businesses thrive, the environment is preserved and everybody wins.

"Consumers today want to know that their purchases are not hurting the environment any more than they need to," explains Dr Chen. "A product that can give them this assurance stands to gain a lot."

BILL OF GREEN HEALTH

It all started when the global oil crisis of 1973 spurred countries like the United States and Japan to pass laws setting minimum standards for energy efficiency. Fuel and energy efficiency labels, sometimes called Green Stickers, began appearing on automobiles and home appliances in the 1970s and 80s. Over time, the public and private sectors developed deeper concerns over environmental issues, and product labeling began to cover not just energy efficiency, but also other ecological concerns.

The concept of ecolabelling was further defined by the International Standards Organisation (ISO) in 1993. The ISO 14020 Environmental Series standards called for accurate and scientifically verifiable environmental labels to inform users about the impact the item has had on the environment during >>its

ECO-LABELS AROUND THE WORLD

AUSTRALIA: "GOOD ENVIRONMENTAL CHOICE AUSTRALIA (GECA)"

The only environmental labelling program in Australia recognised by the Global Ecolabelling Network (GEN). Launched in late 2001. More than 2,200 products have been assessed as conforming to one of 42 GECA standards to date.

SINGAPORE: "THE SINGAPORE GREEN LABEL"

Among the first ecolabel schemes to be launched in Asia (1992), the Singapore green label has more than 1,600 products certified under its scheme.

GERMANY: "THE BLUE ANGEL"

The first ecolabel in the world (1978), the Blue Angel also covers over 90 categories of product and services. Approximately 11,500 individual products carry the label today.

EUROPE: "THE EU FLOWER"

Some food products sold in Europe may carry several labels at once, indicating factors such as organic production, green energy use and sustainable sourcing of ingredients. The flower logo of the EU ecolabel is recognised and carried across all 27 nations in the European Union.

HONG KONG: "THE HONG KONG GREEN LABEL"

Launched in late 2000, the Hong Kong Green Label has been awarded to about 100 products so far, ranging from detergents to paper.

life cycle. Since then, an increasing number of businesses in developed countries have adopted ecolabelling as way of assuring their customers that they are buying a product that is healthier for the environment. Green marks indicating sustainable sourcing and manufacturing have become a common sight on supermarket shelves and throughout the global value chain.

"SIRIM's ETRC sets the criteria for the SIRIM QAS International ecolabel," says Dr Chen. "The ecolabel currently covers many different product types, including electrical and electronic devices, cleaning products, packaging materials, and paints."

In addition to setting ecolabelling criteria, the ETRC also performs Life Cycle Analyses (LCA) on products. Sometimes called a "cradle-to-grave" analysis, an LCA takes a broad view of the all the possible impacts of a product on the environment. Indeed, professional LCA analysts are now so much in demand, that large companies are now hiring them as full-time consultants to help them improve their environmental performance.

"Life Cycle Analysts determine how design decisions impact the environmental footprint of new products," explains Dr Chen. "However, most SMEs are too small to benefit from an inhouse analyst, which is where our service comes in. We perform LCA s for smaller companies that only have one or two products, and can help with environmental profiling, water footprinting and carbon footprinting."

GREEN CREDENTIALS

But getting the SIRIM ecolabel is an involved process, from application to testing and evaluation to final approval and ongoing monitoring. That is what SIRIM QAS International's Product Certification and Inspection Department does.

"We certify products to ensure that they qualify for the ecolabel, which is in line with the government's policy to promote environmentally friendly products," says Hj. Basori bin Hj. Selamat, Senior General Manager at SIRIM QAS International's Product Certification and

Inspection Department. "Our auditors go through a rigorous list of criteria for each type of product before awarding the ecolabel." The department's 39 auditors typically perform audits for companies producing goods such as paint, plastics, detergents or construction materials.

Say you are a paint manufacturer, for example. In order to get an ecolabel for your products, SIRIM's auditors have to look at the entire life cycle of the paint you produce. They will conduct a comprehensive Life Cycle Analysis of your product that covers all aspects of its existence, from manufacture to application to disposal. The raw material should be sourced in a way that does not damage the environment. The manufacturing process should minimise its atmospheric and water emissions. The packaging of the paint should be environmentally responsible. Finally, the paint should have a minimal impact on the environment when it is ultimately disposed.

Naturally, there is a premium to creating products worthy of the SIRIM ecolabel. There is the cost of the eco-label itself, plus the costs of the auditors. Larger companies with more complex operations may require several days' worth of audits.

"Once a product has received the ecolabel, we will continue to make annual inspections to ensure that the correct standards are being followed," explains Basori. "This ensures that the certification is valid through changes in raw materials or production processes."

GOOD CANDIDATE: Green furniture will no doubt be a good candidate for the SIRIM's ecolabel (see next story, page 24).

Still, you can have too much of a good thing. As an increasing number of manufacturers promote their products as environmentally friendly, ecolabelling has become a victim of its own success. There are an estimated 400 ecolabels in use around the world, but not all of them are worth the ink they are printed on - some add value, and some do not. With so many different standards in use, where do consumers go to educate themselves about ecolabelling?

That's where the Global Ecolabelling Network (GEN) comes in. The GEN is a non-profit international association of third-party environmental labelling organisations that is trying to sort out the confusion over ecolabelling. By coordinating over dozens of national and multinational member organisations as well as various associates, the network works to improve, promote and develop ecolabelling practices worldwide. The GEN accepted SIRIM QAS International as a full member in October 2010, thus granting the SIRIM ecolabel international recognition.

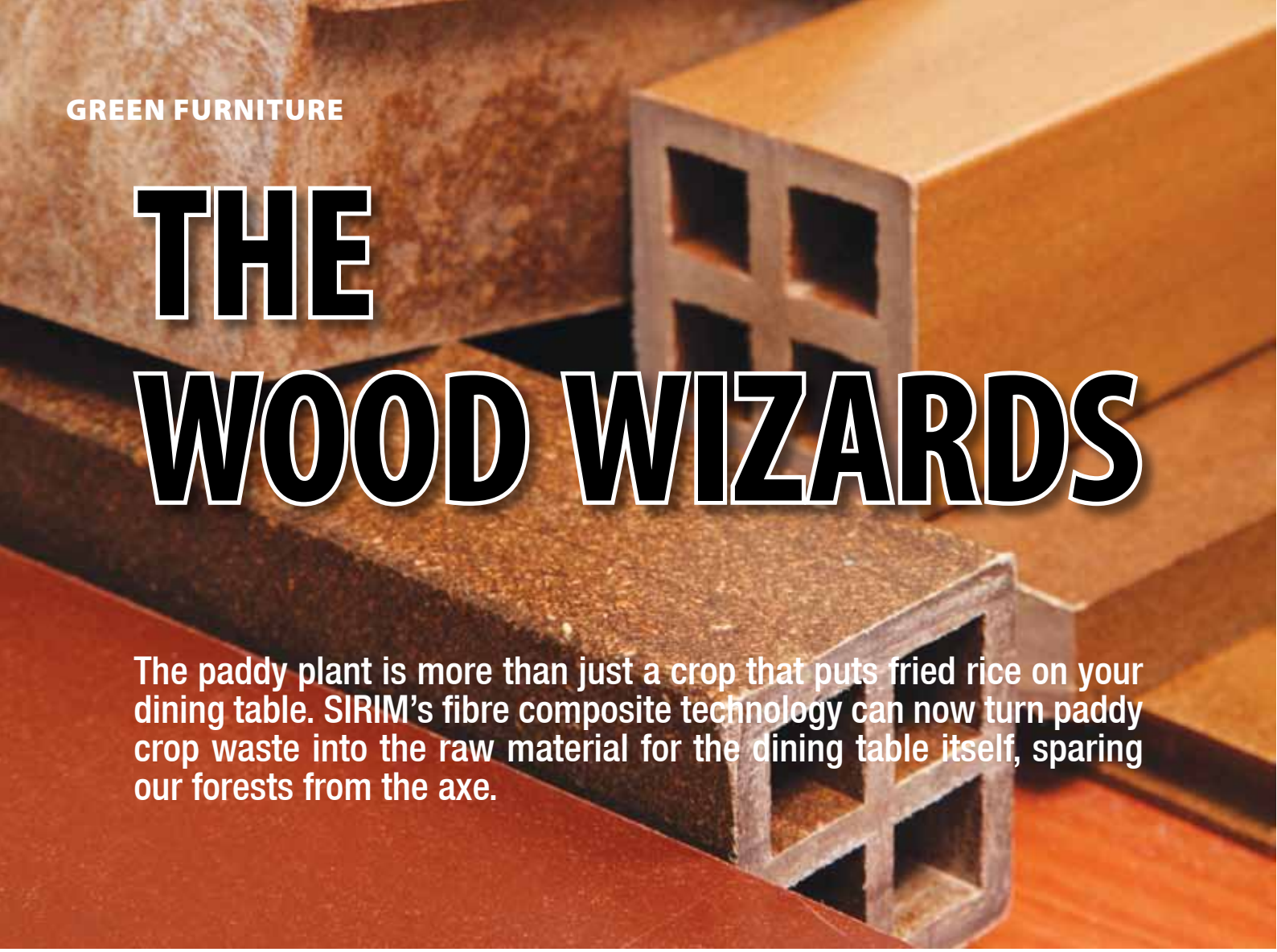
GREEN PAYBACK

So far, only 16 local companies have received the ecolabel from SIRIM. But with the advent of the Eco-4-Eco initiative, SIRIM is targeting a higher uptake.

The question most businesses invariably ask is whether or not an investment into an ecolabel will pay off, and the short answer is Yes. In many markets around the world, products with ecolabels do indeed enjoy a competitive advantage, particularly among the growing, eco-conscious middle-class.

"Any company that wants to sell their products overseas should get an ecolabel, whether you target the public or private sector," says Basori. "It gives your business a distinct advantage."

THE WOOD WIZARDS



The paddy plant is more than just a crop that puts fried rice on your dining table. SIRIM's fibre composite technology can now turn paddy crop waste into the raw material for the dining table itself, sparing our forests from the axe.

FURNITURE EXPORTS ARE projected to reach RM10 billion in 2010. However, the industry's future may be hindered by shortages of natural wood. Rubberwood, together with acacia wood, provides material for about 80% of the furniture produced in Malaysia. Unfortunately, Malaysian furniture makers have been forced to import rubberwood from Thailand to meet current demand. While the Malaysian government is making an effort to ensure a secure source of wood from rubber plantations in the future, the next few years will see serious rubberwood shortages.

The Malaysian timber industry is already feeling the squeeze. Fortunately, there is an ample supply of other raw materials. The Advanced Polymer and Composites Programme at SIRIM has developed an alternative to natural wood, one that utilises the plentiful resource of paddy crop waste, which is one of the most abundant forms of agricultural waste in this region. SIRIM's proprietary technology combines the waste from paddy production with thermoplastic materials to create a bio-composite wood substitute that closely resembles wood, making it an ideal material for indoor furniture especially within the business and hospitality sectors.

SIRIM'S BIO-COMPOSITE REVOLUTION

Humanity has been using wood composites since the dawn of time. The ancient Egyptians used wood veneers on their furniture and sarcophagi and developed varnishes for wood finishing. A thousand years ago, the Chinese used glue and wood shavings to produce furniture. The earliest versions of plywood, a staple of modern construction, first appeared in England and France in the 17th and 18th centuries. By the 19th century, glued laminated timber had been invented as well.

Today, wood composites are commonly used in industries such as furniture and construction. Materials such as particleboard, medium-density fibreboard (MDF) and oriented strand board (OSB) all make use of sawmill scraps and waste wood and can be produced to specific shapes that are difficult to be formed from a single piece of natural wood.

One of the most recent developments in engineered wood materials is wood plastic composite or wood polymer composite (WPC). This combines plastic with various wood fibre materials that are normally considered as waste. Sawdust, peanut hulls, bamboo and straw are all suitable wood fibre materials for making WPC.

The WPC industry is booming. Every year, over 1.5 million tonnes of WPC are produced globally, and the market is growing. One report estimates that demand for WPC in the United States grew 14% in 2010, while demand in Europe grew 18% over the same period. And yet each market has different needs to fill: WPC is used primarily for deck construction in the United States, while in Europe it is used mainly for automobile panels.

Dr Syed Mustafa Syed Jamaludin, Principal Consultant at the Advanced Polymer and Composites Programme in SIRIM says that other countries are using wood plastic composites from sawmill byproducts such as sawdust and wood chips. SIRIM began its research by seeing if it could use paddy fibre waste in a similar way, since this is an abundant natural resource in Malaysia. However, WPC is commonly used as a substitute for natural timber in construction, a field which poses special challenges for SIRIM's bio-composite.

"Construction materials require stringent standards and guarantees before they can be exported," explains Dr Syed. "We decided to explore other, less restrictive possibilities. Instead of going into the housing construction materials industry, we chose indoor furniture as a niche in which we could compete."

Some types of WPC are made from 100% recycled plastic and wood waste, thus sparing the need to produce new plastic and chop down more trees. However, WPC products aimed at high-end markets are made from virgin materials to ensure consistent quality, which makes them a lot less ecologically friendly.

ONE LEG AT A TIME: SIRIM's bio-composite material is heated and then pushed through a die to produce long profiles that are then cut into various lengths depending on the requirements of the furniture.

By using recycled materials, SIRIM's Bio-Composite Green Furniture stands solidly on the greener side of the equation. The organic fiber component, which makes up about 60-to-70-percent of the composite comes from paddy waste such as paddy husks and straw. The thermoplastic component, which is about 30-to-40-percent of the composite, can come from various grades of polypropylene pellets. These pellets can be sourced from recycled plastic to further ensure the environmental friendliness of the product.

SIRIM's green furniture model will also help paddy farmers increase their returns on their crops. Currently, paddy waste is mostly just left out in the open to decompose. But if farmers could sell that waste on to green furniture manufacturers, they could realise improve their profitability.

"Ideally, a Green Furniture production facility should be located close to a reliable supply of >>

paddy waste," says Dr Syed. "A Green Furniture manufacturer should choose a convenient production site near a rice mill."

FLEXI-FURNITURE

At first glance, the process of making green furniture may look convoluted. The first part of the process is compounding, which involves processing and mixing the ingredients into the composite material. Next comes profile extrusion, in which the bio-composite is heated and then pushed through a die to produce long profiles that are then cut into various lengths depending on the requirements of the furniture. Different dies can be used to produce profiles with different cross-sectional shapes. By combining a variety of profiles, SIRIM's engineers can assemble into tables, chairs and cabinets.

"SIRIM's extruder produces straight profiles in the form of solid sheets and hollow pipes, but we have also developed techniques to create more varied profiles," explains Dr Syed. "Outdoor furniture such as deck chairs and benches are made up of straight shapes, so they are easier to produce."

"SIRIM's green furniture lasts longer and is more durable than most natural wood."

Nonetheless, indoor furniture sometimes uses more artistic designs, and so requires more curved shapes. For instance: the armrest of a chair might be composed of a single curved piece of wood, and SIRIM's bio-composite sheets and profiles may be bent using heat to produce the same results. This is the secret of SIRIM's process, as bending is something that most other bio-composite processes cannot achieve.

FURNISHING THE WORLD

Since SIRIM's bio-composite is made from both organic fibre and plastic, it benefits from the best of both worlds. SIRIM's green furniture lasts longer and is more durable than most natural wood. The fibre content of the bio-composite gives the material greater dimensional stability, meaning that it holds its shape better than regular plastic. At the same time, it has a very similar appearance and texture to wood, and can be cut and worked like wood as well.

SIRIM's bio-composite is also very resistant to water damage. All natural wood tends to be vulnerable to water absorption, and when exposed to rain or spilled liquid, natural wood sometimes swells or even cracks as a result. Because of this, natural wood is often treated with chemicals to reduce absorption. These chemicals might be harmful to the environment.

"Our bio-composite material does have microscopic gaps where water can soak in, but the material swells very little when it is drenched," says Dr Syed. "This eliminates the need for treatment with chemicals, which makes the manufacturing process far more environmentally friendly."

Admittedly, the bio-composite process is still an expensive one. SIRIM's green furniture is a pricey product when compared to rubberwood furniture. Nevertheless, its green qualities make it perfect in niche markets with a strong culture of environmental conservation, where people do not mind paying more for something that is greener. That is why SIRIM is actively promoting the technology in trade fairs and expos in the United States and Europe. And, at each stop they make, Dr Syed and his team are overwhelmed with enquiries from business people who are eager to make their enterprises more green by reducing the carbon footprint of their furniture needs.

"Buyers often show interest in the finished furniture pieces we bring with us. Unfortunately, we are not furniture manufacturers," smiles Dr Syed. "What we are really looking for is a company that wants to license the technology; a company that is serious about promoting and selling it. We need a business partner that has the global reach and marketing expertise required to educate buyers about the benefits of green furniture."

TO WOOD AND BEYOND

SIRIM's green furniture lasts longer and is more durable than most natural wood. What really makes it "green", however, is the fact that it can be recycled.

Unlike natural wood, SIRIM's bio-composite can be recycled. By breaking down an unwanted piece of green furniture and grinding it back into pellets, the raw material can be reclaimed and used anew. A furniture manufacturer could therefore take advantage of this unique quality by offering a "sell-back" option, allowing customers to turn in old furniture to be recycled in exchange for rebates, thus significantly reducing the need to chope down trees to make new furniture.

Contemporary tastes for interior design change continuously, and the demand for new furniture with new designs and styles will always be there. With SIRIM's technology, however, Mother Nature no longer needs to foot the bill for society's evolving tastes. Indeed, businesses that want to swap their current Victorian-style furnishings for Balinese-themed furniture can do so without felling a single tree.

All the processes and systems for making SIRIM's furniture are ready to be scaled-up. Dr Syed explains that SIRIM could either set up a special business unit to supply materials and profiles to the private sector, or they could set up a joint venture with a suitable partner. SIRIM's engineers can also provide consultancy for the development of the furniture's production facilities, and interested entrepreneurs can draw upon SIRIM's expertise in processing technologies, equipment and site preparation.

"Our furniture is genuinely green because of the source of the raw material, because it can be recycled, and because of how we make it," enthuses Dr Syed. "It has a lot of potential, and it won't be long before green furniture will be used all over the world."

1 March 2011 – SIRIM Berhad introduced its latest product for the community, SIRIM Robokit, a basic robot development program to provide early exposure to ICT technology to primary students from three schools in Melaka. The schools which received the program were Sekolah Kebangsaan Merlimau 2, Sekolah Kebangsaan Chinchin and Sekolah Kebangsaan Chenderah. Science, Technology and Innovation Minister, YB Datuk Seri Dr Maximus Johnity Ongkili launched the event.

12 January 2011 – Senior Researcher Dr Mohd Afian Omar receiving the Cyber International Genius Inventor Fair (CIGIF) award for his project *Potential Application of Waste Materials as a Binder for Metal Injection Moulding Process*. He was the sole gold award recipient from Malaysia at the event, which attracted over 200 applications from around the world. The award was a cooperation between Korean Invention Academy and MINDS Malaysia.

21 February 2011 – YB Datuk Seri Dr Maximus Johnity Ongkili, Minister of Science, Technology and Innovation (MOSTI) launches the planting of an eco-friendly reef around Shanghai Island in Sandakan, Sabah. An estimated 400 local fishermen in the vicinity of Batu Sapi will enjoy an increase of revenue through more lucrative catches as the reefs will attract more marine life in the area within six months to two years. Also present was Batu Sapi MP, YB Datuk Linda Tsen (in white shirt).

21 February 2011 – President and Chief Executive, Dato' Ir Hj Yahaya Ahmad launches the Micro Hydro Generator in Lembah Temir, Raub, Pahang. Developed by SIRIM, the generator pumps 15.5kW of electricity to a local resort in the area.

2 March 2011 – SIRIM signs an MoU with Al Madinah International University (MEDIU) for the cooperation of expertise in technical fields and laboratory facilities as well as in forensic engineering. The MoU was signed by President and Chief Executive of SIRIM, Dato' Ir Hj Yahaya Ahmad and MEDIU Rector, Prof Dr Mohammad Khalifa Al Tammi. Former Prime Minister Tun Dr Mahathir Mohamad witnessed the event.

MEASURE UP TO GLOBAL STANDARDS

OUR SERVICES

CERTIFICATION

• Quality Management System (ISO 9001, ISO/TS 16949, ISO 13485 and MS 1900)
• Environmental Management System (ISO 14001)
• Occupational Health and Safety Management System (OHSAS 18001 and MS 1722)
• Information Security Management System (ISO/IEC 27001)
• IT Service Management System (ISO/IEC 20000)
• Food Safety Management System (ISO 22000, HACCP and GMP)
• Forest Management • Chain of Custody (COC)
• Business Continuity Management (BS 25999-2) • Social Accountability (SA 8000)
• Roundtable on Sustainable Palm Oil (RSPO) • RSPO Supply Chain
• Clean Development Mechanism (CDM) • EcoLabelling
• Product Certification • Product Listing • Modular Coordination
• Electromagnetic Compatibility (EMC) • Communication Equipment
• Malaysian Brand • NGV Workshop • IECEE-CB Test Certificates

TESTING

• Chemical and Consumer • Civil and Construction • Electrical and Electronic
• Fire Protection • Mechanical • Radio Frequency & EMC • IECEE Test Reports

INSPECTION

• Engineering Inspection • Inspection Services

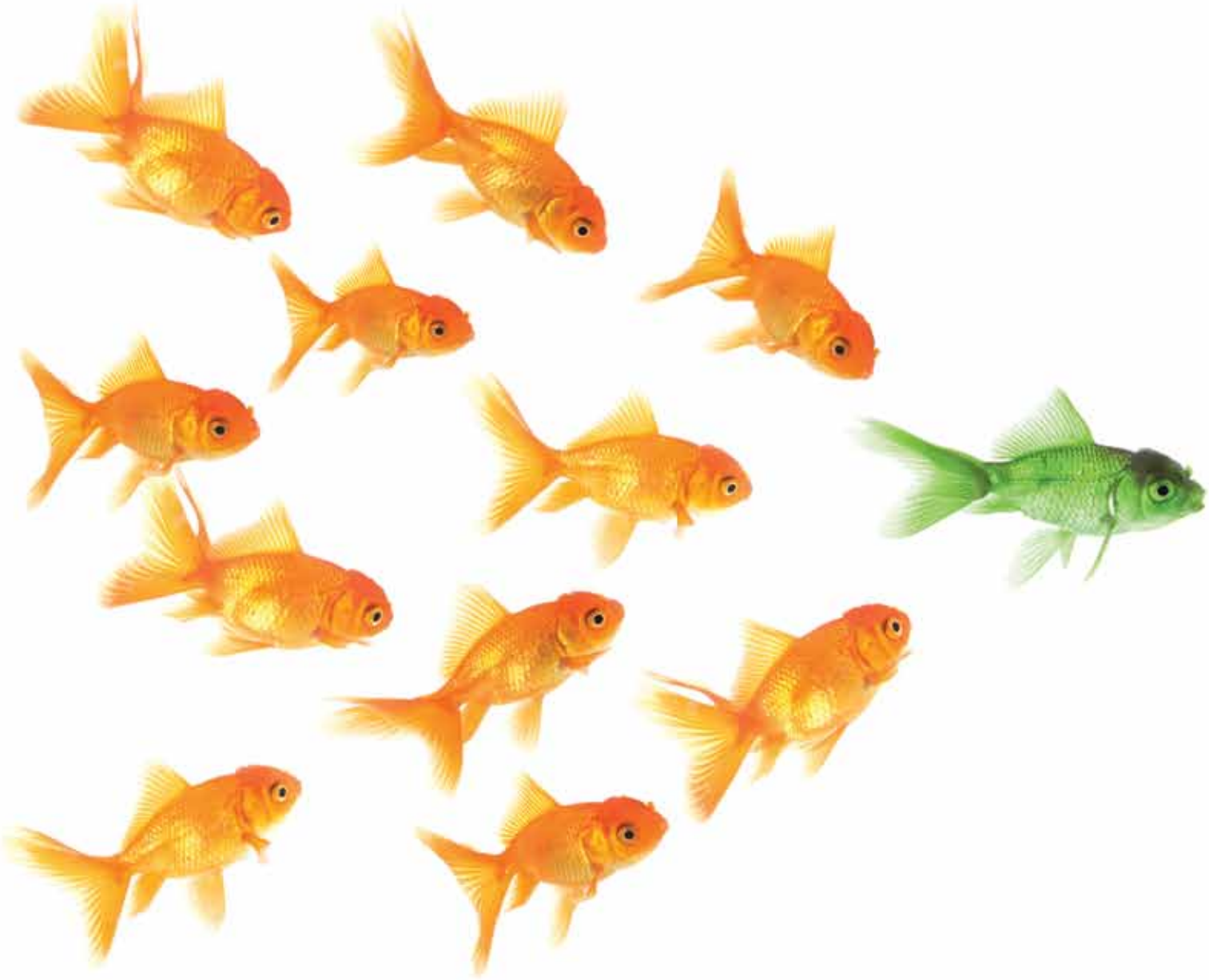
SIRIM QAS INTERNATIONAL

IQNet® THE INTERNATIONAL CERTIFICATION NETWORK

Contact Sales Marketing & Business Development:
603-5533 6400 or log on to www.sirim-qas.com.my
Building 8, SIRIM Complex, 1, Persiaran Dato' Menteri, P.O. Box 7035, 40911 Shah Alam, Selangor, Malaysia

QUALITY, SAFETY AND RELIABILITY
ACHIEVE NATIONAL & INTERNATIONAL RECOGNITION THROUGH OUR SERVICES

We can make sure that going green doesn't mean you have to fall behind.



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