



mosti

LAPORAN TAHUNAN
ANNUAL REPORT **2011**



"Malaysia berjaya mengubah ekonomi berdasarkan pertanian kepada ekonomi berdasarkan pembuatan dan perkhidmatan. Dan kini kami komited merealisasikan matlamat Wawasan 2020 – ekonomi berpendapatan tinggi – menerusi Pelan Transformasi Ekonomi atau ETP. Inisiatif dan pembaharuan dalam ETP direka bentuk untuk menyampaikan pertumbuhan yang akan memanfaatkan ramai rakyat Malaysia dan mentransformasikan Malaysia menjadi sebuah negara maju pada tahun 2020."

"Malaysia has successfully transformed itself from an agriculture-based economy to one that was straddled on manufacturing and services. And now we are committed in working towards realising the goal of Vision 2020 – a high-income economy that is based on innovation and knowledge generation – through our Economic Transformation Plan or ETP. The initiatives and reforms of the ETP are designed to deliver growth that would benefit Malaysians and transform Malaysia into a developed country by 2020."

**Y.A.B. Dato' Seri Najib Tun Abdul Razak, the Prime Minister of Malaysia,
Bernama.**

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Visi

Meneroka, membangun dan memanfaatkan STI untuk menjana ilmu pengetahuan, mencipta kekayaan dan kesejahteraan masyarakat ke arah mencapai ekonomi berpendapatan tinggi yang kompetitif, mampan dan terangkum.

Misi

Memacu dan mengurus STI untuk pertumbuhan sosioekonomi dengan menggalakkan kreativiti dan inovasi; memperkuuhkan penyelidikan dan pembangunan berasaskan pasaran; menghasil dan menyebarkan teknologi baru; membangun dan menarik bakat; meningkat kesedaran STI; dan memperkuuhkan kerjasama dan perkongsian.

Vision

Discovering, developing and utilising STI for knowledge generation, wealth creation and societal well-being towards achieving a high income advanced economy that is competitive, sustainable and inclusive.

Mission

To drive and manage STI for socio-economic growth by intensifying creativity and innovation; strengthening market driven R&D; sourcing and diffusing new technology; developing and attracting talent; deepening STI awareness; and strengthening collaborations and partnerships.

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Perutusan Menteri

Tahun 2011 menandakan bermulanya Rancangan Malaysia ke sepuluh (RMKe-10: 2011-2015) yang akan membawa kita ke satu lonjakan yang genting dalam merealisasikan Wawasan 2020. Wawasan ini jelas menyatakan aspirasi Malaysia untuk menjadi sebuah negara maju dan berpendapatan tinggi melalui penciptaan ekonomi berdasarkan pengetahuan dan dipandu oleh Sains, Teknologi dan Inovasi (STI). Tahun ini juga menyaksikan mobilisasi jentera MOSTI pada pacuan yang lebih tinggi untuk membantu memperkuatkan keupayaan dan kemampuan teknologi dan inovasi negara.

RMKe-10 menumpukan fokus kepada pertumbuhan yang diterajui oleh sektor swasta. Satu dari cabaran hebat kepada negara pada hari ini ialah bagaimana untuk membantu mewujudkan penglibatan yang lebih besar dari sektor swasta dalam senario global yang penuh dengan ketidaktentuan. Bagaimana untuk memajukan lagi penyertaan sektor swasta demi membantu negara menjana gelombang baru kemakmuran ekonomi dalam memastikan Malaysia mampu membuat lonjakan besar untuk mencapai status negara berpendapatan tinggi pada tahun 2020? Ia satu tugas yang mencabar untuk disempurnakan dalam masa kurang dari sembilan tahun, namun kami percaya ia mampu dicapai. Kami telah membuat sebilangan inisiatif transformasi termasuklah membina sebuah model ekonomi baru untuk negara yang menekankan kreativiti, inovasi dan penambahan nilai.

Di MOSTI, kami telah merevolusikan inisiatif STI negara, khususnya dalam penyelidikan dan pembangunan (R&D), untuk memastikan sektor swasta terus memacu pertumbuhan ekonomi. Keutamaan lain termasuklah pembangunan sumber manusia dan peningkatan kompetensi dalam teknologi baru terutamanya dalam industri yang berpotensi mencipta pendapatan tinggi untuk negara seperti minyak dan gas, serta bioteknologi. MOSTI terlibat dalam mewujudkan persekitaran yang tepat untuk menyuburkan perkembangan industri-industri ini dengan menggalak dan membantu mereka yang mempunyai sumber dan kepakaran untuk menjalankan R&D dorongan industri yang dapat memajukan perniagaan mereka. R&D serta usaha niaga yang inovatif mampu menjana penciptaan pengetahuan, produk dan proses dengan tujuan meninggikan lagi mutu produk dan perkhidmatan Malaysia dan menyerlahkan lagi kelebihan persaingan negara di pasaran global.

Satu lagi matlamat penting ialah membangun modal insan dalam bidang STI supaya rakyat Malaysia mempunyai kebolehan merekayasaan dan mengomersilkan teknologi, dan bukan hanya menggunakan dan mengimport teknologi dari negara luar. Sebagai pencipta dan pemilik teknologi sendiri, kita akan dapat banyak manfaat sampingan menerusi pengkomersilan teknologi, seperti pemindahan teknologi kepada negara lain yang minta membeli dan menggunakan teknologi tersebut. Usaha ini akan memberikan pendapatan tambahan kepada negara, yang mana akan menyumbang kepada penciptaan kekayaan dalam negara.

Saya ingin mengambil kesempatan ini untuk menyatakan penghargaan saya kepada pihak pengurusan dan kakitangan MOSTI di atas komitmen dan dedikasi mereka dalam melaksanakan tugas yang diamanahkan kepada MOSTI dan juga kerana sama-sama membantu menjadikan tahun 2011 satu lagi tahun yang berjaya bagi Kementerian.

Y.B. Datuk Seri Dr. Maximus Johnity Ongkili
Menteri Sains, Teknologi dan Inovasi

Minister's Message

The year 2011 marked the beginning of the Tenth Malaysia Plan (10MP: 2011-2015) that will propel us on the next crucial leap towards realising Vision 2020. The vision clearly states Malaysia's aspirations of becoming a high income and advanced country through the creation of a knowledge-based economy, powered by Science, Technology and Innovation (STI). The year also witnessed the mobilisation of MOSTI's machinery on a much higher gear that help to strengthen country's technological and innovation capacity and capability.

The 10th Malaysia Plan placed its focus on private sector-led growth. One of the greatest challenges facing the country today is how to facilitate greater involvement of the private sector in the current global scenarios full of uncertainties. How to further advance active private sector engagement to assist the country to generate a new wave of economic prosperity to ensure Malaysia makes a quantum leap to a high income country by 2020? A daunting task though in less than nine years to go, yet we believe that it is achievable. We have undertaken many national transformation initiatives that include developing a new economic model for the country that put emphasis on creativity, innovation and value addition.

In MOSTI, we have revolutionised the national STI initiatives, in particular, in research and development (R&D), to ensure private sector continues to drive economic growth. Other priorities include human resource development and competency building in emerging technologies especially those in the industries with the potential to create a high income for the nation, such as oil and gas and biotechnology. MOSTI is involved in creating the right environment for these industries to flourish by encouraging and assisting those with the resources and expertise to carry out industry-driven R&D that can boost their own businesses. R&D as well as innovative ventures can drive the creation of knowledge, products and processes with the aim of further improving Malaysian products and services and sharpening the country's competitive edge in the global market.

Another important goal is to build the country's intellectual capital in STI so that Malaysians have the ability to develop, re-engineer and commercialise technology rather than merely using and importing the technology of other nations. As creators and owners of the rights to our own technology, we will be able to gain many spin-off benefits through commercialising the technology, such as knowledge transfer to nations interested to buy and adopt the technology. This effort will bring added revenue for the country, which will contribute towards wealth creation for the nation.

I would like to take this opportunity to extend my appreciation to the management and staff of MOSTI for their commitment and dedication in executing the tasks entrusted to MOSTI and for helping to make 2011 another successful year for the Ministry.

Y.B. Datuk Seri Dr. Maximus Johnity Ongkili
Minister of Science, Technology and Innovation



Prakata Oleh Ketua Setiausaha

Pada tahun 2011, kami meneruskan momentum untuk mencapai prestasi yang lebih tinggi melalui pemantauan rapi output yang telah ditetapkan dalam Rancangan Malaysia Ke 10 yang dilancarkan pada tahun ini. Keberhasilan utama yang dihasilkan termasuklah penjanaan ekonomi berdasarkan inovasi melalui STI, intensifikasi R&D, pengukuhan bakat STI, pemupukan budaya inovatif dan kreatif, perluasan kesedaran, penghayatan dan aplikasi STI.

Tahun ini menyaksikan kemajuan yang signifikan dalam inisiatif R&D dan inovasi teknologi terutamanya di bidang teknologi baru seperti bioteknologi dan nanoteknologi. Pada masa yang sama kemajuan juga dilihat dalam penjanaan dan pertukaran pengetahuan di peringkat tempatan dan antarabangsa; peningkatan modal insan mahir; pengukuhan infrastruktur fizikal; dan promosi STI di kalangan penggiat industri dan orang awam. Pencapaian MOSTI pada tahun ini sebahagian besarnya adalah hasil dari asas kukuh yang terbina dalam tempoh RMKe-9 dan Rancangan Malaysia yang terdahulu. Semua pencapaian ini telah membolehkan kita membangunkan lanskap yang lebih kondusif bagi inisiatif STI di masa hadapan.

Pencapaian kita sehingga kini telah diperolehi bukan sahaja melalui perancangan dan pelaksanaan yang rapi, rancangan dan strategi Kementerian, tetapi juga dilakukan melalui kerja berpasukan dalam Kementerian dan perkongsian bijak dengan Kementerian, jabatan dan agensi kerajaan yang lain, serta kerjasama industri dan awam. Kementerian mengambil berat akan kepentingan mewujud dan mengekalkan suasana kerjasama rapat antara semua pihak yang dapat membantu kita untuk memajukan Negara dalam bidang STI. Kita sentiasa menggalakkan pihak industri untuk menambah nilai terhadap produk, perkhidmatan, proses dan teknologi untuk mendapat akses pasaran meluas di peringkat tempatan dan antarabangsa.

Melalui pengalaman dan pembinaan keupayaan dan kapasiti dalam STI, kita dapat menjana pengetahuan baru dalam bidang strategik yang mampu menjana kekayaan pada masa hadapan. Di MOSTI, peluang seumpama ini terus dipacu melalui pendekatan kluster Agensi, jabatan dan unit di MOSTI ditempatkan secara strategik dalam kluster tertentu, iaitu Teknologi Maklumat dan Komunikasi (ICT), Bioteknologi, Industri, Laut ke Angkasa, Perkhidmatan Teras Sains dan Teknologi. Setiap kluster mempunyai tugas khusus, dari penggalakan penyelidikan dan pengkomersilan ke pemupukan kesedaran tentang STI yang meluas. Marilah kita sama-sama menyatupadukan segala usaha kita dan menggerakkan usaha ini bagi memenuhi keberhasilan keseluruhan MOSTI dengan tujuan utama untuk memajukan STI demi penjanaan pengetahuan, penciptaan kekayaan dan kesejahteraan rakyat.

Saya ingin merakamkan setinggi penghargaan kepada semua warga MOSTI di atas usaha mereka kerana menghasilkan satu lagi pencapaian yang membanggakan.

Sekian, terima kasih.

DATO' MADINAH MOHAMAD
Ketua Setiausaha MOSTI

Foreword By The Secretary-General

In 2011, we continued with the momentum to achieve a high level of performance by closely keeping track of the deliverables expected of us as outlined under the Tenth Malaysia Plan (10MP), which was kicked off during the year. The key deliverables include generation of innovation-led economy through STI, intensification of R&D, strengthening STI talents, creation of innovative and creative culture and increasing the awareness, appreciation and application of STI.

The year saw a significant progress in R&D initiatives and technological innovation especially in emerging areas such as biotechnology and nanotechnology. Also moving forward at a commendable pace are generation and exchange of knowledge on both local and international fronts; upgrading of skilled human capital; strengthening of physical infrastructure; and the promotion of STI among industry players and the general public. MOSTI's achievements during the year owed much to the strong foundation built during the 9MP period and previous Malaysia Plans. These paved the way for us to forge a more conducive landscape for STI initiatives in the coming years.

Our achievements thus far have been made possible not only with careful planning and implementation of the Ministry's plans and strategies but also by working together as a team within the Ministry and building smart partnerships with other Ministries, Government departments and agencies as well as many industry players in both the public and private sectors. We are always mindful of the importance of creating and maintaining an environment of close collaboration with all parties that can help us advance Malaysia's STI further. We have also consistently encourage industry players to add value to products, services, processes and technologies so as to gain greater market access both locally and internationally.

By embracing and building our capability and capacity in STI, we are now capable of generating new knowledge in certain strategic fields of which we could in future able to realise their potential wealth creating opportunities. Within MOSTI, such opportunities continued to be driven by our "clustering" approach. Our agencies, departments and units are strategically placed in specific clusters, namely Information and Communication Technology (ICT), Biotechnology, Industry, Sea to Space, Science and Technology Services and Support Services. Each cluster has specific tasks, ranging from the promotion of research and commercialisation to the creation of greater awareness of STI. Let us continue to integrate all our efforts and mobilise them to fulfil MOSTI's overall deliverables with the ultimate objective of advancing STI for knowledge generation, wealth creation and societal well-being.

My sincere appreciation goes to all the management and staff of MOSTI for your efforts to deliver yet another commendable performance. Thank you.

DATO' MADINAH MOHAMAD
Secretary-General of MOSTI

Profil MOSTI

Profile Of MOSTI



Pengurusan Tertinggi Top Management

1. **Y.B. Datuk Seri Dr. Maximus Johnity Ongkili**
Menteri / Minister
2. **Y.B. Datuk Haji Fadillah b. Haji Yusof**
Timbalan Menteri / Deputy Minister
3. **Dato' Madinah bt. Mohamad**
Ketua Setiausaha / Secretary-General
4. **Prof. Datin Paduka Dr. Khatijah bt. Mohd Yusoff**
Timbalan Ketua Setiausaha (Sains)
Deputy Secretary-General (Science)
5. **Dato' Dr. Sharifah Zarah bt. Syed Ahmad**
Timbalan Ketua Setiausaha (Dasar)
Deputy Secretary-General (Policy)
6. **Kamel b. Mohamad**
Setiausaha Bahagian Kanan (Perancangan)
Senior Under-Secretary (Planning)
7. **Azizah bt. Yusof**
Setiausaha Bahagian Kanan (Pengurusan)
Senior Under-Secretary (Management)

Pengurus Kanan & Ketua Eksekutif Senior Management & Key Executives

Bahagian

- Dr. Amirudin b. Abdul Wahab
Bahagian Dasar ICT
ICT Policy Division (DICT)
- Prof. Dr. Rofina Yasmin bt. Othman
Bahagian Bioteknologi Kebangsaan
National Biotechnology Division (BIOTEK)
- Prof. Dr. Nor Aieni bt. Haji Mokhtar
Direktorat Oceanografi Kebangsaan
National Oceanography Directorate Division (NOD)
- Prof. Dr. Halimaton bt. Hamdan
Direktorat Nanoteknologi Kebangsaan
National Nanotechnology Directorate (NND)
- Datin Nur Wahidah Wong bt. Abdullah
Bahagian Inovasi dan Pengkomersilan
Innovation & Commercialisation Division (I&P)
- Dr. Vilasini Pillai
Urusetia Majlis Sains dan Penyelidikan Kebangsaan
Secretariat of the National Science and Research Council (NSRC)
- Ho Koon Seng
Bahagian Antarabangsa
International Division
- Mohd Khairul Adib b. Abd Rahman
Bahagian Industri
Industry Division
- Chong Poon Chai (mulai Jun 2011)
Bahagian Laut ke Angkasa (S2S)
Sea To Space Division (S2S)
- Dr. Mohd Zahit b. Ali (sehingga Januari 2011)
Bahagian Laut Ke Angkasa (S2S)
Sea To Space Division (S2S)
- Azizah bt. Ariffin (mulai Februari 2011)
Bahagian Teras, Sains dan Teknologi
Science & Technology Core Division
- Syed Abu Bakar b. Syed Hassan Alhabshi
(sehingga Januari 2011)
Bahagian Teras, Sains dan Teknologi
Science & Technology Core Division
- Dr. Tan Yit Quin (mulai Ogos 2011)
Pusat Maklumat Sains dan Teknologi Malaysia (MASTIC)
Malaysian Science and Technology Information Centre (MASTIC)
- Puan Sakena b. Abdul Jabar (sehingga April 2011)
Pusat Maklumat Sains dan Teknologi Malaysia (MASTIC)
Malaysian Science and Technology Information Centre (MASTIC)
- Tuan Sembak b. Tuan Endot
Bahagian Kewangan
Finance Division
- Choong Kok Eng
Bahagian Pembangunan
Development Division
- Mat Yaacob b. Mohammad (mulai April 2011)
Bahagian Pembangunan Sumber Manusia
Human Resource Development Division
- Zailan bt. Mohd Yusof (sehingga Mac 2011)
Bahagian Pembangunan Sumber Manusia
Human Resource Development Division
- Datin Normala bt. Sharom
Bahagian Pengurusan Teknologi Maklumat
Information Technology Management Division (PTM)
- Noor Azzah bt. Abdul Aziz
Unit Perundangan
Legal Unit
- Mohd Nasri b. Mohd Nasir
Unit Audit Dalam
Internal Audit Unit (UAD)
- Lokman b. Abdul Rahman (mulai Mei 2011)
Unit Komunikasi Korporat
Corporate Communications Unit (UKK)
- Akmal Ariff b. Zainul Ariff (mulai April 2011)
Bahagian Pentadbiran
Administration Division
- Asaari b. Zainudin (Sehingga Mac 2011)
Bahagian Pentadbiran
Administration Division



Jabatan-jabatan Departments

Prof. Dr. Nor Muhammad b. Mahadi
Institut Agro-Bioteknologi (ABI)
Agro-Biotechnology Institute (ABI)

Prof. Dato' Dr. Mohammed Isa b. Abdul Majid
Institut Farmaseutikal dan Nutraseutikal Malaysia
(IPharm)
Institute Pharmaceutical and Nutraceutical Malaysia
(IPharm)

Prof. Dr. Nor Muhammad b. Mahadi
Institut Genom Malaysia (MGI)
Malaysia Genome Institute (MGI)

Dato' Dr. Daud b. Mohamad
Agensi Nuklear Malaysia (NUKLEAR MALAYSIA)
Malaysia Nuclear Agency (NUCLEAR MALAYSIA)

YM Raja Dato' Abdul Aziz b. Raja Adnan
Lembaga Perlesenan Tenaga Atom (AELB)
Atomic Energy Licensing Board (AELB)

Fadilah bt. Baharin
Jabatan Standard Malaysia (STANDARDS MALAYSIA)
Department of Standards Malaysia (STANDARDS
MALAYSIA)

Dr. Mustafa Din b. Subari
Agensi Angkasa Kebangsaan (ANGKASA)
National Space Agency (ANGKASA)

Dr. Yap Kok Seng
Jabatan Meteorologi Malaysia (JMM)
Malaysian Meteorological Services (MMS)

Dato' Darus b. Ahmad
Agensi Remote Sensing Malaysia
(REMOTE SENSING MALAYSIA)
Malaysian Remote Sensing Agency
(REMOTE SENSING MALAYSIA)

Ahmad Ridzuan b. Ibrahim
Jabatan Kimia Malaysia (KIMIA MALAYSIA)
Department of Chemistry Malaysia (KIMIA MALAYSIA)

Dr. Ab Rahman b. Awang
Pusat Sains Negara (PSN)
National Science Centre (PSN)

Dr. Ahmad b. Ibrahim
Akademi Sains Malaysia (ASM)
Academy of Sciences Malaysia (ASM)

Vacant
Ketua Pegawai Eksekutif
Yayasan Inovasi Malaysia (YIM)
Chief Executive Officer
Malaysia Innovation Foundation (YIM)

Zailani b. Samberid
Ketua Pegawai Eksekutif
Yayasan Angkasawan Malaysia (YAM)
Chief Executive Officer
Malaysia Astronaut Foundation (YAM)

Syarikat MKD/GLC/CLG MKD/GLC/CLG Company

Dato' Iskandar Mizal b. Mahmood
Malaysia Biotechnology Corporation
(BIOTECHCORP)

Dato' Dr Mohd Nazlee b. Kamal
Inno Biologics Sdn Bhd (INNOBIO)

Dato' Badlisham b. Ghazali
Multimedia Development Corporation (MDeC)

Dato' Abdul Wahab b. Abdullah
MIMOS Berhad

Lt. Kol. (B) Husin b. Jazri
CyberSecurity Malaysia

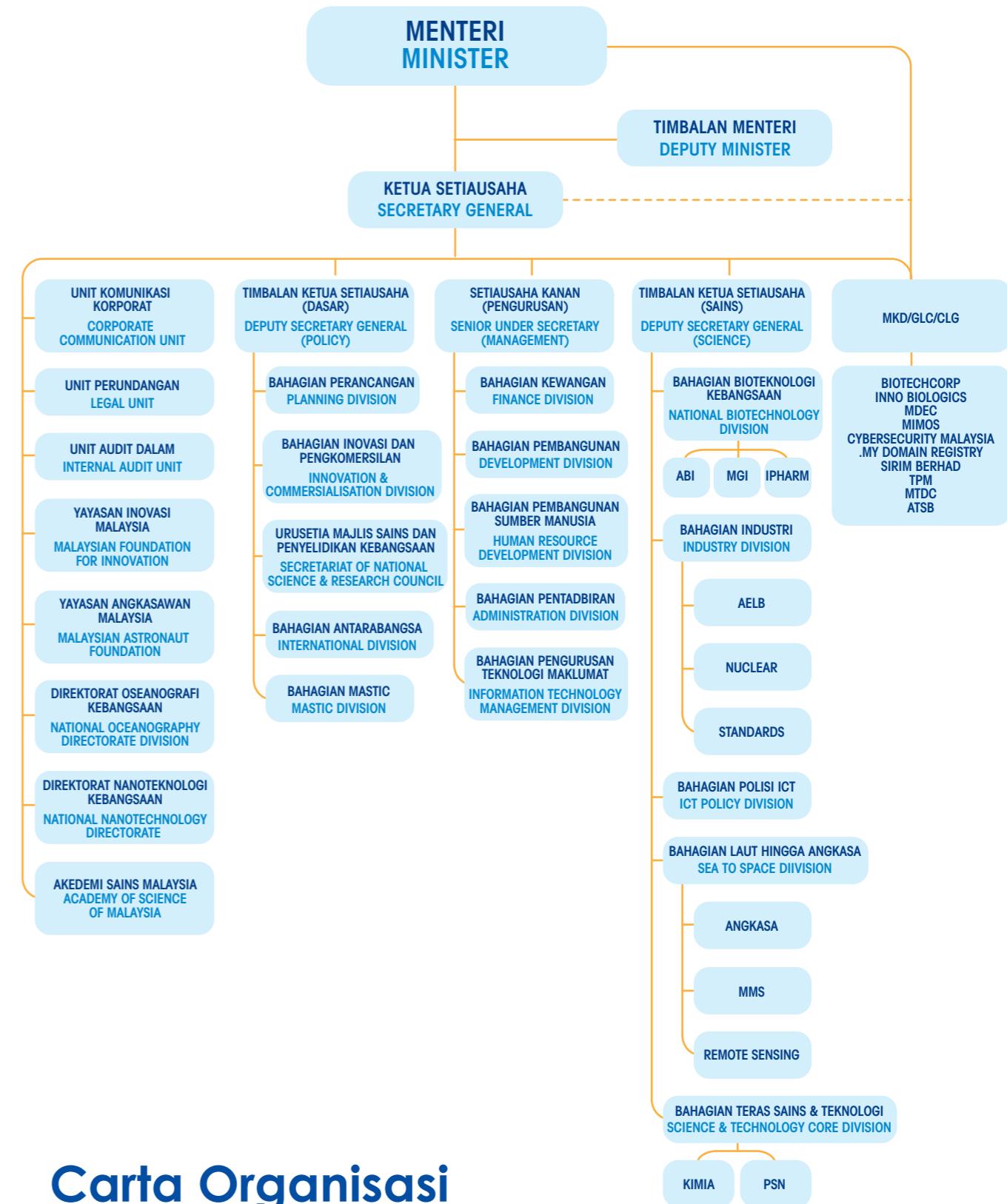
YM. Tengku Intan Narqiah Tengku Othman
Malaysian Network Information Centre (.my
DOMAIN REGISTRY)

Dato' Yahaya b. Ahmad (deceased)
SIRIM Berhad

Dato' Azman b. Shahidin
Technology Park Malaysia Corporation Sdn Bhd
(TPM)

Dato' Azlin b. Alias
Malaysian Technology Development Corporation
(MTDC)

Dato' Dr. Ahmad Sabirin b. Arshad
Astronautic Technology (M) Sdn Bhd (ATSB)



Carta Organisasi Organisation Chart

Fungsi Utama Bahagian, Jabatan Dan Agensi

BAHAGIAN/UNIT

Bahagian Pentadbiran

- Menyediakan khidmat sokongan yang berkesan dan penyelarasan antara semua Jabatan dan Unit dalam MOSTI

Unit Komunikasi Korporat

- Menyampaikan maklumat demi mengukuhkan imej korporat MOSTI menerusi perhubungan awam dan program peningkatan kesedaran

Bahagian Pembangunan

- Menyelaras dan memantau pelaksanaan program/projek MOSTI di bawah Rancangan Lima Tahun Malaysia

Bahagian Kewangan

- Menyelia segala aktiviti kewangan MOSTI, termasuk pengurusan bajet operasi, pemerolehan/pembayaran/perakaunan, dan proses permohonan pinjaman untuk ibu pejabat MOSTI dan semua Pusat Biaya di bawahnya.

Bahagian Pengurusan Sumber Manusia

- Menyelia pengambilan guna tenaga, kenaikan pangkat dan pengiktirafan, pembangunan kerjaya kakitangan, pergerakan dan penilaian prestasi anggota dalam MOSTI

Bahagian Dasar ICT

- Menyelaras dan mengurus Dana Pembangunan Industri Kandungan (e-Content Fund); projek ScienceFund, TechnoFund dan InnoFund; serta menyelaras penyertaan Kluster ICT dalam mempertingkatkan kesedaran ICT

Bahagian Industri

- Merangka dan melaksanakan dasar berkaitan dengan teknologi termaju, terutama bahan-bahan lanjutan; pembuatan maju; mesen dan peralatan; bahan baru; tenaga alternatif; dan 'dari buangan ke kekayaan'

Bahagian Pengurusan Teknologi Maklumat

- Memastikan perkhidmatan dan fasiliti ICT MOSTI diurus dengan cekap dan berkesan

Bahagian Inovasi dan Pengkomersilan

- Menyokong segala usaha MOSTI dalam meninggikan keupayaan inovasi kebangsaan dan meningkatkan pengkomersilan hasil penyelidikan dan pembangunan sektor awam

Bahagian Audit Dalam

- Menjalankan program audit dalam untuk pembangunan bahagian-bahagian MOSTI

Bahagian Antarabangsa

- Membantu mengadakan kerjasama strategik dengan badan-badan antarabangsa dan negara luar untuk meningkatkan keupayaan dan kemahiran di bidang STI.

Core Functions Of Division, Departments And Agencies

DIVISION / UNIT

Administration Division

- Provides overall support and coordination between all Departments and Units in MOSTI

Corporate Communications Unit

- Disseminates information to strengthen MOSTI's corporate image through public relations and awareness initiatives

Development Division

- Coordinates and monitors the implementation of MOSTI's programmes / projects under the Malaysia Five-Year Plans

Finance Division

- Oversees MOSTI's financial activities, including management of operational budgets, procurements / payments / accounting, and loan application process for MOSTI's headquarters and all its Cost Centres

Human Resource Management Division

- Oversees employment, promotion and recognition, staff career development, movement and performance assessment within MOSTI

ICT Policy Division

- Coordinates and manages the Content Industry Development Fund (e-Content Fund); ScienceFund, TechnoFund and InnoFund projects; as well as coordinates ICT Cluster's participation in enhancing ICT awareness

Industry Division

- Formulates and implements policies related to cutting-edge technology, specifically in advanced materials; advanced manufacturing; machinery & equipment; new materials; alternative energy; and 'waste to wealth'

Information Technology Management Division

- Ensures MOSTI's ICT services and facilities are managed effectively and efficiently

Innovation and Commercialisation Division

- Supports the efforts of MOSTI to enhance national innovation capacity and increase the rate of commercialisation of the research and development output of the public sector

Internal Audit Unit

- Undertakes internal audit programmes for the improvement of areas within MOSTI

International Division

- Assist in establishing strategic co-operation with international bodies and foreign countries to enhance capability and skills in the fields of STI

Unit Penasihat Undang-Undang

- Mengendalikan hal berkaitan undang-undang untuk MOSTI

Pusat Maklumat Sains dan Teknologi Malaysia

- Menyediakan maklumat untuk menyokong pembangunan agenda STI negara dan mengesan pencapaian STI

Bahagian Bioteknologi Kebangsaan

- Mempromosi dan menyelaras R&D bioteknologi dan penyertaan sektor swasta-awam dalam program bioteknologi kebangsaan

Bahagian Laut ke Angkasa

- Menyelaras dan melaksana program dan projek pembangunan teknologi, penyelidikan dan penerokaan Kluster Laut ke Angkasa (S2S)

Bahagian Teras Sains dan Teknologi

- Menyelaras dan memantau ScienceFund dan Dana Pra-Pengkomersilan untuk projek R&D

Direktorat Oseanografi Kebangsaan

- Menyelaras dan memantau penyelidikan dalam bidang keutamaan dan membantu pelaksanaan program/projek kebangsaan dan antara-negara berkenaan dengan bidang sains marin dan R&D oseanografi

Direktorat Nanoteknologi Kebangsaan

- Memacu pembangunan R&D dan strategi perniagaan, memperkuatkkan pusat kecemerlangan nanoteknologi sedia ada, menyokong fasiliti baru dan mempertingkatkan pembangunan modal insan dalam nanosains dan teknologi

Bahagian Perancangan

- Merangka strategi, dasar dan rancangan berkenaan STI, menyelaras, memantau dan menilai Petunjuk Prestasi Utama (KPI) MOSTI, Dana HCD dan R&D

Pejabat Penasihat Sains

- Menasihati Kerajaan mengenai dasar, strategi dan pelaksanaan STI

Legal Advisory Unit

- Oversees MOSTI's legal matters

Malaysian Science and Technology Information Centre

- Provides information to support the development of national STI agenda and track STI performance

National Biotechnology Division

- Promotes and co-ordinates biotechnology R&D and private-public sector participation in national biotechnology programmes

Sea to Space Division

- Coordinates and implements programmes and projects on technology development, research and exploration of the Sea-to-Space (S2S) Cluster

Science and Technology Core Division

- Coordinates and monitors the ScienceFund and Pre-Commercialisation Fund for R&D projects

National Oceanography Directorate

- Coordinates and monitors research in priority areas and facilitates implementation of national and intergovernmental programmes / projects pertaining to marine science and oceanographic R&D

National Nanotechnology Directorate

- Drives the development of R&D and business strategies, strengthens existing nanotechnology centres of excellence, supports new facilities, and enhances human capital development in nanoscience and technology

Planning Division

- Formulates strategies, policies and plans on STI, coordinates, monitors and evaluates MOSTI Key Performance Indicators (KPI), HCD and R&D Funds

Office of the Science Advisor

- Advices the Government on STI policies, strategies and implementation.



Agenzi Di Bawah MOSTI

JABATAN

Institut Genom Malaysia

- Mengurus fasiliti platform teknologi dan makmal lanjutan untuk bidang genom dan biologi molekul

Institut Farmaseutikal dan Nutraceutical Malaysia

- Membantu mempercepatkan pembangunan dan pengkomersilan produk farmaseutikal dan nutraceutical menerusi kerjasama strategik dan pembangunan modal insan di bidang bioteknologi penjagaan kesihatan

Institut Agro-Bioteknologi

- Mempromosi produk R,D&C, teknologi, IP dan lain-lain hasil R&D agro-bioteknologi di sektor pertanian

Lembaga Perlesenan Tenaga Atom

- Mengawal dan memantau pengeluaran, aplikasi dan kegunaan selamat tenaga nuklear serta mengekalkan kerjasama dengan badan-badan lain yang mempunyai mandat yang sama

Jabatan Kimia Malaysia

- Menyediakan khidmat analisis saintifik dan juga khidmat perundingan di bidang penyiasatan forensik jenayah, kesihatan awam (keselamatan makanan dan air, dan kualiti alam sekitar), penilaian produk pengguna dan klasifikasi tarif kastam

Jabatan Standard Malaysia

- Membangun dan mempromosi standard negara Malaysia, serta mengurus Skim Akreditasi Negara bersesuaian dengan standard antarabangsa, dengan perkembangan perdagangan domestik dan antarabangsa sebagai fokus utama

Agenzi Nuklear Malaysia

- Bertindak sebagai pusat R&D, perkhidmatan dan latihan di bidang teknologi nuklear untuk pembangunan negara serta sebagai agensi perhubungan dengan Agensi Tenaga Atom Antarabangsa (IAEA) dan Pertubuhan Perjanjian Pengharuman Ujian Nuklear Komprehensif (CTBTO)

Jabatan Meteorologi Malaysia

- Menyediakan khidmat kaji cuaca, memantau aktiviti seismologi dan mengeluarkan amaran mengenai tsunami

Agenzi Remote Sensing Malaysia

- Menjalankan R&D berkenaan teknologi penderiaan jauh dan menyediakan khidmat penderiaan jauh satelit kepada pengguna

Pusat Sains Negara

- Mempromosi kesedaran, apresiasi, minat dan kefahaman mengenai bidang sains kepada orang awam

Agenzi Angkasa Negara

- Menjana kesedaran, memacu dan memantau pembangunan bidang sains dan teknologi angkasa

Agencies Under MOSTI

DEPARTMENT

Malaysia Genome Institute (MGI)

- Manages platform technology facilities and advanced laboratories for genomics and molecular biology

Institute of Pharmaceuticals and Nutraceuticals

- Assist in accelerating the development and commercialisation of pharmaceutical and nutraceutical products through strategic collaboration and development of human capital in healthcare biotechnology

Agro-Biotechnology Institute

- Promotes R,D&C of products, technologies, IP, and other agro-biotechnology R&D outcomes in the agricultural sector

Atomic Energy Licensing Board (AELB)

- Regulates and supervises the production, application and safe use of nuclear energy as well as maintains cooperation with other bodies with a similar mandate

Department of Chemistry Malaysia (KIMIA Malaysia)

- Provides scientific analytical services as well as investigative and consultancy services in the areas of forensic criminal investigations, public health (food and water safety, and quality of the environment), evaluation of consumer products and customs tariff classification

Department of Standards Malaysia (STANDARDS MALAYSIA)

- Develops and promotes national standards, as well as manages a National Accreditation Scheme in accordance with international standards, with a key focus being the expansion of domestic and international trade

Malaysia Nuclear Agency

- Acts as a centre of R&D, services and training in the field of nuclear technology for national development, and acts as the liaison agency with the International Atomic Energy Agency (IAEA) and Comprehensive Nuclear-Test-Ban Treaty Organisation (CTBTO)

Malaysia Meteorological Department

- Provides services for meteorological forecast, monitors seismological activities and issues tsunami warning

Malaysian Remote Sensing Agency

- Conducts R&D related to remote sensing technologies and provides remote sensing satellite services to users

National Science Centre

- Promotes awareness, appreciation, interest and understanding of science to the public

National Space Agency

- Creates awareness, drives and monitors the development of space science and technology

Majlis Rekabentuk Malaysia

- Menyediakan khidmat nasihat dan menyokong para penggiat industri tempatan dalam mengutamakan mutu rekabentuk dan standard komersil dalam perniagaan, pendidikan dan Kerajaan

Syarikat Berkaitan Kerajaan

Astronautic Technologies (M) Sdn Bhd

- Berperanan sebagai peneraju perkembangan sistem angkasa maju dan teknologi yang berkaitan melalui penghususan R&D

BiotechCorp

- Berperanan sebagai pusat setempat untuk memupuk dan mempercepatkan pertumbuhan industri bioteknologi Malaysia

CyberSecurity Malaysia

- Menyediakan perkhidmatan kecemasan siber dan forensik digital, khidmat pengurusan mutu dan kajian ancaman siber dan penilaian risiko

Inno Biologics

- Bertindak sebagai entiti pembuatan kontrak untuk pembangunan biofarmaseutikal

Kumpulan Modal Perdana Sdn Bhd

- Berperanan sebagai syarikat modal usahaniaga global yang bertumpu kepada pemindahan teknologi dan pembangunan modal insan di bidang rekabentuk mikrocip

Kumpulan Industri-Kerajaan bagi Teknologi Tinggi Malaysia

- Menggalakkan pembangunan keupayaan negara di bidang teknologi tinggi dan sektor strategik, menyumbang kepada penyebarluasan dasar, pembangunan kapasiti dan mengeratkan lagi perkongsian dan kerjasama teknologi di peringkat tempatan, serantau dan antarabangsa

MIMOS Berhad

- Menjalankan penyelidikan gunaan dalam teknologi termaju ICT melalui perkongsian bijak dengan universiti, institut penyelidikan, Kerajaan dan industri

Perbadanan Pembangunan Multimedia

- Berperanan sebagai agensi pusat setempat bagi menyelaras, mempromosi dan membangunkan industri ICT dan perkhidmatan terpilih dalam MSC Malaysia serta operasi syarikat berstatus MSC Malaysia

.my DOMAIN REGISTRY

- Bertindak sebagai pengendali alamat sesawang yang berakhir dengan .my di Malaysia, dan bertanggungjawab dalam membangunkan dan mempromosi dasar domain/teknologi

SIRIM Berhad

- Membangunkan teknologi pembuatan dan perkhidmatan, dan mempromosi kemajuan standard dan mutu untuk PKS (Perniagaan Kecil Serdahana/SME)

Malaysia Design Council

- Provides advice to, and supports local industry players on the importance of quality design and commercial standards in business, education and Government

Government Linked Companies

Astronautic Technologies (M) Sdn Bhd

- Acts as a leading player in the development of advanced space systems and related technologies through focused R&D

BiotechCorp

- Acts as a one-stop-centre to nurture and accelerate the growth of Malaysia's biotechnology industry

CyberSecurity Malaysia

- Provides cyber emergency services and digital forensics, quality management services and cyber threat research and risk assessment

Inno Biologics

- Acts as a contract manufacturing entity for the development of biopharmaceuticals

Kumpulan Modal Perdana Sdn Bhd

- Acts as a global venture capital company focusing on technology transfer and human capital development in microchip design

Malaysian Industry-Government Group for High Technology

- Promotes the development of national capability in high technology and strategic sectors, contributes to policy promulgation, capacity building and forging closer partnerships and technology co-operation at the local, regional and international levels

MIMOS Berhad

- Conducts applied research in ICT cutting-edge technologies through smart partnerships with universities, research institutes, the Government and industries

Multimedia Development Corporation

- Acts as a one-stop agency for coordinating, promoting and developing the ICT industry and selected services within MSC Malaysia and the operations of the MSC Malaysia status companies

.my DOMAIN REGISTRY

- Acts as the sole administrator for web addresses that end with .my in Malaysia, and responsible of developing and promoting domain policies / technologies

SIRIM Berhad

- Develops new manufacturing and service technologies, and promotes development of standards and quality for SMEs

Technology Park Malaysia

- Acts as the national hub for R&D, innovation and commercialisation of technologies, and provides a platform for the establishment of strategic business and technology linkages between research institutes and industries

Technology Park Malaysia

- Bertindak sebagai pusat R&D, inovasi dan pengkomersilan teknologi kebangsaan, dan menyediakan platform bagi penubuhan rangkaian perniagaan dan teknologi yang strategik antara institusi penyelidikan dan industri

ANAK SYARIKAT KHAZANAH NASIONAL MALAYSIA

Perbadanan Pembangunan Teknologi Malaysia

- Mempromosi pembangunan syarikat berdasarkan teknologi termasuk pengkomersilan R&D tempatan

Badan Berkanun

Akademi Sains Malaysia

- Bertindak sebagai badan pemikir kepada kerajaan di bidang sains, kejuruteraan dan teknologi

Badan Bukan Kerajaan

Yayasan Inovasi Malaysia

- Membangun dan mempromosi kemahiran kreatif dan menjalankan program kesedaran mengenai inovasi untuk masyarakat

Yayasan Angkasawan Malaysia

- Merangka dan melaksanakan program kesedaran awam tentang sains, teknologi dan sains angkasa

SUBSIDIARY COMPANY OF KHAZANAH

Malaysian Technology Development Corporation

- Promotes the development of technology-based companies including the commercialisation of local R&D

Statutory Body

Academy of Sciences Malaysia

- Acts as a think tank to the government in the fields of science, engineering and technology

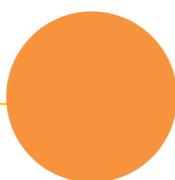
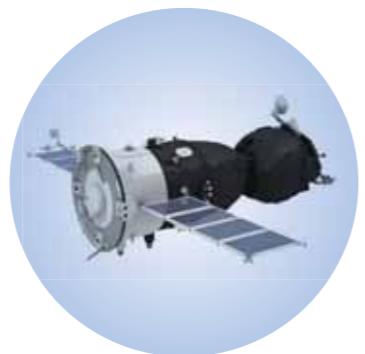
Non Government Organization

Malaysia Innovation Foundation

- Develops and promotes creative skills, and conducts awareness programmes on innovation for society

Malaysia Astronaut Foundation

- Creates and implements educational public awareness programmes on science, technology and space science





YAB PM melawat booth pameran Technology Park Malaysia (TPM) sempena Langkawi International Dialogue (LID) 2011.

YAB PM visits TPM's exhibition booth at LID 2011.



Nano Malaysia-Summit & Expo 2011, Putra World Trade Centre (PWTC).

Gambaran Keseluruhan Rancangan Malaysia ke-Sepuluh (RMK-10)

Latar Belakang

Rancangan Malaysia Kesembilan (RMKe-9: 2006-2010) yang baru berakhir telah memberi penekanan yang ketara terhadap pembangunan keupayaan institusi-institusi dalam negara serta potensi modal insan dalam aspek penjanaan pengetahuan dan inovasi. Dana yang besar telah diperuntukkan untuk pembangunan sains, teknologi dan inovasi (STI) dan juga penyelidikan dan pembangunan (R&D) dalam pelbagai bidang, khususnya teknologi pembuatan termaju (robotik, perisian pintar, pengesian pintar, pembungkusan berteknologi tinggi, automasi dan pemprosesan- nano) dan bahan termaju dari industri petrokimia, automotif, bioteknologi, elektrikal/elektronik dan pertanian. Kerjasama antarabangsa dalam bidang-bidang sains (genomik, biologi molekul, nutraceutical dan farmaseutikal antara yang diutamakan) juga merupakan sebahagian daripada strategi yang digariskan dalam RMKe-9 untuk meningkatkan kompetensi dan dayasaing modal insan negara.

Kebanyakan inisiatif-inisiatif ini telah diterajui oleh Kementerian Sains, Teknologi dan Inovasi (MOSTI), selaras dengan misinya untuk memacu STI dengan menyemarakkan kreativiti dan inovasi; memperkuuhkan R&D berdasarkan pasaran; memperolih dan menyebarluaskan teknologi baru; membangun dan menarik bakat baru; serta mempertingkatkan lagi kerjasama dan perkongsian.

Dalam Rancangan Malaysia Kesepuluh (RMKe-10: 2011-2015), MOSTI telah memantapkan lagi usaha meneruskan pembangunan di atas landasan yang telah diasaskan semasa RMK-9. Ini sejajar dengan matlamat utama negara untuk mencapai status negara maju menjelang tahun 2020. Bidang-bidang fokus Klusternya kekal tidak berubah: Bioteknologi, ICT, Industri, Laut ke Angkasa, Nanoteknologi; Oseanografi; Teras Sains dan Teknologi (S&T).

Berpandukan '10 Idea Utama' dan '5 Teras Strategik' yang dijelaskan dalam RMKe-10, kerajaan akan terus menginstitusikan pra-syarat yang perlu untuk pelaksanaan program bertujuan untuk meningkatkan taraf hidup dan pendapatan negara kasar per kapita kepada RM38,850 pada tahun 2015 menerusi pencapaian pertumbuhan sebenar KDNK sebanyak 6% setahun. Sepanjang proses ini, aspirasi dan objektif khusus yang terkandung dalam dasar-dasar berkaitan, terutamanya Program Transformasi Kerajaan (GTP) dan Program Transformasi Ekonomi (ETP) akan berfungsi sebagai tanda aras yang penting.

Menyokong Inisiatif Kerajaan

Beberapa Bidang Keberhasilan Utama Kementerian (MKRA) dan Petunjuk Prestasi Utama (KPI) yang terkandung dalam Program Transformasi Kerajaan (GTP) adalah sangat relevan kepada MOSTI yang berperanan penting dalam penyelidikan inovatif. Tambahan pula, lebih separuh daripada Bidang Ekonomi Utama Negara (NKEA) yang tersenarai dalam ETP adalah termasuk dalam skop aktiviti MOSTI, sama ada sebagai fokus utama atau menyokong inisiatif-inisiatif agensi kerajaan yang lain. Namun begitu, aspek kreativiti dan inovasi kekal sebagai asas pertimbangan mereka.

An Overview Of Tenth Malaysia Plan (10MP)

Background

The recently-ended Ninth Malaysia Plan (9MP: 2006-2010) was notable in its thrust towards developing the capability of the country's institutions and human potential in the vital areas of knowledge creation and innovation. Substantial funds had been allocated for the development of science, technology and innovation (STI) as well as research and development (R&D) in various fields, namely advanced manufacturing technology (robotics, intelligent software, smart sensors, high-tech packaging, automation and nano-processing) and advanced materials from the petrochemical, automotive, biotechnology, electrical/ electronic, and agricultural industries. International co-operation in scientific fields (genomics, molecular biology, nutraceuticals and pharmaceuticals being some of the priorities) was also part of the strategies spelt out under the 9MP to enhance the competence and competitiveness of the country's human capital.

Much of these initiatives were spearheaded by the Ministry of Science, Technology and Innovation (MOSTI), in line with its mission to drive STI by intensifying creativity and innovation; strengthening market-driven R&D; sourcing and diffusing new technology; developing and attracting new talent; and strengthening collaboration and partnerships.

In the Tenth Malaysia Plan (10MP: 2011-2015), MOSTI redefined its efforts in building upon the foundation laid during the 9MP. This was in line with the government's ultimate goal of achieving developed nation status by the year 2020. Its Cluster focus areas remain unchanged: Biotechnology, ICT, Industry, Sea to Space, Nanotechnology; Oceanography; and science and technology (S&T) Core.

Guided by the '10 Big Ideas' and the '5 Key Strategic Thrusts' elucidated in the 10MP, the government will continue to institutionalise the necessary pre-requisites for the implementation of programmes which aim to raise living standards as well as increase the gross national income per capita to RM38,850 in 2015 by achieving real GDP growth of 6% per annum. Throughout this process, the specific aspirations and objectives contained in complementary policies, in particular, the Government Transformation Programme (GTP) and the Economic Transformation Programme (ETP) will serve as useful benchmarks.

Supporting Government's Initiatives

Several of the Ministerial Key Result Areas (MKRA) and the Key Performance Indicators (KPI) contained in the Government Transformation Programme (GTP) are especially relevant to MOSTI, which play a vital role in innovative research. In addition, more than half of the National Key Economic Areas (NKEA) listed in the ETP fall within MOSTI's scope of activity, either as a primary focus or in support of the initiatives of other arms of government. Regardless, their common denominator remains that of innovation and creativity.

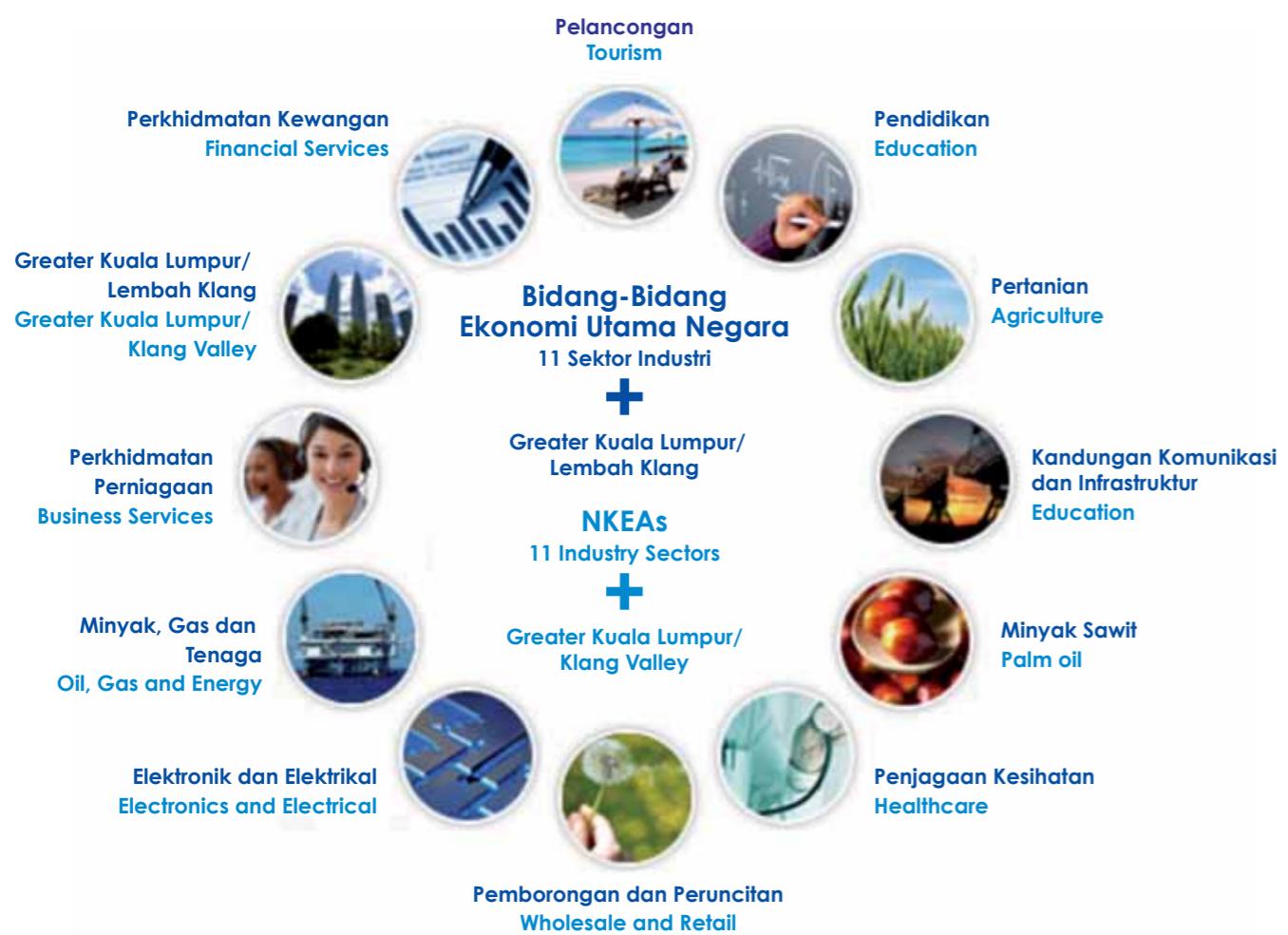


Pelancaran rasmi Bulan ICT Kebangsaan 2011 (PIKOM) di Cap Square KL.
Official launch of National ICT Month 2011 (PIKOM) at Cap Square KL.



Lawatan YB Menteri MOSTI ke Institut Agro-Bioteknologi, Malaysia (ABI).
Visit by YB Menteri MOSTI to ABI.

Bidang Keberhasilan Utama Negara (NKEA) National Key Economic Areas (NKEA)



RMKe-10 memberi focus kepada 12 Bidang Ekonomi Utama Negara yang berpotensi untuk menjana pendapatan tinggi seperti berikut:

- Minyak dan Gas
- Minyak Sawit dan produk berkaitan
- Perkhidmatan Kewangan
- Pemborongan dan Peruncitan
- Pelancongan
- Teknologi Maklumat dan Komunikasi
- Perkhidmatan Pendidikan
- Elektrikal dan Elektronik
- Perkhidmatan Perniagaan
- Penjagaan Kesihatan Swasta
- Pertanian
- Greater Kuala Lumpur

Sumber: www.pemandu.gov.my

The 10MP focuses on the following 12 National Key Economic Areas (NKEAs) with the potential to generate high-income:

- Oil & gas
- Palm oil and related products
- Financial services
- Wholesale and retail
- Tourism
- ICT
- Education services
- Electrical and electronics
- Business services
- Private healthcare
- Agriculture
- Greater Kuala Lumpur

Source: www.pemandu.gov.my

Bidang Keberhasilan Utama Kementerian (MKRA)

1. Penjanaan ekonomi berasaskan inovasi melalui Sains, Teknologi dan Inovasi (STI);
2. Peningkatan penyelidikan dan pembangunan dalam S&T dan Inovasi;
3. Pengukuhan bakat dalam S&T and Inovasi; and
4. Pewujudan budaya inovatif dan kreatif serta peningkatan dalam kesedaran, apresiasi dan aplikasi S&T and Inovasi.

Oleh itu, R&D terus kekal sebagai faktor utama yang akan menentukan kejayaan GTP, ETP dan RMK-10. Mengakui hakikat ini, MOSTI akan terus berusaha mewujudkan persekitaran yang kondusif bagi syarikat-syarikat tempatan dan juga antarabangsa untuk menjalankan inisiatif R&D, memperkuuhkan jaringan kerjasama di antara pihak-pihak yang relevan, menumpukan perhatian kepada pembangunan modal insan berkemahiran tinggi, dan dengan itu meningkatkan daya saing syarikat dan produk Malaysia di pasaran antarabangsa. Sejumlah besar dana yang diperlukan untuk memacu inisiatif-inisiatif ini disediakan oleh kerajaan, di mana sebanyak RM230 bilion telah diperuntukkan dalam RMKe-10 untuk perbelanjaan pembangunan oleh kesemua Kementerian.

Ministerial Key Result Areas (MKRA)

1. Generation of innovation-led economy via Science, Technology and Innovation (STI);
2. Intensification of research and development in S&T and Innovation;
3. Strengthening talents in S&T and Innovation; and
4. Creation of innovative and creative culture and increase in S&T and Innovation awareness, appreciation and application.

Therefore, R&D will remain the lynchpin upon which the success of the GTP, ETP and 10MP rests. In recognition of this fact, MOSTI will continue to strive towards creating a conducive environment for both local and international companies to undertake R&D initiatives, strengthening collaborative links between all relevant stakeholders, focusing on developing highly skilled human capital, and thereby enhancing the competitiveness of Malaysian companies and products in the global markets. The bulk of the funds necessary to drive these initiatives will come from the government, which has allocated a total of RM230 billion in the 10MP for development expenditure by all Ministries.



Meneroka Teknologi Baru

RMKe-10 juga memberi fokus kepada teknologi baru seperti nanoteknologi dan bioteknologi, yang telah di kenalpasti di bawah Dasar Sains dan Teknologi Kedua sebagai penting bagi pembangunan industri, dan juga sebagai platform untuk pembangunan pelbagai NKEA.

Sehubungan dengan ini, Direktorat Nanoteknologi Kebangsaan telah ditubuhkan dengan rasminya pada bulan Julai 2010 di bawah naungan MOSTI. Peranannya ialah untuk memacu Inisiatif Nanoteknologi Negara; membangun strategi; menyelaras R&D nanoteknologi; dan memperkuuh Pusat Kecemerlangan Nanoteknologi dengan menyokong fasiliti penyelidikan; meningkatkan pembangunan modal dalam nanosains dan teknologi; dan mewujudkan jaringan dengan industri dari sudut agenda perniagaan disamping membina satu rangkaian antarabangsa.

RMKe-9 telah menjelas dan memperincikan matlamat-matlamat kerajaan berkenaan dengan bioteknologi, melibatkan peruntukan sebanyak RM2,021 juta, kenaikan hampir empat kali ganda dari RM577 juta di bawah Rancangan Malaysia Kelapan (RMKe-8). Hampir separuh dari pembiayaan dalam RMKe-9 diperuntukkan kepada infrastruktur, manakala RM463 disalurkan kepada R&D, dan RM530 kepada pembangunan perniagaan. Keutamaan-keutamaan ini dilaksanakan hingga ke tempoh RMKe-10.

Memperingkatkan S&T dan R&D

Mengambilkira perlunya kesinambungan program dan aktiviti S&T oleh MOSTI serta agensi-agensi kerajaan yang lain, maka Majlis Sains dan Penyelidikan Kebangsaan (NSRC) telah ditubuhkan dibawah RMKe-10, menggantikan Majlis Penyelidikan dan Kemajuan Sains Negara (MPKSN). Secara ringkasnya NSRC akan bertindak sebagai sebuah badan penasihat yang ditugaskan untuk mempertingkat dan merangka peranan S&T dalam ekonomi negara, dan juga menyelaras pelbagai usaha R&D yang dijalankan oleh institusi dan fasiliti penyelidikan kerajaan.

Tapping on Emerging Technologies

The 10MP also addresses emerging technologies such as nanotechnology and biotechnology, both of which have been identified under the 2nd National Science and Technology Policy as being of crucial importance in the development of industries, as well as the platforms upon which the NKEAs will develop.

In this regard, the National Nanotechnology Directorate (NND) was established officially in July 2010 under the auspices of MOSTI. Its role will be to drive the National Nanotechnology Initiative; develop strategies; co-ordinate R&D nanotechnology; and strengthen existing Nanotechnology Centres of Excellence by supporting new research facilities; enhancing human capital development in nanoscience and technology; and networking with industry to handle a business agenda while at the same time developing a network internationally.

The 9MP had defined and detailed the goals of the government in relation to biotechnology, necessitating the allocation of RM2,021 million, a nearly four-fold increase from the RM577 million under the Eighth Malaysia Plan (8MP). Almost half the funding in the 9MP was intended for infrastructure, while RM463 million was set aside for R&D, and RM530 million for business development. These priorities were carried through to the 10MP period.

Enhancing S&T and R&D

Recognising the need to ensure coherence in S&T activities and programmes both within MOSTI and among other arms of government, the 10MP also called for the establishment of a National Science and Research Council (NSRC), which replaces the now-dormant National Council of Science, Research and Development (MPKSN). In brief, the NSRC will serve as an advisory body tasked to enhance and strategise the role of S&T in the national economy, as well as to co-ordinate the various R&D efforts carried out by government research institutes and facilities.

Ringkasan Pencapaian

MOSTI memulakan tahun 2011 dengan azam baharu untuk merealisasikan aspirasi negara seperti yang terkandung dalam RMKe-10. Sehingga akhir tahun ini, setiap agensi di bawah naungannya telah melaporkan kemajuan yang signifikan dalam usaha R&D (sebahagiannya berpotensi untuk dikomersialkan); inovasi teknologi, khususnya dalam bidang 'baru' seperti bioteknologi dan nanoteknologi; penjanaan dan pertukaran pengetahuan di peringkat tempatan dan antarabangsa; peningkatan modal insan mahir; pengukuhan infrastruktur fizikal; dan kesedaran STI yang lebih tinggi di kalangan industri dan orang awam. Pencapaian ini banyak bergantung kepada kekuatan asas yang dibina pada tahun-tahun dibawah RMKe-9, yang telah memupuk landskap yang lebih kondusif bagi inisiatif-inisiatif STI.

Kesedaran STI, Penyebaran Maklumat dan Penyelarasaran

Program kesedaran awam STI dianjurkan oleh semua agensi MOSTI dalam menjalankan tanggungjawab mereka, terutamanya oleh Bahagian Inovasi dan Pengkomersilan (I&P) yang misinya termasuklah meningkatkan keupayaan inovasi.

Antara program-program yang dirancang dan dilaksanakan oleh Bahagian PSI I&P pada tahun 2011 adalah Persidangan dan Pameran Inovasi Kebangsaan (NICE); Anugerah Inovasi Negara (AIN); Program Innospace dan InfoSTI; Bengkel Harta Intelek; Portal MyIdeas; penyelaras Jejak Inovasi; Forum Inovasi Kuala Lumpur (KLIF) anjuran bersama Yayasan Inovasi Malaysia (YIM); dan aktiviti-aktiviti sempena 2011 diisytiharkan sebagai Tahun Penggalakan Sains dan Matematik (PPSM 2011).

Sejumlah 88 aktiviti telah diadakan sepanjang PPSM 2011 di seluruh Malaysia dengan rakan-rakan strategik seperti Kerajaan Negeri Melaka, Sabah dan Sarawak; pelbagai Kementerian, Jabatan Pembangunan Orang Asli; Jabatan Perpaduan Negara dan Integrasi Nasional; Universiti & Institut Politeknik; Maktab Perguruan; Yayasan Inovasi Malaysia; Yayasan Angkasawan Malaysia; Kolej Yayasan Sabah; Persatuan Kreativiti dan Inovasi Malaysia (MACRI); Institut Kimia Malaysia; PIKOM, syarikat-syarikat swasta dan semua agensi dan jabatan di bawah MOSTI.

Aktiviti-aktiviti ini termasuklah karnival, pameran dan demonstrasi sains, bengkel kreativiti dan inovasi, pertandingan inovatif, pertandingan kereta solar, demonstrasi membentuk kaca dan seramik, pertunjukan sains muzikal, Kampung Sains, Kem Angkasa Angkasawan, pameran Sains bergerak, ceramah dan persidangan. Bahagian I&P juga menyelaras penyertaan MOSTI di Pesta Satok, Sarawak dari 1 – 4 Disember 2011 dan Festival Balau dari 2- 4 Disember 2011 di Dalat, Sarawak, yang dirasmikan oleh Timbalan Menteri MOSTI.

Performance Overview

MOSTI began the year 2011 with a renewed commitment to realising the national aspirations contained in the 10MP. By the end of the year, each agency under its umbrella had reported significant progress in R&D efforts (several with potential for commercialisation); technological innovation, especially in 'new' areas such as biotechnology and nanotechnology; local and international generation and exchange of knowledge; upgrading of skilled human capital, strengthening of physical infrastructure; and greater awareness of STI among industry and the general public. Their achievements owed much to the strength of the foundation laid during the 9MP years, which have had the net result of forging a more conducive landscape for STI initiatives.

STI Awareness, Information Dissemination & Co-ordination

STI public awareness programmes are carried out by all MOSTI agencies in the course of carrying out their responsibilities, perhaps none more so than the Enculturation of Science and Innovation (PSI) Division whose mission includes enhancing innovation capability.

Among the programmes planned and implemented by the PSI Division in 2011 were the National Innovation Conference and Exhibition (NICE); National Innovation Award (AIN); Innospace Programmes and InfoSTI; Intellectual Property Workshops; MyIdeas Portal; co-ordination of the Innovation Walk (Jejak Inovasi); the Kuala Lumpur Innovation Forum (KLIF) in association with Malaysian Innovation Foundation (YIM); and activities in conjunction with 2011 having been declared as the Year for the Promotion of Science and Mathematics (PPSM 2011).

A total of 88 activities were held during PPSM 2011 throughout Malaysia with strategic partners such as the State Governments of Melaka, Sabah and Sarawak; various Ministries, Department of Orang Asli Development; Department of National Unity and Integration; Universities & Polytechnic Institutes; Teacher Training Colleges; Malaysian Innovation Foundation; Malaysian Astronaut Foundation; Sabah Foundation College; Malaysia Association of Creativity and Innovation (MACRI); Malaysian Chemical Institute; PIKOM; private companies; and all agencies and departments under MOSTI.

These activities included carnivals, science exhibitions and demonstrations, creativity and innovative workshops, innovative competitions, a solar car competition, glass and ceramic moulding demonstrations, a musical science show, Science Village, Angkasawan Space Camps, Science on-wheels exhibitions, talks and conferences. The PSI Division also co-ordinated the participation of MOSTI in the SATOK Fest, Sarawak from December 1-4, 2011 and the Balau Festival from December 2-4, 2012 in Dalat, Sarawak, which was officiated by the Deputy Minister of MOSTI.

Pusat Innospace

Innospace, satu lagi program I&P, merupakan Pusat Inovasi Komuniti yang ditubuhkan oleh MOSTI untuk membantu masyarakat tempatan membangunkan idea dan prototaip produk inovatif. Selain dari mengandungi fasiliti asas, setiap pusat menyediakan khidmat nasihat teknikal dan pemasaran. Sehingga kini, terdapat tiga Pusat Innospace, masing-masing satu di Sarawak, Sabah dan Melaka (kedua terakhir ini ditubuhkan



Pelancaran Innospace Sabah , 28 Mac 2011 di SIRIM Kota Kinabalu oleh YB Menteri MOSTI
Launching of Sabah Innospace, 28 March 2011 at SIRIM Kota Kinabalu by YB Minister of MOSTI.

pada tahun 2011). Sepanjang tahun 2011, aktiviti-aktiviti (bengkel hands-on, pertandingan kreativiti, ceramah dan pameran inovasi) yang dijalankan oleh tiga Pusat Innospace telah menarik seramai 902 peserta dan pengunjung. Setiap pusat mempunyai nic sendiri: Innospace Sabah mengkhusus dalam pembuatan kaca dan faundri; Innospace Sarawak memberi tumpuan kepada produk seramik; dan Innospace Melaka mengkhusus dalam faundri dan pengacuanan putaran. Selain itu, sebanyak 91 ceramah telah disampaikan pada tahun 2011 melibatkan 19,186 peserta. Ceramah-ceramah ini telah disampaikan kepada pelbagai kumpulan masyarakat, khususnya, di peringkat sekolah rendah dan menengah, kerajaan tempatan, pelbagai kementerian dan jabatan kerajaan serta kepada peserta-peserta Innospace.

Jejak Inovasi

Jejak Inovasi telah diadakan pada tahun 2011 oleh Bahagian I&P bersama-sama dengan Yayasan Inovasi Malaysia (YIM) di Melaka, Sabah dan Sarawak. Ini merupakan adalah satu program untuk mengenalpasti produk atau output inovatif di peringkat akar umbi yang mempunyai potensi untuk tambahan nilai dan pengkomersilan. Sejumlah 41 produk telah berjaya

Innospace Centres

Innospace, another PSI programme, is a Community Innovation Centre established by MOSTI to assist local communities to develop ideas and prototypes of innovative products. Apart from containing basic facilities, each centre provides technical and marketing advice. To date, there are three Innospace Centres, one each in Sarawak, Sabah, and Melaka (the last two were set up in 2011). Throughout 2011, the activities (hands-on

dikenalpasti untuk pembangunan seterusnya. Disamping itu, dua buah buku mengenai inovasi akar umbi telah diterbitkan oleh Bahagian I&P pada tahun 2011, bertajuk 'Kompilasi Inovasi Akar Umbi 2010' dan 'Jejak Inovasi 2011' untuk diedarkan kepada orang ramai.

InfoSTI @ MOSTI

Untuk manfaat masyarakat tempatan, InfoSTI @ MOSTI ketiga telah dilancarkan di Nenasi, Pahang pada 10 Disember 2011 oleh Menteri Besar Pahang, Y.A.B. Dato' Seri Haji Adnan Haji Yaakob. Timbalan Menteri MOSTI, Y.B. Datuk Haji Fadillah Yusof turut menghadiri majlis pelancaran tersebut. InfoSTI adalah pusat komuniti berdasarkan Teknologi Maklumat (IT) untuk masyarakat tempatan. Pelbagai bengkel latihan kemahiran IT telah dijalankan secara percuma untuk memberi kemahiran kepada peserta untuk menjalankan perniagaan mereka secara atas talian. Sehingga kini, InfoSTI @ MOSTI di Nenasi telah berjaya melatih 21 sukarelawan dan menarik 1,916 peserta. Selain dari majlis pelancaran tersebut, pelbagai aktiviti ceramah, bengkel, serta pameran inovasi dan kesihatan telah disediakan oleh Yayasan Angkasawan Malaysia, CyberSecurity, Multimedia Development Corporation (MDeC) dan Technology Park Malaysia untuk 2,500 pelawat tempatan termasuk masyarakat Orang Asli.

Portal MyIdeas

Pada tahun 2011, Bahagian I&P diamanahkan mentadbir Portal MyIdeas yang sebelumnya berada di bawah Yayasan Inovasi Malaysia (YIM). Portal ini berfungsi sebagai satu platform untuk menggalakkan orang ramai untuk berkongsi idea, yang kemudiannya dikemukakan kepada unit Inovasi yang relevan dalam pelbagai kementerian untuk tindakan selanjutnya. Pada bulan Ogos 2011, Bahagian I&P, melalui Pasukan Penilaian Idea MyIdeas (yang terdiri dari sektor swasta dan ahli inovasi tempatan), telah mengenalpasti satu produk inovatif yang dipanggil 'Tongkat Pintar untuk Orang Buta'. Tongkat ini sedang dibangunkan oleh Universiti Malaya dan Persatuan Orang Buta Malaysia (MAB) dan dijangka akan siap pada tahun 2012. Pada 14 Oktober 2011, sebuah sub-portal Pembaharuan Sistem Pilihanraya Inovatif telah dibangunkan untuk mengumpul maklum balas dan pendapat orang ramai tentang cara menambahbaik sistem pilihan raya negara. Sebanyak 20 cadangan telah dipilih, dan sijil penghargaan diberikan untuk menggalakkan lagi orang ramai terus berkongsi idea. Begitu juga dengan sub-portal MyIdeas @Rural yang telah dirasmikan oleh Timbalan Perdana Menteri, Y.A.B. Tan Sri Muhyiddin Yassin. Portal MyIdeas@Rural mula berfungsi pada bulan November 2011, terutamanya untuk mengumpul maklum balas daripada masyarakat luar bandar. Portal ini telah dilancarkan bersama program Anugerah Ilham Desa, iaitu satu program Kementerian Kemajuan Luar Bandar dan Wilayah yang memberi anugerah kepada masyarakat luar bandar yang berjaya menghasilkan idea-idea dalam usaha memperbaiki kampung dan kehidupan mereka. Seramai 12,000 peserta dari kawasan luar bandar telah menghadiri pelancaran tersebut.



Majlis pelancaran Projek InfoSTI@MOSTI di Pekan, Pahang.
Launching of Projek InfoSTI@MOSTI at Pekan, Pahang.

InfoSTI@MOSTI

Also for the benefit of local communities, the third InfoSTI@ MOSTI was launched in Nenasi, Pahang on December 10, 2011 by the Chief Minister of Pahang, Y.A.B. Dato' Seri Haji Adnan Haji Yaakob. The Deputy Minister of MOSTI, Y.B. Datuk Haji Fadillah Yusof also attended the launching ceremony. InfoSTI is a community centre based on Information Technology (IT) for the local community. Various IT skills training workshops are conducted free of charge to equip participants with the skills to conduct their businesses online. To date, InfoSTI@MOSTI in Nenasi has successfully trained 21 volunteers and attracted 1,916 participants. Apart from the launching ceremony, various talks, workshops, as well as innovation and health exhibitions were provided by Malaysian Astronaut Foundation, CyberSecurity, Multimedia Development Corporation (MDeC) and Technology Park Malaysia for 2,500 local visitors including the Orang Asli community.

MyIdeas Portal

In 2011, the PSI Division was entrusted with administrating the MyIdeas Portal which was previously under the Malaysian Innovation Foundation (YIM). The portal functions as a platform to encourage the public to share their ideas, which are then forwarded to the relevant Innovation units in various ministries for further action. In August 2011, the PSI Division, through the MyIdeas Idea Evaluation Team (which comprises the private sector and local innovators), identified an innovative product called the 'Smart Cane for the Blind'. This cane is being developed by the University of Malaya and the Malaysian Association for the Blind (MAB) and is expected to be completed in 2012. On October 14, 2011, an Innovative Electoral Reform sub-portal was set up to gather feedback and opinion from the public on how to better the nation's election system. A total of 20 suggestions were chosen, and certificates of appreciation given to encourage the public to keep sharing their ideas. Similarly, a MyIdeas@Rural sub-Portal was officiated by Deputy Prime Minister, Y.A.B. Tan Sri Muhyiddin Yassin. Portal MyIdeas@Rural functions in November 2011, mainly to gather feedback from rural communities. The launching was held alongside the Anugerah Ilham Desa, a programme of the Ministry of Rural and Regional Development to award rural communities which mooted ideas to improve their villages and their own livelihood. A total of 12,000 participants from rural areas attended the launching.

Bulan ICT

Pada tahun 2011, Bulan ICT Kebangsaan tahunan telah disambut dalam bulan Oktober. Program-program Bulan ICT Kebangsaan diletakkan di bawah portfolio Bahagian I&P dan diselaraskan bersama dengan PIKOM.

Maklumat S&T

MASTIC telah melancarkan pusat rujukan negara bagi maklumat sains, teknologi dan inovasi iaitu sistem Knowledge Resource for Science and Technology Excellence, Malaysia atau lebih dikenali sebagai KRSTE.my. Pelancaran sistem ini telah disempurnakan oleh YB Datuk Haji Fadillah Yusof, Timbalan Menteri Sains, Teknologi dan Inovasi pada 29 November 2011 di Hotel Pullman, Putrajaya. KRSTE.my merupakan satu sistem berintegrasi yang mengandungi maklumat komprehensif berkaitan Sains, teknologi dan inovasi (STI) termasuk senarai organisasi dan institusi S&T, geran penyelidikan, projek-projek yang berpotensi untuk dikomersialkan, maklumat tentang kemudahan dan peralatan S&T serta personel S&T. Sistem ini bertindak sebagai capaian tunggal kepada maklumat dari pelbagai sumber dalam dan luar negara. Sehingga kini, sistem KRSTE.my telah merekodkan capaian berjumlah 139,180 dan telah mendaftarkan lebih daripada 21,000 orang pengguna. Sistem ini juga berjaya melakukan integrasi dengan 94 buah agensi dalam negara dan lebih 200 sumber dari luar negara.

Selain KRSTE.my, MASTIC turut menyimpan dan mengawal selia maklumat mengenai organisasi yang terlibat di dalam aktiviti berkaitan teknologi dan saintifik di Malaysia. Maklumat-maklumat ini dikumpulkan di bawah pangkalan data STI dan ia merangkumi maklumat sektor awam, sektor swasta dan organisasi bukan kerajaan (NGO). Sehingga kini, sejumlah 1,676 senarai organisasi telah ada dalam simpanan yang meliputi, 274 institusi pengajian tinggi awam/swasta, 80 agensi kerajaan/institut penyelidikan, 1,255 organisasi swasta/industri dan 67 organisasi bukan kerajaan. Selain itu terdapat sebanyak 16,755 maklumat profil penyelidik dan pakar dari pelbagai bidang STI iaitu seramai 488 orang daripada sektor swasta, 13,322 dari institut pengajian tinggi dan 2,945 dari institusi penyelidikan dan agensi kerajaan. Daripada jumlah tersebut, 6,397 merupakan pakar dalam bidang masing-masing.

Pangkalan data ini juga mengandungi sebanyak 10,478 maklumat projek STI yang dilaksanakan oleh penyelidik dari agensi-agensi berkenaan. Sebanyak 2,689 teknologi dan projek telah dikenal pasti sebagai projek penyelidikan dan inovasi daripada penyelidik tempatan yang berpotensi untuk dikomersialkan. Sehingga Disember 2011, sebanyak 753 kemudahan dan 2,319 peralatan yang digunakan dalam penyelidikan oleh pelbagai agensi kerajaan dan institusi pengajian tinggi seperti makmal, kemudahan khusus dan peralatan bagi melaksanakan kerja-kerja penyelidikan dan pembangunan (R&D) serta aktiviti STI yang berkaitan telah didaftarkan di dalam pangkalan data ini.

Bagi pembangunan petunjuk S&T, MASTIC telah melaksanakan pengumpulan maklumat berkenaan aktiviti-aktiviti R&D Negara bagi tahun-tahun kewangan

ICT Month

In 2011, the annual National ICT Month was celebrated in the month of October. The programmes for National ICT Month were placed under the portfolio of the PSI Division, in co-ordination with PIKOM.

S&T Information

MASTIC has launched the national reference repository for science, technology and innovation (STI), known as Knowledge Resource Science and Technology Excellence, Malaysia (KRSTE.my). The event was officiated by YB Datuk Haji Fadillah Yusof, Deputy Minister of Science, Technology and Innovation on the 29 November 2011 at Pullman Hotel, Putrajaya. KRSTE.my is an integrated system which provides information on Science, Technology and Innovation (STI) that include S&T organisations and institutions, funding grant, potential projects for commercialisation, S&T facilities and equipment and S&T personnel. This system acts as a single point of access towards information from various sources from within and outside the country. To date, the system has recorded access of 139,180 and has more than 21,000 registered users. The system is able to integrate information sourced from 94 agencies throughout the country and more than 200 foreign sources.

Apart from KRSTE.my, MASTIC also collects and manages information on organisations involved in technology and scientific activities in Malaysia. The informations are compiled under the STI database comprising Directory of S&T organisations, S&T Human Resources, S&T projects and TECHMart. To date, a total of 1,676 lists of organisations are available and the list includes 274 institutes of higher education public/private, 80 government agencies / research institutes, 1,255 private organisations/industrial and 67 non-governmental organisations. Information on 16,755 researchers and experts in various fields of STI can be obtained from the database. From this total, 6,397 are experts in their respective fields.

In addition, information on 10,478 STI projects undertaken by researchers from the relevant agencies is readily available. A total of 2,689 technology projects have been identified as research and innovation of local researchers with potential for commercialisation. Until December 2011, a total of 753 facilities and 2,319 equipments used in research institutes, government agencies and institutes of higher learning including laboratories, specialised facilities and equipment for research and development (R&D) and STI related activities are registered in this database.

For the development of S&T indicators, MASTIC has initiated the collection of information on R&D activities for the financial years 2008-2011 involving the public sector (institutes of higher learning and government research institutes) and private sector/industry. Statistics obtains will provides an insight on the nation's R&D performances set by the government and are used for international comparison.

A kick-off session for the National R&D Survey 2009-2011 was officiated by Deputy Secretary General (Science) of

2008 hingga 2011 yang melibatkan sektor awam (institusi pengajian tinggi dan institusi penyelidikan kerajaan) dan sektor swasta/industri. Statistik yang diperoleh akan memberikan gambaran prestasi aktiviti R&D negara berbanding sasaran yang telah ditetapkan oleh kerajaan dan turut digunakan untuk perbandingan di peringkat antarabangsa.

Satu majlis kick-off Kajian R&D Kebangsaan 2009-2011 telah disempurnakan oleh YBhg. Prof. Datuk Paduka Dr. TKSU(S) pada 29 November 2011. Seramai 160 orang peserta telah hadir di sesi taklimat dan kick-off ini bagi memaklumkan bahawa proses pengumpulan data R&D telah bermula. Kajian ini dijangka akan tamat sepenuhnya pada bulan Mei 2013.

Perpustakaan MOSTI yang dikendalikan oleh MASTIC menyediakan koleksi yang komprehensif untuk menyokong pembelajaran dan penyelidikan dalam bidang STI. Sebanyak 14,000 bahan monograf, 33 judul jurnal dan majalah langganan, 600 naskhah jurnal/majalah berjilid dan 1200 judul audio-visual tersedia di Perpustakaan MOSTI.

Penerbitan yang dikeluarkan oleh MASTIC pada tahun 2011 ialah:

- i. Laporan Petunjuk S&T 2010 yang memaparkan petunjuk berhubung prestasi dan tahap pembangunan sosio-ekonomi negara dalam aktiviti-aktiviti ekonomi, sains dan teknologi, dan
- ii. MOSTI Facts and Figures yang memaparkan petunjuk-petunjuk utama di MOSTI.

MASTIC juga menerima kunjungan lawatan daripada organisasi dalam dan luar negara seperti Universiti Teknologi MARA pada 31 Mac, 2011 dan Uganda National Council of Science and Technology (UNCST) pada 9 Jun, 2011. Tujuan lawatan adalah untuk berkongsi pengetahuan mengenai pengurusan maklumat S&T.

Majlis Sains dan Penyelidikan Kebangsaan

Tanggungjawab menyelaras inisiatif STI di negara ini telah diletakkan di bawah Majlis Sains dan Penyelidikan Kebangsaan (NSRC) yang baru ditubuhkan. Sejak mesyuarat pertama pada bulan Mac 2011, NSRC telah membentuk lima jawatankuasa kecil dan sepuluh Kumpulan Kerja Pakar yang akan membangunkan peta halatuju R&D dan Strategi Sains Alam Sekitar; Sains Bahan Termaju; Sains Pertanian; Sains Hayat; Sains Kimia; Matematik & Sains Fizikal; Sains Komputer & ICT; Sains Kesihatan & Perubatan; Sains Kejuruteraan; dan Sains Kemanusiaan & Sosial. Di samping menganjur Bengkel Penentuan Bidang Keutamaan R&D di bidang Sains dan Pembangunan Teknologi, sesi-sesi dialog telah diadakan dengan Utusan Sains dari pentadbiran Amerika Syarikat, Dr. Rita Colwell dan Penasihat Sains dari United Kingdom, Sir John Beddington.

Keperluan ICT MOSTI

Bahagian Pengurusan Teknologi Maklumat MOSTI merancang, menyelaras dan melaksanakan keperluan ICT Kementerian berdasarkan Pelan Strategik ICT (ISP). Pada asanya, ia memastikan bahawa semua perkhidmatan, fasiliti dan keperluan ICT MOSTI, termasuk

MOSTI on 29 November 2011. A total of 160 participants attended the briefing session on the R&D data collection. The R&D study is scheduled to be completed in May 2013.

MOSTI library which is managed by MASTIC, has a comprehensive collection of monographs, periodicals, journals, audiovisuals and electronic materials in S&T and related subject areas. By the end of 2011, MOSTI library has 14,000 volumes of monographs, 33 titles of journals and periodicals on subscription and 1,190 audio visual titles in its collection.

Publications produced by MASTIC in 2011 were:

- i. National Science and Technology Indicators Report 2010 which provides details of the national performance and trends in STI activities; and
- ii. Quarterly MOSTI 2011 Facts and Figures which provides STI indicators.

MASTIC had also received visitors from Faculty of Information Studies, University Technology MARA and Uganda National Council of Science and Technology (UNCST) in 2011. The purpose of the visits were to share knowledge on S&T information management.

National Science and Research Council

The responsibility for the co-ordination of STI initiatives in the country has been placed under the newly-formed National Science and Research Council (NSRC). Since its first meeting in March 2011, the NSRC has formed five sub-committees and ten Expert Working Groups which will develop R&D Roadmaps and Strategies for Environmental Sciences; Advanced Material Sciences; Agriculture Sciences; Life Sciences; Chemical Sciences; Mathematics & Physical Sciences; Computer Sciences & ICT; Health & Medical Sciences; Engineering Sciences; and Humanities & Social Sciences. In addition to a Workshop on the Determination of R&D Priority Areas in Science and Technology Development, dialogue sessions were held with the Science Envoy from the US administration, Dr. Rita Colwell; and Science Advisor from the UK, Sir John Beddington.

MOSTI's ICT Requirements

MOSTI's Information Technology Management Division plans, co-ordinates and implements the Ministry's ICT needs based on its Strategic ICT Plan (ISP). Primarily, it ensures that all MOSTI's ICT services, facilities and requirements inclusive of hardware, software, network, security and infrastructure are being managed and administered accurately, securely and in timely fashion, according to the Ministry's needs in order to provide an effective and efficient delivery system. The Division's responsibilities include: (i) to review ICT proposals received from MOSTI agencies in its capacity as the Secretariat for the Ministry's Steering Committee on ICT; and (ii) to respond to ICT security needs through the Computer Emergency Response Team (CERT). The Division represented MOSTI in the X-MAYA 4 Workshop organised by the National Security Council and CyberSecurity Malaysia.

perkakasan, perisian, rangkaian, keselamatan dan infrastruktur diurus dan ditadbir dengan jitu, selamat dan tepat pada masanya, mengikut keperluan Kementerian supaya wujud sistem penyampaian yang berkesan dan cekap. Tanggungjawab Bahagian ini termasuklah: (i) mengkaji cadangan ICT yang diterima dari agensi/agensi MOSTI dalam kapasitinya sebagai Urusetia bagi Jawatankuasa Pemandu Kementerian berkelaan ICT; dan (ii) bertindak balas kepada keperluan keselamatan ICT melalui Pasukan Tindak Balas Kecemasan Komputer (CERT). Bahagian ini telah mewakili MOSTI di Bengkel X-MAYA 4 anjuran Majlis Keselamatan Negara dan CyberSecurity Malaysia.

Inisiatif STI Dalam Sektor Baru

Nanoteknologi

Pada tahun 2011, langkah-langkah pertama ke arah membangunkan industri nanoteknologi negara telah diambil. Dalam usaha merancang dan melaksanakan Inisiatif Nanoteknologi Negara, Direktorat Nanoteknologi Kebangsaan (NND) telah menubuhkan satu Jawatankuasa Pemandu dan empat Jawatankuasa Kerja (Infrastruktur dan Fasiliti R&D; Inovasi, Pembangunan Teknologi dan Pengkomersilan; Pendidikan, Rangkaian Kesedaran Antarabangsa; dan Kesihatan, Keselamatan dan Alam Sekitar). Menjelang akhir tahun ini, NND dapat melaporkan (i) pembentukan satu Peta Halatuju Teknologi dan rangka kerja Pengkomersilan Nanoteknologi Kebangsaan; (ii) Penggubalan Dasar Nanoteknologi Negara; (iii) Pelaksanaan Program NanoMalaysia; (iv) Pembangunan Pusat NanoMalaysia dan NanoMalaysia Berhad ('entiti perniagaan') bagi pelaksanaan Program NanoMalaysia. NanoFund telah ditubuhkan untuk mempermudahkan pelaksanaan R&D berkaitan nanosains dan nanoteknologi dalam bidang-bidang keutamaan. Sejumlah 20 projek R&D telah dipilih untuk menerima geran NanoFund berjumlah RM7 juta.

Beberapa acara telah dianjurkan oleh NND: (i) Bengkel Penyediaan Kajian Halatuju Strategik Nanoteknologi pada bulan Februari 2011 di mana satu pelan tindakan bagi Program NanoMalaysia serta Bidang Tugas untuk Halatuju Strategik Nanoteknologi Negara dan Dasar Nanoteknologi Negara telah disediakan; (ii) Sidang Kemuncak NanoMalaysia dan Ekspo 2011 yang diadakan pada bulan Jun 2011: satu pertukaran idea dan maklumat mengenai perkembangan terbaru di bidang nanoteknologi, yang dihadiri oleh 250 peserta dan dikunjungi oleh lebih daripada 2,000 orang; (iii) Seminar Kesedaran Nanoteknologi /Karnival Nanoteknologi (NanoFest 2011), yang diadakan dengan kerjasama Pusat Sains Negara pada bulan September 2011. Tujuannya ialah untuk meningkatkan kesedaran tentang kepentingan nanoteknologi kepada kumpulan sasar; (iv) Bengkel Implikasi Keselamatan, Kesihatan dan Alam Sekitar (SHE) Nanoteknologi pada bulan Ogos 2011: perbincangan telah diadakan tentang nanotoksiti, alam sekitar dan kesihatan. Input dari bengkel akan digunakan dalam merumus garis panduan SHE negara; dan (v) Mesyuarat Saintis Muda NanoMalaysia 2011 pada bulan Disember 2011: dihadiri oleh kira-kira 100 saintis muda. Tujuannya adalah untuk mempertingkatkan kesedaran dan memupuk minat dan penglibatan saintis muda dalam bidang nanoteknologi.



Penyertaan MGI dalam pameran MySTI-EXPO 2011 anjuran bahagian Teras Sains & Teknologi, MOSTI di KLCC.
MGI's participation in MySTI-EXPO 2011 at KLCC.

Emerging Sectors for STI initiatives

Nanotechnology

In 2011, the first steps towards developing the country's nanotechnology industry were taken. In order to plan and implement the National Nanotechnology Initiative, the National Nanotechnology Directorate (NND) established a Steering Committee and four Working Committees (R&D Infrastructure and Facilities; Innovation, Technology Development and Commercialisation; Education, International Network of Awareness; and Health, Safety and Environment). By the end of the year, the NND was able to report (i) the formulation of a Technology Road Map and the National Nanotechnology Commercialisation framework; (ii) Drafting of the National Nanotechnology Policy; (iii) Implementation of the NanoMalaysia Programme; and (iv) Development of the NanoMalaysia Centre and NanoMalaysia Berhad (the 'business entity') for the implementation of the NanoMalaysia Programme. A NanoFund was created to facilitate the implementation of nanoscience and nanotechnology R&D in priority areas. A total of 20 R&D projects had been selected and were awarded NanoFund grants amounting to RM7 million.

Several events were organised by NND: (i) a Workshop on Preparation of Nanotechnology Strategic Direction Study in February 2011 during which an action plan for the NanoMalaysia Programme as well as Terms of Reference for the National Nanotechnology Strategic Direction and National Nanotechnology Policy were prepared; (ii) NanoMalaysia Summit and Expo 2011 held in June 2011: an exchange of ideas and information on the latest developments in nanotechnology, which was attended by 250 participants and visited by more than 2,000 people; (iii) Nanotechnology Awareness Seminar/Nanotechnology Carnival (NanoFest 2011), held in cooperation with the National Science Centre in September 2011. The aim was to increase awareness of the importance of nanotechnology to target groups; (iv) Workshop on Safety, Health and Environmental (SHE) Implications of Nanotechnology in August 2011: discussions were held on nanotoxicity, environment, and health. The input from the workshop will go into formulating national SHE guidelines; and (v) NanoMalaysia Young

Di samping itu, lima institusi yang terlibat dalam R&D nanoteknologi telah diiktiraf sebagai Pusat Kecemerlangan NanoMalaysia (NanoCoE). Mereka terdiri dari Institut Kejuruteraan Mikro dan Nanoelektronik (IMEN), Pusat Inovatif Nanostruktur dan Nanoperalatan (COINN), Institut Kejuruteraan Nano Elektronik (INEE), Institut Ibnu Sina bagi Pengajian Sains Asas dan Pusat Nanoelektronik MIMOS Berhad.

Bioteknologi

Tahun 2011 menandakan permulaan fasa kedua (2010-2015) pelaksanaan Dasar Bioteknologi seperti yang digariskan dalam RMKe-10. Bahagian Bioteknologi Kebangsaan (BIOTEK) sebagai agensi MOSTI yang bertanggunjawang memandu agenda bioteknologi negara, telah melaporkan satu tahun yang aktif, di mana pencapaian utamanya ialah: (i) pelancaran Inisiatif Bioekonomi sempena BioMalaysia 2011; (ii) penubuhan Majlis Bioetika Negara; (iii) penubuhan Institut Bioteknologi Kebangsaan Malaysia (NIBM) yang menggabungkan Institut Genom Malaysia (MGI), Institut Farmaseutikal dan Nutraceutical Malaysia (IPharm) dan Institut Agro-Bioteknologi Malaysia (ABI); (iv) penyertaan dalam pelbagai acara mempromosikan S&T seperti BioMalaysia 2011, My Bio Carnival 2011, MySTI 2011, NICE 2011, Dialog Antarabangsa Langkawi 2011; dan (v) mengukuhkan kerjasama dan jaringan antarabangsa.

R&D Bioteknologi

Pada tahun 2011, sebanyak RM7.5 juta telah diluluskan untuk tiga projek di bawah skim TechnoFund, iaitu satu berkenaan penjagaan kesihatan dan dua berkenaan agro-bioteknologi. BIOTEK juga terus memantau kemajuan 34 projek TechnoFund yang sedang dilaksanakan. Tiga dari projek ini telah berjaya disiapkan pada tahun 2011 dengan menghasilkan (i) vaksin oral untuk Sindrom Virus Tompok Putih oleh Universiti Malaya-Global Satria Sdn Bhd; (ii) Kit Diagnostik Molekul untuk Penyaringan Penyakit Denggi dan Serotaip Virus oleh GeneFlux Biosciences Sdn Bhd; dan (iii) mempertingkatkan pengeluaran karagenan spartapis oleh Omnidgel Sdn Bhd.

Pembangunan sebanyak 116 projek bernilai RM28,210,464 telah diluluskan di bawah geran ScienceFund. Jumlah tertinggi ialah untuk biofarmasi (25 projek), diikuti oleh bioteknologi tumbuhan (23) dan bioteknologi perubatan (22).

BIOTEK juga telah meluluskan dua projek di bawah geran penyelidikan ER BIOTEK untuk pelaksanaan oleh Institut Genom Malaysia (MGI), di samping memantau projek-projek sedia ada, seperti berikut:

- (i) R&D berkenaan beras jenis Siraj (iaitu hibrid antara jenis Indica dan Japonica) yang menunjukkan potensi meningkatkan hasil tuaian. Beras jenis baru ini telah diluluskan oleh Kementerian Pertanian pada tahun 2011, untuk penanaman komersil di seluruh negara. Kejayaan projek ini telah diiktiraf secara rasminya oleh Yang Teramat Mulia Raja Perlis dalam satu majlis khas di Stesen Penyelidikan MARDI di Tambun Tulang, Perlis, pada 23 Julai 2011.

Scientists Meeting 2011 in December 2011: attended by about 100 young scientists. Its aim was to raise awareness and foster interest and involvement of young scientists in nanotechnology.

In addition, five institutes involved in nanotechnology R&D have been recognised as NanoMalaysia Centres of Excellence (NanoCoE), there are Institute of Microengineering and Nanoelectronics (IMEN), Centre of Innovative Nanostructures and Nanodevices (COINN), Institute of Nano Electronic Engineering (INEE), Ibnu Sina Institute for Fundamental Science Studies and MIMOS Berhad Nanoelectronics Centre.

Biotechnology

The year 2011 marked the start of the second phase (2010-2015) of the implementation of the Biotechnology Policy, as outlined in the 10MP. The National Biotechnology Division (BIOTEK) as the MOSTI agency responsible for steering the national biotechnology agenda, reported an active year, some of the main highlights being: (i) the launch of the Bioeconomy Initiative in conjunction with BioMalaysia 2011; (ii) the setting up of the National Bioethics Council; (iii) the establishment of the National Institutes of Biotechnology Malaysia (NIBM) which consolidates the Malaysia Genome Institute (MGI), Malaysian Institute of Pharmaceuticals and Nutraceuticals (IPharm), and Agro-Biotech Institute Malaysia (ABI); (iv) participation in various events promoting S&T such as BioMalaysia 2011, My Bio Carnival 2011, MySTI 2011, NICE 2011, and the Langkawi International Dialogue 2011; and (v) strengthening of international collaboration and networking.

Biotechnology R&D

In 2011, RM7.5 million was approved for three projects under the TechnoFund scheme, one on healthcare and two on agro-biotechnology. BIOTEK continued to monitor the progress of 34 existing TechnoFund projects. Three of these projects were successfully completed in 2011, resulting in (i) an oral vaccine for White Spot Syndrome Virus by Universiti Malaya-Global Satria Sdn Bhd; (ii) a Molecular Diagnostic Kit for Dengue Disease Screening and Virus Serotyping by GeneFlux Biosciences Sdn Bhd; and (iii) enhancing the production of semi-refined carrageenan by Omnidgel Sdn Bhd.

Financing of 116 projects valued at RM28,210,464 was approved under ScienceFund grants. The highest number was for biopharmacy (25 projects), followed by plant biotechnology (23), and biotechnology in medicine (22).

BIOTEK also approved two projects under the ER BIOTEK research grant, for implementation by Malaysian Genome Institute (MGI), while monitoring several existing projects, as follows:

- (i) R&D on the Siraj rice strain (a hybrid of the Indica and Japonica strains) which shows promise in increasing rice yields. This new strain of rice was approved by the Ministry of Agriculture in 2011, for commercial planting throughout the country. The success of this

- (ii) Tiga projek di bawah InnoFund Komuniti telah menunjukkan hasil yang membanggakan:
 - Buah epal di Ba'Kelalan, Sarawak. Penggunaan baja dan kaedah pengawalan serangga perosak adalah berdasarkan bioteknologi.
 - Penternakan ikan di Kampung Putatan, Panampang, Sabah
 - R&D melibatkan Empurau menggunakan Sistem Akuakultur Kitar Semula. Projek ini bertujuan mengeluarkan sehingga 30,000 anak ikan setahun.

R&D Oseanografi dan Sains Marin

Melalui Direktorat Oseanografi Kebangsaan (NOD), Malaysia telah mengekalkan hubungan yang baik dengan State Oceanic Administration (SOA), People's Republic of China dan Universiti Hasanuddin, Indonesia. Selain itu NOD juga merupakan Sekretariat Nasional Inisiatif Segitiga Terumbu Karang (CTI), Inter-governmental Oceanographic Commission (IOC) UNESCO; dan Naib Pengerusi Kedua IOC Sub-Commission for the Western Pacific (IOC-Westpac). NOD juga mewakili Malaysia dalam Committee on Science and Technology (COST) sebagai ahli kepada Sub-Committee on Marine Science and Technology (SCMSAT) dan projek Stratospheric Ozone: Halogen Impacts in a Varying Atmospheric (Shiva), yang dibiayai oleh Kesatuan Eropah (EU).

Projek-projek NOD

NOD telah menerajui satu pasukan penyelidik dari Universiti Malaysia Terengganu (UMT), Universiti Putra Malaysia (UPM) dan Universiti Malaysia Sabah (UMS) untuk mengkaji kadar mortaliti kupang di Kota Marudu, Sabah. Sementara itu, kejayaan telah dilaporkan dalam beberapa projek R&D yang dibiayai oleh ScienceFund, termasuklah rekabentuk dan pembangunan *intelligent hybrid underwater vehicle* dan penghasilan cyst daripada Harpacticoid Copepods.

Kesedaran Awam

Bagi meningkatkan kesedaran awam, NOD telah berjaya menganjurkan sambutan World Oceans Day (WOD) di Pusat Sains Negara pada 12 Jun 2011, di mana NOD turut terlibat dalam pameran-pameran bersama dengan agensi-agensi MOSTI yang lain. Selain itu, dua buah bengkel telah dianjurkan oleh NOD: (i) Workshop on Status and Technology Development of Biofuel Production from Marine Algae in ASEAN Countries dengan kerjasama Institut Sains Samudera dan Bumi (Universiti Malaya), dan (ii) Workshop on Extent of Transfer of Alien Invasive Organisms in Southeast Asia by Shipping dengan kerjasama Jabatan Laut Malaysia.

project was officially recognised by His Royal Highness the Raja of Perlis in a special ceremony at the MARDI Research Station in Tambun Tulang, Perlis, on July 23, 2011.

- (ii) Three projects under the Community Innofund are showing encouraging results:

- Apples in Ba'Kelalan, Sarawak. The fertilisers and pest control methods are based on biotechnology.
- Fish farming in Kampung Putatan, Panampang, Sabah
- R&D involving Empurau using a Recirculating Aquaculture System. The project aims to produce up to 30,000 fry per year.

Oceanography and Marine Science R&D

Through the National Oceanography Directorate (NOD), Malaysia maintained a sound relationship with the State Oceanic Administration (SOA), People's Republic of China and Hasanuddin University, Indonesia. In addition, NOD is the National Secretariat for the Coral Triangle Initiative (CTI Coral Triangle Initiative); a member of the Executive Council of the Inter-governmental Oceanographic Commission (IOC) of UNESCO; and the Second Vice-Chairman of the IOC Sub-Commission for the Western Pacific (IOC-Westpac). NOD also represents Malaysia in the ASEAN Committee on Science and Technology (COST) a member of the Sub-Committee on Marine Science and Technology (SCMSAT); and a project on Stratospheric Ozone: Halogen Impacts in a Varying Atmospheric (SHIVA), which is supported by the European Union (EU).

NOD's Projects

NOD led a team of researchers from Universiti Malaysia Terengganu (UMT), Universiti Putra Malaysia (UPM) and Universiti Malaysia Sabah (UMS), to investigate mussel mortality rates at Kota Marudu, Sabah. Meanwhile, progress was reported in several R&D projects financed by ScienceFund, which include the design and development of an intelligent hybrid underwater vehicle; and development of cyst from marine Harpacticoid Copepods.

Public Awareness

With regard to enhancing public awareness, NOD celebrated World Oceans Day at the National Science Centre on June 12, 2011, and took part in exhibitions together with other MOSTI agencies. In addition, two major Workshops were organised by NOD: (i) in collaboration with the Institute of Ocean and Earth Science (University of Malaya), a Workshop on Status and Technology Development of Biofuel Production from Marine Algae in ASEAN Countries; and (ii) in collaboration with the Malaysian Marine Department, a Workshop on Extent of Transfer of Alien Invasive Organisms in Southeast Asia by Shipping.



MoU MIMOS dengan Jabatan Pertanian Sabah untuk 'Wireless Sensor Network' dan SEDIA untuk Teknologi Semantik.
MoU between MIMOS and Department of Agriculture, Sabah for 'Wireless Sensor Network' and SEDIA for Symantic Technology.

Pencapaian Mengikut Kluster

Kluster Dan Dasar Ict

Ditubuhkan pada bulan Mac 2005, Bahagian Dasar ICT terdiri dari tiga bahagian, iaitu Perancangan, Pengurusan Dana ICT dan Promosi serta Kerjasama ICT. Bertindak sebagai Urusetia kepada Majlis Teknologi Maklumat Kebangsaan (NITC), Bahagian ini menyelaras dan menguruskan Dana Pembangunan Industri Kandungan (eContent Fund); projek-projek ScienceFund, TechnoFund dan InnoFund; serta menyelaras penyertaan Kluster ICT dalam mempromosi dan meningkatkan kesedaran ICT di peringkat Persekutuan, Negeri dan Antarabangsa.

Jalinan Keselamatan Siber Global

Pada mesyuarat National information Technology Council (NITC) 2011, wakil-wakil telah bersetuju untuk menubuhkan satu Jalinan Keselamatan Siber Global (GCSA), yang akan menjadi platform menggabungkan negara-negara untuk berkongsi maklumat mengenai perkara-perkara berkaitan keselamatan siber. Keahlian GCSA terbuka kepada Pertubuhan Kerjasama Islam (OIC), Forum Serantau ASEAN dan negara-negara membangun yang lain. Di samping itu, Malaysia Industrial Research Consortium on ICT (MiRICT) akan ditubuhkan untuk menggalakkan pembangunan produk berdasarkan ICT yang boleh dikomersilkan di peringkat antarabangsa. Pencapaian lain termasuklah (i) dengan kerjasama CyberSecurity Malaysia, merumus Strategi Negara bagi Pembudayaan Keselamatan Siber dan Pembangunan Kapasiti; (ii) penggubalan Rang Undang-Undang bagi cadangan Lembaga Jurukomputer Malaysia (BCPM), yang bakal bertanggungjawab ke atas Pembangunan Modal Insan ICT; dan (iii) pelancaran Pelan Halatuju Strategik ICT Negara, dan Kajian Semula Pelan Halatuju Teknologi di bawah Rolling Plan Pertama (2011-2012) dalam Rancangan Malaysia Ke-10. Hasilnya akan digunakan untuk meletakkan ICT sebagai penggerak utama ETP, GTP, 1Malaysia dan Digital Malaysia; melonjakkan Malaysia ke kalanjan sepuluh tempat teratas dalam Indeks Inovatif Forum Ekonomi Dunia (WEF); dan meningkatkan sumbangan ekonomi ICT kepada 20 % dari jumlah KDNK negara.

Performance By Clusters

Ict Policy & Services

Established in March 2005, the ICT Policy Division comprises three sections, namely Planning, ICT Fund Management, and ICT Promotion and Co-operation. Acting as the Secretariat to the National Information Technology Council (NITC), the division co-ordinates and manages the Content Industry Development Fund (eContent Fund); ScienceFund, TechnoFund and InnoFund projects; as well as co-ordinates ICT Cluster participation in promoting and enhancing ICT awareness at the Federal, State and International levels.

Global Cyber Security Alliance

Representatives at the 2011 National information Technology Council (NITC) meeting, agreed to the establishment of a Global Cyber Security Alliance (GCSA), which will be the platform for affiliating countries to share information on cyber security matters. The membership of GCSA will be open to Organisation of Islamic Co-operation (OIC), ASEAN Regional Forum and other developing countries. In addition, a Malaysia Industrial Research Consortium on ICT (MiRICT), would be formed to encourage the development of ICT-based products that could be commercialised at the international level. Other milestones included (i) together with CyberSecurity Malaysia, the formulation of a National Strategy for Cyber Security Acculturation and Capacity Building; (ii) the drafting of a Bill for a proposed Board of Computing Professionals Malaysia (BCPM), which would be responsible for ICT Human Capital Development; and (iii) the launching of a National Strategic ICT Roadmap and Technology Roadmaps Review Study, under the First Rolling Plan (2011-2012) of 10th Malaysia Plan. The findings will be used to position ICT as the key enabler for ETP, GTP, 1 Malaysia and Digital Malaysia; propel Malaysia into the top ten of the World Economic Forum (WEF)'s Innovative Index; and increase economic contribution from ICT to 20% of National GDP.

Pengurusan Dana

Seksyen Pengurusan Dana terus bertanggungjawab di atas projek-projek yang dibiayai oleh eContent Fund (bagi pembangunan kandungan ICT untuk pasaran domestik dan antarabangsa); Dana Skim Demonstrator Application Grant Scheme DAGS) (untuk projek-projek berasaskan komuniti), serta ScienceFund dan TechnoFund. Di bawah eContent Fund, sejumlah 97 projek telah diluluskan dalam tempoh RMKe-9, dengan peruntukan sebanyak RM110 juta. Pada tahun 2009 sehingga 2011, 80 dari projek-projek ini telah siap dan 39 telah dikomersilkan. Sebanyak RM53.69 juta hasil jualan telah dijana, dengan kemuncak jualan pada tahun 2011 berada di tahap RM23.74 juta. Kebanyakan dari projek-projek ini telah didaftarkan dengan Hak Harta Intelek (IP).Ianya juga telah menyediakan pekerjaan untuk kira-kira 2,390 orang.

Projek Dibiayai

Salah satu projek eContent yang cemerlang adalah sebuah filem yang dihasilkan oleh KRU Studio: *The Malay Chronicles* (Hikayat Merong Mahawangsa). Ditayangkan di Malaysia, Brunei dan Singapura, filem yang sebahagian besarnya dalam Bahasa Melayu ini, telah berjaya mendapat jumlah kutipan sebanyak RM6.5 juta. Pendapatan sampingan dari projek ini (perdagangan, pelesenan dan iklan TV) adalah bernilai kira-kira RM11.1 juta. Filem ini mengandungi kira-kira 80% dari CGI (lebih 1,500 adegan VFX) yang telah dibangunkan oleh 149 tenaga kerja/bakat tempatan dan asing, termasuk 12 orang yang memainkan peranan utama di sebalik produksi tersebut. Ia telah memenangi lapan anugerah di Festival Filem Malaysia termasuk anugerah utama, Filem Terbaik bagi tahun tersebut.

Satu lagi filem berpotensi pada tahun 2011 ialah SeeFood oleh Silver Ant Sdn Bhd, sebuah animasi 3D dalam Bahasa Inggeris keluaran tempatan yang pertama dihasilkan. Selepas tayangan perdana di Cannes Marché du Film pada bulan Mei 2011, SeeFood telah ditayangkan di lebih 90 buah negara di seluruh Amerika Utara, Eropah, Amerika Latin dan Asia dan telah berjaya mengumpul hasil jualan beranggar RM10 juta. Pada 8 Mac 2012, SeeFood akan tayangkan kepada penonton tempatan di 80 pawagam di seluruh negara. Kejayaan filem animasi ini di peringkat antarabangsa telah meletakkan industri animasi tempatan Malaysia setanding dengan pengeluar-pengeluar antarabangsa.

Dana DAGS membantu projek-projek untuk membangunkan kandungan, bertujuan merapatkan jurang digital di kalangan masyarakat di Malaysia. Peruntukan sebanyak RM47 juta telah disalurkan kepada Dana ini di bawah RMKe-9.Dua puluh enam projek bernilai RM46.9 juta telah diluluskan dari 46 permohonan yang diterima untuk pembiayaan DAGS.Tiga paten telah didaftarkan di bawah Hak Harta Intelek. Menjelang akhir tahun 2011, sejumlah 19 projek telah disiapkan, melibatkan golongan juvana, ibu tunggal, orang miskin di bandar dan orang pekak sebagai komuniti sasaran.

Projek-projek DAGS telah memenangi tujuh anugerah antarabangsa dan 11 anugerah kebangsaan, di antaranya Anugerah Harapan Samsung Digital All Asia Pasifik, Anugerah Merit Projek Sosial NGO (Pendidikan ICT)

Fund Management

The Fund Management Section continued to be responsible for projects financed by the eContent Fund (for the development of ICT content for domestic and international markets); Demonstrator Application Grant Scheme (DAGS) Fund (for community-based projects), as well as ScienceFund and TechnoFund. Under the eContent Fund, a total of 97 projects were approved during the 9MP period, with an allocation of RM110.0 million. During the year 2009 up till 2011, 80 of these projects were completed, of which 39 were commercialised. Some RM53.69 million in sales were generated, hitting a peak in 2011 at RM23.74 million. Most of the projects have registered for Intellectual Property (IP) Rights. They also provided employment for some 2,390 people.

Funded Projects

An outstanding eContent project was a film produced by KRU Studio: *The Malay Chronicles: Bloodlines* (Hikayat Merong Mahawangsa). Shown in Malaysia, Brunei and Singapore, this mainly Malay-language film garnered a total collection of RM6.5 million. The spill-over income from this project (merchandising, licensing and TV commercials) was valued at about RM11.1 million. This film contains about 80% of CGI (over 1,500 VFX shots) which was developed by 149 local and foreign workers/ talents, including 12 of them who played a key role behind the scenes. It went on to win eight awards at the Malaysia Film Festival including the major award, Best Film of the Year.

Another promising film in 2011 was SeeFood by Silver Ant Sdn Bhd, the first locally produced 3D animation in English. After the premiere screening at the Cannes Marché du Film in May 2011, SeeFood has been screened in over 90 countries around North America, Europe, Latin America and Asia and has managed to collect an estimated sales of RM10 million. On March 8, 2012, SeeFood will be screening in front of local audiences in 80 theatres all over the country. The success of this animated film at the international level has put Malaysia's local animation industry at par with international players.

The DAGS Fund assists projects which develop content aimed at bridging the digital divide among the communities in Malaysia. An allocation of RM47 million was channelled to this Fund under 9MP. Twenty six projects worth RM46.9 million were approved out of 46 applications received for DAGS funding. Three patents were registered under the Intellectual Property Rights. By the end of 2011, nineteen projects were completed, with the targeted communities being juveniles, single mothers, urban poor and the deaf.

DAGS projects have won 7 international awards and 11 national awards, among them being the Samsung Digital Hope Award Asia Pacific, NGO Social Project Merit Award (ICT Education) and MSC Malaysia APICTA 2009 Award for Best of e-Inclusion and e-Community. In 2011, nine projects were completed while 7 projects are still on-going and expected to be completed in 2012. Among the prominent projects that have commercial value include the development of electronic Braille panel to digitise the Al-Quran, an online ticket-booking

dan Anugerah APICTA MSC Malaysia 2009 bagi e-Inklusi dan e-Komuniti Terbaik. Pada tahun 2011, sembilan projek telah disiapkan manakala tujuh projek masih berterusan dan dijangka akan siap pada tahun 2012. Di antara projek terkemuka yang mempunyai nilai komersil termasuklah pembangunan panel Braille elektronik untuk mendigitalkan Al-Quran, sistem tempahan tiket atas talian untuk bas dan sebuah portal rangkaian sosial untuk menggalakkan interaksi yang lebih baik antara anak-anak yatim/kanak-kanak miskin dan orang awam.

ScienceFund dirancang untuk projek R&D yang boleh menyumbang kepada penemuan idea-idea baru dan kemajuan pengetahuan di bidang sains gunaan. Dari 147 permohonan yang diterima pada tahun 2011, 47 projek bernilai RM10,032,377.00 telah diluluskan. TechnoFund, yang membiayai teknologi terkini dengan potensi komersil yang kukuh, juga telah menerima banyak permohonan. Dalam tahun 2011, empat projek dari 57 permohonan telah diluluskan dengan peruntukan sebanyak RM4,934,150.00.

Promosi dan Kerjasama ICT

Dari segi promosi dan kerjasama ICT, mesyuarat pertama Kumpulan Kerja Bersama mengenai Teknologi Maklumat dan Perkhidmatan (JWG-ITS) telah diadakan, dengan kehadiran wakil-wakil dari India dan Malaysia. Dua jawatankuasa telah dibentuk – Jawatankuasa Bersama Perundingan Pembangunan Bakat (JITDC); dan Jawatankuasa Keselamatan Siber, dengan dua pencapaian utama: (i) satu rangkaian Perniagaan ke Perniagaan (B2B) melibatkan penggiat industri IT yang serupa diwujudkan di antara kedua-dua negara. Perbincangan lanjut juga akan diadakan dengan India berkenaan inisiatif Pembangunan Kemahiran Nasional (NSDC) negara tersebut; (ii) satu MoU berkenaan Kerjasama Keselamatan Siber akan ditandatangani, meliputi enam bidang berikut: Rangkaian dan isu keselamatan maklumat; Pertukaran maklumat mengenai serangan siber dan tindak balas bersama terhadap insiden keselamatan siber; Kerjasama keselamatan teknologi siber; Pertukaran maklumat mengenai dasar keselamatan siber yang diguna ramai dan amalan terbaik; Kerjasama dalam memerangi jenayah siber dan keganasan siber; dan Pertukaran sumber manusia.

Lain-lain Program Promosi ICT

Bahagian Dasar ICT juga telah bekerjasama dengan Persatuan Industri Komputer dan Multimedia Malaysia (PIKOM) untuk menjadikan rumah Bulan ICT Kebangsaan (NIM) 2011 dengan tema 'Merentas Ke Nilai Tinggi' dari 1-31 Oktober 2011. Sidang Kemuncak Kepemimpinan dan SMART Sourcing; Siri Ceramah Kejayaan Perniagaan dengan ICT (BSI); dan Pesta Komputer telah diadakan di seluruh negara.Satu laporan kajian yang menyeluruh mengenai landskap ICT di Malaysia, PIKOM ICT Strategic Review 2011/12, telah dilancarkan semasa NIM 2011.

Satu Projek InfoST@MOSTI baru telah dilancarkan di Pahang, menjadikan jumlah projek di seluruh negara sebanyak enam (dua di Sabah dan tiga di Sarawak). Projek ini bertujuan merapatkan jurang digital di kawasan luar bandar dengan memudahkan akses kepada portal InfoST@MOSTI (<http://www.infosti.my>) dan

system for buses and a social networking portal to encourage better interaction between orphans /poor children and the public.

ScienceFund is intended for R&D projects that can contribute to the discovery of new ideas and the advancement of knowledge in applied sciences. Out of 147 applications received in 2011, 47 projects worth RM10,032,377.00 were approved. TechnoFund, which finances cutting edge technologies with solid commercial potential, also received many applications. In the year 2011, 4 projects out of 57 applications were approved, with an allocation of RM4,934,150.00.

ICT Promotion and Co-operation

In terms of ICT promotion and co-operation, the 1st Joint Working Group on Information, Technology and Services (JWG-ITS) was held, drawing together representatives from India and Malaysia. Two committees were formed – the Joint ICT Talent Development Consultative Committee (JITDC); and the Cyber Security Committee, which gave rise to two main outcomes: (i) a Business to Business (B2B) network with similar IT industry players will be established between both countries. There will also be further discussions with India on its National Skills Development Corporation (NSDC) initiative; (ii) a MoU on Cybersecurity Co-operation will be signed, covering the following six areas: Network and information security issues; Exchange of information on Cyber attacks and mutual response to cyber security incidents; Cyber security technology co-operation; Exchange of information on prevalent cyber security policies and best practices; Co-operation in combating cyber crime and cyber terrorism; and Human resource exchange.

Other ICT Promotional Programmes

The ICT Policy Division also collaborated with the Association of the Computer and Multimedia Industry, Malaysia (PIKOM) to host National ICT Month (NIM) 2011 with the theme Transcending Into High Values from October 1-31, 2011. Leadership and SMART Sourcing Summits; Business Success with ICT (BSI) Series talks; and PC Fairs were held nationwide. A comprehensive research report on ICT Landscape in Malaysia, PIKOM ICT Strategic Review 2011/12, was launched during NIM 2011.

A new InfoST@MOSTI Project was launched in Pahang, bringing the total number of projects nationwide to six (two are in Sabah and three in Sarawak). The project aims to bridge the digital divide in rural areas through facilitating access to InfoST@MOSTI's portal (<http://www.infosti.my>) and ICT training. Other stakeholders in the project include Cyber Development Corporation (CDC), MIMOS Berhad, .my Domain Registry, CyberSecurity Malaysia, MDeC, Permodalan Nasional Berhad (PNB), Persatuan Industri Komputer Malaysia (PIKOM), Microsoft (Malaysia) Sdn Bhd, SME Bank, Department of Agriculture (DOA), ADUN Mukim Bebar, District Office, Majlis Ugama Islam dan Adat Resam Melayu Pahang (MUIP) and the Local Village Development and Security Committee (JKKK).

latihan ICT. Penggerak utama yang lain dalam projek ini termasuk Cyber Development Corporation (CDC), MIMOS Berhad, .my DOMAIN REGISTRY, CyberSecurity Malaysia, MDeC, Permodalan Nasional Berhad (PNB), Persatuan Industri Komputer Malaysia (PIKOM), Microsoft (Malaysia) Sdn Bhd, SME Bank, Jabatan Pertanian (DoA), ADUN Mukim Bebar, Pejabat Daerah, Majlis Ugama Islam dan Adat Resam Melayu Pahang (MUIP) dan Jawatankuasa Kemajuan dan Keselamatan Kampung (JKKK) tempatan.

Agenzi di Bawah Kluster ICT

Strategi MOSTI dalam dasar dan perkhidmatan ICT adalah didorong oleh pelbagai agensi yang secara kolektif membentuk Kluster ICT, iaitu MIMOS; MDeC; .my DOMAIN REGISTRY; dan CyberSecurity Malaysia.

MIMOS

MIMOS Berhad meneruskan penyelidikan gunaan dalam bidang ICT melalui perkongsian pintar dengan sektor awam dan swasta, serta pihak akademia. Pada tahun 2011, bidang-bidang R&D utama termasuklah Analisis Lanjutan & Permodelan; Pengkomputeran Lanjutan; Keselamatan Maklumat; Informatik Pintar, Teknologi Pengetahuan; Mikrotenaga; Mikroelektronik; Nanoelektronik; Psikometrik dan Komunikasi Tanpa Wayar.

Sehingga 31 Disember 2011, 22 paten MIMOS dan dua paten rekabentuk perindustrian telah dikeluarkan, manakala 98 paten telah difaikan dengan Perbadanan Harta Intelek Malaysia (MyIPO), dan 107 dengan Perjanjian Kerjasama Paten (PCT). Pada keseluruhannya, 161 perakuan paten telah dibuat pada tahun 2011, menjadikan jumlah perakuan IP kumulatif MIMOS kini sebanyak 1,162.

Penyelidikan dan Pengkomersilan Teknologi

MIMOS juga telah mewujudkan perkongsian dengan beberapa syarikat antarabangsa dan tempatan serta institusi penyelidikan dalam pelbagai bidang penyelidikan teknologi. Antara badan-badan antarabangsa tersebut adalah Pusat Maklumat Ekonomi Leibniz (Kiel, Jerman), Universiti Kiel (Jerman), Universiti Loughborough, Royal Holloway/Universiti London, Universiti Cambridge (United Kingdom), Universiti Princeton, Universiti Michigan State, Universiti Carnegie-Mellon, (Amerika Syarikat), Know-centre (Austria) dan Mindteck (India).

Pengkomersilan teknologi MIMOS telah dipertingkatkan melalui platform pemindahan teknologi yang dibangunkan di makmal-makmalnya kepada syarikat-syarikat tempatan yang layak. Pada tahun 2011, MIMOS memeterai Perjanjian Pelesenan Teknologi dengan 12 syarikat; beberapa darinya telah berjaya menembusi pasaran tempatan dan antarabangsa. Syarikat-syarikat ini adalah: Cloud Connect Sdn Bhd (Grid Computing 4.1); DagangNet Technologies (NBvTPM, 12P, AgriOffice, AgriBazaar); Quantum Intellicode Sdn Bhd (Kiosk, PPOD, WiWi); Sistem Konglomerat Sdn Bhd (I2P 3.0); VADS Sdn Bhd (Grid Computing 4.1); Comintel Sdn Bhd (WiWi Gen 1.8); Inforence Sdn Bhd (Wireless Sensor Network); Zuma Engineering Sdn Bhd (Wireless Sensor Network); Multimedia Prospects Sdn Bhd (MSPS 1.0, AgriOffice, AgriBazaar 2.0); Venture Nucleus (M) Sdn Bhd (eKMS, ISP 3.0); System Consultancy Services Sdn Bhd (STP 3.1, USP 2.0, QRNG 1.0); and BiForst Technology Sdn Bhd (Susu 1Malaysia).

Innovative Solutions

In addition, six of MIMOS innovative solutions have been adopted by the government towards enhancing public sector service delivery: Intelligent Mining and Matching Framework (adopted by Ministry of Human Resources); WiFi Access (adopted by Melaka State Government);

Agencies Under ICT Cluster

MOSTI's strategies in ICT policy and services are driven by the various agencies which collectively form the ICT Cluster, namely MIMOS; MDeC; .my Domain Registry; and CyberSecurity Malaysia.

MIMOS

MIMOS Berhad continued to undertake applied research in ICT through smart partnerships with the public and private sectors, as well as the academia. In 2011, the main R&D areas were defined as Advanced Analysis & Modelling; Advanced Computing; Information Security; Intelligent Informatics; Knowledge Technology; Microenergy; Microelectronics; Nanoelectronics; Psychometrics; and Wireless Communications.

As at December 31, 2011, 22 MIMOS patents, and two industrial design patents were granted, while 98 patents were filed with Intellectual Property Corporation of Malaysia (MyIPO), and 107 with the Patent Co-operation Treaty (PCT). On the whole, 161 patent disclosures were made in 2011, bringing MIMOS' cumulative IP disclosures to date to 1,162.

Technology Research and Commercialisation

MIMOS also established partnerships with a number of international and local companies as well as research institutions involving various technology research areas. Among the international bodies were the Leibniz Information Centre for Economics (Kiel, Germany), University of Kiel (Germany), Loughborough University, Royal Holloway/University of London, University of Cambridge (UK), Princeton, Michigan State University, Carnegie-Mellon University, PLDA Inc (USA), Know-centre (Austria), and Mindteck (India).

Commercialisation of MIMOS technologies was stepped up through the transfer of technology platforms developed by its labs to deserving local companies. In 2011, MIMOS sealed Technology Licensing Agreements with 12 companies, some of which have already made inroads into local and international markets. These companies were: Cloud Connect Sdn Bhd (Grid Computing 4.1); DagangNet Technologies (NBvTPM, 12P, AgriOffice, AgriBazaar); Quantum Intellicode Sdn Bhd (Kiosk, PPOD, WiWi); Sistem Conglomerate Sdn Bhd (I2P 3.0); VADS Sdn Bhd (Grid Computing 4.1); Comintel Sdn Bhd (WiWi Gen 1.8); Inforence Sdn Bhd (Wireless Sensor Network); Zuma Engineering Sdn Bhd (Wireless Sensor Network); Multimedia Prospects Sdn Bhd (MSPS 1.0, AgriOffice, AgriBazaar 2.0); Venture Nucleus (M) Sdn Bhd (eKMS, ISP 3.0); System Consultancy Services Sdn Bhd (STP 3.1, USP 2.0, QRNG 1.0); and BiForst Technology Sdn Bhd (Susu 1Malaysia).

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Penyelesaian Inovatif

Di samping itu, enam daripada penyelesaian inovatif MIMOS telah diterima pakai oleh kerajaan ke arah meningkatkan penyampaian perkhidmatan sektor awam: *Intelligent Mining dan Matching Framework* (diguna pakai oleh Kementerian Sumber Manusia); *Akses WiFi* (diguna pakai oleh Kerajaan Negeri Melaka); *AgriBazaar* (diguna pakai oleh Jabatan Pertanian); *Penilaian Psikometrik dan Sistem Pengurusan Pembelajaran Pintar (iLMS)* (diguna pakai oleh Majlis Amanah Rakyat - MARA) dan *Platform Perkhidmatan Penghantaran Pintar (iSDP)*, digabungkan dalam 30,000 unit komputer netbook Idola MIMOS (diguna pakai oleh MCMC dalam inisiatif 1Malaysia).

Enam penyelesaian teknologi yang lain telah diguna pakai dalam sektor utama ekonomi, termasuk lima Entry Point Projects (EPP) pada tahun 2011: *Cloud Computing - Perkhidmatan Perniagaan* (diguna pakai oleh TM VADS); *MyOffice, Intelligent Informatics Platform - Kandungan Komunikasi & Infrastruktur* (diguna pakai oleh DagangNet Technologies, dipasang oleh FAMA); *AgriOffice* dan *AgriBazaar - Pasar Borong Maya & Runcit* (diguna pakai oleh DagangNet Technologies bagi Global Halal Exchange); *WiWi - Kandungan Komunikasi & Infrastruktur* (diguna pakai oleh Quantum IntelliCode); *Kampung WiFi - Kandungan Komunikasi & Infrastruktur* (diguna pakai oleh PERNEC); dan *Rangkaian Pengesahan Tanpa Wayar-Elektrik dan Elektronik* (yang diguna pakai oleh Jabatan Pertanian).

Platform Penjanaan Idea

Bagi menggalakkan perbincangan terbuka di kalangan game-changers di bidang industri yang sedang membangun, MIMOS telah membangunkan tiga Platform Penjanaan Idea untuk perkongsian idea-idea kreatif dan membincangkan keperluan inovasi. Platform-platform ini adalah: iSpark (platform fizikal untuk mempersemprehalkan secara bebas idea-idea game-changing yang berinovatif), iQuest (forum atas talian untuk membincangkan inovasi-inovasi yang berpotensi dari perspektif pasaran) dan iFusion (forum atas talian untuk perbincangan output iSpark dan iQuest). Tiga sesi iSpark telah diadakan, yang menyaksikan idea-idea inovatif dikemukakan oleh 13 penyelidik dan jurutera yang mewakili lapan makmal MIMOS. Idea-idea ini akan melalui proses pembangunan dan penghalusan dengan lebih lanjut.

Modal Insan

Dari segi modal insan, Global Attachment Programme (GAP) telah diwujudkan oleh MIMOS untuk memberi pengalaman kepada para saintis/penyelidik. Pada tahun 2011, enam pemohon GAP telah ditempatkan di pusat-pusat penyelidikan saintifik yang terkenal atau terpilih, di dalam atau di luar negara, untuk

AgriBazaar (adopted by Department of Agriculture); Psychometrics Assessment and Intelligent Learning Management System (iLMS) (adopted by Majlis Amanah Rakyat - MARA); and Intelligent Service Delivery Platform (iSDP), bundled in 30,000 units of MIMOS' iDOLA netbook computer (adopted by MCMC in 1Malaysia initiative).

Six other technology solutions were adopted in key economic sectors, including five Entry Point Projects (EPPs) in 2011: Cloud Computing - Business Services (adopted by TM VADS); MyOffice, Intelligent Informatics Platform - Communications Content & Infrastructure (adopted by DagangNet Technologies, deployed by FAMA); AgriOffice and AgriBazaar-Wholesale & Retail - Virtual Marketplace (adopted by DagangNet Technologies for Global Halal Exchange); WiWi - Communications Content & Infrastructure (adopted by Quantum IntelliCode); Kampung WiFi - Communications Content & Infrastructure (adopted by PERNEC); and Wireless Sensor Network - Electric and Electronics (adopted by Department of Agriculture).

Ideation Platforms

To promote open discussion among developing industry game-changers, MIMOS initiated three Ideation Platforms for MIMOSians to share creative ideas and discuss innovation needs. These platforms were: iSpark (a physical platform for presentation of game-changing innovative ideas in a freeform manner), iQuest (online forum for discussing potential innovations from the market perspective) and iFusion (online forum for deliberating iSpark and iQuest outputs). Three iSpark sessions were held, which saw innovative ideas presented by 13 researchers and engineers representing eight MIMOS labs. The ideas will undergo further refinement and development.

Human Capital

In terms of human capital, a Global Attachment Programme (GAP) was established by MIMOS to offer experiential development to scientists/researchers. In 2011, six GAP applicants were attached to a renowned or selected scientific research centre, locally or abroad, for a maximum duration of three months, in thrust areas namely Cryptography / Information Security, Wireless Communication, Grid Computing, Micro-Nano Electronic Mechanical Systems (NEMS/MEMS), Psychometrics and Knowledge Engineering. MIMOS also worked with large local and multinational companies, assisting them to go global.

In the third quarter of 2011, MIMOS achieved Level 3 with regard to the People Capability Maturity Model (P-CMM). With this accomplishment, MIMOS is now the only organisation in Malaysia and in this region (except China) that is operating at P-CMM Maturity Level 3.

Multimedia Development Corporation (MDeC) Sdn Bhd

In line with its mandate to co-ordinate, promote and develop the ICT industry in the country, MDeC reported that in 2011: (i) 2,953 companies were awarded the MSC Malaysia status; (ii) Foreign and Domestic Investments

tempoh maksimum tiga bulan, dalam bidang teras iaitu Kriptografi/Keselamatan Maklumat, Komunikasi Tanpa Wayar, Pengkomputeran Grid, Sistem Mekanikal Mikro-Nano Elektronik (NEMS/MEMS), Psikometrik dan Kejuruteraan Pengetahuan. MIMOS juga bekerjasama dengan syarikat-syarikat tempatan dan multinasional yang besar bagi membantu mereka maju ke peringkat global.

Pada suku ketiga tahun 2011, MIMOS telah mencapai Tahap 3 People Capability Maturity Model (P-CMM). Dengan pencapaian ini, MIMOS kini merupakan satu-satunya organisasi di Malaysia dan di rantau ini (kecuali China) yang beroperasi pada kematangan P-CMM Tahap 3.

Perbadanan Pembangunan Multimedia (MDeC)

Selari dengan mandat untuk menyelaras, mempromosi dan membangunkan industri ICT di negara ini, MDeC melaporkan bahawa pada tahun 2011: (i) 2,953 syarikat telah dianugerahkan status MSC Malaysia; (ii) Pelaburan asing dan domestik di MSC Malaysia berjumlah RM2.51 bilion; (iii) Jualan bernilai RM31.72 bilion telah dicatatkan oleh syarikat berstatus MSC Malaysia; (iv) Eksport bernilai RM10.12 bilion telah dicatatkan oleh syarikat-syarikat ini, dan (v) 119,138 peluang pekerjaan di MSC Malaysia telah diwujudkan. Dua lokasi baru - Intermark dan Wisma Hamzah Kwong Hing - telah diberi status MSC Malaysia Cybercentre, menjadikan jumlah keseluruhan sebanyak 23.

Aktiviti di Cybercities

Pada tahun 2011, aktiviti-aktiviti yang dijalankan di dalam lingkungan Cybercities di peringkat negeri termasuklah: (i) Malaysian Cybergames Festival ; (ii) dialog dengan industri mengenai MSC Malaysia; (iii) ICT Awareness and Creativity Programmes for marginalised and rural communities; (iv) Pelan Tindakan Kecemasan: latihan prosedur tindak balas kecemasan di MSC Malaysia Cybercentres telah dijalankan dengan tujuan untuk meminimumkan risiko kehilangan nyawa dan harta benda sekiranya keadaan memerlukan.

MDeC menawarkan pelbagai program latihan dan memantau penawaran-permintaan pekerja berpengetahuan untuk mengenalpasti dan menangani jurang di antara keduanya.

Sebagai sebahagian dari Knowledge Development Initiative (KDI), MDeC bekerjasama dengan kementerian dan agensi-agensi yang relevan, khususnya Kementerian Pengajian Tinggi, Kementerian Pelajaran dan Kementerian Sumber Manusia. Satu garis panduan ringkas mengenai program dan aktiviti yang dilaksanakan di bawah penyeliaan KDI MSC Malaysia adalah seperti berikut:

(i) Program Perantis Prasiswazah MSC Malaysia (USP)

Program USP menyediakan latihan kepada mahasiswa dan mahasiswa tahun akhir yang telah dipilih untuk menjalani latihan dalam kemahiran teknikal dan kemahiran insaniah yang diperlukan oleh industri ICT.

into MSC Malaysia totalled RM2.51 billion; (iii) Sales worth RM31.72 billion were recorded by the MSC Malaysia status companies; (iv) Exports worth RM10.12 billion were recorded by these companies; and (v) 119,138 job opportunities at MSC Malaysia were created. Two new locations – the Intermark and Wisma Hamzah Kwong Hing – have been given the MSC Malaysia Cybercentre status, bringing the total to 23.

Activities in Cybercities

In 2011, the activities carried out within the Cybercities at the state level included: (i) Malaysian Cybergames Festival; (ii) dialogue with the industry on MSC Malaysia; (iii) ICT Awareness and Creativity Programmes for marginalised and rural communities; (iv) Emergency Response Plan: drills on emergency response procedures at MSC Malaysia Cybercentres were conducted with the aim to minimise the risk of loss of life and properties should the situation arise.

Specifically, MDeC offers a variety of training programmes and monitors the supply-demand of knowledge workers to identify and address gaps.

As part of its Knowledge Development Initiative (KDI), MDeC works with relevant ministries and agencies, particularly the Ministry of Higher Education, Ministry of Education and Ministry of Human Resources. A brief outline of the programmes and activities executed under the MSC Malaysia's KDI supervision are as follows:

(i) MSC Malaysia Undergraduates Skills Programme (USP)

The USP programme provides training to final year graduates who have been selected to undergo training in technical skills and soft skills required by the ICT industry. Launched in 2006, USP has trained more than 8,800 graduates, including 1,500 graduates in 2011. During the same period, 93% of trainees undergoing the programme were able to secure employment within six months of their graduation.

(ii) MSC Malaysia Apprentice and Graduate Development Programme (UGRAD)

University students undergo training by being placed with selected MSC Malaysia status companies. For the year 2011, a total of 767 students from 90 institutions of higher learning were successfully trained by more than 80 MSC Malaysia-status companies. A total of 92% of these trainees were successfully employed within six months of their graduation.

(iii) MSC Malaysia Graduate Training Programme (GTP)

The main objective of the GTP programme is to encourage MSC Malaysia status companies to employ new graduates who have completed their studies at the diploma or bachelor's degree levels. In 2011, a total of more than 900 new graduates were trained, with 99% of new graduates being placed at the MSC Malaysia status companies and the remaining 1% in other companies.

Dilancarkan pada tahun 2006, USP telah melatih lebih daripada 8,800 graduan, termasuk 1,500 graduan pada tahun 2011. Dalam tempoh yang sama, 93% daripada pelatih yang menjalani program ini mampu mendapatkan pekerjaan dalam tempoh enam bulan selepas tamat pengajian.

(ii) Program Pembangunan Perantis dan Siswazah MSC Malaysia (UGRAD)

Pelajar-pelajar universiti yang menjalani latihan ditempatkan di beberapa syarikat berstatus MSC Malaysia yang terpilih. Bagi tahun 2011, seramai 767 pelajar dari 90 institusi pengajian tinggi telah berjaya dilatih oleh lebih dari 80 syarikat berstatus MSC Malaysia. Seramai 92% daripada pelatih telah berjaya mendapatkan pekerjaan dalam tempoh enam bulan selepas tamat pengajian.

(iii) Program Latihan Graduan MSC Malaysia (GTP)

Objektif utama program GTP adalah untuk menggalakkan syarikat-syarikat berstatus MSC Malaysia mengambil graduan baru yang telah menamatkan pengajian mereka di peringkat diploma atau peringkat ijazah sarjana muda. Pada tahun 2011, sejumlah lebih daripada 900 graduan baru telah dilatih, dengan 99% daripada graduan baru ditempatkan di syarikat-syarikat berstatus MSC Malaysia dan baki 1% di syarikat-syarikat lain.

(iv) Kem Kerja (JC)

Graduan yang masih mencari pekerjaan boleh menjalani latihan kemahiran teknikal dan insaniah untuk tempoh enam minggu hingga tiga bulan. Bagi tahun 2011, sejumlah 1,736 graduan telah menjalani latihan dan 94% daripada mereka mendapat pekerjaan selepas enam bulan tamat pengajian.

(v) Kerjasama Industri-Akademia (IAC)

Dalam program jangka panjang yang berterusan di antara industri dan Institusi Pengajian Tinggi (IPT) ini, pelajar universiti menerima latihan menggunakan modul yang dibangunkan oleh industri dan digunakan oleh tenaga pengajar universiti yang terlatih di bidang industri.

Bagi tahun 2011, sejumlah 6,285 pekerja mahir telah dilatih secara langsung dan tidak langsung melalui pelbagai program IAC seperti Program Melatih Jurulatih. Di samping itu, sejumlah 547 pensyarah dari lebih dari 35 IPT tempatan telah dilatih untuk memperoleh kemahiran yang berkaitan dengan industri seperti JavaEE, MS.Net, Multimedia Kreatif 2D, VLSI dan TRIZ Lanjutan, sebagai usaha berterusan untuk melahirkan lebih ramai graduan yang memenuhi keperluan industri. Sejumlah 34 sesi peningkatan industri telah dianjurkan, manakala 13 rakan strategik telah dilantik, di antaranya ialah Infosys, Cisco, Agilent, Intel, Huawei, IBM dan Altera.

MDeC dengan kerjasama Kementerian Pelajaran dan Kementerian Pengajian Tinggi, juga melaksanakan kempen ICT Sebagai Pilihan Kerjaya untuk mewujudkan kesedaran dan menggalakkan lebih ramai pelajar mendaftar dalam program-program ICT. Pada tahun

(iv) Job Camp (JC)

Graduates who have yet to find employment can undergo technical and soft skills training for a period of 6 weeks to 3 months. For the year 2011, a total of 1,736 graduates underwent training, 94% of whom gained employment six months after graduation.

(v) Industry-Academia Collaboration (IAC)

In this on-going long-term programme between the industry and Institutions of Higher Learning (IHLs), university students receive training using modules developed by the industry and applied by university tutors who are industry-trained.

For the year 2011, a total of 6,285 skilled workers were directly and indirectly trained through the various IAC programmes such as Train-the-Trainer. In addition, a total of 547 lecturers from more than 35 local IHLs were trained to acquire industry-related skills such as JavaEE, MS. Net, 2D Creative Multimedia, Advanced VLSI and TRIZ, as an on-going concern to produce more graduates that meet industry requirements. A total of 34 'industry enhancement' sessions were organised, while 13 strategic partners were appointed, among them being Infosys, Cisco, Agilent, Intel, Huawei, IBM, and Altera.

MDeC, in collaboration with the Ministry of Education and Ministry of Higher Education, also implemented ICT as a Career Choice campaigns to create awareness and encourage more students to enrol in ICT programmes. In 2011, 3,955 students and 135 counsellor teachers attended career lectures organised under the campaign.

International students graduating from local universities were not left out. In 2011, a total of 674 international students accepted employment offers from MSC Malaysia status companies.

(vi) Talent and Employment Analyses

In 2011, a survey was carried out to determine the number of skilled manpower required by the ICT industry, as well as the specific skill sets the industry required, and at the same time identify the total output of graduates from the IHLs. A total of 1,000 companies and 50 IHLs took part in this survey. The results have been shared with the relevant stakeholders.

MDeC also produced Employment Analysis reports for the ICT Sector, and a Supply and Demand Report for the ICT industry focusing on the technical and vocational sector. This report was distributed by the Department of Skills Development to all training providers and ICT companies in Malaysia.

(vii) Entrepreneurship Skills Development (ESD)

The ESD programme began in 2011 with the aim of incorporating ICT entrepreneurship skills among students, researchers and teaching staff in local universities. Some of the programmes developed were through the efforts of MSC Malaysia and the relevant ministries and IHLs, e.g. the Business Pitching Workshop for Researchers was jointly conducted by MOSTI, while the Master Licensing

2011, seramai 3,955 pelajar dan 135 guru kaunseling menghadiri ceramah kerjaya yang dianjurkan di bawah kempen ini.

Pelajar antarabangsa yang lulus dari universiti-universiti tempatan juga tidak ketinggalan. Pada tahun 2011, sebanyak 674 pelajar antarabangsa telah menerima tawaran pekerjaan dari syarikat berstatus MSC Malaysia.

(vi) Analisis Bakat dan Pekerjaan

Pada tahun 2011, satu kaji selidik telah dijalankan untuk menentukan bilangan tenaga kerja mahir yang diperlukan oleh industri ICT, serta jenis kemahiran tertentu yang diperlukan oleh industri, dan pada masa yang sama mengenalpasti jumlah keluaran siswazah dari IPT. Sebanyak 1,000 syarikat dan 50 IPT mengambil bahagian dalam kaji selidik ini. Keputusannya telah dikongsi dengan pihak-pihak yang relevan.

MDeC juga telah menghasilkan laporan-laporan Analisis Pekerjaan bagi Sektor ICT dan Laporan Penawaran dan Permintaan bagi industri ICT dengan memberi tumpuan kepada sektor teknikal dan vokasional. Laporan ini telah diedarkan oleh Jabatan Pembangunan Kemahiran kepada semua penyedia latihan dan syarikat ICT di Malaysia.

(vii) Pembangunan Kemahiran Keusahawanan (ESD)

Program ESD bermula pada tahun 2011 dengan matlamat untuk menggabungkan kemahiran keusahawanan ICT di kalangan pelajar, penyelidik dan tenaga pengajar di universiti tempatan. Sebahagian dari program yang dibangunkan adalah melalui usaha MSC Malaysia dengan kementerian-kementerian dan IPT yang berkenaan, contohnya Bengkel Pembentangan Perniagaan bagi Penyelidik dikendalikan bersama dengan MOSTI, manakala Bengkel Perlesenan Master telah dianjurkan bersama dengan UTM. Pada tahun 2011, sebanyak 536 pelajar, pensyarah dan penyelidik telah berjaya dilatih melalui program ini.

Industri Animasi dan Kandungan Kreatif

Berikut dengan pengenalan Inisiatif Kandungan Multimedia Kreatif MSC Malaysia (M-CMCI) pada tahun 2006, industri animasi dan kandungan kreatif negara telah menyaksikan pertumbuhan yang signifikan. Sehingga tahun 2010, sektor ini telah menjana pendapatan berjumlah kira-kira RM 4.7 bilion, di mana RM 236 juta telah diperolehi dari pengeksportan produk dan perkhidmatan Malaysia. Bilangan syarikat MSC yang terlibat dalam sektor ini berjumlah kira-kira 230, yang mewakili semua sektor, dari penciptaan Harta Intelek asal hingga ke penyediaan perkhidmatan pasca-penerbitan.

Antara kemajuan yang telah dicapai oleh syarikat-syarikat berstatus MSC Malaysia termasuklah:

- (i) Penerbitan filem animasi 3D tempatan yang paling berjaya, *Geng: The Adventure Begins* telah dihasilkan oleh LesCopaque Productions. Filem ini mengutip RM 6.3 juta di box office tempatan.

Workshop was jointly organised with UTM. In 2011, a total of 536 students, lecturers and researchers were successfully trained through this programme.

Animation and Creative Content Industry

Following the introduction of the MSC Malaysia Creative Multimedia Content Initiative (M-CMCI) in 2006, the national animation and creative content industry has seen significant growth. As of 2010, the sector generated approximately RM4.7 billion in revenue, of which RM236 million were derived from exports of Malaysian products and services. The number of MSC companies involved in this sector numbered approximately 230, representing all sectors, from original Intellectual Property creation to the provision of post-production services.

Some of the milestones that have been achieved by MSC Malaysia status companies include:

- (i) The most successful locally produced 3D animated feature film, *Geng: The Adventure Begins* was created by LesCopaque Productions. The film garnered RM 6.3 million at the local box office.
- (ii) In the area of live action content, KRU Productions was able to produce the special effects used in *Hikayat Merong Mahawangsa* through the support provided under the e-Content fund which was managed by MOSTI and supported by MDeC.
- (iii) The successful co-production done by MDeC and Al-Jazeera Children's Channel on the animated TV series *Saladin* has built a loyal following in the Middle Eastern markets.
- (iv) On the international front, Rhythm and Hues Malaysia, the Malaysian arm of the international visual effects studio based in Los Angeles, worked on portions of *Yogi Bear, Alvin and the Chipmunks 2* and *X-Men First Class*.

MDeC's Malaysian Animation Creative Content Centre (MAC3), which recorded a total expenditure of RM 150 million in the 9MP, has played a central role in catalysing and accelerating the development of new ideas within the creative content industry. Programmes implemented such as the Intellectual Property Challenge Series (IPCC) have resulted in approximately 126 projects being awarded a total of RM4.59 million in development grants since 2006 after being evaluated as winners by a panel of industry judges. Some of the projects (such as *Drop Dead by Inspidea*) have been picked up by global networks such as Cartoon Network Asia for further development.

The implementation of the Digital Story programme in collaboration with Disney has allowed MAC3 to demonstrate the basics of creative content development utilising multimedia technologies to primary and secondary school students. The industry also benefits from the Masterclass programmes run in collaboration with IHLs such as The One Academy, which expose practitioners to updated industry production techniques.

MAC3's Accelerator programme continued to nurture the growth of young start-up's, the best example

(ii) Di dalam bidang kandungan aksi langsung, KRU Productions telah berupaya menghasilkan kesan khas yang digunakan dalam *Hikayat Merong Mahawangsa* melalui sokongan yang diberikan di bawah e-Content Fund yang diurus oleh MOSTI dan disokong oleh MDeC.

(iii) Kejayaan penerbitan bersama siri animasi TV *Saladin* yang dibuat oleh MDeC dan Saluran Kanak-kanak Al-Jazeera telah mewujudkan golongan pengikut setia di pasaran Timur Tengah.

(iv) Di peringkat antarabangsa, Rhythm and Hues Malaysia, cawangan Malaysia bagi studio kesan khas antarabangsa yang berpengkalan di Los Angeles, telah membangunkan beberapa bahagian dari *Yogi Bear, Alvin and the Chipmunks 2* dan *X-Men First Class*.

Pusat Kandungan Kreatif Animasi Malaysia (MAC3) MDeC, yang mencatat jumlah perbelanjaan sebanyak RM150 juta dalam RMK-9, telah memainkan peranan penting dalam memangkin dan mempercepatkan pembangunan idea-idea baru dalam industri kandungan kreatif. Program yang dilaksanakan seperti Siri Cabaran Harta Intelek (IPCC) telah menyebabkan kira-kira 126 buah projek dianugerah sejumlah RM4.59 juta dalam bentuk geran pembangunan sejak 2006 setelah dinilai sebagai pemenang oleh sebuah panel hakim industri. Beberapa projek (seperti *Drop Dead oleh Inspidea*) telah dipilih oleh rangkaian global seperti Cartoon Network Asia untuk pembangunan selanjutnya.

Pelaksanaan program Digital Story dalam kerjasama dengan Disney telah membolehkan MAC3 mendemonstrasikan asas-asas pembangunan kandungan kreatif menggunakan teknologi multimedia kepada pelajar-pelajar sekolah rendah dan menengah. Industri ini juga mendapat manfaat dari program Masterclass yang dijalankan dengan kerjasama IPT seperti *The One Academi*, yang mendedahkan teknik pengeluaran industri yang dikemaskini kepada para pengamal.

Program Pemecut MAC3 terus memupuk pertumbuhan usaha muda baru, contoh terbaiknya adalah kejayaan Animonsta Studios, yang mencipta siri animasi TV, *Boboi Boy*. Sementara itu, syarikat-syarikat yang lebih mantap telah mendapat manfaat dari penubuhan Rendering Farm MAC3 yang memberikan mereka akses kepada kuasa pemprosesan pengolahan yang berpatutan untuk membantu mempermudahkan pengeluaran kandungan animasi 3D. Antara projek-projek yang lebih ketara termasuklah pengolahan yang telah dilakukan untuk *Seefood*, sebuah filem cereka animasi yang dijadualkan untuk siaran pada tahun 2012, dan yang merupakan terbitan bersama antara Silver Ant dan Saluran Kanak-Kanak Al-Jazeera.

Mengiktiraf Pencapaian

Dalam usaha berterusan untuk mengiktiraf pencapaian dalam bidang ICT, MDeC dan PIKOM telah menganjurkan MSC Malaysia Asia Pacific ICT Alliance Awards (APICTA). Bertemakan 'Merangsang Kreativiti, Inovasi dan Kecemerlangan dalam ICT', acara ini telah memberi penghormatan kepada 16 pemenang dan 15 penerima Anugerah Merit yang telah berjaya menghasilkan inovasi terbaik di seluruh negara.



Lawatan turun padang oleh Ketua Setiausaha MOSTI ke Program Pusat Kandungan Kreatif Animasi Malaysia (MAC3) MDeC. Visit by Secretary General MOSTI to Animation and Digital Content Centre, MSC Malaysia, MDeC.

is the success of Animonsta Studios, which created the animated TV series, *Boboi Boy*. Meanwhile, more established companies have benefitted from the establishment of the MAC3 Rendering Farm which provides them access to affordable rendering processing power to help facilitate the production of 3D animated content. Some of the more notable projects included the rendering that was done for *Seefood*, a feature-based animation film slated for release in 2012, and which is a co-production between Silverant and the Al-Jazeera Children's Channel.

Recognising Achievements

In its on-going bid to recognise achievements, MDeC and PIKOM organised the 12th MSC Malaysia Asia Pacific ICT Alliance (APICTA) Awards. Themed, Stimulating Creativity, Innovation and Excellence in ICT, the event honoured a total of 16 winners and 15 Merit Award recipients deemed to have produced the best innovations nationwide.

Profiling Companies

In the area of IT, MDeC continued to provide management and support services to the industry through various approaches, e.g. profiling of companies (480 in total during the year) to understand any pertinent issues and to facilitate their involvement in the MSC Malaysia plan. The MSC Malaysia SCORE+ Programme was also made available to determine the fundamentals which make a company competitive, with a view towards increasing their effectiveness and competitiveness in the global market. In 2011, the SCORE+ Business Performance Rating saw an increase of 13.9% as compared to the previous year.

Marketing Missions

MDeC's Growth and Development Department continued to promote and market MSC Malaysia-made products and services to both domestic and global markets.

A MOSTI-led Specialised Trade Mission to Vietnam, Laos and Cambodia was organised in July 2011 to explore business opportunities for collaboration between Malaysian and Vietnamese, Laotian and Cambodian companies/organisations in the ICT sector. MDeC,

Memprofil Syarikat

Dalam bidang IT, MDeC terus menyediakan perkhidmatan pengurusan dan sokongan kepada industri melalui pelbagai pendekatan, contohnya pemprofilan syarikat (480 kesemuanya sepanjang tahun) untuk memahami isu-isu yang berkaitan dan untuk mempermudahkan penglibatan mereka dalam rancangan MSC Malaysia. Program SCORE+ MSC Malaysia juga telah disediakan untuk menentukan asas-asas yang menjadikan sesebuah syarikat itu berdaya saing, dengan harapan untuk meningkatkan keberkesanan dan daya saing mereka di pasaran global. Pada tahun 2011, the SCORE+ Business Performance Rating + telah menyaksikan peningkatan sebanyak 13.9% berbanding dengan tahun sebelumnya.

Misi Pemasaran

Jabatan Pertumbuhan dan Pembangunan MDeC terus mempromosi dan memasarkan produk dan perkhidmatan MSC Malaysia kepada pasaran-pasaran domestik dan global.

MOSTI telah menganjurkan satu Misi Perdagangan Khas ke Vietnam, Laos dan Kemboja pada bulan Julai 2011 untuk meninjau peluang perniagaan bagi kerjasama antara syarikat/pertubuhan Malaysia dan Vietnam, Laos dan Kemboja dalam sektor ICT. MDeC, MIMOS, CyberSecurity, .my DOMAIN REGISTRY dan MSC Malaysia merupakan sebahagian dari delegasi, bersama-sama dengan 12 syarikat MSC Malaysia yang lain. Di Vietnam, 34 mesyuarat perintis telah dijalankan dengan 11 syarikat Vietnam. Satu potensi perjanjian perdagangan telah dicatatkan (bernilai anggaran RM 8.1 juta). Di Vientiane, 13 syarikat Laos telah bertemu dengan 9 syarikat Malaysia. Satu potensi perjanjian perdagangan bernilai RM 10.5 juta telah direkodkan. Begitu juga di Phnom Penh, potensi perjanjian perdagangan bernilai RM 14 juta telah dicatatkan melalui mesyuarat dengan 17 syarikat Kemboja. Lewat tahun ini, MDeC merupakan sebahagian dari misi perdagangan ke Jakarta, yang terdiri dari 35 syarikat ICT (23 darinya adalah syarikat MSC Malaysia). Satu potensi perjanjian perdagangan bernilai RM 42.43 juta dicatatkan di pelbagai bidang perniagaan, termasuk solusi infrastruktur IT, sistem maklumat hospital, solusi pengurusan kewangan untuk majlis tempatan; sistem anti-pengubahan wang haram; dan pengangutan.

Kem Pemangkin InnovAsian

Jabatan ini juga mewujudkan satu program yang unik dipanggil InnovAsian Catalyst Camp yang menggunakan pendekatan berstruktur untuk menghubungkan syarikat MSC Malaysia dengan pelanggan/pembeli yang berpotensi, terutamanya syarikat-syarikat besar tempatan dan syarikat berkaitan kerajaan. Kem pertama ialah dengan AirAsia Berhad, di mana 15 syarikat MSC Malaysia telah meneliti satu set cabaran terpilih yang dihadapi oleh AirAsia. Syarikat-syarikat tersebut kemudian diberikan masa satu minggu untuk mengemukakan cadangan penyelesaian dan kembali untuk sesi pembentangan. Setiap syarikat diberi 10 minit untuk mencadangkan dua penyelesaian dengan setiap penyelesaian terhad kepada hanya lima



CyberSecurity Malaysia memenangi Pertandingan Global Cyberlympics peringkat Asia Pasific.
CyberSecurity Malaysia wins the Global Cyberlympics Asia Pacific Competition.

MIMOS, CyberSecurity, Domain Registry, and MSC Malaysia were part of the delegation, along with 12 MSC Malaysia companies. In Vietnam, 34 exploratory meetings took place with 11 Vietnamese companies. A potential trade deal was recorded (approximate value RM8.1 million). In Vientiane, 13 Laotian companies met with 9 Malaysian companies. A potential trade deal of approximately RM10.5 million was recorded. Similarly, in Phnom Penh, a potential trade deal of RM14 million was noted following meetings with 17 Cambodian companies. Later in the year, MDeC was part of a trade mission to Jakarta, which included 35 ICT companies (23 of which were MSC Malaysia companies). A potential trade deal of RM42.43 million was recorded, relating to various business areas, including IT infrastructure solutions, hospital information systems, financial management solutions for local councils; anti-money laundering systems, and transportation.

InnovAsian Catalyst Camp

The department also conceived a unique programme called InnovAsian Catalyst Camp, which employs a structured approach to connect MSC Malaysia companies with potential customers/buyers, particularly local large corporations and government-linked corporations. The first such camp was with AirAsia Berhad, where 15 MSC Malaysia were presented with a selected set of challenges faced by AirAsia. Companies were given one week to work on their proposed solutions and come back for a pitching session. Each company was given 10 minutes to propose two solutions with each solution limited to only five slides. The pitching was judged by four key heads of AirAsia operations.

slaid. Sesi pembentangan tersebut diadili oleh empat ketua utama operasi AirAsia. Penilaian adalah tertumpu kepada pemahaman syarikat terhadap keperluan AirAsia, kesegaran/keunikan solusi mereka, potensi pelaksanaan solusi tersebut serta nilai yang diwujudkan.

Konsep Sekolah Bestari

Satu peranan utama MDeC adalah berkaitan dengan konsep Sekolah Bestari, di mana pengajaran dan pembelajaran (P&P) dijalankan dengan cara yang kreatif. MDeC telah bekerja rapat dengan Kementerian Pelajaran Malaysia (KPM) sejak tahun 1999 dalam melaksanakan pelbagai program inovatif P&P berdasarkan ICT. Pada tahun 2011, MDeC telah memberi tumpuan kepada perkara-perkara berikut: (i) Pematuhan pendekatan NextGen eContent (satu sumber yang mengandungi aset digital dan kandungan berdasarkan aktiviti) untuk pembangunan bahan P&P; (ii) Pematuhan kepada Proses Pembangunan Standard NextGen eContent, dan penubuhan Komuniti Amalan (COP), yang melibatkan kumpulan utama Pakar-Pakar Subjek (PKS), Pereka Pengajaran (ID), Pengarah Kreatif (CD), dan Pengguna (guru-guru) untuk memberi input dan maklum balas untuk terus meningkatkan pembangunan NextGen eContent; dan (iii) Pelaksanaan pemangkin Sekolah MSC Malaysia-MySTL (Pemimpin Teknologi Pelajar) yang merupakan salah satu mekanisme yang digunakan untuk memantau tahap kemahiran ICT murid dengan merujuk kepada standard yang dibangunkan oleh Persatuan Teknologi dalam Pendidikan Antarabangsa (ISTE).

Pembangunan IT

Satu lagi penglibatan utama MDeC dalam inisiatif MSC Malaysia, melalui Solusi Pembangunan Perusahaan (EDS), ialah peruntukan pembangunan holistik syarikat-syarikat IT, dengan memberi tumpuan kepada solusi meningkatkan prestasi perniagaan, pengurusan operasi, keupayaan kewangan dan lain-lain lagi. Satu alat diagnostik yang dipanggil SCORE + telah digunakan untuk mengenalpasti kekuatan dan kelemahan syarikat-syarikat ini. Adalah didapati bahawa keupayaan keseluruhan syarikat MSC Malaysia telah berkembang sebanyak 19% dari penilaian terakhir (2.67 pada tahun 2011 berbanding 2.24 pada tahun 2010). Selain dari keupayaan pengurusan organisasi yang lebih kuat, pertumbuhan pasaran juga dilihat mula meningkat bagi produk masing-masing.

Aktiviti Pembangunan

Di samping itu, kira-kira 200 syarikat telah mendapat manfaat dari 80 aktiviti pembangunan seperti bimbingan dan mentoring, perundingan, pembiayaan, bengkel, ceramah dan seminar di bawah EDS. Hasilnya:

(i) MSC Malaysia Certified Solutions (MSCCS), yang diiktiraf di peringkat antarabangsa oleh TUV Rheinland, telah dilancarkan kepada industri dengan 80 produk selesai melalui penilaian awal dan 26 produk melalui penilaian akhir;

Evaluation focused on the companies' understanding of AirAsia's needs, the freshness/uniqueness of their solutions, the execution potential of the solutions and the value created.

Smart School Concept

A major role for MDeC relates to the Smart School concept, where teaching and learning (Pengajaran & Pembelajaran – P & P) are conducted in a creative way. MDeC has been working closely with the Ministry of Education Malaysia (MoE) since 1999 in implementing various innovative ICT-based P & P programmes. In 2011, MDeC focused on the following: (i) Acceptance of the NextGen eContent (a resource containing digital assets and activity-based content) approach for the development of P & P materials development; (ii) Compliance to the eContent NextGen Standards Development Process, and establishment of the Community of Practice (COP), which include the major groups of Subject Matter Experts (SMEs), Instructional Designers (IDs), Creative Directors (CDs), and Users (teachers) to provide input and feedback to further enhance the development of eContent NextGen; and (iii) Implementation of the MSC Malaysia-MySTL (Student Technology Leaders) School catalysts which is one of the mechanisms utilised to monitor the ICT skills level of pupils by referring to the standards developed by the International Society of Technology in Education (ISTE).

IT Development

Another major involvement of MDeC in MSC Malaysia initiatives, through Enterprise Development Solutions (EDS), has been the provision of holistic development of IT companies, focusing on solutions for business performance, operational management, financial capability, etc. A diagnostic tool called SCORE+ was used to rate competitiveness and to identify strengths and weaknesses of these companies. It was found that the overall capabilities of MSC Malaysia companies have grown by 19% from the last assessment (2.67 in 2011 from 2.24 in 2010). Apart from stronger organisational management capability, they have begun to see more market growth for their products.

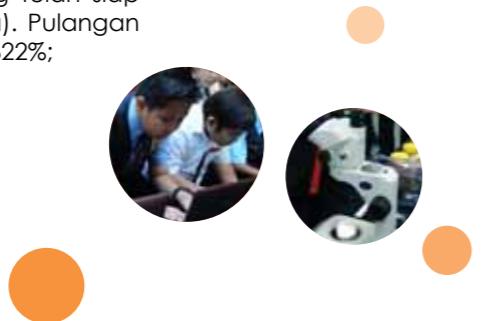
Developmental Activities

In addition, about 200 companies benefited from 80 developmental activities such as coaching and mentoring, consultancy, funding, workshops, talks and seminars under EDS. As a result:

(i) MSC Malaysia Certified Solutions (MSCCS), which is internationally recognised by TUV Rheinland, was launched to the industry with 80 products having completed preliminary assessment and 26 products going through the final assessment;

(ii) Professional Capability Development certified more than 200 professionals in various technical areas;

- (ii) Pembangunan Keupayaan Profesional telah mentauliahkan lebih daripada 200 profesional dalam pelbagai bidang teknikal;
- (iii) Pembangunan Keupayaan Organisasi telah membangunkan 15 program Impak Tinggi di bidang penjenamaan, kewangan, strategi jualan dan perniagaan di mana lebih dari 165 syarikat telah menyertai dan mendapat manfaat dari pelbagai program yang dijalankan;
- (iv) IP – sebanyak 2,395 IP telah difaikan; dan,
- (v) Malaysia Research and Development Grant Scheme (MGS) menyaksikan pendapatan sebanyak RM398.8 juta dijana oleh 52 daripada 61 projek yang telah siap (jumlah pelaburan bernilai RM64.15 juta). Pulangan atas Pelaburan (ROI) adalah sebanyak 622%;



Sambutan Jubli Intan (25 tahun) MIMOS Berhad.
Celebration of MIMOS Berhad 25th Anniversary.



Perkhidmatan Perkongsian dan Penyumberan Luar

MDeC's Global Sourcing Department telah melaporkan bahawa pada tahun 2011, terdapat 216 (SSO), yang mana 30 darinya telah menghadiri satu Sesi Induksi. Di samping itu, Kluster Perkhidmatan Perkongsian dan Penyumberan Luar (GSC) telah berjaya menilai SCORE profil bagi 31 syarikat (bilangan yang disasarkan adalah 27).

Selain aktiviti SCORE+, Kluster ini juga telah menjalankan kajian profil menyeluruh bersama dengan Penyelidikan Pasaran IDC ke atas sejumlah 14 syarikat untuk mengetahui potensi nilai dan daya saing masing-masing.

Pada bulan Januari 2011, MDeC, berganding dengan Outsourcing Malaysia, telah mula melaksanakan Projek Titik Permulaan No.2 (EPP2) di bawah NKEA Perkhidmatan Perniagaan (matlamat teras EPP2 adalah untuk membina penyumber luar tempatan yang berdaya saing di peringkat global). Struktur KPI berdasarkan keberhasilan disasarkan kepada dua perkara utama: mewujudkan 43,000 pekerjaan baru menjelang 2020, dan meningkatkan sumbangan sektor ini kepada Pendapatan Negara Kasar (GNI) dari USD2.33 bilion pada tahun 2010 kepada USD4.55 bilion menjelang 2020, di mana penghasilan projek tersebut diletakkan di tahap USD2.1 bilion.

Pencapaian pada tahun 2011 adalah: (i) Kumpulan pertama 16 syarikat penyumberan luar tempatan telah dinilai bagi Industri Program Peningkatan Keusahawanan; (ii) Program penanda aras dan pensijilan telah dikenalpasti bagi syarikat-syarikat tersebut, semua syarikat mencapai persetujuan mengenai program dan komited untuk menjana 37,690 pekerjaan baru menjelang 2017 (87% dari sasaran EPP); (iii) Tiga SIR telah diperoleh (Riyadh, Dallas, Singapura); (iv) Eksport: RM277 juta (Tempatan) dan RM570 juta (MNC); (v) Peluang Potensi Baru: 50 akaun; dan (vi) Lebih 20 pelaburan nilai tinggi termasuk IBM, Paypal, AMD dan Schlumberger diumumkan dengan komitmen lebih dari 5,300 pekerjaan.

Kluster (GSC) juga memulakan pembangunan strategi Kawasan Nic sebagai sebahagian dari inisiatif menggerakkan pertumbuhan Industri SSO MSC Malaysia. Setakat ini, pertumbuhan adalah berdasarkan Bangunan Kapasiti dan berjaya menarik sejumlah 216 syarikat SSO dari pelbagai industri dan jenis aktiviti SSO. Strategi ini telah terbukti berjaya, seperti yang ditunjukkan oleh Indeks Lokasi Perkhidmatan Global AT Kearney 2011, yang menyenaraikan Malaysia sebagai salah satu dari Tiga Lokasi SSO Global Teratas selepas India dan China. Walau bagaimanapun, oleh kerana persaingan menjadi lebih sengit dengan kemunculan lokasi baru, iaitu Vietnam, Thailand dan Indonesia, Malaysia perlu mula memberi tumpuan dalam membangunkan Kawasan Nic (Pembangunan Keupayaan) dan mengurangkan risiko menjadi penggiat komoditi. Ertinya, manakala

Shared Services and Outsourcing

MDeC's Global Sourcing Department reported that in 2011, there were 216 Shared Services and Outsourcing (SSO) companies, 30 of which attended an Induction Session. In addition, the Shared Services and Outsourcing Cluster (GSC) managed to SCORE profile 31 companies (the targeted number was 27).

Besides the SCORE + activities, the Cluster conducted a thorough profile study with IDC Market Research on a total of 14 companies to understand their individual value propositions and competitive advantages.

In January 2011, MDeC, in partnership with Outsourcing Malaysia, started operationalising the Entry Point Project No. 2 (EPP2) under the Business Services NKEA (the core aim of the EPP2 is to build globally competitive local outsourcers). The outcome-based KPI structure targeted two major items: the creation of 43,000 new jobs by 2020, and raising the Gross National Income (GNI) contribution of the sector from USD2.33Billion in 2010 to USD4.55Billion by 2020, of which the project delivery was defined as USD2.1Billion.

The 2011 outcomes were: (i) First batch of 16 local outsourcing companies assessed for Enterprise Enhancement Programme Industry; (ii) Benchmark and certification programme identified for the companies, all companies reached agreement on programmes and committed to generate 37,690 new jobs by 2017 (87% of EPP target); (iii) Three SIRs secured (Riyadh, Dallas, Singapore); (iv) Exports: RM277 million (Local) and RM570 million (MNC); (v) New Potential Opportunities: 50 accounts; and (vi) Over 20 high value investments include IBM, Paypal, AMD and Schlumberger announced with commitments of over 5,300 jobs.

The Shared Services and Outsourcing Cluster (GSC) also embarked on the development of a Niche Area strategy as part of the initiatives to propel the growth of the MSC Malaysia SSO Industry. Thus far, the growth had been based on Capacity Building, successfully attracting a total of 216 SSO Companies from various industries and types of SSO Activities. This strategy has proven to be successful, as evidenced by the AT Kearney Global Services Location Index 2011, which listed Malaysia as one of the Top Three Global SSO locations after India and China. However, as the competition is becoming more intense, and as more new locations emerge, i.e. Vietnam, Thailand and Indonesia, Malaysia will have to start focusing on building its Niche Area (Capability Building) and reduce the risk of being a commodity player. In other words, while the generic marketing and Capacity Building approach of attracting more new SSO investment into MSC Malaysia will have to be maintained, Capability Building will raise MSC Malaysia's attractiveness in the SSO Industry.

pendekatan pemasaran generik dan Pembangunan Keupayaan untuk menarik lebih banyak pelaburan baru SSO ke MSC Malaysia perlu dikekalkan, Pembangunan Keupayaan juga akan meningkatkan daya tarikan MSC Malaysia dalam Industri SSO.

Sebagai langkah awal, sasaran vertikal atau segmen industri untuk mengoptimumkan keperluan infra-pengetahuan, program dan insentif (faktor tarikan) yang diingini oleh setiap segmen sasaran telah dikenalpasti, seperti berikut: (i) Perbankan, Perkhidmatan Kewangan dan Insurans (BFSI), khususnya dalam bidang Kewangan dan Perakaunan; (ii) Tenaga, Kimia dan Sumber (ECR), khususnya dalam bidang Perkhidmatan Kejuruteraan Industri Minyak dan Gas; (iii) Logistik dan Pengangkutan (L&T); (iv) Farmaseutikal dan Kesihatan (P&H); dan (v) Industri ICT.

Vertikal-vertikal yang terpilih di atas juga layak berdasarkan kepada Industri Strategik/Sektor yang dikenalpasti di bawah ETP serta data prestasi yang lepas dalam Sektor SSO MSC Malaysia. Bagi tahun 2011, Pasukan GSC telah memilih Vertikal BFSI dan ECR sebagai Bidang Nic utama bagi pertumbuhan. Setakat akhir tahun ini, GSC telah menarik pelaburan baru tahun 2011 seperti berikut ke dalam MSC Malaysia:

As an initial step, target industry verticals or segments to optimise the knowledge-infra requirements, programmes and incentives (pull factors) desired by each target segment have been identified, as follows: (i) Banking, Financial Services and Insurance (BFSI), specifically in the area of Financial and Accounting; (ii) Energy, Chemical and Resources (ECR), specifically in Engineering Services area of the Oil and Gas Industry; (iii) Logistics and Transportation (L&T); (iv) Pharmaceutical and Healthcare (P&H); and (v) ICT industry.

The selected verticals above are also qualified based on the Strategic Industry/Sector identified under the ETP, combined with historical data of performance in the MSC Malaysia SSO Sector. For the year 2011, the GSC Team had selected the BFSI and ECR Verticals as the key Niche Areas for growth. As at the end of the year, the GSC had attracted the following new 2011 investments into MSC Malaysia:

	Bidang Khusus BFSI BFSI Niche Area	Bidang Khusus ECR ECR Niche Area
Nama Syarikat Name of Company	Worley Parsons Business Services Sdn Bhd	RNZ Integrated Sdn Bhd
Nilai Pelaburan untuk 3 Tahun Value of Investment for 3 Years	37.99 juta / million	49.34 juta / million
Unjurian Perolehan untuk 3 Tahun Revenue Projection for 3 Years	69.23 juta / million	400 juta / million
Unjurian Eksport untuk 3 Tahun Export Protection for 3 Years	65.66 juta /million	212 juta / million
Peluang Perkerjaan untuk 3 Tahun Jobs Creation by 3 Years	246	400

Tahun 2011 juga menyaksikan sejumlah 30 syarikat baharu menyertai GSC. Jumlah pelaburan yang ditempah bagi tempoh 3 tahun ialah RM400 juta melibatkan RM203 juta dalam FDI, dan RM 197 juta dalam DDI. Ini tidak termasuk pelaburan yang ditempah bagi 3 tahun untuk IBM & ATES Sdn. Bhd. Syarikat-syarikat yang baru terlibat adalah Worley Parson, BASF, UOB, Electrolux, Fuji-Xerox, Sherwin Williams, AT&T and Axiata.

Year 2011 also saw a total of 30 new companies in the GSC. The total for 3 years booked investment was RM40 million, comprising RM203 million in FDI, and RM197 million in DDI. This excluded the 3 years booked investments for IBM & ATES Sdn Bhd. The new additions were Worley Parson, BASF, UOB, Electrolux, Fuji-Xerox, Sherwin Williams, AT&T and Axiata.



Pelancaran Sistem Pengurusan Pembelajaran Pintar (iLMS).
Launching of iLMS.



15th International Conference of Asian Political Parties (ICAPP).

Digital Malaysia

Satu inisiatif baru yang diterajui MDeC, Digital Malaysia, telah dilancarkan pada tahun 2011, diikuti beberapa siri bengkel yang dihadiri oleh 500 peserta dari industri dan sektor awam. Bertujuan untuk mengambil kesempatan ke atas revolusi digital global, Digital Malaysia akan memacu penciptaan kekayaan dan meningkatkan kualiti hidup dengan memanfaatkan pelbagai inisiatif ICT Malaysia. Fasa pertama program ini dijangka bermula pada suku pertama tahun 2012. Untuk mencapai wawasan ini, Program Transformasi Digital (DTP) telah diwujudkan, yang akan menjadi batu asas kepada Dasar Transformasi Nasional (DTP melengkapkan Agenda Transformasi Negara bersama-sama dengan ETP, GTP, PTP dan RTP). Melalui DTP, matlamatnya adalah bagi Malaysia untuk mempertingkatkan sumbangan ekonomi digital dari paras semasa sebanyak 12.5% dari PNK hingga 17% dari PNK menjelang 2020.

DTP disokong oleh 10 Projek Titik Permulaan (EPP) dalam lima Dimensi yang boleh diringkaskan seperti berikut:

- (i) Dimensi Ekonomi, yang meliputi keupayaan perusahaan dan e-dagang, akan meningkatkan Pendapatan Negara Kasar (PNK), permodalan pasaran, dan meningkatkan produktiviti negara serta mewujudkan lebih banyak pekerjaan bernilai tinggi;
- (ii) Dimensi Sosial, yang bertujuan merangsang warga maya dan menaikkan tahap kalangan 40% terbawah dalam masyarakat, akan memastikan penerapan teknologi yang lebih besar dalam usaha meningkatkan kualiti hidup;
- (iii) Dimensi Tadbir Urus, yang merangkumi kedua-dua sektor awam dan swasta, akan membolehkan kerajaan mendekati rakyat dengan lebih rapat, meningkatkan ketelusan dan mendemokrasikan lagi negara;
- (iv) Dimensi Teknologi bertujuan memperkasa ekonomi dan memacu inovasi melalui penyerapan teknologi yang lebih tinggi; dan,
- (v) Dimensi Alam Sekitar, yang memberi tumpuan kepada 'menghijaukan IT' dan 'penghijauan oleh IT', akan melihat kepada kemampuan alam sekitar dalam sektor ICT serta menggunakan ICT untuk meningkatkan kecekapan persekitaran di bidang bukan ICT.

Digital Malaysia

A new MDeC-led initiative, Digital Malaysia, was launched in 2011 following a series of workshops attended by 500 participants from the industry and public sector. Meant to capitalise on the global digital revolution, Digital Malaysia will drive wealth creation and enhance quality-of-life by harnessing and building upon Malaysia's varied ICT initiatives. The first phase of the programme is expected to begin in the first quarter of 2012. To achieve this vision, a Digital Transformation Programme (DTP) was created, which would be a cornerstone of the National Transformation Policy (the DTP completes the National Transformation Agenda together with the ETP, GTP, PTP and RTP). Through the DTP, the goal is for Malaysia to increase the contribution of the digital economy from the current level of 12.5% of GNI to 17% of GNI by 2020.

The DTP is underpinned by 10 Entry Point Projects (EPP) across five Dimensions. They can be summarised as follows:

- (i) The Economic Dimension, which covers enterprise enablement and e-commerce, will increase Gross National Income (GNI), market capitalisation, and improve the nation's productivity as well as create more high-value jobs;
- (ii) The Social Dimension, which is aimed at spurring Netizens and uplifting the bottom 40% of society, will ensure greater infusion of technology in order to uplift quality of life;
- (iii) The Governance Dimension, which encompasses both public and private sectors, will enable the government to better reach out to the rakyat, enhance transparency and further democratise the nation;
- (iv) The Technological Dimension looks at empowering the economy and driving innovation through higher absorption of technology; and
- (v) The Environmental Dimension, which is focused on the 'greening of IT' and 'greening by IT', will look at environmental sustainability within the ICT sector as well as using ICT to improve the environmental efficiency in non-ICT areas.

Penyertaan dalam Mesyuarat Utama

MDeC juga menganjurkan/menyertai beberapa mesyuarat penting pada tahun 2011, termasuk Mesyuarat Majlis Pelaksanaan MSC Malaysia (ICM) ke-23 dan MSC Malaysia International Advisory Panel (IAP) MSC Malaysia ke-14. YAB Perdana Menteri, telah mengulas mengenai kedua-dua ICM dan IAP, dengan menyatakan bahawa hasil dari mesyuarat-mesyuarat ini akan memberi kesan yang positif kepada inisiatif negara untuk mempercepatkan transformasi negara ke arah ekonomi berpendapatan tinggi dan berdasarkan pengetahuan.

.my Domain Registry

Sebagai nama domain peringkat nasional, .my DOMAIN REGISTRY memberikan kepada organisasi dan individu Malaysia satu identiti jenama yang unik di Internet. Di samping itu, .my DOMAIN REGISTRY sentiasa berada di barisan hadapan dalam teknologi nama domain, menjalankan projek penyelidikan seperti Protokol Internet versi 6 (IPv6), Sambungan Keselamatan Sistem Nama Domain (DNSSEC), Nama Domain Antarabangsa (IDN) dan Anycast dan juga yang terlibat dalam mempromosi aktiviti latihan penggunaan teknologi ini.

Projek 1nita

Berikut dengan pelancaran portal Myideas@Women pada tahun 2010, .my DOMAIN REGISTRY terus berusaha untuk mewujudkan kesedaran ICT di kalangan wanita bermula dengan Projek 1nita. Pada tahun 2011, kira-kira 200 wanita telah menghadiri seminar di Temerloh dan Pekan Ayer Panas di mana mereka telah diberi taklimat mengenai projek tersebut, termasuk garis panduan mengenai bagaimana untuk mempromosikan produk melalui platform 1nita. Sesi teknik fotografi juga telah dijalankan, di mana peserta telah dilatih tentang bagaimana untuk memuat naik gambar-gambar untuk tujuan promosi. Satu acara yang serupa telah diadakan di Kuching, di mana 32 usahawan wanita telah belajar asas-asas pemasaran atas talian dan penjenamaan perniagaan. Pada akhir bengkel, semua peserta telah membina dan mendaftar laman web mereka sendiri dengan .my DOMAIN REGISTRY.

1MYID

Untuk golongan belia, satu projek nasional yang dikenali sebagai 1MYID telah dilancarkan pada bulan September 2011. Projek ini yang merupakan kerjasama di antara .my DOMAIN REGISTRY dan Majlis Belia Malaysia dengan Edorey Technologies Sdn Bhd sebagai Urusetia, bertujuan untuk menyediakan perkhidmatan atas talian yang unik kepada golongan muda di Malaysia dengan satu nama domain .my yang dipakej bersama web hosting, akaun e-mel peribadi, kursus komputer dan Internet. Sehingga 31 Disember 2011 sejumlah 10,376 nama domain telah didaftarkan bawah 1MYID.

Participation in Key Meetings

MDeC also organised/participated in several key meetings in 2011, including the 23rd MSC Malaysia Implementation Council Meeting (ICM) and the 14th MSC Malaysia International Advisory Panel (IAP) Meeting. The Hon. Prime Minister, commenting on both ICM and IAP, said the outcomes from the meetings will bring a positive impact on the national initiatives to accelerate the country's transformation into a high-income and knowledge-based economy

.my Domain Registry

As the national level domain, .my DOMAIN REGISTRY gives Malaysian organisations and individuals their unique brand identity on the Internet. In addition, .my DOMAIN REGISTRY is always in the forefront of domain name technologies, carrying out research projects such as Internet Protocol version 6 (IPv6), Domain Name System Security Extensions (DNSSEC), Anycast and Internationalised Domain Names (IDN) and also involved in promoting and training activities for the usage of these technologies.

Reaching Out to Women

Following the launch of the Myideas@Women portal in 2010, .my DOMAIN REGISTRY continued to create ICT awareness amongst women through its launch pad, Project 1nita. In 2011, approximately 200 women attended seminars in Temerloh and Pekan Ayer Panas where they were briefed on the project, including guidelines on how to promote products via the 1nita platform. Photography technique sessions were also conducted, during which participants were trained on how to upload pictures for promotional purposes. A similar event was held in Kuching, where 32 women entrepreneurs learnt the basics of online marketing and business branding. At the end of the workshop, all participants had developed and registered their own website with .my DOMAIN REGISTRY.

For Young People

For the youth, a national project called 1MYID was launched in September 2011. A collaboration project between .my DOMAIN REGISTRY and Majlis Belia Malaysia and with Edorey Technologies Sdn Bhd as its Secretariat, the project aims to provide a unique online presence to young people in Malaysia through the ownership of a .my domain name, packaged together with web hosting, personalised email accounts, computer and Internet course. As of December 31, 2011, a total of 10,376 domain names had been registered under 1MYID.

Projek Get Malaysia Business Online (GMBO)

Satu lagi inisiatif kebangsaan yang telah dilancarkan pada tahun 2011 ialah projek Get Malaysian Business Online (GMBO), bertujuan untuk menyediakan perkhidmatan atas talian yang unik kepada komuniti perniagaan Malaysia (terutamanya perusahaan kecil dan sederhana) dengan satu nama .my domain yang dipakej bersama dengan web hosting dan akaun e-mel peribadi.

Projek ini merupakan kerjasama di antara .my DOMAIN REGISTRY, PEMANDU, Suruhanjaya Komunikasi dan Multimedia Malaysia (MCMC) dan Google Malaysia. Projek GMBO ini dijangka dapat meningkatkan pendaftaran baru nama domain .com.my kepada 50,000. Sehingga 31 Disember 2011, sejumlah 3,296 nama domain telah didaftarkan di bawah GMBO.

Keselamatan Maklumat

.my DOMAIN REGISTRY juga telah memulakan pelaksanaan dan pensijilan Sistem Keselamatan Maklumat ISO 27001:2005. Inisiatif ini adalah sebahagian dari projek ISMS & Pengurusan Risiko Perusahaan (ERM) di bawah RMKe-10. Kerja-kerja ke arah pensijilan ISMS ini bermula pada 6 Jun 2011 dan akan siap menjelang 2012. Di antara objektifnya adalah untuk: (i) meningkatkan keyakinan pelanggan, kepuasan pihak berkepentingan dan persepsi pasaran terhadap organisasi; (ii) membangunkan Rangka Kerja ISMS menggunakan Standard Antarabangsa sebagai penanda aras; (iii) membangunkan Panduan Penyesuaian untuk fleksibiliti dan kecekapan rangka kerja; (iv) menyelaraskan proses dan objektif IT dengan objektif keseluruhan perniagaan; (v) meningkatkan kawalan pengurusan dan mencapai konsistensi dalam operasi; dan (vi) mengurangkan kos dengan memantapkan sistem amalan dan proses dalam.

Dalam usaha untuk meningkatkan perkhidmatan .my DOMAIN REGISTRY, berkuatkuasa dari 23 Mei 2011, dua fasiliti baru telah diperkenalkan seperti berikutnya: (i) Status Permohonan Atas Talian, yang membolehkan pelanggan melihat status permohonan baru mereka dalam .my DOMAIN REGISTRY dengan serta-merta, dan (ii) Perolehan Nama Domain melalui SMS untuk memudahkan pelanggan menghantar pesanan ringkas (SMS) kepada .my DOMAIN REGISTRY untuk menyemak nama-nama .my domain yang sedia ada. Di samping itu, pendaftaran untuk IDN Jawi, Cina dan Tamil, yang berkuatkuasa pada 1 Disember 2011, telah dibuka kepada orang ramai. Tiada surau pendaftaran dikenakan untuk tahun pertama. Antara bulan Jun dan Disember 2011, .my DOMAIN REGISTRY juga telah memberi diskaun sebanyak 50% kepada pelanggan yang mendaftar 4 nama domain dalam satu pendaftaran.

Pada tahun 2011, .my DOMAIN REGISTRY telah melancarkan Dasar Penyelesaian Pertikaian Nama Sensitif (SNDRP), Peraturan SNDRP dan Peraturan Tambahan Pusat Arbitrasi Serantau Kuala Lumpur. FAQ pada SNDRP boleh dilayari pada <http://www.domainregistry.my/en/faq.php?id=136>.

Online Business

Another national initiative launched in 2011 was the Get Malaysian Business Online (GMBO) project, which aims to provide an unique online presence to the Malaysian business community (particularly small and medium-sized enterprises) through ownership of a .my domain name, packaged together with web hosting and personalised email accounts.

The project is in collaboration between .my DOMAIN REGISTRY, PEMANDU, Malaysian Communications and Multimedia Commission (MCMC) and Google Malaysia. The GMBO project is expected to increase new .com.my domain name registration by 50,000. As of December 31, 2011, a total of 3,296 domain names have been registered under GMBO.

Information Security

.my DOMAIN REGISTRY also embarked on ISO 27001:2005 Information Security Management Systems implementation and certification. This initiative is part of the ISMS & Enterprise Risk Management (ERM) project under 10 MP. Work towards ISMS certification began on June 6, 2011 and will be completed by 2012. Among its objectives are: (i) to enhance customers' confidence, stakeholders' satisfaction and market perception of organisation; (ii) to develop an ISMS Framework using International Standards as a benchmark; (iii) to develop Tailoring Guides for framework flexibility and efficiency; (iv) to align IT processes and objectives with overall business objectives; (v) to improve management control and achieve consistency in operations; and (vi) to minimise costs by rationalising internal systems, practices and processes.

In an effort to enhance .my DOMAIN REGISTRY domain name service, effective from May 23, 2011, two new facilities have been introduced as follows: (i) Online Application Status, which enables customers to view their new application status in .my DOMAIN REGISTRY website instantly; and (ii) Domain Name Availability via SMS to enable customers to send SMSs to .my DOMAIN REGISTRY in order to check the availability of .my domain names. Further, effective from December 1, 2011, registration for IDN Jawi, Chinese and Tamil was opened to the public. No registration fee will be charged for the first year. Between June and December 2011, .my DOMAIN REGISTRY also provided a 50% discount to customers who registered 4 domain names in a single registration.

In 2011, .my DOMAIN REGISTRY launched the Sensitive Names Dispute Resolution Policy (SNDRP), Rules of the SNDRP and Supplemental Rules of the Kuala Lumpur Regional Centre for Arbitration. The FAQ on SNDRP can be accessed at <http://www.domainregistry.my/en/faq.php?id=136>.

CyberSecurity Malaysia

A total of 15,218 cyber security incidents were reported to the Cyber999 Help Centre in 2011, representing an increase of 88% over the previous year's 8,090 incidents, and 327% over the year 2009. This means that in just two

CyberSecurity Malaysia

Sebanyak 15,218 insiden keselamatan siber telah dilaporkan kepada Pusat Bantuan Cyber999 pada tahun 2011, di mana terdapat peningkatan sebanyak 88% dari 8,090 insiden pada tahun sebelumnya, dan peningkatan 327% berbanding pada tahun 2009. Ini bermakna bahawa dalam masa dua tahun, insiden keselamatan siber telah meningkat sebanyak 11,654 berbanding dengan hanya 3,564 pada tahun 2009.

Pada tahun 2011, CyberSecurity Malaysia menerima sokongan yang meningkat dari media tempatan dan antarabangsa, sebahagiannya daripada aktiviti penglibatan media yang dianjurkan dengan kerjasama rakan industri seperti Bernama, The Star, Microsoft, Fortinet, NGTS, Norton (Symantec), Akamai, PayPal dan Kaspersky. Peningkatan jumlah insiden keselamatan siber yang dihadapi oleh orang awam serta Ops Malaysia, di mana serangan penggodam ke atas laman-laman sesawang kerajaan pada bulan Jun 2011, juga telah menarik minat orang awam kepada CyberSecurity Malaysia.

Pencapaian Antarabangsa

Pencapaian yang ketara di arena antarabangsa termasuklah:

- (i) Malaysia menerusi CyberSecurity Malaysia telah diterima sebulat suara oleh ahli-ahli Common Criteria Recognition Arrangement (CCRA) sebagai Authorising Participant kepada komuniti CCRA. Ini dianggap sebagai satu pencapaian yang signifikan kerana ia meningkatkan profil Malaysia setanding dengan negara-negara maju. Sebagai Authorising Participant, semua sijil yang dikeluarkan oleh badan pensijilan Malaysia di bawah Common Criteria MS ISO/IEC 15408 kini diiktiraf dan diterima di seluruh dunia oleh semua ahli CCRA, yang mana akan membantu pengeluar dan pembekal produk ICT tempatan memasuki pasaran global;
- (ii) Makmal Forensik Digital CyberSecurity Malaysia telah lulus audit pensijilan ASCLD/LAB dan menjadi makmal forensik digital multimedia pertama di rantau Asia-Pasifik yang diperakui atau diiktiraf dengan ISO/IEC 17025;
- (iii) Pada Mesyuarat Agung Tahunan OIC Ke 3 – Pasukan Tindakan Kecemasan Komputer (OIC-CERT), CyberSecurity Malaysia telah dilantik semula sebagai pengurus untuk tempoh dua tahun lagi.
- (iv) CyberSecurity Malaysia menjadi juara Asia Pasifik selepas memenangi pertandingan penggodaman beretika yang dipanggil Cyberlympics anjuran Majlis EC. Peserta-peserta dari CyberSecurity Malaysia akan mewakili Asia Pasifik di kejohanan akhir Global Cyberlympics di Amerika Syarikat pada tahun 2012; dan



12th International Common Criteria Conference (12th ICC), One World Hotel.

years, cyber security incidents have increased by 11,654 incidents compared with 3,564 in the year 2009.

In 2011, CyberSecurity Malaysia received increased support from local and international media, partly as a result of various media-engagement activities organised in collaboration with industry partners such as Bernama, The Star, Microsoft, Fortinet, NGTS, Norton (Symantec), Akamai, PayPal and Kaspersky. The rise in cyber security incidents faced by the general public as well Ops Malaysia, a targeted hacktivist attack on government websites in June 2011, also diverted public interest towards CyberSecurity Malaysia.

International Achievements

Notable achievements in the international arena included:

- (i) Malaysia, through CyberSecurity Malaysia has been unanimously accepted by Common Criteria Recognition Arrangement (CCRA) members as an Authorising Participant of the CCRA community. This is considered to be a significant achievement, raising as it does the profile of Malaysia at par with developed countries. As an Authorising Participant, all certificates issued by Malaysia's certification body under the Common Criteria MS ISO/IEC 15408 are now recognised and accepted worldwide by all the CCRA members, which will help producers and suppliers of local ICT products to enter global markets;
- (ii) CyberSecurity Malaysia's Digital Forensic Laboratory passed the certification audit by ASCLD/LAB and became the first multimedia digital forensic lab in the Asia-Pacific region to be certified or accredited with ISO/IEC 17025;

- (v) Pada persidangan dan mesyuarat agung tahunan Asia-Pacific Computer Emergency Response Team (APCERT) di Korea Selatan, CyberSecurity Malaysia telah dilantik semula sebagai ahli Jawatankuasa Pemandu APCERT bagi penggal 2011-2013.

Pencapaian Kebangsaan

Beberapa aktiviti utama CyberSecurity Malaysia pada tahun 2011 adalah seperti berikut:

- (i) Penganjuran acara penting/persidangan, termasuk:
 - 12th International Common Criteria Conference (12th ICCC), Persidangan ICCC pertama yang pernah diadakan di Asia Tenggara. Status Malaysia sebagai 'Authorising Participant' kepada komuniti CCRA telah diumumkan;
 - The 5th Counter e-Crime Operations Summit (CeCOS V), dengan kerjasama Kumpulan Kerja 'Anti-Phishing' (APWG), sebuah organisasi global. Ia adalah CeCOS pertama yang pernah diadakan di rantau ASEAN;
 - The 4th National Cyber Crisis Exercise or X-Maya 4 – dengan kerjasama Majlis Keselamatan Negara (MKN), sebagai sebahagian dari 'Teras 7: Kesediaan Kecemasan' Dasar Keselamatan Siber Negara (NCSP);
 - The first meeting of the CSCAP Study Group (CSCAP SG), di mana CyberSecurity Malaysia sebagai wakil CSCAP Malaysia juga telah dilantik sebagai salah satu daripada Pengerusi bersama CSCAP SG berkenaan Keselamatan Siber;
 - Satu Bengkel Teknikal OIC-CERT selama lima hari telah dianjurkan bersama dengan Pasukan Tindakan Kecemasan Komputer Brunei Darussalam (BruCERT) dan Bank Pembangunan Islam. CyberSecurity Malaysia terlibat dalam penganjuran bengkel ini atas kapasitinya sebagai Pengerusi OIC-CERT;
 - Kempen Bulan Pembelian Selamat Atas Talian pada bulan Disember 2011 dengan kerjasama PayPal;
 - Program Digi CyberSAFE, kerjasama pintar sepanjang tahun dengan Digi Telecommunications Sdn Bhd (Digi), Childline dan Kementerian Pendidikan untuk meningkatkan promosi aktiviti kesedaran di sekolah-sekolah di seluruh Malaysia.
- (ii) Penyediaan garis panduan dan amalan terbaik bagi Mobile Security; Blackberry Handheld Usage; dan Usage of Social Networking Sites.
- (iii) Pelaksanaan projek-projek Business Continuity Management (BCM);
- (iv) Penganjuran aktiviti-aktiviti di bawah Program Kesedaran Keselamatan Siber untuk Semua (CyberSAFE):
 - aktiviti-aktiviti CyberSAFE sempena Safer Internet Day 2011 yang melibatkan pelajar dari UniKL, dan lain-lain universiti awam dan swasta; dan juga

- (iii) At the 3rd Annual General Meeting of the OIC - Computer Emergency ResponseTeam (OIC-CERT), CyberSecurity Malaysia was re-elected for another term of two years as Chair;
- (iv) CyberSecurity Malaysia became the Asia Pacific champion after winning the ethical hacking competition called CyberLympics organised by the EC-Council. Participants from CyberSecurity Malaysia will represent Asia-Pacific in the Global CyberLympics Final Championship in the USA in 2012; and
- (v) During the conference and annual general meeting of the Asia-Pacific Computer Emergency Response Team (APCERT) in South Korea, CyberSecurity Malaysia was re-appointed as member of APCERT Steering Committee for the term 2011-2013.

National Achievements

Nationally, CyberSecurity Malaysia was mostly successful in fulfilling (and in several areas, exceeded) its Key Performance Indicators (KPI), including at the ministry level (MKPI).

Some of CyberSecurity Malaysia's key activities in 2011 were:

- (i) The organisation of major events / conferences, including:
 - 12th International Common Criteria Conference (12thICCC), the first ICCC ever held in South East Asia. Malaysia's status as an Authorising Participant of the CCRA community was announced;
 - The 5th Counter e-Crime Operations Summit (CeCOS V), in collaboration with the Anti-Phishing Working Group (APWG), a global organisation. It was the first CeCOS ever held in the ASEAN region;
 - The 4th National Cyber Crisis Exercise or X-Maya 4 - in collaboration with the National Security Council (MKN), as part of the 'Thrust 7: Emergency Readiness' of the National Cyber Security Policy (NCSP);
 - The first meeting of the CSCAP Study Group (CSCAP SG) on Cyber Security, where CyberSecurity Malaysia as a representative of CSCAP Malaysia was also appointed as one of the co-Chairs of CSCAP SG on Cyber Security;
 - A five-day OIC-CERT Technical Workshop in partnership with Brunei Darussalam's Computer Emergency Response Team (BruCERT) and the Islamic Development Bank. CyberSecurity Malaysia organised this workshop in its capacity as the Chair of OIC-CERT;
 - Safe Online Shopping Month campaign in December 2011 in partnership with PayPal; and
 - Digi CyberSAFE programme, a year-long smart partnership with Digi Telecommunications Sdn Bhd (Digi), Childline and Ministry of Education to

- pelajar dari 14 buah sekolah dari seluruh Malaysia;
- Bekerjasama dengan Microsoft dalam Safer Internet Month campaign;
- Karnival Mesra Belia Sarawak 2011 bagi DUN Tupong dan DUN Samariang;
- Hari Kesedaran Keselamatan Siber sempena program Pusat Seni Setempat oleh JKKN, Perak. Aktiviti-aktiviti ini disokong oleh CELCOM, Kelab Anak Malaysia, Kaspersky dan Key Platinum Sdn Bhd;
- Pelaksanaan program CyberSAFE di Sekolah yang melibatkan 26 sekolah, 10,190 pelajar dan 802 guru/ kakitangan. Bilangan organisasi dan sekolah yang dicapai di seluruh negara melalui pelaksanaan program CyberSAFE diberikan dalam jadual di bawah:

- (v) Penganjuran aktiviti-aktiviti di bawah Program Latihan Cyber Security Specialist Training dan Program Pembangunan Keselamatan Maklumat, termasuk kursus forensik digital dan kriptografi untuk agensi sektor awam yang berkenaan dan universiti; Latihan Asas Keselamatan Rangkaian: Program Bantuan Anti-Keganasan, Kedutaan Amerika Syarikat; dan Latihan Tindakan & Kendalian Insiden bagi Pasukan Keselamatan Komputer & Pengendalian Insiden yang dianjurkan oleh Pasukan Tindakan Kecemasan Komputer Malaysia (MyCERT), dan Aktiviti-aktiviti di bawah Program Menjamin Bandar Digital (SDC) di Perak.



increase the outreach of awareness activities in schools throughout Malaysia.

- (ii) The development of guidelines and best practices on Mobile Security; Blackberry Handheld Usage; and Usage of Social Networking Sites;
- (iii) Business Continuity Management (BCM) implementation projects;
- (iv) The organisation of activities under the Cyber Security Awareness For Everyone (CyberSAFE) Programme:
 - CyberSAFE activities in conjunction with Safer Internet Day 2011 involving students from UniKL, and other public and private universities; and also students from 14 schools from all over Malaysia;
 - Collaborated with Microsoft for Safer Internet Month campaign;
 - Karnival Mesra Belia Sarawak 2011 for DUN Tupong and DUN Samariang;
 - Cyber Security Awareness Day in conjunction with Pusat Seni Setempat programme by JKKN, Perak. Activities were supported by CELCOM, Kelab Anak Malaysia, Kaspersky and Key Platinum Sdn Bhd.
- (v) The implementation of CyberSAFE in Schools programme involving 26 schools, 10,190 students and 802 teachers/staff. The number of organisations and schools reached nationwide via the implementation of CyberSAFE programmes is given in the table below:

- (v) The organisation of activities under the Cyber Security Specialist Training and Information Security Development Programme, including digital forensic and cryptography courses for the relevant public sector agencies, and universities; Training on Fundamentals of Network Security: Anti Terrorism Assistance Programme, US Embassy; and Training on Incident Response & Handling for Computer Security & Incident Response Team organised by the Malaysian Computer Emergency Response Team (MyCERT); and (vi) Activities under the Securing Digital City (SDC) Programme in Perak.

Kluster Bioteknologi

Dasar Bioteknologi Negara, yang dilancarkan pada 28 April 2005, menjelaskan wawasan Malaysia untuk 'menempatkan bioteknologi sebagai enjin pertumbuhan ekonomi baru dalam usaha meningkatkan kemakmuran dan kesejahteraan negara menjelang 2020'. Pada tahun tersebut, kerajaan Malaysia menjangka sejumlah 160,000 orang bakal diambil bekerja dalam sektor ini dan menyumbang sebanyak 5% kepada KDNK negara.

Tiga badan yang terletak di bawah bidang kuasa Biotek ialah iPharm, ABI dan MGI.

iPharm

Institut Farmaseutikal dan Nutraceutical Malaysia (iPharm), yang ditubuhkan pada bulan November 2006, berperanan menerajui pelaksanaan R&D bertaraf dunia untuk mempercepatkan penemuan, pembangunan dan pengkomersilan produk farmaseutikal dan nutraceutical. Memandangkan bioteknologi kesihatan memainkan peranan penting dalam merealisasikan Dasar Bioteknologi Negara, tumpuan iPharm termasuklah mempermudahkan kerjasama strategik dengan dan antara institusi penyelidikan bioteknologi kesihatan kebangsaan dan antarabangsa, membangunkan modal insan dan memperkuuhkan kepakaran tempatan dalam bidang bioteknologi kesihatan.

Pada tahun 2011, iPharm telah menfaikan Hak Harta Intelek untuk pembangunan(i) Multiplex Quantitative Reverse Transcription-PCR Assay for the Measurement of CYP Isoforms;(ii) Cell line yang Stabil dan Kaedah untuk Mengukur dan Menentukan Ekspresi Protein Berdasarkan Promoter CYP3A4.

Sejumlah 18 kertas penyelidikan telah diterbitkan dalam penerbitan dan jurnal tempatan dan antarabangsa termasuk Journal of Ethnopharmacology; European Journal of Medicinal Chemistry; Comparative Biochemistry and Physiology; World Journal of Microbiology and Biotechnology; Journal of Tropical Forest Science; Applied Biochemistry and Biotechnology; and the Journal of Applied Polymer Science. Sesetengah dari teknologi ini dikongsi dengan pihak akademia (contohnya Universiti Parma, Itali, Universiti Islam Antarabangsa Malaysia dan, Universiti London); dan agensi-agensi kerajaan.



Pameran MOSTI.
An exhibition from MOSTI.



EU-ASEAN Scientific Workshop on
Computational Biology (Group Discussion).



Lawatan turun padang Ketua Setiausaha MOSTI ke Institut Farmaseutikal & Nutraceutical (iPHARM), Pulau Pinang.
Visit by Secretary General MOSTI to iPHARM, Pulau Pinang.

Biotechnology

The National Biotechnology Policy, which was launched on April 28, 2005, states Malaysia's vision to 'position biotechnology as the new economic engine to enhance prosperity and wellness of the nation by 2020'. By that year, the Malaysian government expects the sector to employ 160,000 people and contribute 5% to the country's GDP.

Three establishments come under the purview of Biotek; iPharm, ABI and MGI.

iPharm

The Malaysian Institute of Pharmaceuticals and Nutraceuticals (iPharm), established in November 2006, spearheads the delivery of world-class R&D to accelerate the discovery, development and commercialisation of pharmaceutical and nutraceutical products. Recognising the pivotal role that healthcare biotechnology plays in the realisation of the National Biotechnology Policy, iPharm's focus includes facilitating strategic collaboration with and between national and international healthcare biotechnology research institutions, developing human capital and strengthening local expertise in healthcare biotechnology.

In 2011, iPharm has filed Intellectual Property Rights for the development of a (i) Multiplex Quantitative Reverse Transcription-PCR Assay for the Measurement of CYP Isoforms; (ii) Stable cell line and Method for Quantifying and Determining Protein Expression Based on CYP3A4 Promoter.

A total of 18 research papers were published in local and international journals and publications, including the Journal of Ethnopharmacology; European Journal of Medicinal Chemistry; Comparative Biochemistry and Physiology; World Journal of Microbiology and Biotechnology; Journal of Tropical Forest Science; Applied Biochemistry and Biotechnology; and the Journal of Applied Polymer Science. Some of these technologies were shared with academia (e.g. University of Parma, Italy, and the International Islamic University of Malaysia, University of London); and government agencies.

Dalam usaha untuk memupuk minat dalam sains dan teknologi di kalangan komuniti luar bandar, iPharm telah menganjurkan program promosi luar seperti Hari Eksplorasi Sains (Julai) di sebuah kampong Orang Asli; dan menyertai pelbagai acara termasuk Herbal Asia/ Pameran Perdagangan Herbal Utama Asia (Julai); Ekspo MySTI 2011 (Julai); BioMalaysia 2011 (November); dan Pesta Sains Antarabangsa Pulau Pinang (Disember). Sebuah pameran juga telah dianjurkan sempena pembukaan rasmi Kompleks iPharm (Jun).

iPharm juga menjadi tuan rumah kepada lawatan oleh wakil-wakil dari syarikat dan institusi peneraju seperti Agilent Technologies; InvestPenang; Universiti Teknologi MARA; Fakulti Kejuruteraan Kimia, Universiti Sains Malaysia; Sekolah St. Joseph, Kuching; Queensland Compound Library and Eskitis Institute for Cell and Molecular Therapies dari Australia; Akademi Sains Diraja dari Morocco, serta juga dari kementerian-kementerian.

Satu perkembangan penting pada tahun 2011 ialah penubuhan dua syarikat 'spin-off' iPharm: Neopeutics Sdn Bhd (Jun 2011); dan Human Architecture Technologies Sdn Bhd.

Tahun ini berakhir dengan iPharm bersedia untuk bergerak ke fasa baru dengan memberi tumpuan kepada R&D intensif, pembangunan produk dan pelesenan.

Institut Agro-Bioteknologi (ABI)

Selaras dengan pelaksanaan Dasar Bioteknologi Negara, Institut Agro-Bioteknologi (ABI) telah dilancarkan oleh Yang Amat Berhormat Perdana Menteri Malaysia pada 21 April 2005 bersama-sama dengan dua institusi lain iaitu iPharm dan MGI di bawah MOSTI. Berperanan untuk perkembangan agro-bioteknologi negara, skop tugas ABI termasuklah penyelidikan, pembangunan dan pengkomersilan produk, teknologi dan lain-lain hasil R&D agro-bioteknologi demi pembangunan dan pemodenan sektor pertanian.

Sepanjang 2011, ABI telah melaksanakan 10 aktiviti utama termasuk Lawatan Kerja Menteri MOSTI, Y.B. Datuk Seri Panglima Dr. Maximus Johnity Ongkili; a science exploration programme with the Orang Asli; Memorandum of Agreement (MoA) exchange ceremony between ABI, Sabah Government agencies and Pure Circle Sdn Bhd; empurau/kelah

In its effort to inculcate interest in science and technology to rural communities, iPharm organised outreach programmes such as a Science Exploration Day (July) at an Orang Asli village; and participated in various events including Herbal Asia/Asia's Premier Herbal Trade Show (July); MySTI Expo 2011 (July); BioMalaysia 2011 (November); and Penang International Science Fair (December). An exhibition was also held in conjunction with the official opening of the iPharm Complex (June).

iPharm also hosted visits by representatives of leading companies and institutions such as Agilent Technologies; InvestPenang; Universiti Teknologi MARA; School of Chemical Engineering, Universiti Sains Malaysia; St Joseph School, Kuching; Australia's Queensland Compound Library and Eskitis Institute for Cell and Molecular Therapies; Morocco's Royal Academy of Science, as well as by Ministries.

A significant development in 2011 was the establishment of two iPharm 'spin-off' companies: Neopeutics Sdn Bhd (June 2011); and Human Architecture Technologies Sdn Bhd.

The year ended with iPharm getting set to move on to a new phase focusing on intensive R&D, product development and licensing.

Agro-Biotech Institute Malaysia (ABI)

Established as part of the National Biotechnology Policy, the Agro-Biotechnology Institute (ABI) was launched by the Honourable Prime Minister of Malaysia on April 21, 2005 along with two other institutions (iPharm and MGI) under MOSTI. Taking the lead in the development of the country's agro-bioteknologi, ABI's scope includes research, development and commercialisation of products, technologies, and other agro-biotechnology R&D outcomes for the development and modernisation of the agricultural sector.

Throughout 2011, ABI organised and was involved in a total of 10 main activities, including a Working Visit by MOSTI Minister, Y.B. Datuk Seri Panglima Dr. Maximus Johnity Ongkili; a science exploration programme with the Orang Asli; Memorandum of Agreement (MoA) exchange ceremony between ABI, Sabah Government agencies and Pure Circle Sdn Bhd; empurau/kelah



Majlis Perasmian Kompleks iPharm.
Launching of iPharm Complex.

ABI, agensi-agensi Kerajaan Sabah dan Pure Circle Sdn Bhd; pelan penyelidikan strategik empurau/kelah; dan juga penanaman Stevia, bengkel-bengkel penulisan saintifik dan OECD-GLP.

Semasa Lawatan Kerja oleh Menteri MOSTI pada 13 Januari 2011, selain melaporkan kemajuan Kampus tetap ABI di MARDI, delegasi diberi taklimat oleh Pemangku Ketua Pengarah ABI, Prof. Madya Dr. Norihan Mohd Saleh berkenaan keputusan dan status projek penyelidikan, termasuk masalah yang timbul di peringkat-peringkat pelaksanaan. Sebanyak RM60.1 juta telah diperuntukkan kepada program Inisiatif R&D Agro-Bioteknologi untuk menjana pengetahuan baru dalam sains gunaan dan mencipta produk baru atau proses-proses pembangunan dan pengkomersilan. Adalah diharapkan bahawa hasil dari inisiatif ini akan meningkatkan tahap kepakaran dalam Negara dan memberi manfaat kepada kumpulan sasar program iaitu petani, usahawan dan PKS. Projek yang menerima dana dari inisiatif ini termasuklah permohonan dari agensi dan institusi seperti MARDI, UPM, PERHILITAN, USM, IIUM, UMS, NaFISH, MPOB, LGM, UKM, USM, UNISEL, and UM, in addition to ABI projects (Jatropha, mushrooms, seaweed, Bali cattle, empurau/kelah, live feed and metabolomics research).

Sehingga Disember 2011, sebanyak 16 projek di bawah program Inisiatif R&D Agro-Bioteknologi telah siap dan 24 projek masih dijalankan. Output projek-projek ini telah menyumbang kepada Petunjuk Prestasi Utama Kementerian iaitu jumlah paten yang difaikan, penerbitan yang dihasilkan, (16 semuanya); 48 RSE; dan juga dua kerjasama kebangsaan dan antarabangsa yang terbentuk melalui projek-projek penyelidikan tersebut.

Aktiviti ABI

Aktiviti-aktiviti ABI yang dijalankan pada tahun 2011 termasuklah Program Eksplorasi Sains dengan komuniti Orang Asli, yang diadakan pada 16 Julai 2011 di Simpang Pulai, Perak. Program dengan tema 'Go Science, Love Maths' ini merupakan sebahagian daripada kempen Malaysia Inovatif 2010 yang bertujuan untuk mempromosikan sains dan matematik pada tahun 2011. Daripada 143 peserta, 52% adalah wanita manakala 48% adalah lelaki. Kebanyakannya dari peserta datang dari puak Temiar (72%), dan bakinya dari puak Semai (28%). Lebih kurang 40% berumur dalam lingkungan 13-29 tahun, diikuti dengan peserta berumur 7-12 tahun (28%), 30-39 tahun (22%) dan bakinya berumur lebih 40 tahun (10%). Seramai 75.6% dari mereka datang dari Perkampungan Pos Raya, diikuti dengan Pos Slim (10%), Pos Lalang (4.8%), Pos Pergum (4.8%) and Pos Beringin (4.8%). Para peserta mengambil bahagian dalam aktiviti yang melibatkan 'air ajaib' (enzim untuk membasuh), kompos, sains di rumah, 'tunggu dan lihat' (penanaman cendawan) dan 'susu pelangi'. Penyelidik dari IPPharm juga membimbing peserta membuat sabun. Hampir kesemua peserta bersetuju bahawa sains adalah menarik dan mereka akan mencuba membuat aktiviti yang telah dipelajari; malah, 77% berkata pengetahuan sains mereka telah bertambah.

strategic research plan; as well as Stevia planting, scientific writing and OECD-GLP workshops.

During the Working Visit by MOSTI Minister on January 13, 2011, aside reporting on the progress of ABI's permanent campus in MARDI, the delegation was briefed by the Acting Director General of ABI, Associate Prof. Dr. Norihan Mohd Saleh on the outcome and status of research projects, including problems which arose during the implementation stages. A total of RM60.1 million was allocated to the Agro-Biotechnology R&D Initiative programme for the purpose of generating new knowledge in applied science, and to create new products or processes for development and commercialisation. The expected outcomes of this initiative will enhance the level of expertise in the country and benefit the target groups of i.e. the farmers, entrepreneurs and SMEs. Projects that received funding under this initiative included applications from agencies and institutions like MARDI, UPM, PERHILITAN, USM, IIUM, UMS, NaFISH, MPOB, LGM, UKM, USM, UNISEL, and UM, in addition to ABI projects (Jatropha, mushrooms, seaweed, Bali cattle, empurau/kelah, live feed and metabolomics research).

As at the end of 2011, 16 projects under the Agro-Biotechnology R&D Initiative programme have been completed while 24 projects are still ongoing. The outputs of these projects have contributed to the Ministry's Key Performance Indicators, i.e. the number of patents filed, publications produced (16 in total); 48 RSEs; as well as two national and international collaborations formed through the research projects.

ABI's Activities

ABI's activities carried out in 2011 include the Science Exploration Programme with the Orang Asli community, which was held on July 16, 2011 in Simpang Pulai, Perak. The programme was organised in conjunction with 2011 having been declared as the year to promote science and mathematics with the theme of Go Science, Love Maths (part of the Malaysia Innovatif 2010 campaign). Of 143 participants, 52% were females while 48% were males. Most of the participants were from the Temiar (72%) group, and the rest were Semai (28%). Some 40% were those aged 13-29 years old, followed by participants aged 7-12 years (28%), 30-39 years (22%) and the rest were above 40 years (10%). A total of 75.6% of them came from Perkampungan Pos Raya, followed by Pos Slim (10%), Pos Lalang (4.8%), Pos Pergum (4.8%) and Pos Beringin (4.8%). The participants took part in activities involving miracle water (enzyme for washing), compost, science at home, wait and see (mushroom cultivation) and rainbow milk. Researchers from IPPharm also guided participants on how to make soap. Almost all the participants agreed that science is interesting and that they would try out the activities learnt, and 77% said that their knowledge in science had increased.

Usahasama

ABI, Pure Circle Sdn Bhd, Jabatan Pertanian Sabah (JPS) dan Koperasi Pembangunan Desa Sabah (KPDS) telah menandatangani Memorandum Persetujuan (MoA) pada 10 Oktober 2011 untuk melancarkan penanaman Stevia bagi tujuan komersil. Sebagai langkah awal, tumpuan akan diberi untuk mengenalpasti jenis Stevia yang paling sesuai di tanam di Malaysia dan mengoptimalkan amalan agronomi yang relevan. Pada umumnya, Stevia optimumnya memerlukan 13 jam sinaran cahaya matahari setiap hari; jadi Sabah dipilih oleh kerana tempoh cahaya mataharinya lebih panjang dari Semenanjung Malaysia. MoA ini berkuatkuasa dari 10 Oktober 2011 hingga bulan Disember 2012. Seramai 27 peserta kemudian telah menghadiri Bengkel Penanaman Stevia anjuran penyelidik ABI dan PureCircle Sdn Bhd.

Di Sarawak, ABI dan Jabatan Pertanian Sarawak telah menganjurkan Bengkel Pelan Penyelidikan Strategik Empurau/Kelah (Tor tambroides) dari 19-22 Julai 2011, dengan kerjasama Jabatan Perikanan Malaysia, Universiti Malaysia Terengganu dan Universiti Putra Malaysia. Bengkel ini dirasmikan oleh Timbalan Ketua Menteri Sarawak, Y.B. Datuk Patinggi Tan Sri Dr. Alfred Jabu dengan kehadiran bersama Timbalan Menteri MOSTI, Y.B. Datuk Haji Fadillah Haji Yusof. Objektif bengkel tersebut adalah untuk: (i) menentukan hala tuju penyelidikan empurau/kelah di Malaysia dari aspek penternakan, pembiakan dan pemakanan; (ii) mengwujudkan peluang untuk bekerjasama di kalangan institusi pendidikan tinggi awam dan institusi penyelidikan; (iii) menentukan peranan dan tanggungjawab masing-masing untuk mengelakkan pertindihan.

Seramai 30 penyelidik dari pelbagai institusi telah mengambil bahagian dalam bengkel empat hari tersebut. Mereka juga dibawa melawat projek di Tarat, Kampung Terbat di Serian di mana sistem 'tagang' diamalkan, dan juga ke fasiliti LTT Aquaculture Sdn Bhd di Asajaya. Di akhir bengkel, satu pelan penyelidikan strategik telah dirangka, sah digunakan hingga tahun 2020. Seterusnya satu pelan kerja untuk penyelidikan empurau/kelah pula telah disediakan, untuk dilaksanakan oleh kesemua universiti/institusi yang terlibat. Di antara inisiatif-inisiatif yang dirancang ialah pembangunan tiga pusat penetasan di Perlok, Pahang; Tarat, Sarawak; dan Tasik Kenyir, Terengganu.

Seminar dan Bengkel

ABI telah menyertai ekspo MySTI 2011 yang diadakan pada bulan Julai, mempamerkan dua projek penyelidikan agro-bioteknologi, iaitu penanaman Stevia untuk industri makanan dan teknologi pengeluaran live feed untuk industri akuakultur. Di Persidangan dan Pameran Komoditi Antarabangsa Malaysia 2011 (MICCOS 2011) pada bulan Oktober, ABI mempamerkan pembangunan teknologi berkenaan sistem penetasan ikan kelah dan pengeluaran live feed, sejajar dengan tema acara 'Mencipta Kekayaan Melalui Inovasi'. Pada bulan November, di Pameran dan Persidangan BioMalaysia tahunan, ABI memperlihatkan dua projek penyelidikan, iaitu Kajian Metabolomik

Collaborative Efforts

In terms of collaborative efforts, ABI, Pure Circle Sdn Bhd, Jabatan Pertanian Sabah (JPS) and Korporasi Pembangunan Desa Sabah (KPDS) exchanged a Memorandum of Agreement (MoA) on October 10, 2011 to launch Stevia farming for commercial purposes. As an initial step, the focus would be placed on identifying the most suitable Stevia variety for planting in Malaysia and to optimise the relevant agronomic practices. In general, Stevia optimally requires 13 hours of sunlight per day; therefore Sabah was chosen due to its longer sunlight hours as compared to Peninsular Malaysia. The MoA is effective from October 10, 2011 until December 2012. A total of 27 participants later attended a Stevia Planting Workshop organised by researchers from ABI and PureCircle Sdn Bhd.

In Sarawak, ABI and the Sarawak Agriculture Department jointly organised the Malaysia Empurau/Kelah (Tor tambroides) Strategic Research Plan Workshop from July 19-22 2011, in collaboration with Department of Fisheries Malaysia, Universiti Malaysia Terengganu and Universiti Putra Malaysia. The workshop was officiated by the Deputy Chief Minister of Sarawak, Y.B. Datuk Patinggi Tan Sri Dr. Alfred Jabu with the Deputy Minister of MOSTI, Y.B. Datuk Haji Fadillah Haji Yusof, in attendance. The objectives of the workshop were: (i) to determine the direction of empurau/kelah research in Malaysia from the aspect of cultivation, propagation and feeding; (ii) to create collaboration opportunities among public institutions of higher learning and research institutes; and (iii) to determine roles and responsibilities so as to prevent overlaps.

A total of 30 researchers from various institutions participated in the four-day workshop. They were also taken for tours to IFRPC, Tarat, Kampung Terbat in Serian in which the "tagang" system is in use, and to the LTT Aquaculture Sdn Bhd facility in Asajaya. At the end of the workshop, a strategic research plan was charted, valid until year 2020. Subsequently, a work plan for empurau/kelah research was developed, which will be implemented by all the universities/institutions involved. Among the initiatives planned was to develop three hatchery centres in Perlok, Pahang; Tarat, Sarawak; and Tasik Kenyir, Terengganu.

Seminars and Workshops

ABI participated in the MySTI 2011 exposition which was held in July, showcasing two research projects in agro-biotechnology, namely Stevia cultivation for the food industry and live feed production technology for the aquaculture industry. At the Malaysia International Commodity Conference and Showcase (MICCOS 2011) held in October, ABI exhibited its technological developments related to kelah fish hatchery systems and live feed production, in line with the event's theme Creating Wealth Through Innovation. In November, at the annual BioMalaysia Conference and Exhibition, ABI showcased two research projects, namely, Metabolomic study for The Development of Functional Foods with Anti-Diabetic Property; and Cryopreservation of Malaysian Mahseer (Tor tambroides and Tor douronensis) Semen to promote kelah breeding in the aquaculture industry.

untuk Pembangunan Makanan Kesihatan Bercirikan Anti-Diabetik; dan Kriopresevasi Semen Mahseer (*Tor tambroides* dan *Tor douronensis*) Malaysia untuk mempromosikan pembiakan ikan kelah dalam industri akuakultur.

Buat pertama kalinya, ABI telah menganjurkan Seminar Prinsip Amalan Makmal Baik Pertubuhan Kerjasama Ekonomi dan Pembangunan(OECD-GLP).Objektif Seminar ialah untuk membangunkan modal insan berkemahiran menjalankan kerja-kerja penyelidikan dan melaksanakan sistem pengurusan berasaskan OECD-GLP.Tiga puluh sembilan pegawai ABI telah menghadiri seminar yang bertumpu kepada pengumpulan data, pengurusan rekod bahan kimia dan peralatan, dan amalan pengendalian peralatan makmal.Peserta juga diberi taklimat tentang peranan dan tanggungjawab setiap individu dalam kumpulan penyelidikan, juga berdasarkan prinsip-prinsip OECD-GLP.Pada akhir seminar diputuskan bahawa penyelidik di setiap pusat penyelidikan ABI perlu menyediakan Prosedur Operasi Standard (SOP) untuk peralatan makmal dan membina panduan pengurusan makmal berdasarkan standard OECD-GLP.

ABI juga telah mengadakan Bengkel Penulisan Saintifik bertujuan meningkatkan kemahiran dan pengetahuan penulisan pegawai-pegawaiannya.Tiga puluh sembilan kakitangan ABI mengambil bahagian dalam bengkel ini, majoriti terdiri dari pegawai penyelidik.Pada akhir bengkel, peserta berupaya membuat draf bertulis untuk jurnal sains dalam bidang penyelidikan mereka.Bengkel ini telah dicadangkan supaya dijadikan acara tahunan.

Institut Genom Malaysia (MGI)

Institut Genom Malaysia (MGI) pada asalnya merupakan makmal interim di UKM, yang ditugaskan untuk menubuh dan menguruskan beberapa fasiliti platform teknologi dan makmal lanjutan untuk genomik dan biologi molekul, untuk menyokong Program R&D Direktorat Bioteknologi Kebangsaan (NBD), MOSTI, di bawah Rancangan Malaysia Ke 8 (RMKe-8).

Di bawah RMKe-9 pada tahun 2006, Unit Perancang Ekonomi (EPU) telah meluluskan dana R&D MGI iaitu program Inisiatif Genomik dan Biologi Molekul (GMBI). Setelah ditubuhkan dengan rasmi, MGI telah mengukuhkan program GMBI dengan memantapkan kerjasama penyelidikan antarabangsa, hubungan penyelidikan dan kerjasama dengan sektor swasta untuk membentuk satu rangkaian hub penyelidikan. Selain itu, peranan MGI juga adalah untuk memperkuuhkan infrastruktur penyelidikan; menilai dan memberi geran yang dipohon di bawah program RMKe-10; dan membangunkan modal insan dalam enam bidang utama: Komparatif Genomik dan Genetik; Biologi Struktur; Biologi Perkomputeran dan Sistem; Sistem Ekspresi Rekombinan; Kejuruteraan Metabolik; dan Bioinformatik. MGI juga menyokong MOSTI dan lain-lain agensi di karnival Malaysia Inovatif dan program MyBio@School programmes.

Projek GMBI

Sehingga akhir tahun 2011, sebanyak 25 projek GMBI yang melibatkan 179 penyelidik telah berjaya

For the first time, ABI organised an Organisation of Economic Cooperation and Development (OECD) Principles of Good Laboratory Practices (OECD-GLP) Seminar. The objective of the seminar was to produce personnel with the skills to conduct research activities and implement laboratory management systems based on OECD-GLP. Thirty nine ABI officers attended the seminar, which focused on data collection, record management of chemicals and equipment, and laboratory equipment handling practices. Participants were also briefed on the responsibilities and roles of each individual in a research group, again based on OECD-GLP principles. At the end of the seminar, it was decided that researchers at each ABI research centre would prepare Standard Operating Procedures for laboratory equipment, and produce guidelines on laboratory management based on OECD-GLP standards.

ABI also organised a Scientific Writing Workshop aimed at enhancing writing skills and knowledge. Thirty nine ABI staff participated in the workshop, the majority being research officers. At the end of the workshop, participants were able to produce written drafts for scientific journals in their field of research. It was proposed that the workshop should be an annual event.

Malaysia Genome Institute (MGI)

The Malaysia Genome Institute (MGI) was originally an interim laboratory at UKM, tasked to establish and manage a number of platform technology facilities and advanced laboratories for genomics and molecular biology, in order to support the R&D Programme of the National Biotechnology Directorate (NBD), MOSTI, under the 8th Malaysia Plan (8MP).

Under the 9MP in 2006, the Economic Planning Unit (EPU) approved the MGI R&D fund i.e. the Genomics and Molecular Biology Initiatives (GMBI) programme. Following its official establishment, MGI consolidated the GMBI programme, combining international research collaboration, research links and collaboration with the private sector to form a research hub. In addition, MGI's role is to strengthen research infrastructure; assess and award grant applications under the 10MP programme; and develop human capital in six main areas: Comparative Genomics and Genetics; Structural Biology; Computational and Systems Biology; Recombinant Expression Systems; Metabolic Engineering; and Bioinformatics. MGI also supports MOSTI and other agencies, e.g. in the Malaysia Innovative carnival and MyBio@School programmes.

GMBI Projects

As at the end of 2011, 25 GMBI projects involving 179 researchers were successfully completed. These projects involved 112 principal investigators from MGI, national universities and other research institutions; as well as 67 investigators from international institutions. To date, 103 publications in high impact journals and 19 intellectual properties have been generated. The GMBI programme also contributed to the increase in the number of Researchers, Scientists and Engineers and Technologists, the availability of job opportunities and Malaysian research expertise competent in undertaking competitive research in the fields of genomics and

disiapkan.Projek-projek ini membabitkan pengkaji dari MGI, universiti-universiti kebangsaan dan lain-lain institusi penyelidikan; dan juga 67 pengkaji dari institusi antarabangsa. Sehingga kini, 103 penerbitan dalam jurnal berimpak tinggi dan 19 harta intelek telah dihasilkan. Program GMBI juga telah menyumbang kepada peningkatan jumlah Penyelidik, Saintis dan Jurutera dan Ahli Teknologi, pewujudan peluang pekerjaan dan kepakaran penyelidikan Malaysia yang kompeten dalam menjalankan penyelidikan kompetitif di bidang genomik dan biologi molekul di peringkat antarabangsa. Sepanjang RMKe-9, sebanyak 71 calon PhD, 169 calon MSc dan lain-lain telah dilatih dengan jayanya dalam bidang-bidang teknologi baru. Lain-lain manfaat termasuklah hubungan dan kerjasama dengan universiti dan institusi penyelidikan bertaraf dunia.

Projek Mega

Menerusi bidang penyelidikan juga , MGI telah mengendalikan satu projek jangka panjang peringkat kebangsaan yang dinamakan Kohort Malaysia (TMC), dengan kerjasama Pusat Penyelidikan Kanser Fred Hutchinson (Amerika Syarikat) dan UKM. TMC mengkaji hubungan di antara faktor gaya hidup, persekitaran dan genetik dalam pelbagai penyakit di kalangan penduduk Malaysia, termasuk kanser dan penyakit kronik seperti kencing manis, darah tinggi dan strok. Oleh kerana peserta kohort akan dinilai semasa mereka sihat dan juga semasa mereka sakit, kajian ini juga akan memberarkan analisis ke atas perubahan yang berlaku untuk mengenalpasti biomarkers penyakit kritis seperti kanser. Pada masa sekarang, ramai pesakit kanser tidak dapat diselamatkan oleh kerana penyakit ini hanya dikesan pada peringkat yang sudah lewat.

Penyertaan dalam TMC adalah dari pelbagai kumpulan etnik, dengan peserta yang berumur 35 tahun dan ke atas. Data asas kesihatan 55,000 peserta yang direkrut sehingga pertengahan 2010 telah menunjukkan bahawa 39% mengalami tekanan darah tinggi, 15% mengidap kencing manis, 33% adalah obes dan 78% mempunyai paras kolesterol yang tinggi. Ini adalah satu trend yang membimbangkan dan mempunyai implikasi yang besar dari segi beban kewangan kos penjagaan kesihatan sekiranya intervensi awal dan langkah-langkah proaktif tidak diambil.

TMC telah membangunkan satu biobank terbesar di Malaysia yang mengandungi biospesimen daripada 60,000 peserta. Sebagai ahli Konsortium Kohort Asia yang diketuai oleh Pusat Penyelidikan Kanser Fred Hutchinson dan Konsortium P3G Biobank, pengambilan dan pembangunan protokol biobank telah diiktiraf dan digunakan oleh semua ahli konsortium.

Penyelidikan Dibiayai

Sebanyak tujuh projek penyelidikan baru MGI telah diluluskan untuk pembiayaan di bawah ScienceFund MOSTI.Sepertimana dalam projek sebelumnya, projek-projek baru ini juga melibatkan kerjasama dan perkongsian pengetahuan dengan rakan tempatan dan luar negara.

Dalam usaha memperkuuhkan lagi kemudahan fizikal penyelidikan, sebanyak RM3 juta telah diluluskan di

molecular biology at the international level. Throughout the 9MP, some 71 PhD candidates, 169 MSc candidates, and others were successfully trained in new fields of technology. Other benefits included links and collaboration with world-class universities and research institutions.

Mega Project

Also under the area of research, MGI administers a national level, long-term mega-project called The Malaysian Cohort (TMC), working together with the Fred Hutchinson Cancer Research Center (USA) and UKM. TMC studies the relationship between lifestyle, environmental and genetic factors for various diseases within the Malaysian population, including cancer and chronic diseases such as diabetes, hypertension and stroke. As the cohort participants will be evaluated when they are healthy followed by when they are diseased, this study will also allow for analysis of changes that occur to identify early biomarkers for critical diseases such as cancer. Currently, many cancer patients cannot be saved as the disease is only diagnosed at the later stages.

Participation in the TMC is by various ethnic groups, with participants aged 35 years and above. The fundamental health data of 55,000 recruited participants up to mid-2010 indicated that 39% suffered from high blood pressure, 15% were diabetics, 33% were obese and 78% had high cholesterol levels. This is a worrying trend and has huge implications in terms of financial burden of healthcare costs if early intervention and pro-active measures are not taken.

TMS has developed the largest biobank in Malaysia, containing biospecimens from 60,000 participants. As the project is a member of the Asia Cohort Consortium, led by the Fred Hutchinson Cancer Research Centre, and the P3G Consortium of Biobanks, recruitment and biobank development protocols have been accredited and utilised by all consortium members.

Funded Research

Seven new research MGI projects were approved for financing under MOSTI's ScienceFund. As in previous projects, these new projects will involve collaboration and knowledge-sharing between local and foreign partners.

With regard to strengthening the physical landscape for research, RM 3 million was approved under the 10MP for this purpose. Among others, renewed focus will be given to research into proteomics and metabolomics, which has resulted in the acquisition of a Single Quadrupole Mass Spectrometer Detector, and a Proteomic Data Analysis System, both of which will allow for more accuracy in determining findings. Other equipment include those for use in Differential Scanning Calorimetry, Circular Dichroism Spectrometry, Gas Chromatography, Fluorescence Spectrometry, and High Performance Liquid Chromatography.

In terms of working with other institutions, apart from the on-going collaboration with Stanford University initiated in 2005 and with The University of Sheffield which began in 2006, a new collaborative project in

bawah RMKe-10 bagi tujuan tersebut. Antara bidang yang diberi perhatian semula ialah penyelidikan proteomik dan metabolomik, dengan perolehan peralatan Single Quadrupole Mass Spectrometer Detector, dan Sistem Analisis Data Proteomik, yang mana kedua-duanya mampu menghasilkan ketepatan yang lebih tinggi dalam penilaian sesuatu penemuan. Peralatan-peralatan lain yang diperolehi termasuklah yang digunakan dalam Differential Scanning Calorimetry, Circular Dichroism Spectrometry, Gas Chromatography, Florescence Spectrometry, dan High Performance Liquid Chromatography.

Dari segi hubungan kerja dengan institusi-institusi lain, selain dari kerjasama yang dijalankan dengan Universiti Stanford sejak tahun 2005 dan dengan Universiti Sheffield sejak tahun 2006, satu projek baru dalam bidang genomik struktur dengan Universiti Monash, Australia telah dimulakan pada tahun 2010 melalui satu Memorandum Persefahaman (MoU) yang ditandatangani bersama pada bulan Ogos 2010. Projek ini dijangka akan menghasilkan penemuan pelbagai molekul protein yang unik dan berpotensi melahirkan industri-industri bioteknologi yang baru. MGI juga terus bekerjasama dengan Universiti Maryland; Universiti Concordia; Universiti Queensland; Universiti Manchester; Konsortium Kohort Asia dan Universiti Oxford dalam pelbagai topik berkaitan dengan genom.

Kerjasama dengan Sektor Swasta

Dalam RMKe-9, MGI telah menjalin kerjasama dengan sektor swasta untuk membangunkan bidang bioteknologi moden. Geran TechnoFund yang telah diperolehi pada tahun 2007 telah membantu kerjasama di antara MGI dan Quantumbeez Sdn Bhd, di mana pembangunan perisian dan perkakasan bagi accelerator platforms telah dipilih sebagai tumpuan penyelidikan di bidang teknologi informatik genom. Pada tahun 2010, output projek ini telah didaftarkan sebagai hak cipta. Pada tahun yang sama, MGI, dalam kerjasama dengan UKM dan Xynergen Sdn Bhd telah berjaya membangunkan satu prototaip biocip berdasarkan interaksi protein DNA yang mampu dipasarkan. Pada tahun 2011, MGI dan Pusat Sumber Genomik Malaysia (MGRC) telah menjalankan dua projek: Projek MyGenome (bidang perubatan), dan Projek Probosis (hidupan liar). MGI juga terus bekerja bersama dengan InnoBiologics Sdn Bhd (ekspresi gen dalam mamalia), and DNA Laboratories Sdn Bhd (kit diagnostik untuk pengesahan penyakit).

Program Latihan

Program penyelidikan GMBI memerlukan teknologi tinggi dan pendekatan penyelidikan untuk mencapai objektif penemuan gen, protein dan proses baru untuk kegunaan di bidang bioteknologi moden. Oleh itu, MGI telah menganjurkan program latihan melalui siri bengkel berdasarkan makmal mengenai informatik genom, teknologi microarray dan ekspresi rekombinan protein.

Kuliah, Seminar dan Lawatan

Sepanjang tahun 2011, MGI telah menganjurkan 11 kuliah dan seminar terbuka. Seramai 870 dari golongan orang awam, pelajar sarjana dan penyelidik telah menyertai siri seminar ini.

the field of structural genomics with Monash University Australia was initiated in 2010 through the signing of an MOU with Monash University in August 2010. This project is expected to lead to discoveries of many unique protein molecules that can spawn new biotechnology industries. MGI also continued to collaborate with the University of Maryland; Concordia University; University of Queensland; University of Manchester; the Asia Cohort Consortium; and the University of Oxford on a range of topics related to genomes.

Private Sector Collaboration

During the 9MP, MGI established collaboration with the private sector for the development of modern biotechnology. A TechnoFund grant secured in 2007 facilitated collaboration between MGI and Quantumbeez Sdn Bhd, in which the development of software and hardware accelerator platforms was selected as the research focus in genome informatics technology. In 2010, the project output was registered as a copyright. In that same year, MGI, in collaboration with UKM and Xynergen Sdn Bhd successfully developed a marketable prototype of a biochip based on DNA-protein interaction. In 2011, MGI and Malaysia Genomics Resource Centre (MGRC) worked on two projects: the MyGenome Project (medical field), and the Proboscis Project (wildlife). MGI also continued to work with InnoBiologics Sdn Bhd (gene expression in mammals), and DNA Laboratories Sdn Bhd (diagnostic kit for detection of diseases).

Training Programmes

The GMBI research programme requires advanced technologies and research approaches to achieve the objectives of gene, protein and new process discovery for applications in modern biotechnology. As such, MGI organised training programmes through a series of laboratory-based workshops on genome informatics, microarray and recombinant protein expression technologies.

Lectures, Seminars and Visits

Throughout 2011, MGI organised 11 open lectures and seminars. A total of 870 general public, graduate students and researchers participated in this seminar series.

MGI was also a main resource centre for those wishing to obtain further information and direct exposure to facilities and research on genomes conducted via the GMBI programme. Throughout 2011, MGI received 18 official visits from more than 660 university and school students as well as national and international scientists.

In addition, MGI took part in MOSTI and BIOTEK programmes such as the Karnival Malaysia Inovatif 2011 exhibition, MyBiotech@School (previously known as the Promotion of Biotechnology to Schools), and organised exhibitions in seven locations.

MGI juga merupakan pusat sumber utama bagi mereka yang ingin mendapatkan maklumat lanjut dan pendedahan terus kepada fasiliti dan penyelidikan tentang genom yang dijalankan melalui program GMBI. Sepanjang tahun 2011, MGI telah menerima 10 kunjungan rasmi dari 660 pelajar universiti dan sekolah serta saintis tempatan dan antarabangsa.

Selain itu, MGI juga telah mengambil bahagian dalam program-program MOSTI dan BIOTEK seperti pameran Karnival Malaysia Inovatif 2011, MyBiotech@School (sebelum ini dikenali sebagai Promosi Bioteknologi kepada Sekolah), dan menganjurkan pameran di tujuh buah lokasi.

Kompleks MGI

Kompleks bangunan MGI di Bangi telah dibuka secara rasmi pada tahun 2011. Kompleks ini mengandungi 10 makmal penyelidikan lanjutan dan 10 fasiliti teras yang menyediakan suasana kerja yang kondusif dengan pembinaan fasiliti terkini untuk penyelidikan lanjutan dalam bidang sains genom dan bioteknologi moden.

BiotechCorp

Dasar Bioteknologi Negara (NBP) merupakan rancangan induk kepada pembangunan industri bioteknologi Malaysia. BiotechCorp sebagai agensi peneraju yang ditugaskan untuk memangkin perkembangan bioteknologi di negara ini, telah melaporkan bahawa Fasa 1 NBP, yang bertumpu kepada pembangunan keupayaan, telah selesai dijayakan pada tahun 2010. Dalam fasa ini, satu asas kukuh untuk kejayaan bidang bioteknologi telah dibina dengan memberi fokus kepada faktor utama, iaitu sumber manusia, pembangunan institusi dan regulatori, pelaburan dan penjanaan pendapatan.

Tahun 2011 menandakan fasa pengkomersilan NBP –iaitu Sains ke Perniagaan – yang melibatkan pembangunan kepakaran dalam penemuan dan pembangunan ubat-ubatan baru berdasarkan sumber semula jadi, dan seterusnya mencipta jenama global bagi syarikat-syarikat bioteknologi Malaysia serta produk mereka. Di peringkat ini, fokus telah berpindah kepada pengkomersilan projek dan R&D yang telah dibangunkan pada Fasa 1, hingga akhirnya membawa kepada keuntungan yang lebih besar dan pertumbuhan industri yang lebih mampan.

Sektor Utama

Terdapat tiga sektor utama dalam industri bioteknologi iaitu pertanian, kesihatan dan bioteknologi perindustrian. Bioteknologi pertanian bertujuan mentransformasi dan meningkatkan nilai tambah dalam sektor pertanian melalui bioteknologi, manakala bioteknologi kesihatan memberi tumpuan terhadap usaha manfaatkan biokelabogaian negara dengan mengkomersilkan penemuan produk-produk kesihatan semula jadi dan ubat-ubatan bio-generic. Melalui bioteknologi perindustrian pula, harapannya ialah untuk menggunakan kekuatan sektor pengilangan untuk meningkatkan kadar aplikasi bio-pemprosesan dan bio-pembuatan. Menerusi pelbagai inisiatif bagi meningkatkan

MGI Complex

The new MGI building complex in Bangi was officially declared open in 2011. The complex, comprising 10 advanced research laboratories and 10 core facilities will provide a conducive working environment by providing state-of-the-art facilities for advanced research in genome sciences and modern biotechnology.

BiotechCorp

The National Biotechnology Policy (NBP) is the blueprint for the development of the Malaysian biotechnology industry. BiotechCorp, the lead agency tasked with catalysing expansion of biotechnology in the country, reported that Phase 1 of the NBP, which centred on capacity building, was successfully completed in 2010. During this phase, a strong foundation for biotechnology, focusing on the key success factors, namely human resource, regulatory and institutional development, investment and revenue generation, has been built.

2011 marked the commercialisation phase of the NBP - Science to Business - which involves developing expertise in the discovery, and development of new drugs based on natural resources, as well as creating a global brand for Malaysia's biotech companies and its products. At this stage, the focus has shifted to commercialisation of the projects and R&D conceptualised during Phase 1, ultimately translating into greater profitability and sustainable growth for the industry.

Major Sectors

There are three major sectors within the biotechnology industry namely agriculture, healthcare and industrial biotechnology. Agricultural biotechnology is aimed at transforming and enhancing the value creation of the agriculture sector through biotechnology, while healthcare biotechnology entails capitalising on the country's biodiversity by commercialising the discoveries of health-related natural products and bio-generic drugs. Through industrial biotechnology meanwhile, the hope is to leverage on the country's strong manufacturing sector to increase opportunities for bio-processing and bio-manufacturing. Through the various industry development initiatives aimed at enhancing the capacity of players in these sectors, it is envisaged that each sector will present niche areas for Malaysia to explore and expand.

Given that biotechnology is knowledge and technology-intensive, enhancing R&D is absolutely crucial. Biotechnology projects also face high risks, long gestation periods, and require substantial upfront capital investment and stringent regulatory compliance. Recognising these facts, BiotechCorp has, over the past six years, worked with partners who possess the relevant facilities and capabilities; as well as formulated a comprehensive funding structure and attractive incentive schemes which are necessary to address gaps in financing. In the process, BioNexus Malaysia was established, comprising a group of specialised companies and institutions that can support each other to create a centre of excellence. Qualified companies that participate in and undertake value-added

keupayaan pengusaha dalam sektor-sektor ini, adalah dijangka bahawa setiap sektor akan dapat mengemukakan bidang nic yang mampu diterokai dan dikembangkan oleh negara seterusnya.

Memandangkan bioteknologi merupakan bidang yang melibatkan teknologi dan pengetahuan intensif, maka usaha mempertingkatkan R&D adalah sangat penting. Projek bioteknologi juga menghadapi risiko yang tinggi, tempoh matang yang lama, dan memerlukan pelaburan modal permulaan yang besar di samping pematuhan peraturan yang ketat. Mengambil kira perkara ini, bagi enam tahun yang lepas BiotechCorp telah bekerjasama dengan rakan-rakan yang mempunyai fasiliti dan keupayaan yang relevan; serta merangka struktur pembiayaan yang menyeluruh dan skim insentif yang menarik untuk menangani jurang pembiayaan. Dalam proses ini BioNexus Malaysia telah diwujudkan, yang terdiri dari sekumpulan syarikat dan institusi khusus yang menyokong satu sama lain untuk membina satu jaringan pusat-pusat kecemerlangan. Syarikat-syarikat yang layak untuk mengambil bahagian dan menjalankan aktiviti nilai tambah bioteknologi diberi status BioNexus, dan ia merupakan satu pengiktirafan yang diberikan oleh Kerajaan Malaysia melalui BiotechCorp. Syarikat-syarikat ini juga dapat menikmati satu pakej insentif dan keistimewaan seperti manfaat yang diperuntukkan dalam Piagam Jaminan BioNexus.

Status BioNexus

Sehingga bulan Februari 2011, sebanyak 201 syarikat telah diberi status BioNexus dengan kelulusan pelaburan lebih dari RM2 bilion. Dengan sokongan inisiatif-inisiatif BiotechCorp yang lain dalam membentuk persekitaran yang menggalakkan, Program Rakan BioNexus (BNP) telah menjadi satu daripada inisiatif BiotechCorp yang paling berjaya, dengan wujudnya kelompok modal insan dan infrastruktur untuk kemudahan R&D dan Pengkomersilan (R&D&C) di Malaysia. Sehingga kini BNP membabitkan 56 makmal dan unit dari 13 institusi pengajian tinggi, tiga institut penyelidikan dan dua buah syarikat berkaitan kerajaan. Selain itu, beberapa inisiatif penyelidikan yang dijalankan dalam BNP sekarang berada di peringkat awal pengkomersilan. Langkah-langkah telah diambil untuk melaksanakan program pembangunan dan perolehan teknologi untuk menyemarakkan lagi produktiviti penyelidikan dan memendekkan tempoh masa yang diperlukan untuk memasarkan produk.

Pembangunan Modal Insan

Tumpuan yang tinggi telah diberi terhadap pembangunan modal insan dan peningkatan kemahiran. Melalui penubuhan program seperti Program Usahawan Bioteknologi dan Program Latihan Khas Usahawan Bioteknologi (BeST), satu pendekatan yang lebih tersusun ke arah peningkatan modal insan telah boleh diguna pakai. Daripada 1,040 pelajar yang dilatih di bawah inisiatif-inisiatif ini, 86% telah berjaya mendapat pekerjaan di bidang industri bioteknologi. Yang lainnya telah memutuskan untuk melanjutkan pelajaran mereka ataupun memulakan usaha perniagaan baru.

biotechnology activities are given BioNexus Status, which is a recognition awarded by the Malaysian Government through BiotechCorp. Such companies enjoy a set of incentives and privileges contained within the BioNexus Bill of Guarantees.

BioNexus Status

As of February 2011, a total of 210 companies have been awarded the BioNexus Status, with an approved investment of more than RM2 billion. Supported by BiotechCorp's other initiatives in building an enabling environment, the BioNexus Partners Programme (BNP) has become one of the most successful of BiotechCorp's initiatives, having been able to create a critical mass and infrastructure to facilitate R&D and Commercialisation (R&D&C) in Malaysia. To date, the BNP involves 56 laboratories and units from 13 institutions of higher learning, three research institutes and two government-linked companies. On a very encouraging note, several research initiatives undertaken in BNP labs are now in the early stages of commercialisation. Steps have also been taken to establish technology development and acquisition programmes to fuel research productivity and shorten the time required to bring products to the market.

Human Capital Development

Much focus was placed on the development of human resource capital and improvement of skill sets. Through the establishment of programmes such as the Biotechnology Entrepreneur Programme and the Biotechnology Entrepreneur Special Training (BeST) Programme, a more structured approach towards human capital enhancement could be adopted. Of the 1,040 students trained under these initiatives, 86% have successfully secured employment within the biotechnology industry. Others either decided to further their studies or start new business ventures.

Legislative and Regulatory Frameworks

BiotechCorp has also engaged with various stakeholders to ensure that existing legislative and regulatory frameworks for the biotechnology sector is conducive for investment and initiatives fostering innovation. In fact, despite the recent global economic slowdown, Malaysia continued to attract considerable biotechnology investments from the private sector outside of its BioNexus Programme. Some of the more notable investments include those by Biocon Ltd, India's first billion dollar company, to establish a biomanufacturing and R&D facility; a joint-venture between South Korea-based CJ CheilJedang and French chemical producer Arkema, to build the world's first bio-methionine plant; and a collaboration between Japan-based Mitsui Engineering and Shipbuilding and Sime Darby Plantation, to build a bioethanol demonstration plant from oil palm.

To further develop Malaysia's competitiveness as a regional biotechnology hub, BiotechCorp, together with UEM Land, one of Malaysia's leading property developers, has jointly developed Malaysian Bio-XCell, located at the southern tip of Peninsular Malaysia. Effectively, Bio-XCell functions as a platform through

Rangka Kerja Perundangan dan Regulatori

BiotechCorp telah juga terlibat dengan pelbagai pihak berkepentingan untuk memastikan bahawa rangka kerja perundangan dan peraturan sedia ada untuk sektor bioteknologi adalah kondusif untuk pelaburan dan inisiatif penggalakkan inovasi. Meskipun dalam kelembapan ekonomi global baru-baru ini, Malaysia terus menarik pelaburan bioteknologi yang besar dari sektor swasta di luar Program BioNexus. Beberapa pelaburan yang ketara termasuklah dari Biocon Ltd, syarikat bilion dolar pertama India, untuk menubuhkan sebuah fasiliti bio-pembuatan dan R&D; satu usahasama antara CJ Cheil Jedang yang berpengkalan di Korea Selatan dan pengeluar bahan kimia Perancis Arkema, untuk membina loji biometionin yang pertama di dunia; dan kerjasama Kejuruteraan dan Pembinaan Kapal Mitsui yang berpengkalan di Jepun dengan Sime Darby Plantation, untuk membina sebuah loji demonstrasi bioetanol dari kelapa sawit.

Untuk memajukan lagi daya saing Malaysia sebagai pusat bioteknologi serantau, BiotechCorp, bersama dengan UEM Land, salah satu pemaju harta tanah terkemuka di Malaysia, telah bekerjasama membangunkan Malaysian Bio-XCell, yang terletak di Johor. Bio-XCell berfungsi sebagai satu platform di mana BiotechCorp menempatkan infrastruktur seperti insentif kewangan, pembangunan modal insan, khidmat nasihat permulaan perniagaan dan operasi, model pajakan yang menarik, serta infrastruktur fizikal yang akan membolehkan syarikat-syarikat melancarkan aktiviti perniagaan bioteknologi dan pengkomersilan mereka. Sehingga kini, empat syarikat global telah beroperasi dalam Bio-XCell, iaitu Biocon Ltd dan Strides Arcolab Ltd yang keduanya berpengkalan di India, Metabolic Explorer yang berpengkalan di Perancis dan AS Glycos Biotechnologies Inc. yang berpengkalan di Amerika Syarikat, dengan pelaburan keseluruhannya berjumlah RM1.146 bilion.

InnoBio Ventures Sdn Bhd

InnoBio Ventures Sdn Bhd, merupakan sebuah Syarikat Kementerian Kewangan Diperbadankan, yang berfungsi sebagai pemangkin bagi industri bioteknologi tempatan; serta untuk merapatkan jurang antara pihak akademia dan sektor korporat. Tiga anak syarikat telah ditubuhkan di bawah kumpulan InnoBio: (i) Inno Biologics, organisasi pembuatan kontrak biofarmaseutikal pertama (CMO) di Malaysia; (ii) InnoBio Diagnostics, dengan perniagaan teras di bidang diagnostik berdasarkan sel dan perubatan regeneratif; dan (iii) Pusat Inovasi Bio, yang merupakan pusat yang disediakan untuk aktiviti keusahawanan bioteknologi.

Pada tahun 2011, InnoBio telah melaporkan bahawa:

- (i) Satu Sistem Bioreaktor (1000 L) untuk sebuah syarikat Korea, telah berjaya dihasilkan, dan pembangunan antibodi monoklonal untuk rawatan artritis reumatoid; iaitu bahan untuk percubaan klinikal Fasa 1 (sejenis ubat berinovasi);
- (ii) Inno Biologics juga telah menerima perakuan dari Biro Pengawalan Farmaseutikal Kebangsaan (NPCB) kerana telah berjaya mematuhi keperluan

which BiotechCorp pools 'soft' infrastructure – financial incentives, human capital development, business and operational set-up advisory, attractive leasing models, as well as the physical infrastructure that will enable companies to springboard their biotechnology business and commercialisation activities. To date, four global names are present within Bio-XCell, namely Biocon Ltd, France-based Metabolic Explorer, India-based Strides Arcolab Ltd. and US-based Glycos Biotechnologies Inc., with investments totalling RM1.146 billion.

Inno Bio Ventures Sdn Bhd

Inno Bio Ventures Sdn Bhd, a Ministry of Finance Incorporated Company, aims to serve as a catalyst for the domestic biotechnology industry; and to bridge the gaps between academia and the corporate sector. Three subsidiary companies have been established under the Inno Bio group: (i) Inno Biologics, the first contract manufacturing organisation (CMO) for biopharmaceuticals in Malaysia; (ii) Inno Bio Diagnostics, with core business in cell-based diagnostics and regenerative medicine; and (iii) Bio Innovation Centre, which is a designated centre for biotech entrepreneurial activities.

In 2011, Inno Bio reported that:

- (i) A Bioreactor System (1000 L) for a Korean company, was successfully produced, as well as the development of monoclonal antibodies for the treatment of rheumatoid arthritis; material for clinical trial Phase I (an innovator drug);
 - (ii) Inno Biologics received certification by the National Pharmaceutical Control Bureau (NPCB) for conforming to the requirements of Good Manufacturing Practices (GMP) in accordance with the current Pharmaceutical Inspection Co-operation Scheme (PIC/S) GMP Guides for manufacturing Recombinant Proteins and Monoclonal Antibodies;
 - (iii) A Best Paper Award was given to the Process Science Department of Inno Biologics, for its paper entitled Comparison of Binding Capacity and Affinity of Monoclonal Antibody towards Different Affinity Resins Using High-Throughput Chromatography Method.
- In addition, Inno Bio organised and/or participated in: (i) the 2nd Annual Biomanufacturing & Single Use Systems Asia (March 2011); (ii) Minggu Sains & Teknologi at the Universiti Sains Islam Malaysia (April 2011); (iii) Pharma Regulatory Affairs Asia 2011 (April 2011); (iv) 4th Annual BioPharmaceutical Cold Chain Management Asia (May 2011); (v) Advanced GMP Asia Conference 2011 (June 2011); (vi) MyBiotechnology Carnival 2011 at Taylor's University Lakeside Campus (July 2011); (vii) myBest Graduate Returning Programme (July 2011), which promoted career opportunities in Inno Bio, especially for Malaysians who graduated abroad; (viii) Pharmaceutical & Clinical Trial Logistics Asia Pacific Conference (July 2011); (ix) MySTI Expo 2011 (July 2011); (x) Bio Korea 2011 (September 2011); (xi) BioMalaysia 2011 (November 2011); (xii) LogiPharma Asia 2011 (November 2011); and (xiii) Festival Sains 2011 (December 2011).

Amalan Pengilangan Baik (GMP) selaras dengan Skim Kerjasama Pemeriksaan Farmaseutikal (PIC/S) Panduan GMP untuk pembuatan Protein Rekombinan dan Antibodi Monoklonal;

- (iii) Satu Anugerah Kertas Terbaik telah diberikan kepada Jabatan Sains Proses Inno Biologics, untuk kertas yang bertajuk 'Comparision of Binding Capacity and Affinity of Monoclonal Antibody towards Different Affinity Resins Using High-Throughput Chromatography Method'.

Di samping itu, InnoBio juga telah menganjur dan/ atau mengambil bahagian dalam acara-acara : (i) Biopembuatan & Sistem Kegunaan Tunggal Asia Ke 2 (Mac 2011); (ii) Minggu Sains &Teknologi di Universiti Sains Islam Malaysia (April 2011); (iii) Hal Ehwal Regulatori Farma Asia 2011 (April 2011); (iv) Pengurusan Cold Chain Biofarmaseutikal Tahunan Asia ke-4 (Mei 2011); (v) Persidangan GMP Lanjutan Asia 2011 (Jun 2011); (vi) Karnival MyBiotechnology 2011 di Taylor's University, Kampus Lakeside (Julai 2011), (vii) Program Siswazah Kembali myBest (Julai 2011), yang mempromosikan peluang kerjaya dalam Inno Bio, terutama bagi rakyat Malaysia yang berkelulusan luar negara; (viii) Persidangan Farmaseutikal& Logistik Ujian Klinikal Asia Pasifik (Julai 2011); (ix) Ekspo MySTI 2011 (Julai 2011); (x) Bio Korea 2011 (September 2011); (xi) BioMalaysia 2011 (November 2011); (xii) LogiPharma Asia 2011 (November 2011); dan (xiii) Festival Sains 2011 (Disember 2011). Dalam beberapa acara tersebut, Naib- Presiden bagi Jabatan Pengurusan Kualiti dan Hal Ehwal Regulatori (QMRA) Inno Biologics Sdn. Bhd., Dr. Shivraj Dasari adalah salah seorang pembentang.

Technology Park Malaysia

Technology Park Malaysia (TPM) yang menempatkan lebih 200 syarikat tempatan dan multinasional dengan pengkhususan dalam pelbagai aspek teknologi maklumat (IT, kejuruteraan, bioteknologi, telekomunikasi dan perkhidmatan sokongan) telah meneruskan misinya untuk menggalakkan inovasi dan daya saing melalui empat anak syarikatnya: TPM Sdn Bhd; TPM Biotech Sdn Bhd; TPM College Sdn Bhd; dan TPM IT Sdn Bhd.

Kebanyakan syarikat yang berurusan dengan TPM adalah dari sektor IT. Walau bagaimanapun, dengan keputusan MOSTI untuk meletakkan TPM di bawah Kluster Bioteknologi, jumlah syarikat dengan pengkhususan bioteknologi telah meningkat dibawah naungannya pada tahun 2011, termasuk beberapa syarikat multinasional (Stempeutics (M) Sdn Bhd; Aurigene Discovery; dan Asiatic Centre for Genome Technology) dan juga syarikat-syarikat tempatan (Cambrian; Magna Mission; Algaetech; and Synamatix).

Perkhidmatan TPM

Di antara perkhidmatan yang disediakan oleh TPM ialah penyewaan premis inkubator; program inkubasi teknologi dan perniagaan (perkhidmatan mentor dan bimbingan, perkhidmatan perundingan perniagaan, pemasaran & kewangan, forum teknologi & perniagaan, dll), serta pengkomersilan teknologi, bantuan dan sokongan. Sehingga Disember 2011, terdapat 177 syarikat yang mempunyai asas yang



Kempen Safer Internet Month – Kerjasama antara CyberSecurity Malaysia dengan Microsoft.
Safer Internet Month Campaign – Collaboration between CyberSecurity Malaysia with Microsoft.

Technology Park Malaysia

Technology Park Malaysia (TPM), home to over 200 local and multinational companies, and specialising in various aspects of technology (IT, engineering, biotechnology, telecommunications, and support services), continued its mission to promote innovation and competitiveness largely through its four subsidiaries: TPM Engineering Sdn Bhd; TPM Biotech Sdn Bhd; TPM College Sdn Bhd; and TPM IT Sdn Bhd.

The majority of companies aligned to TPM are from the IT sector. However, with the decision by MOSTI to place TPM under the Biotechnology Cluster, an increasing number of companies specialising in biotechnology came under its umbrella in 2011, including several multinationals (Stempeutics (M) Sdn Bhd; Aurigene Discovery; and Asiatic Centre for Genome Technology) as well as local companies (Cambrian; Magna Mission; Algaetech; and Synamatix).

Services of TPM

Among the services provided by TPM were rental of incubator premises; technology and business incubation programmes (mentoring and coaching services, business, marketing & financial consultancy services, technology & business forums, etc); as well as technology commercialisation, assistance and support. As at the end of 2011, there were 177 companies with a solid footing in TPM, with a rise of 15% of incubatees. Industry response for the newly established incubation innovation centre (IIC) was also positive, with the number of incubatees increasing from 43 to 70. Similarly, the number of multinationals, attracted by the use of TPM's corporate address, rose from 28 to 40.

The earnings of all the TPM companies totalled RM6.42 billion, a significant contribution towards the national economy and development of human resources. It also reflects the fact that the TPM has played a major role in facilitating the development of technologically-driven

kukuh dalam TPM, dengan peningkatan sebanyak 15% jumlah peserta inkubasi. Maklum balas dari industri terhadap pusat inovasi inkubasi (IIC) juga adalah positif, dengan bilangan peserta inkubasi meningkat dari 43 ke 70. Bilangan syarikat multinasional yang tertarik dengan penggunaan alamat korporat TPM, juga meningkat dari 28 ke 40.

Pendapatan bagi semua syarikat TPM adalah berjumlah RM6.42 bilion, iaitu satu sumbangan yang besar kepada ekonomi negara dan pembangunan modal insan. Ia juga mencerminkan hakikat bahawa TPM telah memainkan peranan utama dalam mempermudahkan pembangunan perniagaan berdasarkan teknologi dan kemudahan infrastruktur holistik yang berkaitan, selaras dengan standard global. PKS yang merupakan sebahagian dari kampus TPM telah menjadi di antara beneficiari utama, dengan mengwujudkan 6,579 pekerjaan baru, yang mana 6,118 darinya memerlukan tenaga kerja mahir. Sejumlah 814 PKS baru telah ditubuhkan, dengan 481 berdaftar dalam program inkubasi TPM. PKS ini telah dapat menjana RM6.92 bilion (RM484.2 juta hasil dari eksport) bagi tempoh lima tahun yang lepas.

businesses, and the associated holistic infrastructure in line with global standards. SMEs which are part of the TPM campus have been among the main beneficiaries, reporting the creation of 6,579 new jobs, of which 6,118 required skilled personnel. A total of 814 new SMEs were set up, with 481 registered in TPM's incubation programme. These SMEs were able to generate RM6.92 billion (RM484.2 million from exports) in the past five years.



Pameran Technology Park Malaysia (TPM) dengan produk-produk berdasarkan Parlimen dan System metro-E sempena Langkawi International Dialogue (LID) 2011.
TPM's exhibition booth at LID 2011.



YB Menteri menyaksikan 'Robotic Telescope' di Langkawi National Observatory (ONL).
YB Menteri at the 'Robotic Telescope', Langkawi National Observatory (ONL).



Kluster Perkhidmatan Industri

Penggubalan dan pelaksanaan dasar-dasar dalam usaha meningkatkan aplikasi teknologi baru dalam industri merupakan satu fokus yang berterusan bagi Bahagian Industri MOSTI pada tahun 2011, khususnya dalam bidang-bidang berikut: bahan termaju; pembuatan termaju; kejenteraan & kelengkapan; bahan-bahan baru; tenaga alternatif; dan 'penggunaan sisa buangan sebagai sumber pendapatan'. Usaha-usaha ini telah dilaksanakan oleh pelbagai agensi, iaitu Agensi Nuklear Malaysia (Nuklear Malaysia), Lembaga Perlesenan Tenaga Atom (AELB), Jabatan Standard Malaysia (STANDARDS MALAYSIA), SIRIM Berhad, Perbadanan Pembangunan Teknologi Malaysia (MTDC), dan Majlis Rekabentuk Malaysia (MRM).

Di samping itu, bahagian ini juga telah memantau kemajuan projek-projek R&D khususnya yang diluluskan di bawah pelbagai dana dan program; menyertai inisiatif kerjasama perdagangan antarabangsa; serta menyumbang kepada salah satu dari enam Inisiatif Pembaharuan Strategik (SRI) di bawah Program Transformasi Ekonomi negara (TEP), iaitu Standard Antarabangsa & Liberalisasi, yang kemudiannya dikenali sebagai Dayasaing, Standard & Liberalisasi (SRI:CSL).

Nuklear Malaysia

Melalui Nuklear Malaysia, MOSTI terus memberi tumpuan untuk mencapai Petunjuk Prestasi Utama (KPI) dalam empat bidang keutamaan iaitu teknologi perindustrian, teknologi pemprosesan sinaran, teknologi perubatan dan biosains. Keselamatan sinaran dan pengurusan sisa turut diberi penekanan. Sejumlah 193 projek penyelidikan telah dijalankan pada tahun 2011, menghasilkan 20 produk, lima proses, enam prosedur, lima pengkalan data dan lima pakej perisian untuk kegunaan dalam bidang radiofarmasi, pemantauan alam sekitar dan sisa, pengimejan perubatan, pertanian, kejuruteraan, polimer dan pembuatan. Di samping itu, tiga paten telah berjaya diperolehi.

Seperti institut penyelidikan yang lain di negara ini, Nuklear Malaysia menekankan kepentingan pemindahan teknologi kepada industri, terutamanya perusahaan kecil dan sederhana (PKS), dalam usaha untuk meningkatkan daya saing dan kebajikan pengguna. Pada tahun 2011, agensi ini telah menjana pendapatan sebanyak RM15.78 juta, hasil daripada program pengkomersilan dan pemindahan teknologi. Dalam usaha untuk menjana usahawan teknologi, sebanyak lima kursus latihan dan bengkel telah diadakan, di samping 32 lawatan industri untuk meningkatkan profil PKS yang terpilih. Selain itu, tiga projek penyelidikan telah dipromosikan semasa pameran Ekspo Solusi PKS yang diadakan pada bulan Jun. Secara keseluruhan, program pengkomersilan dan pemindahan teknologi telah menyaksikan majlis menandatangani tiga Memorandum Perjanjian, 18 Perjanjian Kerahsiaan dan 13 Kontrak Perkhidmatan.

Pada tahun 2011, sebanyak 562 penerbitan telah dikeluarkan oleh Nuklear Malaysia yang mana 150 daripadanya adalah di peringkat antarabangsa.

Industry Services

The formulation and implementation of policies aimed at enhancing cutting-edge technology in industry was a continued focus for MOSTI's Industry Division in 2011, specifically in the following areas: advanced materials; advanced manufacturing; machinery & equipment; new materials; alternative energy; and 'waste to wealth'. These efforts were driven by the various implementing bodies, i.e. Malaysian Nuclear Agency (Nuclear Malaysia), Atomic Energy Licensing Board (AELB), Department of Standards Malaysia (STANDARDS MALAYSIA), SIRIM Berhad, Malaysian Technology Development Corporation (MTDC), and Malaysia Design Council (MRM).

In addition, the division monitored the progress of specific R&D projects awarded under various funds and programmes; participated in international trade co-operation initiatives; as well as contributed towards fulfilling one of the six Strategic Reform Initiatives (SRI) under the national Economic Transformation Programme (ETP), i.e. International Standards & Liberalisation, which later became known as Competition, Standards & Liberalisation (SRI:CSL).

Nuclear Malaysia

Through Nuclear Malaysia, MOSTI continued to focus on achieving the Key Performance Indicators (KPI) in the four priority areas of industrial technology that is radiation processing technology, medical technology and biosciences. Radiation safety and waste management were also emphasised. A total of 193 research projects were carried out in 2011, resulting in the output of 20 products, five processes, six procedures, five databases and five software packages for use in radiopharmacy, environment and waste monitoring, medical imaging, agriculture, engineering, polymers, and manufacturing. In addition, three patents were successfully obtained.

In common with other research institutes in the country, Nuclear Malaysia places importance on the transfer of technology to the industry, particularly small and medium-sized enterprises (SMEs), in order to enhance competitiveness and consumer welfare. In 2011, the agency generated RM15.78 million in revenue as a result of this commercialisation and technology transfer programme. In an effort to generate technopreneurs, a total of five training courses and workshops were held, in addition to 32 industrial visits to raise the visibility of selected SMEs. Further, three research projects were highlighted at the SME Solutions Expo exhibition held in June. Overall, the commercialisation and technology transfer programme saw the signing of three Memoranda of Agreement, 18 Non-Disclosure Agreements and 13 Service Contracts.

In 2011, a total of 562 publications were published by Nuclear Malaysia, of which 150 were at the international level.

AELB

Berhubung dengan pemantauan dan penguatkuasaan teknologi nuklear, AELB terus menggunakan Peraturan Perlesenan Tenaga Atom (Pengurusan Sisa Radioaktif) 2011 sebagai garis panduan dalam mengawalselia semua aspek sisa radioaktif dan pengurusan sisa dari perubatan, penyelidikan, industri dan lain-lain aplikasi yang ditentukan oleh Lembaga. Pada tahun 2011, AELB meluluskan 1,166 permohonan lesen; memberi 6,678 kelulusan, dan mentaulahkan 412 Pegawai Perlindungan Sinaran. Jumlah pemegang lesen adalah 1,092, yang mana 661 telah terlibat dengan aktiviti-aktiviti yang membabitkan gauges. Amaran atau tindakan undang-undang telah dimulakan dalam 54 kes, manakala 26 aduan daripada orang ramai telah berjaya dikendalikan. Pada tahun 2011, AELB telah mengwujudkan hubungan kerjasama dengan sepuluh agensi antarabangsa, termasuk Agensi Tenaga Atom Antarabangsa (IAEA) dan Jabatan Keselamatan Nuklear Nasional (NNSA), Amerika Syarikat.

SIRIM Berhad

Melalui Pusat Penyelidikan Teknologi Alam Sekitar (ETRC), SIRIM terus mengukuhkan empat saluran perniagaan utama bagi aplikasi penilaian kitaran hayat, penilaian risiko bahaya alam sekitar dan kesihatan, kajian pematuhan Amalan Makmal Baik (GLP) dan perkhidmatan pengurangan pencemaran.

Tahun 2011 telah menyaksikan penyertaan aktif Pusat Penyelidikan Bioteknologi Perindustrian (IBRC) SIRIM dalam pengeluaran biokimia, biobahan dan biobahan api. Sembilan penerbitan dan empat paten telah difaiklan manakala pengkomersilan kosmetik berasaskan akuamarin kini berada di peringkat akhir bagi pelesenan. IBRC juga melaksanakan Projek Rumpai Laut dengan Jabatan Perikanan untuk pembangunan produk penjagaan kulit dan melatih kira-kira 400 usahawan kosmetik di seluruh Malaysia. Di samping itu, IBRC berjaya memasang, menguji dan mentaulahkan sebuah kilang perintis untuk menjalankan penapaian cuka secara semulajadi di Makassar, Indonesia.

Sementara itu, Skim Pelabelan-Eko Kebangsaan oleh SIRIM telah menyaksikan sejumlah 31 dokumen kriteria pelabelan eko yang meliputi 12 kategori produk telah dibangunkan pada akhir tahun 2011.

Di peringkat antarabangsa, SIRIM telah melaksanakan dua projek dengan Pertubuhan Pembangunan Perindustrian Pertubuhan Bangsa-Bangsa Bersatu (UNIDO) yang mana salah satu daripadanya telah mewujudkan Pusat Pengeluaran Bersih di Malaysia.

Kejuruteraan dan Kejenteraan

Tahun 2011 merupakan tahun operasi terakhir bagi Pusat Penyelidikan Nanoteknologi Perindustrian (INRC) SIRIM di Kulim. Antara beberapa pencapaiananya, INRC telah menandatangani tiga MoU, iaitu dengan Universiti Sains dan Teknologi Iran berkenaan bahan sintesis TiO₂ dan SiO₂-TiO₂ dan nanobahan super-paramagnetik Fe₂O₃; dengan Jabatan Sains Molekul dan Teknologi, Universiti Ajou dari Korea dalam pembangunan nanoteknologi

AELB

With regard to monitoring and enforcement of nuclear technology AELB continued to use the Atomic Energy Licensing Regulations (Radioactive Waste Management) 2011 as guidelines in regulating all aspects of radioactive waste and waste management from medical, research, industry and any other application that may be specified by the Board. In 2011, AELB approved 1,166 licensing applications; issued 6,678 approvals, and certified 412 Radiation Protection Officers. The total number of licensees was 1,092, of whom 661 were involved with activities involving gauges. Warnings or legal action have been initiated in 54 cases, while 26 complaints from members of the public were successfully handled. In 2011, AELB established co-operative links between ten international agencies, including the International Atomic Energy Agency (IAEA) and the United States' National Nuclear Security Administration (NNSA).

SIRIM Berhad

Through its Environment Technology Research Centre (ETRC), SIRIM continued to strengthen its four key business lines of life cycle assessment applications, environmental and health hazard assessment, Good Laboratory Practice (GLP)-compliant studies and pollution abatement services.

Year 2011 saw the active participation of SIRIM's Industrial Biotechnology Research Centre (IBRC) in the production of bio-chemicals, bio-materials and bio-fuels. Nine publications and four patents were filed while commercialisation of aquamarine-based cosmetics was in the final stages for licensing. IBRC also undertook a Seaweed Project with the Department of Fisheries for skincare product development, and trained about 400 cosmetic entrepreneurs throughout Malaysia. In addition, IBRC successfully installed, tested and commissioned a natural vinegar fermentation pilot plant in Makassar, Indonesia.

Meanwhile, SIRIM's National Eco-labelling Scheme saw a total of 31 eco-labelling criteria documents covering 12 product categories developed by end-2011.

Internationally, SIRIM undertook two projects with United Nations Industrial Development Organisation (UNIDO), one of which resulted in the setting up of a Cleaner Production Centre in Malaysia.

Engineering and Machinery

Year 2011 saw the last year of operations for SIRIM's Industrial Nanotechnology Research Centre (INRC) in Kulim. Among other achievements, INRC signed three MoUs, namely with Iran University Science and Technology in synthesis material TiO₂ and SiO₂-TiO₂ and super-paramagnetic nano material Fe₂O₃; with Department of Molecular Science and Technology, Ajou University of Korea in the development of bio-sensor nanotechnology; and with University Malaysia Pahang on nanotechnology research and solar cells.

Another SIRIM facility, the Product Design and Engineering Centre (PDEC), assisted more than 50

biosensor dan dengan Universiti Malaysia Pahang dalam penyelidikan nanoteknologi dan sel solar.

Satu lagi fasiliti SIRIM adalah Pusat Rekabentuk Produk dan Kejuruteraan (PDEC) yang telah membantu lebih dari 50 syarikat dalam usaha menambahbaik produk mereka hingga ke taraf global, dan menubuhkan Loji Pandu Bioplastik PHA yang pertama di negara ini. Sementara itu, PKS tempatan telah mendapat manfaat dari Pusat Pembungkusan Setempat (OSPC) yang telah ditubuhkan di SIRIM Perak.

PKS tempatan terus dibantu oleh Pusat Automasi Termaju dan RFID (AARC) SIRIM. Sejumlah 25 projek melibatkan sistem RFID, sistem automasi, rekabentuk mesin dan set alat multimedia telah disiapkan dan tujuh mesin telah dihasilkan untuk digunakan dalam pelbagai sektor termasuk pertanian dan industri songket. AARC juga menyokong pendidikan robotik kepada seramai 300 pelajar sekolah menengah yang menggunakan produk buatan tempatan, Robokit.

Pusat Kejuruteraan Automotif (AEC) di SIRIM telah mencatat satu tahap pencapaian yang ketara iaitu pelaksanaan peraturan Kelulusan Jenis Kenderaan untuk tiga Motosikal Elektrik berdasarkan MS 2413.

Tenaga Boleh Diperbaharui

Melalui SIRIM, Kementerian juga telah mengenalpasti sembilan sumber tenaga yang boleh diperbaharui di negara ini: biomas kelapa sawit, sisa hutan dan sisa kilang perabot, sisa pepejal perbandaran, sisa kilang padi, tahi ayam, potensi kuasa hidro mikro dan piko, tenaga solar, tenaga angin dan tenaga lautan/ombak. Ia akan boleh diakses oleh orang awam dalam tempoh terdekat melalui www.myreemap.my. SIRIM juga bertanggungjawab menyelia pembangunan projek Detoksifikasi Solar Berterusan untuk Air Bawah Tanah Yang Tercemar Dengan Racun Perosak di Cameron Highlands.

Pusat Penyelidikan Tenaga Boleh Diperbaharui (RERC) SIRIM terus mempertingkatkan penyelidikan dan pembangunan teknologi dalam biojisim, pengurusan solar, angin dan tenaga, termasuk pengeluaran bioetanol, penyelidikan photovoltaic dan solar termal, serta projek penggunaan tenaga di Institut Jantung Negara.

Projek Mikrocip Malaysia (MM)

MOSTI terus bekerjasama dengan FEC International (M) Sdn Bhd dan Senstech Sdn Bhd untuk mencipta, menghasilkan dan memasarkan mikrocip untuk merealisasikan potensi Teknologi Identifikasi Frekuensi Radio (RFID). Dengan mempunyai pelbagai jalur frekuensi, mikrocip boleh digunakan dalam pertahanan negara dan juga sektor-sektor lain seperti pembuatan, logistik, pengesahan hidupan liar, pengurusan hutan, pengesahan dokumen dan pengangkutan.

Standard dan Akreditasi

Pada tahun 2011, MOSTI, melalui Jabatan Standard Malaysia (STANDARDS MALAYSIA) telah ditugaskan

companies to bring their products up to global standards, and established the first PHA Bioplastic Pilot Plant in the country. Meanwhile, local SMEs benefitted from a One-Stop Packaging Centre (OSPC) which was established in SIRIM Perak.

Local SMEs were further assisted by SIRIM's Advanced Automation and RFID Centre (AARC). A total of 25 projects involving RFID systems, automation systems, machine design, and multimedia toolkits were completed, and seven machines were produced for use in various sectors including agriculture and the songket industry. AARC also supported robotics education to a total of 300 secondary students using a home-grown product, Robokit.

The Automotive Engineering Centre (AEC) at SIRIM recorded some notable milestones such as the implementation of regulatory Vehicle Type Approval for three Electric Motorcycles based on MS 2413.

Renewable energy

Through SIRIM, the Ministry mapped nine of the country's renewable energy resources: palm biomass, forest residue and furniture mill wastes, municipal solid waste, paddy mill waste, chicken manure, potential micro and pico hydropower, solar energy, wind energy and ocean/tidal energy. It will soon be available for public access via www.myreemap.my. SIRIM also oversaw the development of a Continuous Solar Detoxification for Pesticide Contaminated Ground Water project in Cameron Highlands.

The Renewable Energy Research Centre (RERC) continues to enhance SIRIM's research and technology development in biomass, solar, wind and energy management, including bioethanol production, photovoltaic and solar thermal research and an energy utilisation project at the National Heart Institute.

Malaysia Microchip (MM) Project

MOSTI continued to work together with FEC International (M) Sdn Bhd and Senstech Sdn Bhd to create, produce and market microchips to realise the potential of Radio-Frequency Identification (RFID) technology. Possessing multi-band frequency, the microchips are used in national defence and other sectors such as manufacturing, logistics, tracking of wildlife, forest management, verification of documents and transport.

Standards and Accreditation

In 2011, MOSTI, through Department of Standards Malaysia (STANDARDS MALAYSIA) was tasked to coordinate efforts between relevant ministries and agencies to formulate a new policy which would result in enforcement of mandatory standards, while ensuring that these standards are in line with international standards. Encouraging industry adherence to Good Regulatory Practices was also placed under the purview of MOSTI.

STANDARDS MALAYSIA, the national governing body for standards and accreditation, and through SIRIM, 548

untuk menyelaraskan kerjasama di antara kementerian dan agensi-agensi yang relevan untuk merumuskan satu dasar baru bagi penguatkuasaan standard mandatori, di samping memastikan bahawa piawaian yang digunakan adalah selaras dengan standard antarabangsa. Selain itu MOSTI juga bertanggungjawab menggalakkan pematuhan industri terhadap Amalan Regulatori Baik.

STANDARDS MALAYSIA merupakan badan kebangsaan yang mengawal standard dan akreditasi, dan melalui SIRIM, sebanyak 548 kursus latihan kualiti dan pengurusan telah dijalankan yang memberi manfaat kepada 944 peserta. Pusat Pengurusan Kualiti dan Perusahaan (QEMC) telah menyediakan khidmat perundingan kepada 1,714 syarikat, yang mana 1,624 daripadanya merupakan PKS. Produk baru juga telah diperkenalkan, iaitu Green 5S, BRC dan Kriteria Penilaian TQftM. Sepanjang tahun ini, sembilan syarikat telah dianugerahkan Sijil Halal dan lapan syarikat yang dianugerahkan MS ISO 9001.

Sementara itu, Makmal Metrologi Kebangsaan (NML) di SIRIM telah membangunkan satu standard baru untuk Isotope Dilution Mass Spectrometry for Trace Metal Analysis. Lain-lain pencapaian NML termasuklah Program Proficiency Testing and Measurement Audit (PT/MA), Manual Kualiti & Prosedur berdasarkan ISO/IEC 17043 dan lima program Audit Pengurusan bersama dengan syarikat-syarikat tempatan.

Anak syarikat SIRIM, SIRIM QAS International, terus menawarkan perkhidmatan baru pada tahun 2011, iaitu Skim Pensijilan Sistem Pengurusan Kesinambungan Perniagaan, Skim Pensijilan Bengkel NGV, Skim Pensijilan Konkrit Siap Bancuh dan Skim Fasiliti Perkhidmatan Bertauliah IECEX. Tahun 2011 juga menyaksikan pembukaan cawangan SIRIM QAS International di Kerteh, Terengganu.

Pensijilan Sistem Pengurusan Tenaga telah dilancarkan pada tahun 2011, berdasarkan ISO 50001:2011, yang menawarkan pendekatan yang sistematik untuk meningkatkan prestasi, termasuk kecekapan tenaga dan penggunaan. Di samping itu, Skim Pelabelan-Eko SIRIM juga telah diiktiraf oleh kerajaan sebagai Program Pelabelan-Eko Kebangsaan, manakala tahun ini juga mencatat satu lagi kejayaan penting apabila Sunrise Quality Certifications Pte Ltd menjadi sebuah syarikat bersekutu SIRIM QAS International. Sunrise menyediakan perkhidmatan pengesahan dan verifikasi di India untuk projek-projek Mekanisme Pembangunan Bersih (CDM) dan Verified Carbon Standard (VCS).

Satu anugerah Penghargaan Pengguna Standard Malaysia (MS) telah diperkenalkan oleh STANDARDS MALAYSIA untuk menggalakkan sektor swasta menghasilkan produk dan perkhidmatan yang berkualiti dalam usaha untuk kekal berdaya saing di peringkat nasional dan antarabangsa; dan untuk menggalakkan penyertaan dalam aktiviti standardisasi. TNB Research Sdn Bhd dan Hume Cembord Industries Sdn Bhd adalah penerima anugerah ini bagi tahun 2011.

Penggalakan pematuhan piawaian rekabentuk dan komersil juga menjadi fokus berterusan bagi Majlis Rekabentuk Malaysia (MRM). Pada tahun 2011, usaha

training courses on quality and management were held, benefiting 944 participants. The Quality and Enterprise Management Centre (QEMC) provided consultation to 1,714 companies, of which 1,624 were SMEs. New products were also introduced, namely Green 5S, BRC and TQftM Assessment Criteria. Throughout the year, nine companies were awarded with Halal Certification; eight companies awarded with MS ISO 900.

Meanwhile, the National Metrology Laboratory (NML) at SIRIM developed one new standard on Isotope Dilution Mass Spectrometry for Trace Metal Analysis. Other NML accomplishments included a Proficiency Testing and Measurement Audit (PT/MA) Programme, Quality Manual & Procedure based on ISO/IEC 17043 and five Management Audit programmes together with local companies.

SIRIM's subsidiary, SIRIM QAS International continued to offer new services in 2011, namely Business Continuity Management System Certification Scheme, NGV Workshop Certification Scheme, Ready-Mixed Concrete Certification Scheme and IECEX Certified Service Facilities Scheme. Year 2011 also saw the opening of a SIRIM QAS International branch office in Kerteh, Terengganu.

The Energy Management System Certification was launched in 2011, based on ISO 50001:2011, which offers a systematic approach to improve performance, including energy efficiency and consumption. In addition, the SIRIM Eco-Labeling Scheme was also recognised by the government as the National Eco-Labeling Programme, while the year also marked a milestone when Sunrise Quality Certifications Private Limited became an associate company of SIRIM QAS International. Sunrise provides validation and verification services in India for Clean Development Mechanism (CDM) and Verified Carbon Standard (VCS) projects.

A Malaysian Standards (MS) User Appreciation Award was introduced by STANDARDS MALAYSIA to encourage the private sector to produce quality products and services in order to stay competitive both nationally and internationally and to encourage participation in standardisation activities. TNB Research Sdn Bhd and Hume Cembord Industries Sdn Bhd were the recipients for 2011.

Encouraging adherence to design and commercial standards was also a continued focus for the Malaysia Design Council (MRM). In 2011, the search for companies and factories with the potential to be part of the Malaysia Good Design Mark (MGDM) programme took MRM representatives to several States in the country. Workshops were also organised in Johor, Negeri Sembilan, and Kedah. These were attended by teachers from technical and vocational secondary schools that would then be in a better position to nurture the creativity of their students. In addition, MRM organised Design Innovation Exploration (DIX) workshops for approximately 2,500 students in Kelantan, Pahang, and Perak. Internationally, MRM became affiliated to the Korea Institute of Design Promotion to encourage competitiveness of Malaysian products beyond its shores.

mencari syarikat dan kilang yang berpotensi menjadi sebahagian dari program Tanda Rekabentuk Baik Malaysia (MGDM) telah membawa wakil-wakil MRM kepada beberapa negeri di negara ini. Bengkel-bengkel juga telah dianjurkan di Johor, Negeri Sembilan dan Kedah. Ianya telah dihadiri oleh guru-guru dari sekolah-sekolah menengah teknikal dan vokasional yang mempunyai potensi yang lebih baik dalam memupuk kreativiti pelajar. Di samping itu, MRM juga menganjurkan bengkel Eksplorasi Inovasi Rekabentuk (DIX) untuk kira-kira 2,500 pelajar di Kelantan, Pahang dan Perak. Di peringkat antarabangsa, MRM telah bergabung dengan Institut Promosi Rekabentuk Korea untuk menggalakkan daya saing produk Malaysia di luar negara.

Perkhidmatan-Perkhidmatan Lain

Pusat Harta Intelek (IPC) di SIRIM telah menjalankan sebanyak 126 carian meliputi paten, cap dagangan dan rekabentuk perindustrian. Tujuh belas spesifikasi paten yang meliputi pelbagai bidang teknologi telah dideraf, manakala 198 permohonan paten, 101 permohonan cap dagangan dan 13 permohonan rekabentuk perindustrian telah difaikkan di Pejabat Harta Intelek Malaysia (MyIPO) sepanjang tahun. Di bawah Dasar IP SIRIM 2011, satu skim insentif telah diadakan untuk menggalakkan penyelidik menghasilkan lebih banyak ciptaan. Sebanyak sembilan permohonan paten dan dua permohonan cap dagangan telah difaikkan pada tahun 2011.

SIRIM Training Services Sdn Bhd (SIRIM Training) telah menganjurkan sebanyak 325 program latihan kualiti dan teknologi untuk orang awam dan industri yang telah dihadiri oleh 6,719 peserta pada 2011. Tiga belas Memorandum Persefahaman (MoU) dan enam Memorandum Perjanjian (MoA) telah ditandatangani dengan agensi-agensi tempatan dan antarabangsa yang terkemuka dalam bidang latihan dan bantuan teknikal pada tahun 2011.

Kerjasama Antarabangsa

- Dialog Antarabangsa Langkawi

Sebagai Urusetia bagi jawatankuasa kecil Dialog Antarabangsa Langkawi, MOSTI dengan kerjasama kementerian-kementerian lain, telah berjaya menganjurkan acara ini pada bulan Jun 2011. Selain dari pameran, lawatan telah disusun dalam lima kategori: pertanian, pembuatan, bioteknologi, perubahan iklim dan pembangunan mampan serta ICT.



Langkawi International Dialogue (LID) 2011.

Other Services

The Intellectual Property Centre (IPC) at SIRIM conducted a total of 126 searches covering patents, trademarks and industrial designs. Seventeen patent specifications covering various fields of technology were drafted, while 198 patent applications, 101 trade mark applications and 13 industrial design applications were filed at the Malaysian Intellectual Property Office (MyIPO) throughout the year. Under the SIRIM IP Policy 2011, an incentive scheme was put in place to encourage researchers to come out with more inventions. A total of nine patent applications and two trade mark applications were filed in 2011.

SIRIM Training Services Sdn Bhd (SIRIM Training) organised a total of 325 training programmes in quality and technology for the public and industries, which were attended by 6,719 participants during 2011. Thirteen MoUs and six Memoranda of Agreement (MoAs) were signed with leading local and international players in 2011 on training and technical assistance.

International Co-operation

- Langkawi International Dialogue

As the Secretariat for a Langkawi International Dialogue sub-committee, MOSTI collaborated with other ministries in the successful organisation of the event in June 2011. Apart from exhibitions, Parallel Visits were arranged in five categories: agriculture, manufacturing, biotechnology, climate change and sustainable development and ICT.

- ASEAN Sub-Committee on Science and Technology

In 2011, the Industry Division was the focal point in the ASEAN Sub-committee on Science and Technology Infrastructure and Resources Development (SCIRD), a component of the ASEAN Committee on Science and Technology (ASEAN-COST). At the 58th ASEAN-COST meeting, Malaysia was given the responsibility of leading the Biofuel Flagship programme, and to possibly organise a Workshop on ASEAN Biofuel in 2012 in Kuala Lumpur.

- Asia-Pacific Economic Co-operation (APEC) - Industrial Science and Technology Working Group

As 2011 'Lead Shepherd' of the APEC Industrial As 2011 'Lead Shepherd' of the APEC Industrial Science and Technology Working Group (ISTWG), MOSTI (representing Malaysia) led the co-ordination, monitoring, and application of science and technology development initiatives within the APEC region. MOSTI also used this avenue to convey Malaysia's position on policies and issues related to science and technology. In March 2011, MOSTI headed a Friends of the Chairs meeting held in the USA which discussed the way forward for the ISTWG. In addition, MOSTI stated its interest in seeing the drawing up of a revised medium-term (2011-2015) Work Plan which would harmonise efforts in line with the APEC Growth Strategy.

Jawatankuasa kecil Sains Dan Teknologi ASEAN

Pada tahun 2011, Bahagian Industri adalah focal Point bagi Jawatankuasa Kecil Infrastruktur Sains dan Teknologi dan Pembangunan Sumber (SCIRD), salah satu komponen dalam Jawatankuasa ASEAN bagi Sains dan Teknologi (ASEAN-COST). Pada mesyuarat ASEAN-COST yang ke-58, Malaysia telah diberi tanggungjawab untuk mengetuai Program Flagship Biofuel dan juga menganjurkan satu Bengkel mengenai ASEAN Biofuel pada 2012 di Kuala Lumpur.

- Kerjasama Ekonomi Asia Pasifik (APEC) - Sains Perindustrian dan Kumpulan Kerja Teknologi

Sebagai Ketua (Lead Shepherd) tahun 2011 bagi Kumpulan Kerja Sains Perindustrian dan Teknologi (ISTWG) APEC, MOSTI (mewakili Malaysia) telah mengetuai penyelaras, pemantauan dan aplikasi inisiatif pembangunan sains dan teknologi di rantau APEC. MOSTI juga telah menggunakan peluang ini untuk menjelaskan kedudukan Malaysia mengenai dasar-dasar dan isu-isu yang berkaitan dengan sains dan teknologi. Pada bulan Mac 2011, MOSTI mengetuai satu Mesyuarat Rakan Pengerusi yang diadakan di Amerika Syarikat untuk membincangkan hala tuju bagi ISTWG. Di samping itu, MOSTI juga telah menyatakan minatnya dalam merangka semula Pelan Kerja jangka sederhana (2011-2015) yang dikemaskini, bertujuan mengharmonikan segala usaha sejajar dengan Strategi Pertumbuhan APEC.

- MoU dengan Republik Uganda

Bersempena dengan Mesyuarat Ketua-Ketua Kerajaan Komanwel (CHOGM) 2011 di Perth, satu MoU telah ditandatangani di antara Kerajaan Malaysia dan Kerajaan Republik Uganda untuk meningkatkan perdagangan di antara kedua-dua ekonomi melalui pengiktirafan piawaian produk dan perkhidmatan.



MoU di antara Republik Uganda dan Malaysia dalam bidang standardisasi.

MoU between Malaysia and the Republic of Uganda in the areas of standardisation.

- MoU with the Republic of Uganda

In conjunction with the 2011 Commonwealth Heads of Government Meeting (CHOGM) in Perth, a MoU was signed between the Government of Malaysia and the Government of the Republic of Uganda to enhance trade between the two economies through recognition of product and service standards.



Kluster Sains Dan Teknologi

Bahagian Teras Sains dan Teknologi (TS&T) menjalankan penilaian dan pemantauan ke atas projek-projek R&D di bawah program ScienceFund (SF), Community InnoFund (CIF) dan TechnoFund (TF). Bidang utama penyelidikan di bawah program ini ialah sains matematik, sains fizikal, sains kimia, sains alam sekitar, sains pertanian, kemanusiaan dan sains sosial. Bahagian ini juga bertanggungjawab untuk menyelaras dan memantau aktiviti dan program beberapa agensi di bawah MOSTI, iaitu Jabatan Kimia Malaysia (Kimia Malaysia), Pusat Sains Negara (PSN) dan Akademi Sains Malaysia.

Karnival Belia

Pada tahun 2011, Seksyen Dasar dan Korporat di bawah Bahagian ini dengan jayanya telah menganjurkan Karnival Mesra Belia Sarawak 2011 dengan kerjasama Kementerian Belia dan Sukan. Objektif Karnival ini ialah untuk menggalakkan penyertaan golongan muda dalam program Kerajaan, sejajar dengan slogan 1Belia, 1Malaysia. Pameran-pameran diadakan di Tupong dan Samariang pada bulan Mac dan di Satok pada bulan April 2011. Lebih dari 450 orang telah menyertai aktiviti-aktiviti yang dijalankan semasa pameran tersebut.

Seksyen Dasar dan Korporat juga telah menganjurkan Program Penggalakkan Sains dan Matematik (PPSM) 2011, yang dilancarkan pada bulan Mei 2011 oleh YB. Menteri MOSTI. Tema terpilih untuk PPSM 2011 ialah Go Science, Love Maths yang menggambarkan kepentingan sains dan matematik dalam penggalakan kreativiti dan inovasi. Sebanyak 55 aktiviti dijalankan termasuk pameran, persidangan, bengkel, penyampaian anugerah dan pertandingan.

Ekspo Inovasi

Seksyen Dasar dan Korporat dengan kerjasama MIMOS Berhad selaku urusetia telah terlibat dalam penganjuran Malaysia Science, Technology and Innovation Expo 2011 (MySTI Expo 2011). MySTI-Expo pertama ini bertujuan utama untuk: (i) menyediakan satu platform untuk memperkenalkan sektor sains dan teknologi yang dihasilkan oleh Malaysia sendiri; (ii) memudahkan pertukaran maklumat di kalangan penggiat industri; dan (iii) mempromosi dan memupuk minat terhadap sains dan matematik di kalangan golongan muda.

Projek Dibiayai

Seksyen Penyelidikan dan Pembangunan menumpukan fokus kepada pemantauan dan penilaian projek di bawah Science Fund dan Community Innovation Fund (CIF)

Sebanyak 314 permohonan Science Fund telah diterima, yang mana 101 permohonan bernilai RM16.62 juta telah diluluskan. Di samping itu, 64 projek yang masih dalam pelaksanaan dan 10 projek yang telah siap telah dinilai oleh 35 orang pakar teknikal yang dilantik untuk menilai kemajuan dari segi teknikal dan kewangan ke atas projek-projek yang diluluskan antara tahun 2007 hingga 2012. Penilaian ke atas projek-projek yang telah siap adalah untuk mengenalpasti potensi untuk

Science & Technology

The Science and Technology Core Division (TS&T) undertakes assessment and monitoring of R & D projects under the Science Fund (SF), Community InnoFund (CIF) and TechnoFund (TF) programmes. The primary fields of research under these programmes are mathematical sciences, physical sciences, chemical sciences, environmental sciences, agricultural sciences, humanities and social sciences. The division is also responsible for co-ordinating and monitoring the activities and programmes of several agencies under MOSTI, namely the Department of Chemistry Malaysia (KIMIA), National Science Centre (PSN) and Akademi Sains Malaysia.

Youth Carnival

In 2011, the Division's Policy and Corporate Section successfully organised the Karnival Mesra Belia Sarawak 2011, in collaboration with the Ministry of Youth and Sports. The objective of the Carnival was to encourage the participation of young people in Government programmes, in line with the 1Youth, 1Malaysia Carnival slogan. Exhibitions were held at Tupong and Samariang in March and at Satok in April 2011. More than 450 people participated in the activities.

The Policy and Corporate Section also worked on the Science and Mathematics Promotional Programme (Program Penggalakkan Sains dan Matematik – PPSM) 2011, which was launched in May 2011 by the MOSTI Minister. The theme chosen for PPSM 2011 was Go Science ♥ Maths, reflecting the importance of science and mathematics in promoting creativity and innovation. A total of 55 activities were held, including exhibitions, conferences, workshops, awards presentations and contests.

Innovation Expo

The Policy and Corporate Section, in collaboration with MIMOS Berhad as the Secretariat, was involved in the organisation of the Malaysia Science, Technology and Innovation Expo 2011 (MySTI-Expo 2011). The inaugural MySTI-Expo aimed mainly to: (i) provide a platform to showcase Malaysia's home-grown science and technology sectors; (ii) facilitate the exchange of information among industry players; and (iii) promote and inculcate the love for science and mathematics among young people.

Funded Projects

The Research and Development Section focuses on the monitoring and evaluation of projects under the Science Fund and Community Innovation Fund.

A total of 314 Science Fund proposals were received, of which 101 were approved with a value of RM16.62 million. Meanwhile, 64 on-going projects and 10 completed projects were evaluated by 35 technical experts tasked to assess the technical and financial progress of projects approved from 2007 to 2010. The assessment on completed projects was to identify projects which have potential for commercialisation. On the whole, most projects had been carried out successfully, with a few requiring extension of project duration.

dikomersilkan. Pada keseluruhannya, hampir kesemua projek telah dilaksanakan dengan jayanya, dengan sebilangan darinya memerlukan tempoh lanjutan.

Berhubung dengan CIF, 13 permohonan telah dipertimbangkan, di mana 10 permohonan bernilai RM3,169,850 telah diluluskan. Pada tahun 2011, sebanyak 14 projek Dana Inovasi Komuniti (termasuk projek di bawah RMKe-9) telah dipantau oleh Bahagian ini. Pada keseluruhannya Bahagian ini berpuas hati dengan kemajuan yang dicapai.

Jabatan Kimia

Jabatan Kimia Malaysia (Kimia Malaysia) menyediakan perkhidmatan analisis bersepadu dan sinergistik kepada agensi-agensi kerajaan dan sektor swasta melalui:

- (i) Perkhidmatan Sains Forensik menyediakan khidmat pakar yang bebas dan berkecuali kepada agensi penguatkuasa dan dalam kes yang melibatkan penguatkuasaan undang-undang. Bahagian Forensik di Ibu Pejabat, Petaling Jaya, bersama dengan makmal serantau di Pulau Pinang dan Bintulu, Sarawak telah berjaya mendapat akreditasi antarabangsa ASCLD/LAB dalam Ujian Sains Forensik di bawah program American Society of Crime Laboratories Directors/Laboratory Accreditation Board (ASCLD/LAB) untuk tempoh lima tahun dari 9 Januari 2012 hingga 8 Januari 2017, setelah menjalani audit oleh 23 orang pakar sains forensik dari Amerika Syarikat, New Zealand dan Singapura dari 14 hingga 21 Mac 2011;
- (ii) Perkhidmatan Kesihatan Alam Sekitar yang berkaitan dengan keselamatan kesihatan awam, iaitu keselamatan makanan dan air minuman, perlindungan alam sekitar serta memastikan produk makanan untuk eksport menepati standard kualiti dan keselamatan negara pengimpor;
- (iii) Perkhidmatan Klasifikasi Tarif Kastam dan Industri, memastikan kadar cukai yang betul dikenakan pada barang untuk tujuan pemungutan hasil cukai, dan produk industri menepati spesifikasi kontrak kerajaan;
- (iv) Perkhidmatan Penyelidikan dan Jaminan Kualiti yang menjalankan penyelidikan, pembangunan kaedah baru untuk makmal dan memastikan pelaksanaan sistem pengurusan kualiti Jabatan yang berkesan.

Pelan Korporat

Kimia Malaysia berpandukan kepada Pelan Korporat 2011-2015, yang mana telah dilancarkan dengan rasminya pada bulan April 2011 oleh Ketua Pengarah Kimia. Pelan Korporat ini bertujuan untuk meningkat, memperhebat dan mentransformasikan Kimia Malaysia sebagai peneraju solusi saintifik.

Pada tahun 2011, Kimia Malaysia telah mengeluarkan sebanyak 316,340 laporan analisis daripada 1,380,731 sampel forensik, makanan, air, alam sekitar dan produk industri. Hampir semua (97%) dari laporan ini dikeluarkan dalam tempoh masa yang ditetapkan dalam Piagam

With regard to the Community Innovation Fund, 13 proposals were evaluated, of which 10 were approved with a value of RM3,169,850.00. In 2011, a total of 14 CIF projects (including 9MP projects) were monitored by the Division. Overall, the Division was satisfied with the progress of the projects.

Department of Chemistry

The Department of Chemistry Malaysia (Kimia Malaysia) provides integrated and synergistic analytical services to the government agencies and the private sector through:

- (i) Forensic Science Services providing independent and impartial expertise to law enforcement agencies and in cases involving the administration of justice. In fact, the Forensic Division at the Headquarters, Petaling Jaya, together with the regional laboratories in Penang and Bintulu, Sarawak have successfully achieved the ASCLD/LAB-International accreditation in Forensic Science Testing under the American Society of Crime Laboratories Directors/Laboratory Accreditation Board (ASCLD/LAB) programme for a period of five years from January 9, 2012 to January 8, 2017 after undergoing an audit by 23 forensic science experts from USA, New Zealand and Singapore from March 14-21, 2011;
- (ii) Environmental Health Services related to public health safety, namely in food and drinking water safety, safeguarding the environment and ensuring that food products for export meet the quality and safety standards of the importing countries;
- (iii) Industrial and Customs Tariff Classification services, ensuring that correct duties are levied on goods for revenue collection and that industrial product meet specifications for government contracts;
- (iv) Research and Quality Assurance services, carrying out research, developing new methodologies for the laboratories and ensuring the effective implementation of the Department's quality management system.

Corporate Plan

Kimia Malaysia is further guided by its Corporate Plan 2011-2015, which was officially launched in April 2011 by the Director-General of Chemistry. This Corporate Plan aims to upgrade, enhance and transform Kimia Malaysia as a leader for scientific solutions.

In 2011, Kimia Malaysia issued a total of 316,340 reports relating to analysis of 1,380,731 forensic, food, water, environment and industrial product samples. Most (97%) of these reports were issued within the time frames pledged in the Clients' Charter. Its performance in the coming years will be enhanced following the delivery of a Mobile Laboratory, equipped with an air-conditioned mini-laboratory, work space for analytical work, portable scientific instruments and its own electrical supply to facilitate on-site investigations to be carried out.

Pelanggan. Pencapaiannya pada tahun-tahun akan datang dijangka akan lebih menyerlah lagi dengan penerimaan Makmal Bergerak yang dilengkappkan dengan makmal mini berhawa dingin, ruang kerja untuk tugas analitikal, peralatan saintifik mudah alih dan mempunyai bekalan letrik sendiri untuk memudahkan penyiasatan dijalankan.

Kes-kes yang Dikendalikan

Kebanyakan kes yang diterima oleh Kimia Malaysia pada tahun 2011 adalah berkaitan dengan kes pengedaran dadah yang masuk melalui pelbagai pintu masuk dan keluar negara.

Antara kes-kes lain yang menggunakan kepakaran Kimia Malaysia termasuklah:

- (i) Aduan awam mengenai telur tiruan di pasaran. Analisis telah dijalankan untuk memastikan kewujudan DNA ayam dalam sampel. Keputusan membuktikan bahawa telur-telur tersebut adalah asli;
- (ii) Kes serangan maut oleh dua ekor anjing ke atas seorang warganegara Ireland di sebuah kebun durian. Keputusan DNA menunjukkan bahawa darah dan tisu pada kapas yang dikesat di mulut seekor anjing tersebut adalah kepunyaan mangsa.
- (iii) Pada 11 November 2011, sebuah makmal memproses MDMA (pil ekstasi) telah dijumpai di Kawasan Perindustrian Mergong Barrage, Alor Setar, Kedah. Menurut pihak polis, makmal tersebut merupakan premis rahsia pertama jenis ini di Asia Tenggara. Kimia Malaysia mengesahkan kewujudan cecair mengandungi safrole, dan 3,4-Methylenedioxymethyl-2-propanone (MDP2P), yang mana kedua-duanya digunakan dalam pembuatan MDMA.
- (iv) Kimia Malaysia juga memperkenalkan kaedah baru yang lebih sensitif dalam mengesan kehadiran DNA porsin untuk tujuan pensijilan Halal. Dengan kaedah baru ini, Kimia Malaysia dapat mengesan DNA porsin dalam berbagai jenis makanan yang diproses seperti mentega, sos dan serbuk kopi.

Program Latihan

Daripada segi latihan dan kerjasama, Kimia Malaysia, bersama-sama dengan MARDI, telah mengadakan dua buah bengkel analisis Genetically Modified Organisms (GMO) di peringkat ASEAN pada 10 hingga 14 Oktober 2011. Bengkel pertama Asas Analisis GMO telah disasarkan kepada penganalisis dari makmal kerajaan yang mempunyai pengetahuan dan kompetensi teknikal analisis GMO pada peringkat asas sahaja. Bengkel kedua merupakan peringkat lanjutan dan meliputi topik seperti Pengesahan Kaedah dan Pengukuran Ketidakpastian. Tujuan utama kedua-dua bengkel adalah untuk menyelaraskan kaedah analisis di rantau ASEAN serta memastikan bahawa makmal baru yang sedang dibangunkan akan menggunakan kaedah piawaian yang ditetapkan. Kedua-dua bengkel ini telah dihadiri oleh 38 orang peserta dari negara-

Cases Handled

Some of the cases where Kimia Malaysia was called upon to investigate in 2011 were related to the trafficking of drugs through the various entry and exit points of Malaysia.

Other cases which required expertise from Kimia Malaysia included:

- (i) As a result of public complaints about fake eggs in the market, analysis was carried out to determine the presence of chicken DNA in the samples. Results of the analysis proved that the eggs were real;
- (ii) A case of a fatal attack by two dogs on an Irish citizen at a durian orchard. DNA results showed that the blood swabs and the tissue found in the mouth of one of the dogs belonged to the victim.
- (iii) On November 11, 2011, a laboratory processing MDMA (Ecstasy) was found in the Mergong Barrage Industrial Estate, Alor Setar, Kedah. According to the police, this was the first clandestine premises of this kind in South East Asia. Kimia Malaysia confirmed the presence of liquids containing safrole, and 3,4-Methylenedioxymethyl-2-propanone (MDP2P), both used in the manufacturing process of MDMA.
- (iv) Kimia Malaysia also introduced new and more sensitive methods to detect the presence of porcine DNA for the purpose of Halal certification. With these new methods, Kimia Malaysia was able to detect the presence of porcine DNA in various processed foods such as butter, sauces and coffee powder.

Training Programmes

In terms of training and collaboration, Kimia Malaysia, together with MARDI, held two workshops on the analysis of Genetically Modified Organisms (GMOs) at the ASEAN level from October 10-14, 2011. The first workshop on Basic GMO Analysis was targeted at analysts from government laboratories with little or no technical competency in the analysis of GMO. The second workshop was more advanced and covered topics such as Method Validation, and Measurement of Uncertainty. The primary aim of these two workshops was to harmonise the methods of analysis in the ASEAN region as well as ensuring that new laboratories that are being developed will use standard methods. These two workshops were attended by 38 participants from ASEAN countries i.e. Malaysia, Indonesia, Philippines, Brunei and Vietnam.

Forensic Science Symposium

The 2nd International Forensic Science Symposium 2011 was successfully organised by the Forensic Science Society Malaysia with the support of Kimia Malaysia from November 15-16, 2011. The Symposium, attended by some 300 delegates, was officially opened by MOSTI's Secretary-General, Y.Bhg. Dato' Madinah bt. Mohamad. Workshops on DNA PROKIDS, Forensic DNA, Toxicology, and Physical Trace Evidence were held in conjunction with the event.



negara ASEAN iaitu Brunei, Filipina, Indonesia, Malaysia dan Vietnam.

Symposium Sains Forensik

Symposium Sains Forensik Antarabangsa Kedua 2011 telah berjaya dianjurkan oleh Persatuan Sains Forensik Malaysia dengan sokongan Kimia Malaysia pada 15 hingga 16 November 2011. Simposium ini yang dihadiri oleh kira-kira 300 orang perwakilan, telah dirasmikan oleh Ketua Setiausaha MOSTI, Y.Bhg. Dato' Madinah bt. Mohamad. Bengkel PROKIDS DNA, Forensik DNA, Toksikologi dan Bukti Kesan Fizikal juga telah diadakan bersempena dengan simposium tersebut.

Pusat Sains Negara

Sepanjang tempoh RMKe-9, Pusat Sains Negara (PSN) telah menaik taraf tiga buah galeri pameran tertutup dan membangunkan tujuh galeri yang baru. Dua daripada galeri tersebut ialah Wonderspark dan Kidz World yang mana ia beroperasi pada suku pertama tahun 2011. Selain itu, PSN kini mempunyai tiga buah galeri bertema dengan menganjurkan pameran-pameran bertema seperti Dinos Alive! Age of Giants dan Encyclopaedia of the Actroid manakala pameran Ice Age Experience diadakan di PSN Cawangan Utara, Kedah. Di samping itu, sebuah kawasan baru di luar bangunan PSN iaitu Science Wonderland telah dirasmikan oleh Menteri MOSTI, Y.B. Datuk Seri Maximus Johnity Ongkili pada 17 Januari 2011. Science Wonderland berkoncepcian pembelajaran konsep sains tidak formal dalam persekitaran rekreasi. Pada tahun 2011, seramai 1,243,837 orang pengunjung telah hadir ke PSN dan majoriti mereka (1,086,958 orang) telah mengambil bahagian dalam program dan aktiviti yang diadakan di PSN.

National Science Centre

During much of the 9MP period, the National Science Centre upgraded three indoor exhibition galleries and created seven new ones. Two of these galleries – Wonderspark and Kidz World – began operations in the first quarter of 2011. With the transformation of Galeri Future World into Thematic Gallery 3, the NSC now has three Thematic Galleries with exhibits such as Dinos Alive!, Age of the Giants, Encyclopaedia of the Actroid, and Ice Age Experience. A new outdoor area – Science Wonderland – was inaugurated by MOSTI Minister, Y.B. Dato' Seri Maximus Johnity Ongkili on January 17, 2011, with a focus on non-formal learning of science concepts in a recreational setting. A total of 1,243,837 visitors to the NSC were recorded in 2011, of which the majority (1,086,958) participated in programmes and activities held on the centre's premises.

School Programmes

In its efforts to cater to as many audiences as possible, the National Science Centre continued to offer several School Programmes (Budding Scientist, Science Wonders, Biotech, Innotech, Science Trail, Nature Secret and Special Education); Public Programmes (Science Show, Let's Experiment, Nature Secret, Subterranean Journey, Driving Demonstration, and Meet the Scientist); and Programme for Teachers in collaboration with the Ministry of Education (how to enhance science education through hands-on learning).

Program Sekolah

Pusat Sains Negara terus menawarkan beberapa Program Sekolah (Budding Scientist, Keajaiban Sains, Biotech, Innotech, Jejak Sains, Rahsia Alam dan Pendidikan Khas); Program Awam (Pertunjukan Sains, Let's Experiment, Rahsia Alam, Perjalanan Bawah Tanah, Demonstrasi Memandu dan Meet the Scientist) dan Program Guru dengan kerjasama Kementerian Pelajaran Malaysia (bagaimana untuk meningkatkan pendidikan sains melalui pembelajaran hands-on).

Program Perkhidmatan Sosial

Sejak tahun 1999, PSN telah menganjurkan program perkhidmatan sosial khas yang bersesuaian mengikut kumpulan sasar dengan keperluan tertentu, seperti Hari Sains Khas tahunan untuk orang kurang upaya, serta kumpulan yang kurang berasib baik. Pada tahun 2011, sejumlah 4,558 orang dari rumah kebajikan dan pusat pendidikan khas telah hadir ke Hari Sains Khas. Selain itu, program Science Kids telah memberikan peluang kepada pelajar luar bandar untuk merasai aktiviti hands-on yang melibatkan bidang sains. Pada tahun 2011, seramai 58 orang pelajar dan 16 orang guru dari kawasan luar bandar telah menyertai program tersebut. Festival dan Karnival Sains turut diadakan di PSN bersempena dengan pameran-pameran bertema.

Program Outreach

PSN juga mengadakan program Promosi Luar seperti Science on Wheels (untuk sekolah-sekolah dan masyarakat tempatan); Science on the Move, Kem Sains dan Kelana Sains (bagi masyarakat tempatan, melalui jemputan).

PSN mempunyai satu lagi cawangan di Utara iaitu Kedah selain daripada PSN Cawangan Bukit Kiara. Pada tahun 2011, seramai 205,759 orang pelawat telah hadir ke PSN Cawangan Utara di mana 37,703 orang daripada jumlah tersebut telah mengambil bahagian dalam program-program anjuran PSN Cawangan Utara seperti Program Keajaiban Sains dan Budding Scientist.

Akademi Sains Malaysia (ASM)

Pentadbiran Akademi Sains Malaysia (ASM) dilaksanakan oleh Majlis yang terdiri daripada 16 orang ahli. Di ASM terdapat 201 orang Felo, enam orang Felo Kehormat iaitu Y.A.Bhg. Tun Dr. Mahathir Mohamad, Y.A.Bhg. Tun Abdullah Ahmad Badawi, Nobel Laureate Professor Ahmed Zewail, Y.A.Bhg. Tun Ahmad Sarji Abdul Hamid and Professor Lee Yuan Tseh and Y.B. Tan Sri Law Hieng Ding and 21 Senior Fellows. The Fellows of the Academy are eminent Malaysian scientists, engineers and technologists from the fields of Medical and Health Sciences; Engineering and Computer Sciences; Biological, Agricultural and Environmental Sciences; Mathematical and Physical Sciences; Chemical Sciences and Science & Technology Development and Industry.

Social Services Programmes

In addition, the NSC has, since 1999, organised specially-tailored social services programmes according to target groups with particular needs, such as the annual Special Science Day for persons with disabilities, as well as disadvantaged groups. In 2011, a total of 4,558 people from welfare homes and special education centres attended the Special Science Day. Another programme, Science Kids, gives the opportunity to rural students to experience hands-on awareness in science. In 2011, 58 students and 16 teachers from rural areas participated in this Programme. Other NSC activities include festivals or carnivals, usually held in conjunction with a thematic exhibition.

Outreach Programmes

Beyond its premises, the NSC continued to offer its Outreach Programme, comprising several components: Science on Wheels (for schools and local communities); Science on the Move, Science Camp, and Science Wanderers (for local communities, by invitation).

The NSC also has a Northern Branch, where visitors can participate in its Science Wonders and Budding Scientist programmes. In 2011, the Northern Branch recorded a total of 205,759 visitors, 37,703 of whom took part in the programmes.

Academy of Sciences Malaysia (ASM)

The Academy of Sciences Malaysia (ASM) is governed by a Council consisting of 16 members. In addition, there are 201 Fellows, six Honorary Fellows namely Y.A.Bhg Tun Dr Mahathir Mohamad, Y.A.Bhg Tun Abdullah Ahmad Badawi, Nobel Laureate Professor Ahmed Zewail, Y.A.Bhg Tun Ahmad Sarji Abdul Hamid and Professor Lee Yuan Tseh and Y.B. Tan Sri Law Hieng Ding and 21 Senior Fellows. The Fellows of the Academy are eminent Malaysian scientists, engineers and technologists from the fields of Medical and Health Sciences; Engineering and Computer Sciences; Biological, Agricultural and Environmental Sciences; Mathematical and Physical Sciences; Chemical Sciences and Science & Technology Development and Industry.

Responsibilities of ASM

ASM remained cognisant of its responsibilities to, among others,

- (i) menggalakkan dan merangsang pembangunan sains, kejuruteraan dan teknologi;
- (ii) menggalakkan keupayaan negara di bidang sains, kejuruteraan dan teknologi;
- (iii) Sebagai forum untuk mengekalkan kesedaran di pihak kerajaan tentang pentingnya peranan sains, kejuruteraan dan teknologi dalam proses pembangunan negara dan mengenalpasti keperluan pembangunan negara untuk perhatian para saintis, jurutera dan ahli teknologi;
- (iv) menggalakkan penyelidikan, pembangunan, pendidikan dan latihan sumber manusia di bidang saintifik, kejuruteraan dan teknikal yang sesuai; dan
- (v) mewujud dan mengekalkan hubungan di antara akademi dengan badan-badan antarabangsa yang berkaitan.

- (v) establish and maintain relations between the academy and relevant international bodies.

Studies Undertaken

In 2011, the academy worked on two studies, one being a Mega Science Framework Study for Sustained National Development (2011-2050) for the Biodiversity Sector. Led by Academician Tan Sri Dr. Ahmad Mustaffa Babjee FASc, the Sectoral Team submitted the Final Report to the Academy on December 30, 2011. The second study was on the Rare Earths Industry, where representatives from ASM and the National Professors Council (NPC) sought to assess the strategic importance of Rare Earths in enhancing the green economy agenda of the nation. The Study Report, entitled Rare Earth Industries: Moving Malaysia's Green Economy Forward was submitted to the government for its consideration.

ScienceBuzz Malaysia Portal

ASM initiated the ScienceBuzz Malaysia portal in 2011 to encourage scientists and professionals to promote the understanding and appreciation of science by presenting it in a digestible and understandable form. ScienceBuzz is themed Dare to be Curious. The project team, led by Dr. Mohammad Zahran Dato' Sheikh Abd Halim as Project Advisor and Dr. Ghazally Ismail as the Managing Editor, successfully launched the portal on the World Wide Web (www.sciencebuzz.my) on November 25, 2011.

Pacific Science Congress

In terms of events, ASM, together with the Pacific Science Association (PSA), the International Council for Science, Regional Office for Asia and the Pacific (ICSU ROAP) and the International Science, Technology and Innovation Centre for South-South Co-operation under the Auspices of UNESCO (ISTIC) organised the 22nd Pacific Science Congress in June 2011. The theme of the Congress was Asia-Pacific Science in the 21st Century: Meeting the Challenges of Global Change

Seminar for Scientists

In addition, as a follow-up to the Imbak Canyon Scientific Expedition held at the end of 2010, a seminar involving scientists who had participated in the expedition and relevant stakeholders was organised in Kota Kinabalu, Sabah, in March 2011. Jointly organised by the ASM and Yayasan Sabah, the objective of the seminar was to provide opportunities for the participants to discuss possible follow-up studies. On June 29, 2011, the academy, represented by the Secretary General of ASM, Dato' Dr. Samsudin Tugiman, and witnessed by Chief Executive Officer of ASM, Dr. Ahmad Ibrahim, signed a Memorandum of Understanding (MoU) for the Promotion of Research, Training and Education with Yayasan Sabah, Sabah Forestry Department, Sabah Wildlife Department, Primate Research Institute of Kyoto University, and PETRONAS in Kota Kinabalu, Sabah.

Tanggungjawab ASM

Berikut adalah tanggungjawab ASM sebagai sebuah badan berkanun:

- (i) promote and foster the development of science, engineering and technology;
- (ii) promote national self-reliance in the fields of science, engineering and technology;
- (iii) act as a forum for maintaining awareness on the part of the government of the significance of the role of science, engineering and technology in the development process of the nation and bringing national development needs to the attention of scientists, engineers and technologists;
- (iv) encourage research, development, education and training of human resources in the appropriate scientific, engineering and technical fields; and

Kongres Sains Pasifik

ASM bersama dengan Persatuan Sains Pasifik (PSA), Majlis Sains Antarabangsa, Pejabat Serantau Asia & Pasifik (ICSU ROAP) dan Sains Antarabangsa, Pusat Teknologi & Inovasi untuk Kerjasama Selatan-Selatan di bawah naungan UNESCO (ISTIC) telah menganjurkan Kongres Sains Pasifik ke-22 pada bulan Jun 2011. Tema Kongres tersebut ialah 'Sains Asia Pasifik di Abad ke-21: Menyahut Cabaran Perubahan Global'.

Seminar untuk Saintis

Satu seminar yang melibatkan para saintis yang mengambil bahagian dalam ekspedisi dan juga pihak berkepentingan yang relevan telah dianjurkan di

Kota Kinabalu, Sabah, pada bulan Mac 2011. Program tersebut merupakan susulan daripada Imbak Canyon Scientific Expedition yang diadakan pada akhir tahun 2010. Objektifnya adalah untuk membincangkan kajian susulan daripada ekspedisi tersebut. Pada 29 Jun 2011, Setiausaha Agung ASM, Dato' Dr. Samsudin Tugiman, dan Ketua Pegawai Eksekutif ASM, Dr. Ahmad Ibrahim, telah menandatangani satu Memorandum Persefahaman (MoU) untuk mempromosikan Penyelidikan, Latihan dan Pendidikan dengan Yayasan Sabah, Jabatan Perhutanan Sabah, Jabatan Hidupan Liar Sabah, Institut Penyelidikan Primat Universiti Kyoto dan PETRONAS di Kota Kinabalu, Sabah.

Lawatan Kerja

ASM bersama MOSTI dan MOFA telah bekerjasama Kerajaan New Zealand dalam menganjurkan Lawatan Kerja oleh Seri Paduka Baginda Yang Di-Pertuan Agong Al-Wathiq Billah Tuanku Mizan Zainal Abidin Ibni Al-Marhum Sultan Mahmud Al-Muktafi Billah Shah ke Antartika pada 21–23 November 2011, dibawah Program Penyelidikan Antartika Malaysia (MARP). Seri Paduka Baginda diiringi oleh Menteri MOSTI, Datuk Seri Panglima Dr. Maximus Johnity Ongkili, Pengurus Pasukan Petugas Antartika Akademi Sains Malaysia, Ahli Akademik Tan Sri Dr. Salleh Mohd Nor dan Pengarah Pusat Penyelidikan Antartika Kebangsaan, Dato' Prof. Azizan Abu Samah. Sejurus selepas kembali dari Lawatan Kerja Seri Paduka Baginda ke Antartika, ASM telah menganjurkan satu acara khas, di mana gambar-gambar dan rakaman video lawatan telah dipaparkan. Semasa lawatan, Seri Paduka Baginda juga telah menandatangani plak sebagai tanda kenangan.

Anugerah Sains

Anugerah Sains Mahathir 2011 telah disampaikan kepada Ketua Pengarah Pusat Penyelidikan dan Pembangunan Beras Hibrid Nasional China, Profesor Yuan Ping Long di atas sumbangan cemerlang beliau di bidang Pertanian Tropikal. Anugerah ini mengiktiraf pendekatan inovatif beliau dalam membangunkan beras hibrid. Sebagai pemenang anugerah, Profesor Yuan bakal menerima RM100,000, pingat emas dan sijil. Beliau juga dimohon oleh Yayasan Anugerah Sains Mahathir untuk mengambil bahagian dalam ceramah dan wacana intelektual dengan para penyelidik.

Penyelidikan Berorientasikan Dasar

Pada 9 Februari 2011, Malaysia telah diterima sebagai ahli baru International Institute of Applied System Analysis (IIASA) untuk tempoh lima tahun sehingga 2015 di mana ASM berfungsi sebagai Pertubuhan Negara Ahli (NMO) bagi Malaysia. IIASA merupakan sebuah institut saintifik antarabangsa yang menjalankan penyelidikan berorientasikan masalah yang besar atau terlalu rumit untuk diselesaikan oleh sebuah negara atau satu-satu disiplin akademik. Institut ini menumpukan usaha penyelidikan dalam tiga bidang bagi masalah global, iaitu tenaga dan perubahan iklim, makanan dan air serta kemiskinan dan ekuiti.

Working Visit

ASM, together with MOSTI and MOFA, worked closely with the government of New Zealand in organising a Working Visit by His Majesty Seri Paduka Baginda Yang Di-Pertuan Agong Al-Wathiq Billah Tuanku Mizan Zainal Abidin Ibni Al-Marhum Sultan Mahmud Al-Muktafi Billah Shah to Antarctica on November 21-23, 2011, under the Malaysian Antarctica Research Programme (MARP). His Majesty was accompanied by MOSTI Minister, Datuk Seri Panglima Dr. Maximus Johnity Ongkili, Academy of Sciences Malaysia Antarctic Taskforce Chairman, Academician Tan Sri Dr. Salleh Mohd Nor, and National Antarctica Research Centre Director, Prof. Dato' Azizan Abu Samah. Shortly after His Majesty's return from the Working Visit to Antarctica, ASM organised a special event, during which photographs and video footages of the visit were displayed. His Majesty also signed a plaque to commemorate his visit.

Science Award

The 2011 Mahathir Science Award was presented to the Director General of China National Hybrid Rice Research and Development Centre, Professor Yuan Long Ping for his outstanding contribution to Tropical Agriculture. The award recognised his innovative approach in developing hybrid rice. As the winner of the award, Professor Yuan will receive RM100,000.00, a gold medal and a certificate. He will also be called upon, through the Mahathir Science Award Foundation, to participate in talks and intellectual discourse with researchers.

Policy-oriented Research

Malaysia was accepted as a new member of the International Institute of Applied System Analysis (IIASA) on February 9, 2011 for a period of five years until 2015, with ASM serving as the National Member Organisation (NMO) for Malaysia. IIASA is an international scientific institute that conducts policy-oriented research into problems that are too large or too complex to be solved by a single country or academic discipline. The institute concentrates its research efforts within three core global problem areas, namely energy and climate change, food and water as well as poverty and equity.



Penglibatan pemimpin tertinggi dari Kerajaan Negeri Sabah dan MOSTI yang memastikan kejayaan implementasi CTI.
The involvement of top leaders of the Sabah State Government and MOSTI proves Malaysia's support and readiness to ensure CTI implementation plan is on track.

Kluster Angkasa, Laut dan Atmosfera (S2s)

MOSTI, melalui Bahagian S2S, terus memberi tumpuan kepada teknologi pembangunan, penyelidikan dan penerokaan Kluster Laut ke Angkasa (S2S), iaitu Oceanografi, Sains Atmosfera, Penderian Jauh dan Teknologi Angkasa. Agensi yang terlibat adalah: Direktorat Oceanografi Kebangsaan (), Jabatan Meteorologi Malaysia (JMM), Agensi Remote Sensing Malaysia (ARSM), Agensi Angkasa Negara (ANGKASA) dan sebuah syarikat berkaitan kerajaan (GLC), Astronautic Technology Sdn Bhd (ATSB).

Pada tahun 2011, Bahagian S2S menerima sejumlah 222 permohonan Science Fund, 55 daripadanya (bernilai RM15,161,990) telah disyorkan dan diluluskan. Tiga permohonan TechnoFund telah diterima, yang mana satu daripadanya yang bernilai RM3,000,000 telah diluluskan. Secara keseluruhannya, penilaian projek untuk permohonan TechnoFund dan ScienceFund telah diketuai oleh Bahagian S2S, dengan ahli-ahli jawatankuasa penilaian termasuk pakar-pakar dari ANGKASA, ARSM, JMM, NOD, ATSB, agensi lain yang berkaitan dan institut pengajian tinggi (IPT).

Beberapa acara telah dianjurkan, termasuk (i) satu perbincangan mengenai Program Pembangunan Satelit RazakSAT-2 (tiga agensi, iaitu ANGKASA, ARSM, dan ATSB telah merangka draf pelan strategik dan hasil dijangka untuk Program ini); (ii) bengkel mengenai Data RazakSAT-1; dan (iii) bengkel latihan untuk wakil ASEAN berkenaan Ramalan Cuaca Mesoscale Numerical - Fasa II.

Bahagian ini juga telah menganjurkan pameran sempena acara kebangsaan dan antarabangsa utama seperti Persidangan dan Pameran Inovasi Kebangsaan (NICE) dan Pameran Maritim dan Aeroangkasa Langkawi (LIMA), yang membolehkan agensi-agensi S2S memperkenalkan pencapaian dalam bidang R&D dalam bidang-bidang sektor ini. Antara produk dan sistem yang dipaparkan adalah sebuah antena yang diperbuat dari bahan meta; mikrokapsul Asid Lemak Politiktepu untuk pemakanan karang; Bandpass Multilayer Filters; a disaster management system; material on satellite technologies; a fish forecasting system; Fishing Sites Identification System (FSI); a tsunami simulation model; and an artificial reef model.

Agenzia di Ricerca Spaziale (ARSM)

ARSM adalah salah satu daripada agensi Kementerian yang memenuhi keperluan industri. Antara pencapaianannya ialah Sistem Penentuan Lokasi Penangkapan Ikan di seluruh negara yang dibangunkan dengan kerjasama Jabatan Perikanan Lembaga Kemajuan Ikan Malaysia (LKIM) dan Persatuan Nelayan Kebangsaan.

Selain itu, ARSM dengan kerjasama Kementerian Kesihatan Malaysia (KKM) telah membangunkan Sistem Pengawasan Wabak Denggi yang mula beroperasi pada bulan Julai 2011. Maklumat yang dikumpul telah digunakan oleh KKM untuk menyelaras pengurusan

Sea To Space Division

MOSTI, through its(S2S), continued to focus on technology development, research and exploration of the Sea-to-Space (S2S) Cluster, namely Oceanography, Atmospheric Sciences, Remote Sensing and Space Technology. The agencies involved are: National Oceanography Directorate (NOD), Malaysian Meteorological Department (MMD), Malaysian Remote Sensing Agency (ARSM), National Space Agency (ANGKASA) and a government-linked company (GLC), Astronautic Technology Sdn Bhd (ATSB).

In 2011, the S2S Division received a total of 222 ScienceFund applications, 55 of which (valued at RM15,161,990.00) were recommended and approved. Three TechnoFund applications were received, of which one, valued at RM 3,000,000.00 was accepted. Overall, the evaluation of projects for TechnoFund and ScienceFund applications was led by the S2S Division, with the members of evaluation committee including experts from ANGKASA, ARSM, MMD, NOD, ATSB, other relevant agencies and institutes of higher learning.

Several events were organised, including (i) a discussion on the RazakSAT-2 Satellite Development Programme (the three agencies involved, namely ANGKASA, ARSM, and ATSB came up with a draft strategic plan and expected outcomes for this Programme); (ii) workshop on RAZAKSAT-1 Data; and (iii) a training workshop for ASEAN representatives on Mesoscale Numerical Weather Prediction – Phase II.

The Division also organised exhibitions in conjunction with major national and international events such as the National Innovation Conference and Exhibition (NICE) and Langkawi International Maritime and Aerospace (LIMA), which allowed the S2S agencies to showcase its R&D achievements in these sectoral areas. Among the products and systems displayed were an antenna made of metamaterial; Polyunsaturated Fatty Acids microcapsules for coral feeding; Bandpass Multilayer Filters; a disaster management system; material on satellite technologies; a fish forecasting system; Fishing Sites Identification System (FSI); a tsunami simulation model; and an artificial reef model.

Malaysian Remote Sensing Agency (ARSM)

ARSM is one of the Ministry's agencies which responded to the needs of the industry. Among its achievements was a nationwide Fishing Site Identification System), which was developed in collaboration with the Department of Fisheries), Malaysian Fisheries Development Authority (), and the National Fishermen's Association).

In addition , ARSM, in collaboration with the Ministry of Health MOHdeveloped a Dengue Outbreak Surveillance System (DOSS) which became operational in July 2011. The information gathered was used by MoH to co-ordinate the management of dengue outbreaks at national level, as well as to formulate a dengue risk map for outbreak prevention. By the end of 2011, DOSS was already fully operational in Melaka, Pulau Pinang, and

wabak denggi di peringkat kebangsaan, serta untuk merangka satu peta risiko denggi untuk mencegah wabak denggi. Menjelang akhir tahun 2011, DOSS sudah beroperasi sepenuhnya di Melaka, Pulau Pinang dan Negeri Sembilan, dan akan diperluaskan ke semua negeri pada tahun 2012.

ARSM terus memperkuuh kualiti perkhidmatan data penderiaan jauh melalui perolehan versi terbaru sistem pemprosesan data satelit PCI Geomatica; menaik taraf perisian PCI Proline untuk menggabungkan Model Pembetulan Atmosferik terbaru; dan pembelian Pencetak Digital Chromira untuk pengeluaran imej satelit dalam format fotografi resolusi tinggi. Satu peningkatan signifikan (73%) dalam bilangan pengedaran data satelit telah diperolehi, berbanding tahun sebelumnya (dari 6,482 kepada 11,261imej).

Jabatan Meteorologi Malaysia (JMM)

MOSTI melalui JMM, terus memantau dan menyampaikan maklumat berkenaan bidang meteorologi dan seismologi, termasuk amaran awal tsunami. Tiga latih amal tsunami telah diadakan sepanjang tahun di Pulau Langkawi, Kuala Muda, dan Labuan. Lima lagi kempen kesedaran awam mengenai gempa bumi, tsunami dan cuaca yang melampau telah diadakan dengan kerjasama Majlis Keselamatan Negara di Kedah, Kelantan, Perak, Sabah dan Pulau Pinang. Latih amal dan kempen kesedaran awam ini telah dijalankan antara usaha yang dijalankan bagi meningkatkan kesedaran awam di kalangan penduduk tempatan dalam menghadapi bencana tsunami.

Di samping itu, JMM telah menyertai 132 aktiviti pameran yang bertujuan untuk meningkatkan pengetahuan dan kefahaman orang ramai tentang fungsi-fungsi JMM sebagai agensi pemantau bencana. Di samping itu, JMM juga mengeluarkan amaran terhadap cuaca buruk, hujan lebat dan angin kencang melalui media massa.

Dalam bidang penerokaan dan pemantauan angkasa, langkah-langkah telah diambil dengan pelancaran Langkawi National Observatory (ONL); perjanjian dengan National Space Academy dan JMM untuk menubuhkan National Space Weather Lab Centre; di samping mengemaskini draf bagi National Space Policy.

Agensi Angkasa Negara (ANGKASA)

Berikut pelancaran Program Angkasawan Negara pada tahun 2007, beberapa program penyelidikan sains mikrograviti telah dimulakan melalui kerjasama dengan Institut Penyelidikan dan Kemajuan Pertanian Malaysia (MARDI) dan Agensi Eksplorasi Aeroangkasa Jepun (JAXA). Pada tahun 2011, Unit Penyelidikan Sains Angkasa Agensi Angkasa Negara telah menghantar benih tempatan dari Malaysia ke modul Kibo Jepun di Stesen Angkasa Antarabangsa (ISS) untuk pendedahan kepada persekitaran mikrograviti. Benih ini dibawa balik ke Bumi pada bulan Jun 2011 dan menjadi subjek kajian di 100 sekolah menengah, sebagai langkah pertama ke arah memperkenalkan bidang sains mikrograviti

Negeri Sembilan, and will be expanded to all States in 2012.

ARSM continued to strengthen the quality of its remote sensing data services through the procurement of the latest version of PCI Geomatica satellite data processing system; upgrading of PCI Proline software to incorporate the latest Atmospheric Correction Model; and purchasing of Chromira Digital Printer for the production of satellite imagery in high-resolution photographic format. A significant (73%) increase in the number of satellite data distribution was seen, compared to the previous year (from 6,482 to 11,261 scenes).

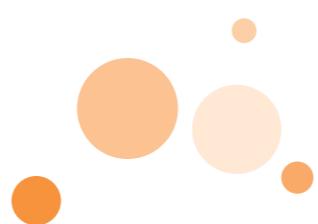
Malaysian Meteorological Department (MMD)

MOSTI through MMD, continued to monitor and relay information on the meteorological and seismological environment, including early warnings on tsunami. Three tsunami drills were held throughout the year, in Pulau Langkawi, Kuala Muda, and Labuan. A five public awareness campaigns on earthquake, tsunami and extreme weather were held in collaboration with the National Security Council in Kedah, Kelantan, Perak, Sabah, and Penang. These tsunami drills and awareness campaigns are among efforts carried out to increase public awareness among locals when facing tsunami disaster.

MMD had participated in 132 exhibitions as part of the public awareness programme to enhance the knowledge and understanding of the public on MMD's functions as the disaster monitoring agency. In addition, MMD also issued warning on extreme weather, heavy rain and strong wind via mass media

National Space Agency (ANGKASA)

Following the launch of the National Astronaut Programme in 2007, several microgravity science research programmes were initiated through collaboration with the Malaysian Agricultural Research and Development Institute (MARDI) and the Japan Aerospace Exploration Agency (JAXA). In 2011, the Space Science Research Unit of the National Space Agency sent local seeds from Malaysia to Japan's Kibo module on the International Space Station (ISS) for exposure to the microgravity environment. Brought back to Earth in June 2011, these seeds became the subject of research for a total of 100 secondary schools, as the first step towards introducing the field of microgravity science to students. ANGKASA also published a research module as guidance for students and teachers.



kepada para pelajar. ANGKASA juga telah menerbitkan satu modul penyelidikan sebagai panduan untuk pelajar dan guru.

Program Angkasawan Negara

ANGKASA dengan kerjasama Yayasan Angkasawan Negara telah menyambut ulang tahun keempat Program Angkasawan Negara dengan beberapa acara, termasuk (i) Siri Syarahan Awam di lima universiti di seluruh negara – Universiti Multimedia Malaysia, Universiti Sains Malaysia, Universiti Darul Iman Malaysia, Universiti Teknologi Malaysia dan Universiti Malaysia Sabah yang melibatkan 2 penceramah daripada Agensi Eksplorasi Aeroangkasa Jepun (JAXA); dan (ii) Sambutan Minggu Dunia Angkasa di Planetarium Negara dan program Night Astronomy Sidewalk pada bulan Oktober di Taman Tasik Titiwangsa bersempena dengan penglihatan Musytari di kedudukan bertentangan.

Kesedaran awam telah dipertingkatkan lagi melalui program promosi luar, di mana 10 sesi pencerapan untuk orang awam menggunakan teleskop, program sekolah dan persembahan/perunjukan multimedia, anjuran Planetarium Negara telah diadakan. (120,000 pelawat telah dicatat di Planetarium Negara pada tahun 2011, melebihi sasaran 100,000).

Astronautic Technology Sdn Bhd (ATSB)

Teknologi angkasa dan satelit terus berada di bawah bidang kuasa Astronautic Technology Sdn Bhd (ATSB), yang menyelia pelancaran mikrosatelit TiungSAT-1 pada tahun 2000, dan satelit RazakSAT pada tahun 2009. Ini menyediakan peluang bagi ATSB untuk menawarkan perkhidmatan dalam beberapa program S2S seperti Program Angkasawan Negara dan Sistem Amaran Awal Tsunami Kebangsaan.



National Astronaut Programme

ANGKASA in collaboration with the National Astronaut Foundation celebrated the fourth anniversary of the National Astronaut Programme with several events, including (i) a Public Lecture Series at five universities across the country - Multimedia University Malaysia, Universiti Sains Malaysia, Universiti Darul Iman Malaysia, Universiti Teknologi Malaysia and Universiti Malaysia Sabah. Two of the speakers were from the Japan Aerospace Exploration Agency (JAXA); and (ii) World Space Week Celebration at the National Planetarium and a Night Astronomy Sidewalk programme in October at Lake Titiwangsa in conjunction with a sighting of Jupiter at opposite position.

Public awareness was further enhanced through outreach programmes, where 10 public observation sessions using telescopes, school programmes, and multimedia presentations/ shows, organised by the National Planetarium (120,000 visitors were recorded at the National Planetarium in 2011, exceeding the target of 100,000) had been carried out.

Astronautic Technology Sdn Bhd (ATSB)

Space and satellite technology continued to be under the purview of Astronautic Technology Sdn Bhd (ATSB), which oversaw the launching of the TiungSAT-1 micro-satellite in 2000, and the RazakSAT satellite in 2009. This set the stage for ATSB to offer its services in several S2S programmes such as the National Astronaut Programme and the National Tsunami Early Warning System.

Pembayaan dan Kewangan

Bahagian Kewangan MOSTI adalah bertanggungjawab bagi pengurusan bajet operasi, proses perolehan, pembayaran dan perakaunan, dan proses permohonan pinjaman untuk ibu pejabat MOSTI dan semua pusat biaya. Jumlah bajet yang diluluskan bagi tahun 2011 adalah RM777,320,000. Setakat akhir tahun ini, sebanyak RM754,074,276.14 atau 97.01% telah dibelanjakan selaras dengan keperluan yang ditetapkan.

Dana R&D diagihkan oleh MOSTI sebagai geran untuk membantu penyelidik yang layak dari universiti, institusi penyelidikan kerajaan, syarikat-syarikat dan pertubuhan bukan kerajaan (NGO) untuk menjalankan projek inovatif, berimpak tinggi dan berasaskan pasaran serta mempunyai potensi untuk dikomersilkan.

Pada tahun 2011, RM115.09 juta telah diperuntukkan untuk tujuan pembangunan, yang mana RM46.22 juta adalah untuk ScienceFund, RM59.32 untuk TechnoFund dan RM9.55 juta bagi program InnoFund. Setakat akhir tahun 2011, jumlah yang diperuntukkan telah digunakan sepenuhnya.

Sebanyak 373 projek telah diluluskan pada tahun 2011, bernilai RM105.25 juta. Projek ScienceFund berjumlah 322 (RM70.9 juta), projek TechnoFund: 19 (RM26.67 juta) dan projek InnoFund: 27 (RM6.71 juta). Terdapat juga lima projek Saintis Residen (bernilai RM0.97 juta) yang telah digunakan untuk membiayai kos mendapatkan saintis bekerja dengan MOSTI.

Pengagihan Dana R&D oleh Sektor Distribution of R&D Funds by Sector

Program Programme	Permohonan Diterima Applications Received	Jumlah dipohon (RM juta) Amount Applied for (RM million)	Projek yang Diluluskan Approved Projects	Jumlah yang Diluluskan (RM juta) Amount Approved (RM million)
ScienceFund ScienceFund	1,510	431.84	322	70.9
TechnoFund TechnoFund	237	768.56	19	26.67
InnoFund InnoFund	88	27.86	27	6.71
Saintis Residen Resident Scientist	5	1.04	5	0.97
Program Flahship Flagship Programme	11	47	-	-
Jumlah / Total	1,851	1276.3	373	105.25

Unit InnoFund, sebagai urusetia, telah melakukan pemantauan dan lawatan penilaian keatas projek-projek yang telah diluluskan, ada kalanya bersama dengan agensi pelaksana. Dalam tahun 2011, unit ini telah melawat 23 projek yang menerima pembiayaan melalui Enterprise Innovation Fund (EIF), TAPMOSTI@COMMUNITY, dan Community Innovation Fund (CIF).

The InnoFund Unit, as the Secretariat, conducts monitoring and evaluation visits on approved projects, sometimes together with the implementing agency. In 2011, the unit visited 23 projects which had been the recipients of the Enterprise Innovation Fund (EIF), TAPMOSTI@COMMUNITY, and Community Innovation Fund (CIF).

Funding & Finance

The Finance Department of MOSTI is responsible for management of operational budgets, procurement processes, payments and accounting, and the loan application process for MOSTI headquarters and all its cost centres. The total approved budget for the year 2011 is RM777,320,000. As at the end of the year, a total of RM754,074,276.14 or 97.01% was spent in accordance with the specified needs.

R&D funds are distributed by MOSTI as grants to assist eligible researchers from universities, government research institutes, companies and non-governmental organisations (NGOs) to carry out innovative, high impact and market-driven projects that have potential for commercialisation.

In 2011, RM115.09 million was allocated for development purposes, of which RM46.22 million was for ScienceFund, RM59.32 for TechnoFund and RM9.55 million for InnoFund programmes. As at the end of 2011, the allocated amount had been fully utilised.

A total of 373 projects were approved in 2011, valued at RM105.25 million. ScienceFund projects numbered 322 (RM70.9 million), TechnoFund projects: 19 (RM26.67 million) and InnoFund projects: 27 (RM6.71 million). There were also five Resident Scientist projects (valued at RM0.97 million) which was used to finance the costs of having scientists working with MOSTI.

Geran R&D Negara

Pengurusan Geran R&D Negara juga merupakan fungsi beberapa agensi-agensi di bawah MOSTI. Perbadanan Pembangunan Teknologi Malaysia (MTDC) menguruskan dua Geran tersebut, iaitu: (i) Dana Pengkomersilan Penyelidikan dan Pembangunan (CRDF) bagi pembiayaan aktiviti pengkomersilan berkaitan dengan teknologi tempatan yang dibangunkan oleh syarikat-syarikat milik warga Malaysia; dan (ii) Dana Pemerolehan Teknologi (TAF), yang membiayai kos pemerolehan teknologi asing oleh syarikat-syarikat milik warga Malaysia bagi pelaksanaan segera dalam aktiviti pembuatan mereka.

Setakat akhir tahun 2011, terdapat sebanyak 64 permohonan CRDF, di mana 30 syarikat (atau 46.88%) telah menerima kelulusan pada nilai sebanyak RM58.9 juta. Hampir semua syarikat tersebut (97%) telah mengkomersilkan output R&D dari universiti awam manakala baki 3% telah menggunakan teknologi dari MARDI. Dari segi pengagihan, Bioteknologi berada di hadapan pada 24%, diikuti oleh Produk Perindustrian (14%), Bahan Termaju (12%), ICT (12%) dan Tenaga Alternatif (10%). Baki 28% meliputi Elektronik dan Elektrikal (7%), Perubatan (7%), Makanan (5%), Produk Pertanian (3%), Automotif (2%), Jentera (2%) dan Industri Berasaskan Logam (2%). Geran TAF, bernilai RM2 juta, telah diluluskan kepada sebuah syarikat. Sebagai satu langkah lanjut, acara yang dinamakan MTDC ReUnites telah dianjurkan, mengumpulkan 150 penerima geran TAF/CRDF, syarikat penerima pelaburan MTDC dan penyewa inkubator bagi meningkatkan jaringan dan peluang perniagaan.

Pada tahun 2011, Direktorat Oseanografi Kebangsaan (NOD) melaporkan bahawa sebanyak 10 projek ScienceFund telah disempurnakan dengan jayanya. Dua dari projek penyelidikan ini mempunyai potensi dibangunkan untuk pengkomersilan.

(i) Rekabentuk dan pembangunan kenderaan hibrid pintar bawah air untuk aplikasi pemeriksaan dan pemantauan.

(ii) Pembangunan Cyst daripada Harpacticoid Copepods Marin.

Di bawah RMKe-9, Bahagian Industri MOSTI telah dipertanggungjawabkan untuk mengurus penilaian teknikal projek Kluster Industri di bawah program Brain Gain. Pada tahun 2011, 17 projek telah diluluskan dan lawatan tapak ke UPM, UKM, Universiti Multimedia (MMU), Universiti Tunku Abdul Rahman (UTAR) dan UM telah dijalankan. Tujuh telah disiapkan pada tahun 2011.

National R&D Grants

The management of National R&D Grants is also a function of several of the agencies under MOSTI. The Malaysian Technology Development Corporation (MTDC) manages two such Grants, namely: (i) Commercialisation of Research and Development Fund (CRDF) for the funding of commercialisation activities related to locally-developed technologies by Malaysian-owned companies; and (ii) Technology Acquisition Fund (TAF), which funds the cost of acquisition of foreign technology by Malaysian-owned companies for immediate implementation into their manufacturing activities.

As at the end of 2011, there were 64 CRDF applications, of which 30 companies (or 46.88%) received approvals at a total value of RM58.9 million. Almost all the companies (97%) were commercialising R&D output from the public universities while the remaining 3% were using technology from MARDI. In terms of distribution, Biotechnology was in the lead at 24%, followed by Industrial Products (14%), Advanced Materials (12%), ICT (12%) and Alternative Energy (10%). The balance 28% covered the Electronics and Electricals (7%), Medical (7%), Food (5%), Agriculture Products (3%), Automotive (2%), Machinery (2%) and Metal-based (2%) industries. The TAF grant, valued at RM2 million, was awarded to one company. As a further step, an event called MTDC ReUnites was organised, bringing together 150 TAF/CRDF grant recipients, MTDC investee companies and incubator tenants for networking and business opportunities.

In 2011, the National Oceanography Directorate (NOD) reported that a total of 10 ScienceFund projects have been completed successfully. Two of these research projects have the potential to be developed for commercialisation.

(i) Design and development of an intelligent hybrid underwater vehicle for inspection and monitoring application.

(ii) Development of Cyst from Marine Harpacticoid Copepods.

Under the 9MP, the Industry Division of MOSTI was given the responsibility of managing technical evaluation of the Industry Cluster's projects under the Brain Gain programme. In 2011, 17 projects were approved and conducted site visits to UPM, UKM, Universiti Multimedia (MMU), Universiti Tunku Abdul Rahman (UTAR) and UM. Seven were completed in 2011.

Peristiwa Bergambar / Events in Pictures



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