PRESS RELEASE

STRENGTHENING THE GRAPHENE ECOSYSTEM TOWARDS THE NATIONAL AGENDA

KUALA LUMPUR, 29th October 2018 – NanoMalaysia Berhad and Phantoms Foundation Spain are joining forces to bring together executives and decision makers from multinational corporations, leading entrepreneurs, policymakers and academicians for an opportunity to network, exchange ideas and gain insights into nanotechnology, and revolutionise innovations with graphene technology.

Graphene Malaysia 2018: Strengthening Graphene Ecosystems Towards the National Agenda held at Menara MITI aims to be a catalyst for interaction and collaborative innovation within the Graphene Industry.

Organised under the aegis of the National Graphene Action Plan 2020 spearheaded by NanoMalaysia Berhad, this annual global event supported by the Ministry of Energy, Science, Technology, Environment and Climate Change (MESTECC), Ministry International Trade and Industry (MITI), the Malaysian Investment Development Authority (MIDA), and SCOPUS is open to industry leaders, small and medium entrepreneurs, start-up business owners, academicians, researchers and students who are interested in revolutionising innovations with graphene.

This flagship event under Malaysia's National Graphene Action Plan 2020, now on its third edition will offers participants positive insights from industry experts on emerging technologies in advanced materials, the challenges and opportunities in nanotechnology as one of the drivers of the fourth industrial revolution, as well as its impact on business, government and people.

Prominent leaders of the industry will be present at the conference to share their achievements and innovation roadmaps, as well as explore partnership opportunities.

Speaking at the opening of the conference, YB Dr Ong Kian Ming, Deputy Minister of International Trade & Industry (MITI) said: "The US, UK, China, Australia, Germany and Canada have allocated huge sums of investments to build graphene hubs and

kickstart graphene research and commercialisation. The European Union's Graphene Flagship Programme demonstrates an unprecedented level of commitment to exploit the benefits of graphene.

Malaysia is fully cognisant of the economic potential of nanotechnology especially of this wonder material, graphene. The global graphene market size was valued at USD23.7 million in 2015 and it is projected to grow at a CAGR of over 36% from 2016 to 2025.

The government led by MITI, will launch the National Policy on Industry 4.0 (2018-2025) which will outline the action plan on the use of technologies related to Industry 4.0. The policy aims to increase productivity and the competitiveness of the manufacturing industry and focus will be given on several sectors including nanotechnology."

Graphene Malaysia 2018 was inaugurated by YB Dr Ong Kian Ming, Deputy Minister of International Trade & Industry (MITI) and YB Isnaraissah Munirah Majilis, Deputy Minister of Energy, Science, Technology, Environment and Climate Change (MESTECC), this conference brings together almost 150 participants from local and international institutions and companies.

This includes more than 15 exhibitors comprising of NanoMalaysia, MIMOS, MIDA, Go Advanced Solutions Sdn Bhd, Crest, Histocenter and Abalonyx among others.

Fifteen local and 20 international speakers from US, UK, South Korea, China, Spain, Taiwan, Singapore, France and Japan will present on various topics on the graphene industry at the forum.

MESTECC Deputy Minister Isnaraissah Munirah Majilis said: "Graphene Malaysia 2018 is an excellent platform for industry players and academics to pool their resources and research to address the rapid growth and demands of the graphene industry. It is an incredible opportunity for postgraduate students to not only build their networks, but also to develop their knowledge of graphene and nanotechnology.

She added that the large scale research and development of graphene in west and the flourishing aerospace, defence, energy and healthcare industries is geared to increase the product demand in the coming years owing to the rise in demand for this light-weight and energy efficient material.

NanoMalaysia Berhad Chief Executive Officer Dr Rezal Khairy Ahmad said that of numerous downstream applications for graphene, opportunities for commercialisation in Malaysia have been geared towards both pre-existing and new market applications markets.

"Malaysia's approach in commercialisation of graphene namely National Graphene Action Plan 2020 connects product development to manufacturing. This delivery framework for graphene innovations was designed to jump-start graphene based industries in the country."

Since 2014, the National Graphene Action Plan 2020 has activated nearly 30 industrial projects with participation from local and foreign innovation partners.

Dr Rezal added conferences like this are a culmination of past and present efforts to catalyse an economy energised by graphene innovations and manufacturing.

“Malaysia’s National Graphene Action Plan 2020 is getting due recognition, globally and there is a wider acceptance by the public, industry and government of graphene.”

This year the National Graphene Action Plan 2020 graduated **4** more companies in developing industrial products for applications in the areas of rubber, oil and gas, plastics, electronics and renewable energy namely graphene-based lubricant, coolant, alternative energy and back-up storage, automotive component, concrete admixture, rubber master-batch and glove.

The potential revenue from the 4 companies is RM2.8 billion and more than 1,400 high-value jobs created.

Rezal stressed that NanoMalaysia through iNanovation and NGAP 2020 prioritises the commercialisation of endogenous nanotechnology innovations. It is also amenable to collaborations in the form of technology transfer, joint ventures and co-investments, and as such the forum is the appropriate platform to explore such ventures.

There was also an MOU signed between NanoMalaysia Berhad and Universiti Teknologi PETRONAS (UTP) to establish a collaboration enhancing scientific, technical and engineering competencies and to develop beneficial programmes.

The Mi-Atomizer, an ultrasonic atomiser system for nanomaterial coating was also launched during the opening of Graphene Malaysia 2018. Jointly developed by MIMOS and NSW Automation Sdn Bhd, the product launch is one of several strategic collaborations established in nanotechnology aimed at enhancing graphene research in the country.

Incorporated in 2011 as a company limited by guarantee (CLBG) under the Ministry of Science Technology and Innovation (now known as MESTECC) to act as a business entity entrusted with nanotechnology commercialisation and industrialisation activities, NanoMalaysia is looking at jumpstarting nanotechnology development via four key sectors. These are electronics, devices and systems; food and agricultural; energy and environment; and wellness, medical and healthcare.

For background of organisers kindly visit NanoMalaysia’s website at www.nanomalaysia.com.my or Phantom Foundation Spain at http://www.phantomsnet.net

For media enquiries kindly contact Audra at +6012 6915 024 or Sunita at +6012 280 3026.

NanoMalaysia Berhad was incorporated in 2011 as a Company Limited by Guarantee (CLBG) under the Ministry of Science, Technology and Innovation (now known as the Ministry of Energy, Science, Technology, Environment and Climate Change) to consolidate and spearhead the commercialisation and industrialisation of nanotechnology activities in Malaysia. Led by CEO Dr Rezal Khairi Ahmad, NanoMalaysia services include:

- Technology & Business Due Diligence Service
- Facilitation of Investment in Nanotechnology
- Nanotechnology Landscaping and Business Opportunities
- Development of Human Capital in Nanotechnology
- Strategic Planning and Consulting in Commercialisation and Industrialisation of Nanotechnology Research and Development

To assist companies in Malaysia through nanotechnology commercialisation and development, NanoMalaysia have introduced the iNanovation programme; the National Action Graphene Plan 2020 (NGAP2020); Advanced Materials Industrialisations, and the NANOVerify Programme. These programmes will focus on four key sectors namely Electronic Devices & Systems, Energy & Environment, Food & Agriculture, and Wellness, Medicine & Healthcare.

About Graphene

- Graphene – a single-atomic layer of graphite first isolated in the UK in 2004. It has a strength of 200x more powerful than steel, 1,000,000x more conductive than copper (one of the best electrical conductor known to man), more flexible than rubber (it can be stretched by 20% without any damage). It has been fittingly dubbed by the scientific community as a “wonder material”.

About National Graphene Action Plan 2020

- Launched in 2014, the National Graphene Action Plan 2020 (NGAP2020) is the result of an extensive collaboration between the Malaysian government, private sector companies, domestic and international research institutes, and academia to assess how the country can benefit from the potential of graphene.

- By 2020, the plan is aimed at exploring the material’s downstream economic potential in five priority focus areas:

    1. Lithium-ion battery anodes & Ultracapacitors
        - Market size for lithium-ion battery/ultracapacitor is USD 3 billion global sales at addressable market size and USD 5 billion global sales at downstream market sie by 2020.
    2. Rubber additives
        - Market size for rubber additives is USD 8 billion global sales at addressable market size and USD 42 billion global sales at downstream market sie by 2020.
    3. Nanofluids

        - Market size for nanofluids is USD 1 billion global sales at addressable market size and USD 25 billion global sales at downstream market sie by 2020.
    4. Conductive Inks
        - Market size for graphene conductive inks for RFID is USD 1 billion global sales at addressable market size and USD 3 billion global sales at downstream market sie by 2020.
    5. Plastic additives
        - Market size for plastic additive is USD 1 billion global sales at addressable market size and USD 10 billion global sales at downstream market sie by 2020.

- By 2020, the National Graphene Action Plan 2020 has the potential to contribute RM10 billion of Malaysia's GDP, and more than RM20 billion of GNI impact. In addition, about 9,000 Malaysia jobs could be created.

- The National Graphene Action Plan 2020 has also demonstrated the commitment and cooperation of the two ministries, MESTECC and MITI (as co-chair of the National Graphene Action Plan 2020 Steering Community), and the efforts and contribution by NanoMalaysia, Economic Planning Unit (EPU) and MIDA as well as other agencies.

- This year the National Graphene Action Plan 2020 has graduated 4 companies in developing industrial products for applications in several areas.

- The potential revenue for the 4 companies is RM2.8 billion and more than 1,400 high-value jobs added.

- Companies: Goodway Integrated Industries Berhad, DRB-Hicom Defense Technologies Sdn Bhd, SOL Polymer Sdn Bhd and ACME Chemicals Sdn Bhd.

About Graphene Malaysia 2018

- Third instalment since Graphene Malaysia 2016 and a flagship event under the National Graphene Action Plan 2020.

- Organised by NanoMalaysia Berhad and Phantom Foundation of Spain.

- Supported by the Ministy of Energy, Science, Technology, Environment and Climate Change (MESTECC), Ministry of International Trade and Industry (MITI), the Malaysia International Development Authority (MIDA) and SCOPUS.

- List of Exhibitors: Abalonyx, Histocenter (M) Sdn. Bhd, MIDA, Vacuumtech Engineering Sdn Bhd, inLAZER Dynamics, Nanoverify, Universiti Teknologi Petronas, MIMOS SEMICONDUCTOR (M) SDN BHD, NanoMalaysia, Crest Group of Companies, Aseptec, Universiti Putra Malaysia (UPM), GO Advanced Solutions Sdn. Bhd, KDJ Law, NNC, UiTM.

- Website: www.graphenemalaysiaconf.com

About MoU Exchanges

- Carbon Water (France) and Mont Aero Sdn Bhd
    1. Grant exclusive right for Mont Aero Sdn Bhd to market and sell Carbon Water, a specially formulated liquid graphene – a single-layer graphene in water which is pure, stable and safe to use in research and industrial contexts – in Malaysia.
    2. Dr Alban Chesneau, CEO of Carbon Waters exchanged MoU with Mr Alimin Hafizi Bin Aminuddin, Managing Director of Mont Aero Sdn Bhd.

- NanoMalaysia Berhad and Universiti Teknologi PETRONAS (UTP)
    1. To establish a collaboration enhancing scientific, technical and engineering competencies and to develop beneficial programmes
    2. Dr Rezal Khairi Ahmad, CEO of NanoMalaysia Berhad exchanged MoU with Professor Dr Mohamed Ibrahim bin Abdul Mutalib, Vice Chancellor of Universiti Teknologi PETRONAS (UTP).

Mi-Atomizer Product Brief (Product Launch)

- **MIMOS Semiconductor Sdn Bhd (MSSB)** and **NSW Automation Sdn Bhd (NSW)** have signed a Collaborative Research and Development Agreement (CRADA) in process tool development for graphene and other 2D nanomaterials deposition. Under this agreement, MSSB and NSW will jointly develop an ultrasonic atomiser system for nano-thin film deposition of graphene and other 2D nanomaterials on silicon wafer. This is to enable the seamless integration of nanomaterials into semiconductor process technologies and provide greater opportunity for the development of advanced semiconductor devices.

- Researchers from both companies took about six months to establish the product requirements and specifications, and later design the proof-of-concept equipment. The resultant product, an ultrasonic atomiser system named **Mi-Atomizer** was built at NSW's manufacturing plant in Penang, and subsequently transferred to MIMOS for nano thin film coating process development.

- The equipment is targeted to deposit ultra-thin (<10nm) spray coating of nano materials with high coverage areas (>90%) and uniformity on eight inch silicon wafer substrate. The product is expected to be released and launched by end of 2018.

- The MSSB-NSW collaboration is a part of strategic collaboration in nanotechnology to enhance graphene research in Malaysia. At the same time, the pact is intended to provide opportunities for local equipment manufacturer to enter into a new market segment in semiconductor supply chain.

- **About MSSB**
  - MIMOS Semiconductor Sdn Bhd (MSSB) is a subsidiary of MIMOS Berhad, the national applied R&D centre. MSSB provides R&D Advanced Shared Facilities for the Electrical and Electronics (E&E) industries. Among services offered are in the areas of Advanced Materials, Failure Analysis/Material Analysis, Reliability Testing, Integrated Circuit Design, Wafer and Integrated Circuit Testing, Wafer Fabrication & Prototyping, Rapid Product Prototyping, Nano and Micro Electro Mechanical Systems (NEMS/MEMS) and Photonic technology research. Along with the advanced facilities, the company offers upskilling and competency development programme for universities and the semiconductor industry.

- **About NSW**
  - NSW Automation Sdn Bhd (NSW) is a Malaysian-based company that provides a full range of World-class Standard Precision Dispensing Solutions and Automated Equipment for Semiconductors, LEDs and many other advanced electronics manufacturing industries since 2004. The company's main R&D Centre & ODM facilities are both located in Penang.