

ANNUAL REPORT 2017

Forces of Bioeconomy

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Key Events in 2017



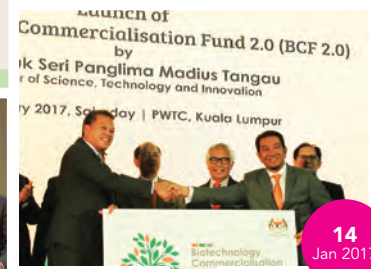
19
May 2017



6-7
May 2017



14
Mar 2017



14
Jan 2017



21
May 2017



25
May 2017



26-30
June 2017



30
July 2017



18
Dec 2017



19
Nov 2017



12-17
Oct 2017



12
Aug 2017



11-13
Sept 2017

Key Milestones in 2017

BIONEXUS STATUS COMPANIES

Industry sector	Total 2017
Number of Companies Approved	11
AgBiotech	8
Healthcare Bio	2
BioIndustrial	1
Approved Investment (RM)	113,834,691
Number of Jobs Planned	427
Number of Knowledge Workers Planned	149

REALISED INVESTMENT BY INDUSTRY

Industry sector	Total 2017 (RM Million)
AgBiotech	39.8
Healthcare Bio	36.5
BioIndustrial	4.4
TOTAL	80.7

REVENUES BY INDUSTRY

Industry sector	Total 2017 (RM Million)
AgBiotech	417.0
Healthcare Bio	234.9
BioIndustrial	818.7
TOTAL	1,470.6

14 January 2017

Launch of the Second Biotechnology Commercialisation Fund (BCF 2.0) at Karnival Kewangan, Putra World Trade Centre, Kuala Lumpur

This fund to assist local bio-based companies to expand their business growth was launched under the 11th Malaysian Plan. Officiating the event was the Minister of Science, Technology & Innovation (MOSTI), YB Datuk Seri Panglima Wilfred Madius Tangau.

14 March 2017

Bioeconomy Day 2017, Grand Ballroom Intercontinental Hotel, Kuala Lumpur

The forum gathered close to 500 attendees from ministry agencies, bioeconomy stakeholders, industry players, and researchers. It was designed to maximise the growth potential of the nation's bioeconomy and identify new bio-based projects as well as business opportunities.

6-7 May 2017

BioBorneo Day 2017, Imperial Hotel, Kuching, Sarawak

Themed "Driving Bioeconomy for Rural Transformation", the event outlined plenary sessions as well as workshops to discuss trends in driving a bioeconomy towards rural transformation and emerging technologies.

19 May 2017

Official Handover of the MOSTI Social Innovation (MSI) 16032 Project: Bioeconomy Community Development Programme (BCDP) - Planting of Kacip Fatimah Project to Persatuan Peniaga Kecil Kampung Sagil Tangkak Johor

The project enabled members of the association to acquire the skills to mass produce Kacip Fatimah through vegetative propagation by cutting method. Minister of Science, Technology & Innovation (MOSTI), YB Datuk Seri Panglima Wilfred Madius Tangau, officiated the handover.

21 May 2017

Official Handover of the MOSTI Social Innovation (MSI) 16031 Project: Bioeconomy Community Development Programme (BCDP) - Growth of Oyster Mushroom Project to Koperasi Waris Jati Kondok, Negeri Sembilan

The project enabled members of the Koperasi to acquire the relevant knowledge and skills to operate, manage, and produce a consistent and sustainable supply of oyster mushrooms for commercialisation. Officiating the handover was the Secretary General of Minister of Science, Technology & Innovation (MOSTI), Datuk Seri Dr. Mohd. Azhar bin Hj. Yahaya.

25 May 2017

Official Handover of the MOSTI Social Innovation (MSI) 16030 Project: Bioeconomy Community Development Programme (BCDP) - Seaweed Aquaculture Project to Persatuan Pengusaha Rumpai Laut Langkawi

Pantai Tanjung Rhu, Langkawi, Kedah

The project enabled members of the association to farm, maintain, and increase seaweed production for commercialisation by applying the latest techniques provided by Langkawi Aquaculture Sdn Bhd (LASB). The Deputy Secretary General of Minister of Science, Technology & Innovation (MOSTI), Prof. Madya Dr. Ramzah Dambul, officiated the event.

26-30 June 2017

Expo Astana 2017 - Astana City, Republic of Kazakhstan

Together with the Ministry of Science, Technology and Innovation (MOSTI), Bioeconomy Corp managed the third week of this international environmental expo. Officiated by the Minister of MOSTI, YB Datuk Seri Panglima Wilfred Madius Tangau, the event which was themed "Green Innovation, Powering your Future", showcased Malaysia's initiatives in the sustainability of renewable biological resources and its conversion into high-value products.

30 July 2017

Minister of MOSTI Visit to Malaysian Bio-XCell Sdn. Bhd. Malaysian Bio-XCell Sdn. Bhd., Iskandar Puteri, Johor

In conjunction with the site visit showcasing Bio-XCell's progress in the bio-based industry, Verdezyne and Bio-XCell held a groundbreaking ceremony for the VerdePalm plant, Verdezyne's first commercial-scale renewable chemicals manufacturing facility. The ceremony was officiated by YAB Dato' Mohamed Khaled Nordin, Chief Minister of Johor.

12 August 2017

Exchange of Sales and Purchase Agreement (SPA) Ceremony between Free The Seed Sdn Bhd (FTS) and Pertubuhan Peladang Kawasan Pendang Selatan (PPKPS) for the Rice Straw Project under Bioeconomy Community Development Programme (BCDP), Gurun & Pendang, Kedah

This innovative waste-to-wealth project transforms rice straw, which would otherwise be burned as the means for disposal, into high quality biodegradable products. The SPA ceremony for the project was officiated by Kedah State Executive Council Member, YB Dato' Norsabrina Binti Mohd Noor who represented the Chief Minister of Kedah. The 10-year agreement will see PPKPS supply 57,000 metric tonnes of rice straws to FTS, who will process it into biodegradable packaging.

11-13 September 2017

BioMalaysia 2017, Kuala Lumpur Convention Centre

With the theme, "Driving Growth and Prosperity of the Nation", the 3-day event was jointly organised by Bioeconomy Corp and the Ministry of Science, Technology and Innovation (MOSTI). Over 6,000 visitors benefited from the exhibition and knowledge-sharing sessions with world-leading biotechnology experts on the opportunities in bio-based industries. The event was officiated by the Minister of MOSTI, YB Datuk Seri Panglima Wilfred Madius Tangau.

12-17 October 2017

National Innovation & Creative Economy Expo 2017 (NICE '17), Technology Park Malaysia (TPM), Bukit Jalil, Kuala Lumpur

An initiative of Ministry of Science, Technology and Innovation (MOSTI), NICE Expo 2017 promotes scientific and technology-based economic activities to the public. As the leading agency of the Wellness Cluster at the expo, Bioeconomy Corp educated visitors on how bio-based products can bring positive impact to their daily lives in a holistic manner.

19 November 2017

Exchange of Collaboration Agreement between NAZA Plantation Services Sdn Bhd (NAZA) and Perak State Agricultural Development Corporation (SADC Perak) for the Pineapple Farming Project under Bioeconomy Community Development Programme (BCDP), Fiesta NBOS Sayang Malaysia, Bagan Datuk, Perak

Malaysia's pineapple industry is set to expand following the launch of the first Pineapple Farming Project in Perak under the BCDP. The project is a collaboration between SADC Perak and NAZA to commercially develop 147 acres of MD2 Pineapple Plantation through tissue cultured-pineapple seedlings in Lekir, Perak.

18 December 2017

Exchange of Memorandum Collaboration between Bioeconomy Corp and Coordinating Secretariat for Science, Technology and Innovation (COSTI) of Sri Lanka for the Framework Development of Sri Lanka's Bioeconomy Colombo, Sri Lanka

The collaboration between Bioeconomy Corp and COSTI aims to expand the growth of bioeconomy in both countries. Under the memorandum, Bioeconomy Corp will also consult COSTI to develop Sri Lanka's bioeconomy initiative, as well as assist in the management of a dedicated biotechnology park in Colombo. Signing the memorandum collaboration were Bioeconomy Corp's Chief Executive Officer Dr. Mohd Shuhaizam Mohd Zain and and Secretary of the Ministry of Science, Technology and Research for Sri Lanka, Mr. Udaya R. Seneviratne.

R&D EXPENSES BY INDUSTRY

Industry sector	Total 2017 (RM Million)
AgBiotech	34.8
Healthcare Bio	39.0
BioIndustrial	8.3
TOTAL	82.1

NUMBER OF JOBS PLANNED BY INDUSTRY

Industry sector	Total 2017
AgBiotech	344
Healthcare Bio	63
BioIndustrial	20
TOTAL	427

NUMBER OF KNOWLEDGE WORKERS PLANNED BY INDUSTRY

Industry sector	Total 2017
AgBiotech	97
Healthcare Bio	43
BioIndustrial	9
TOTAL	149





THE MESSAGES

Insights on the Forces of Bioeconomy

Get insights on how Bioeconomy Corp aligned our initiatives and efforts to leverage the forces of bioeconomy, including our key accomplishments in 2017 which have contributed to advance Malaysia's national growth strategy.

Foreword by

Chairman of Bioeconomy Corp



As the global bioeconomy continues to usher in an economic and industrial revival, it becomes vital for Malaysia to support the various driving forces of bioeconomy. By that, we must be courageous in taking on new initiatives, at all levels of the bioeconomy chain, to support developments which can elevate quality of life through biotechnology.

It is thus with great pleasure that I look back upon 2017 and recognise how it has been a year of many new adventures—new faces, new businesses, and new programmes that have brought impact to the nation's bioeconomy. Undeniably, this progress brings Malaysia closer to fulfilling our goal of developing global businesses in the bioeconomy during this third and final phase of the National Biotechnology Policy.

One significant new introduction to Bioeconomy Corp, which I'd like to first acknowledge, is the appointment of our new Chief Executive Officer, Dr. Mohd Shuhaizam Mohd Zain. Through his dedication and drive, Dr. Mohd Shuhaizam has delivered fresh insights and innovative approaches to accelerate our organisation forward and spur the bio-based industry to reach greater heights.

Another notable introduction is the addition of 11 bio-based companies into our BioNexus Status family. In addition to attracting more investments, creating revenue and jobs, upskilling knowledge workers, and elevating rural areas with bioeconomy, these companies are also spearheading the nation's impact in the global bioeconomy.

Speaking of which, I am very proud to note many new achievements that have stamped Malaysia's name into the global bioeconomy scene. In June 2017, we brought the nation's leading bio-based players to participate in Astana Expo 2017 in Kazakhstan, where they presented Malaysia's value proposition and opened new opportunities to attract investors from Central Asia.

Another exciting new venture is our collaboration with Sri Lanka to develop a national bioeconomy framework, with the potential for Sri Lanka to become

a strategic bioeconomy partner for Malaysia while expanding the growth of bioeconomy in both countries.

One other significant achievement in 2017 is the groundbreaking ceremony of VerdePalm, the world's first commercial bio-based plant for DDDA production. By being home to the world's first bio-based chemical manufacturing plant, we have laid down the foundation for Malaysia to be a catalyst of change in the production of renewable bio-based chemicals for non-consumable products.

On a national level, Bioeconomy Corp has initiated new programmes that create a conducive ecosystem for the growth of globally competitive bio-based players in Malaysia. Most notably are the introduction of financial incentives, such as the second Biotechnology Commercialisation Fund (BCF 2.0), revisions of the BioNexus framework (BioNexus 3.0), and bringing in market access initiatives for bio-based players to take advantage of.

The impact of all these activities are somewhat reflected in Malaysia's GDP growth of 5.9% in 2017, compared to 4.2% in 2016 (Source: Bank Negara). This accelerated growth, which was the fastest pace in three years, was mainly driven by exports and domestic demand amid steady employment rate.

I have no doubt that the forces of Malaysia's bioeconomy have significantly contributed to this GDP growth. What makes me even more proud is knowing that these achievements are aligned with the Government's plans of achieving a high-income nation status while at the same time diversifying our economy and fostering social development for the people.

While we have many new achievements and milestones to celebrate, it does not give us permission to rest on our laurels. The global bioeconomy is a fast-changing and dynamic industry filled that can pose many new challenges. Moving forward, we need to address these challenges, which includes closing the national, and especially global, gaps in market access for local bio-based companies and entrepreneurs.

We also need to be vigilant in closing the gaps between the scientific communities and business practices, as well as closing the gaps between the public's consumption behaviour and adoption of biotechnology innovations. Additionally, we must continue enhancing our human capital in bioeconomy to retain competitiveness in the globalised world. Education, advocacy, and awareness initiatives will be key to achieve these goals.

Last but not least, to ensure Malaysia does not lag behind other countries that are also investing in growing their bioeconomy, our future focus must include escalating and improving our efforts in achieving sustainable development as part of the 2030 Agenda for Sustainable Development. This also ensures an economic growth that's environmentally sustainable, competitive and socially inclusive, while creating prosperity and high-value jobs in rural and urban areas through bioeconomy.

I am proud to be part of Bioeconomy Corp's journey in inciting the growth of Malaysia's bioeconomy, which sets the stage for our beloved nation to become a global bioeconomy force to be reckoned with.

I would like to thank and express our sincere appreciation to the Government of Malaysia, our valued stakeholders, industry players, clients, and business associates for their continuous support. For your dedicated service, contribution and loyalty, I thank the Board of Directors, Management team, and staff.

Thank you.

Professor Tan Sri Zakri Abdul Hamid
Chairman of Bioeconomy Corp

A portrait of a man with short dark hair and glasses, wearing a grey suit, white shirt, and orange tie. He is smiling and has his arms crossed. In the background, the Petronas Towers in Kuala Lumpur are visible against a cloudy sky.

Foreword by

Chief Executive Officer of Bioeconomy Corp

Everything we do here at Bioeconomy Corp, from support to facilitation and advisory, equates to the rise and strength of bioeconomy in our country.

Thus, I am pleased to look back upon 2017 and observe how the forces of bioeconomy in Malaysia played an important role in driving our nation's economic and industrial development. This growing strength of bioeconomy in Malaysia is reflected in the theme of this year's annual report: Forces of Bioeconomy.

When I joined Bioeconomy Corp as Chief Executive Officer in August 2017, the two main factors driving the forces of bioeconomy were bio-based companies and the growth of agro-biotechnology in rural areas. By intensifying our efforts in these focus areas, we have proudly been able to further develop a high-income bioeconomy industry that serves our rural communities and provides a global platform for local bio-based companies.

Alongside pushing for a high-income global bioeconomy, we also focused on creating an inclusive economy by intensifying growth and unlocking value in the bio-based industry across the agriculture, industrial and healthcare sectors to benefit all levels of society, as aligned with the government's vision.

There are a few notable projects that Bioeconomy Corp played a key role in to further develop the expanding bio-based industry in Malaysia and drive economic growth. Among them is the continual commitment to the government's National Biotechnology Policy (NBP).

I am pleased to report that we have successfully reached the targets set for the third phase of the NBP, namely in supporting bio-based companies to become competitive global players, helping them penetrate the international market, and providing all the necessary resources and support to help them commercialise high-value products and services which meet global demand.

Of all our accomplishments in 2017, the achievement that stands out most is the growth and contribution of BioNexus Status companies. By the end of 2017,

we awarded the BioNexus Status to 283 companies that, from the period of 2008 to 2017, contributed to our nation RM3.58 billion in cumulative realised investments and RM1.47 billion in revenue, as well as created 3,391 new jobs which include 2,044 knowledge workers, and recorded 144 patents. Additionally, 18 BioNexus Status companies were successfully listed in Bursa Malaysia, of which 15 also succeeded in being listed in Australia, London, Singapore and New York.

These achievements contributed to Malaysia's healthy economic growth in 2017 by driving profits, attracting inward investment, and creating job across the country. The impact they had on our communities at grassroots level is just as significant, which includes improving yield and production of local agriculture through agricultural biotechnology, creating sustainable and green solution for industries the bioindustrial field, and finally improving biopharmaceuticals, biomedical technology, bio services, and the emerging biosciences under the healthcare bio industry.

Another significant contribution from BioNexus Status companies can be seen in rural communities and rural farming via our Bioeconomy Community Development Programme (BCDP) in 2017. A total of 37 projects were implemented under the BCDP that involved over 2,800 participants and is expected to impact over 13,000 lives in rural communities by improving their income and quality of life.

By having both bio-based companies and farming communities work together to create value through bio-based innovations, we are not only providing income to the communities but also allowing commercialisation of bio-based products to meet local and global market demands, especially high-value products that are natural-based, green-friendly and halal.

In the coming years, as more countries adopt bioeconomy into their national agenda and economic policies, it is important for Malaysia to remain competitive in the global arena. Bioeconomy Corp keeps a pulse on these growing forces of bioeconomy around the world and will continue to ensure the bioeconomy of our country not only keeps up in terms of growth, but aspires to exceed in quality and value.

With the continual support of the government and all stakeholders invested in Malaysia's bioeconomy agenda, Bioeconomy Corp will persevere to validate their backing by strengthening forces in bioeconomy to achieve results which significantly impact Malaysia's economic, social and sustainable development.

In order to make the Malaysian bioeconomy a force to be reckoned with on the international stage, we must strengthen our local players first. That's why we are dedicated in improving our work of getting local companies to understand emerging global bioeconomy trends so they can tap into them, as well as providing them with platforms to access the local and international markets and commercialise their value-added downstream products.

We will also continue to help these companies improve their products and services to satisfy global safety requirements and standards, alongside nurturing their growth so they can provide job opportunities for local talents. Our sights are also focused on developing local talents with educational programmes and trainings to be globally competitive and savvy.

We want the global community to know Malaysia's bioeconomy has a lot to offer the world, from helping to solve the food crises of rising populations, to developing solutions that support the environment, and improving healthcare and quality of life.

For this to happen, I foresee Bioeconomy Corp will not cease in our collaboration with players across many industries, public-private sectors and academic-industry crossovers so that our nation's bioeconomy can truly flourish in a holistic and global manner.

Dr. Mohd Shuhaizam Mohd Zain

Chief Executive Officer of Bioeconomy Corp





THE ORGANISATION

About Bioeconomy Corp

Malaysian Bioeconomy Development Corporation Sdn Bhd (Bioeconomy Corp) (Company No. 691431-D) was incorporated under provisions of the Companies Act 1965 on 13 May 2005 to identify value propositions in research and development (R&D) and commerce for the bio-based industry, as well as to support and facilitate these ventures through financial assistance and advisory services.

Bioeconomy Corp is an agency under the purview of the Ministry of Science, Technology and Innovation (MOSTI) from 2005 to October 2018 and is owned by the Ministry of Finance Incorporated and Federal Lands Commissioner (one share). It is governed by the National Bioeconomy Council (formerly known as Biotechnology Implementation Council) and counselled by the Bioeconomy International Advisory Panel.



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SENIOR MANAGEMENT



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Senior Vice President
Corporate Affairs



THE ACHIEVEMENTS





CREATING IMPACT *IN THE NEXT INDUSTRIAL REVOLUTION*

AgBiotech

Agricultural biotechnology, or AgBiotech is a major driving force of the global bioeconomy. It is an exciting area of agricultural science for the development and adoption of sustainable solutions to increase agricultural productivity and quality.

Globally, technological advances in the Agriculture Biotechnology sector have enabled agriculture systems to increase food production supporting global population growth. The application of biotechnology in the agriculture sector includes the use of environmentally friendly farm inputs, such as biofertilisers and biopesticides, and the development of high-yielding plant varieties. These applications establish sustainable and efficient agriculture systems to ensure better food safety and quality are available to all.

In Malaysia, AgBiotech will continue to be a key catalyst for the nation's bioeconomy development. Moving forward, the development in AgBiotech would enable the modernisation of sectors such as Natural Products, Livestock, Aquaculture and Crop Nutrition, Protection and Improvement. The development of these four key areas, which are seen as the four pillars of growth, will support the development of downstream industries enhancing the agriculture value chain as a whole.

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AgBiotech

A Vital Driving Force of the Nation's Bioeconomy

The AgBiotech division of Bioeconomy Corp works closely with biotechnology companies in the field of agricultural biotechnology that have potential to qualify for BioNexus Status. The division nurtures and facilitates these companies with various forms of support and assistance to move them towards achieving BioNexus Status. This includes roles such as providing:

1. Technical and financial due diligence services.
2. Support in business plan development and cash-flow analysis.
3. Regulatory support, including requirements from local authorities and quarantine.
4. Assistance to secure funding, including VCs, financial institutions, and private investors.
5. Assistance to secure land/space (including sea space) from state (government) authorities.
6. Assistance in technical collaboration, especially with local R&D centres.
7. Services to support mergers, acquisitions, and partnerships, especially towards market expansion/penetration.

The AgBiotech division focuses on four major sectors, each with its own subsectors.

Focus Sectors & Subsectors Under AgBiotech Division



Natural Products

- Nutraceutical
- Cosmeceutical
- Perfumery & Personal Care
- Functional Food



Aquaculture

- Finfish Aquaculture
- Crustaceans
- Other Marine Species
- Feed Ingredients
- Waste Remediation



Crops

- Plant Nutrition & Protection
- Planting Material



Livestock

- Animal Reproductive Technology, Genetics & Breeding
- Animal Health
- Animal Nutrition

Key Projects in 2017: Natural Products



The natural products industry comprises of the following four subsectors where products are developed using ingredients derived from natural sources:

1. Nutraceutical

Health and wellness products formulated with naturally-based extracts.

2. Cosmeceutical

Cosmetics produced from natural substances, which contain medicinal or therapeutic properties.

3. Perfumery & Personal Care

Perfumes and personal care products formulated from extracted natural essential oils that contain a complex composition of aromatic compounds.

4. Functional Food

Food products enriched with specific nutrients or substances that can potentially improve health beyond basic nutrition and may help to reduce or minimise risk of certain diseases and other health conditions.

KEY PROJECTS UNDER NATURAL PRODUCTS SECTOR IN 2017

Company	Subsector	Origin (FDI/DDI)	Investment (RM Million)	Activity	Outcomes
I-Green Sdn Bhd	Perfumery & Personal Care	DDI	9.9	Commercialisation of standardised aloe vera extract-based personal care products.	<ul style="list-style-type: none"> Awarded with BioNexus Status in January 2017. Completed R&D to enhance product formulation using polysaccharides extracted from aloe vera.

AgBiotech

Key Projects in 2017: Aquaculture



The aquaculture sector comprises of R&D and commercialisation of the breeding and cultivation of both marine and freshwater species for sustainable aquaculture produce. The sector is comprised of five subsectors, as follows:

1. Finfish Aquaculture

Breeding and cultivation of marine and freshwater fish species.

2. Crustaceans

Breeding and cultivation of shrimps, mud crabs, and bivalves (oysters, scallops and abalone).

3. Other Marine Species

Breeding of other marine species such as sea cucumber both for food and medicinal applications.

4. Feed Ingredients

Feed ingredients and additives such as probiotics and ingredients produced from biotechnology processes such as fermentation and insect meals for fishmeal replacement.

5. Waste Remediation

Microbial-based treatment solutions that cannot be used in Recirculation Aquaculture Systems.

KEY PROJECTS UNDER AQUACULTURE SECTOR IN 2017

Company	Subsector	Origin (FDI/DDI)	Investment (RM Million)	Activity	Outcomes
J&J Aquatech Sdn Bhd	Finfish	DDI	3.9	Aquaculture activities utilising biotechnology for the breeding and grow-out of marine fish species.	Successfully commenced activities at its Pekan facility to produce marine fingerlings up to nursery culture.
GK Aqua Sdn Bhd	Crustaceans	DDI	3.3	Breeding and culture of all-male (monosex) giant freshwater prawns (<i>udang galah</i>).	<ul style="list-style-type: none"> Its Lenggeng hatchery commenced commercialisation of its all-male giant freshwater prawns. Successful grow-out of its all-male giant freshwater prawns by farmers.
Aqua 77 Sdn Bhd	Finfish Crustaceans	DDI	2.8	Aquaculture of marine fish and shrimps from breeding to grow-out.	Commenced initial aquaculture activities at Kompleks Ternakan dan Pembiakan Udang (Prawn Farming and Breeding Complex), Sungai Kerang, Perak.

Key Projects in 2017: Crops



Crop biotechnologies have significantly contributed towards improving crop yield and meeting the challenges in food production, which includes shrinking land banks, limited water resources, environmental concerns, and increasing input costs. The crop biotechnology sector is currently composed of the following subsectors:

1. Plant Nutrition & Protection

Inputs for plant development and growth, such as biofertilisers and biopesticides. These could include organic substances/bio-based matter formulated with secondary metabolites (enzymes) or beneficial microbes.

2. Planting Material

Hybrid seed production and micro-propagation via tissue cultures techniques, marker assisted selection breeding, and/or any methods that provide elite planting material (high yield, disease resistance, and desirable traits). These include techniques such as mutation breeding and genetic engineering.

KEY PROJECTS UNDER CROPS SECTOR IN 2017

Company	Subsector	Origin (FDI/DDI)	Investment (RM Million)	Activity	Outcomes
Q-Plant Biotech (a wholly owned subsidiary of Kelantan Biotech)	Planting Material	DDI	2.3	Commercialisation of high-quality planting material.	<ul style="list-style-type: none"> Successfully completed R&D on developing tissue culture know-how and protocols with Universiti Sains Malaysia (USM). Commenced commercialisation of tissue culture as a high-quality planting material.
Quangrow Sdn Bhd	Planting Material	DDI	0.6	Commercialisation of high-quality planting material.	Sales of its Kelampayan plantlets produced using tissue culture techniques has successfully penetrated the East Malaysia market.

AgBiotech

Key Projects in 2017: Livestock



Biotechnology can improve livestock breeding and farming, as well as positively shift the economic returns from livestock. The biotechnology tools applied for livestock improvement fall under the following subsectors:

1. Animal Reproductive Technology, Genetics & Breeding

Includes biotechnology applications such as artificial insemination, embryo transfer, embryo sexing and cloning, and hormone use.

2. Animal Health

Includes biotechnology applications such as disease diagnosis, vaccines, and physiology of lactation and growth.

3. Animal Nutrition

Includes biotechnology applications such as increasing digestibility of low quality forages, improving nutritive value of cereals, removing anti-nutritive factors from feeds improving nutritive value of conserved feed, and improving rumen function.

To support the local livestock industry that face the risk of high-cost imported feed, raw materials and health products, the focus in 2017 has been on promoting companies involved in the feed and animal health sector.

KEY PROJECTS UNDER LIVESTOCK SECTOR IN 2017

Company	Subsector	Origin (FDI/DDI)	Investment (RM Million)	Activity	Outcomes
Yenher Biotech Sdn Bhd	Animal Feed	DDI	3.6	Commercialisation of animal feed ingredients through biotechnology processes (fermentation).	<ul style="list-style-type: none"> Completed R&D on the fermentation of soybean meal. Commenced its commercial processes on the fermentation of soybean meal.
Malaysian Vaccines and Pharmaceutical Sdn Bhd	Animal Health	DDI	4.1	Commercialisation of vaccines for the livestock industry.	<ul style="list-style-type: none"> Successfully increased market share in the country. Continues to expand its export market potential.

Key Success in 2017

BioNexus Status Award

A total of eight companies within AgBiotech sectors have commenced their activities to meet the requirements of BioNexus Status and hence were successfully awarded with the BioNexus Status.

BioNexus Status Awarded in 2017 to AgBiotech Companies



The eight companies awarded with BioNexus Status in 2017 had received investment approvals totalling RM27.4 million in 2017 over an investment timeline period of five years.

Successful Uptake of Local Public-Funded Research

The AgBiotech division facilitated a collaboration between the National Institutes of Biotechnology Malaysia (NIBM) with Bio-Swood Sdn Bhd, a non-BioNexus Status company, to commercialise their 'Fizzy Annona' and 'Mas Cotek' effervescent beverages.

This collaboration, which was announced during the National Innovation and Creative Economy Expo 2017 (NICE '17), represents the successful uptake of local public-funded research by the industry for commercialisation.

AgBiotech

Moving Forward

The AgBiotech division will focus on the following plans and initiatives to continue supporting the AgBiotech sector and developing its integral role as one of the key driving forces of bioeconomy.

PLANS

1. Encourage investments into the AgBiotech sector for food and feed security.
2. Revenue generation through our engagement within the AgBiotech sector.
3. Technology uptake towards commercialisation through public private partnerships.

INITIATIVES

1. Policy developmental initiatives such as the inclusion of biofertilisers/biopesticides in government subsidy programs.
2. An aquaponics-based urban farming initiative.
3. Trainings and awareness programs and seminars to promote the application of biotechnology tools in agriculture to farmers, including urban farmers.



TRANSFORMING THE NATION'S HEALTHCARE BIO CLUSTER

Healthcare Bio

Today's healthcare technology is more advanced and effective. The merging of biotechnology with healthcare innovation has significantly contributed to meet the growing public and global health needs, from improving diagnostics, prevention, and treatment measures to advances in emerging biosciences such as wellness and pharmanutrition. Without doubt it has brought better health, better quality of life, and an increase in life expectancy.

In Malaysia, the healthcare bio cluster consists of numerous sectors which produce staple products ranging from biopharmaceuticals to medical devices, as well as cellular medicine and health supplements to cell and gene therapy products. In the past seven years, Malaysia's healthcare bio industry has entered a period of significant growth with the entry of multiple strategic and high-impact projects, especially in the biopharmaceuticals and biomedical technology sectors.

Healthcare Bio

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Healthcare Bio

Shaping the Future of Malaysia's Healthcare Bio Industry

Since the launch of the National Biotechnology Policy back in 2005, Bioeconomy Corp has played a key role as the lead government agency facilitating the development of bio-based industries in Malaysia.

The Healthcare Bio division of Bioeconomy Corp has contributed to growing the nation's healthcare bio cluster by:

- Securing strategic investments
- Creating a conducive environment in target sectors
- Seeking and securing foreign investments
- Nurturing and growing local healthcare bio companies
- Creating new jobs in the biotechnology field
- Addressing regulatory hurdles
- Facilitating access to market
- Assisting with business matching activities

The Healthcare Bio division focuses on developing several focus areas within the healthcare bio cluster, each with its own subsectors.

HEALTHCARE BIO CLUSTER

1. Biopharmaceuticals

- Small Molecule Pharmaceuticals
 - New Chemical Entities (NCEs) / New Molecular Entities (NMEs)
 - Generics
- Large Molecule Pharmaceuticals
 - Innovator Biologics / New Molecular Entities (NMEs)
 - Biosimilars
 - Vaccines

2. Biomedical Technology & Diagnostics

- Medical Devices
- In-vitro Diagnostics
- Biosensors

3. Bio Services

- Contract Research Organisations (CROs)
- Contract Manufacturing Organisations (CMOs)
- Bioinformatics

4. Emerging Biosciences

- Cellular Medicine & Cell and Gene Therapy (CGTP)
- Biocosmeceuticals
- Wellness & Pharmanutrition

Healthcare Bio

Key Projects in 2017: Biopharmaceuticals

Biopharmaceuticals, or biological drugs, are made from complex molecules manufactured using living organisms, plants or animal cells to treat many serious and chronic illnesses.

In 2017, Healthcare Bio nurtured the growth, supported and facilitated the securing of investments for the following BioNexus Status companies and non-BioNexus Status companies in the biopharmaceuticals subsectors.

KEY PROJECTS UNDER BIOPHARMACEUTICALS IN 2017

Company	Status	Origin (FDI/DDI)	Investment (RM Million)	Activity	Outcomes
Viramatix Sdn Bhd	BioNexus Status company	DDI	71	Discovery, development, and commercialisation of peptide based antiviral therapeutics.	<ul style="list-style-type: none">• Successfully completed pre-clinical stage for influenza therapeutics.• Moving forward to Phase 1 clinical stage for influenza therapeutics.
Biocon Sdn Bhd	Non-BioNexus Status company	FDI	1,000+	Malaysia's first biopharmaceutical manufacturing and research facility and Asia's largest integrated insulin manufacturing facility.	As part of EPP under Malaysia's Healthcare NKEA initiative, Biocon is currently expanding its capacity as a premier insulin solution provider to include disposable insulin pen assembly line and related machineries.

Healthcare Bio

Key Projects in 2017: Biomedical Technology & Diagnostics

Biomedical technology and diagnostics combines engineering and technology to aid in solving medical issues, especially in the design of medical equipment to improve diagnosis and treatment of various diseases.

In 2017, Healthcare Bio supported the biomedical technology and diagnostics subsector by nurturing the growth and securing investments for the following BioNexus Status companies and non-BioNexus Status companies:

KEY PROJECTS UNDER BIOMEDICAL TECHNOLOGY & DIAGNOSTICS IN 2017

Company	Status	Origin (FDI/DDI)	Investment (RM Million)	Activity	Outcomes
Cell Tissue Technology Sdn Bhd	BioNexus Status company	DDI	11	Commercialisation of tissue engineered technology, including human skin graft for: <ul style="list-style-type: none"> • Wound care treatment. • Research. • Autologous dermal fibroblast cell suspension for skin rejuvenation. 	Its tissue-engineered human skin can: <ul style="list-style-type: none"> • Provide an alternative solution to conventional surgical skin substitute methods. • Replace human skin testing. • Reduce cost of clinical trials. • Reduce complications or adverse reactions from human test subjects in clinical trials. • Replace animal models to conduct safety and toxicity test of compounds in cosmetics or other industries.
3D Instrument Sdn Bhd	Non-BioNexus Status company	DDI	21	Production and commercialisation of biocompatible orthopaedic medical devices.	<ul style="list-style-type: none"> • ISO13485 and 9001 certified medical device company. • Capabilities in precision CNC machining, finishing, and assembly. • Design & development, and quality assurance, to produce a range of biocompatible orthopaedic devices.

Healthcare Bio

Key Success in 2017: Biopharmaceuticals

Healthcare Bio's projects to develop biopharmaceutical companies in Malaysia directly impact the people of Malaysia through improving solutions for human health and wellness.

In 2017, Healthcare Bio supported the following BioNexus Status companies and non-BioNexus Status companies in the biopharmaceuticals subsector to provide health and wellness solutions which can benefit the nation.

KEY SUCCESS UNDER BIOPHARMACEUTICALS IN 2017

Company	Subsector	Job Creation	Benefits to Malaysians
Viramatix Sdn Bhd	BioNexus Status company	20	The company's novel approach on drug discovery has led to the development of drugs for: <ul style="list-style-type: none">• Anti-Influenza therapeutics• HIV therapeutics• RSV therapeutics• HSV therapeutics• CMV therapeutics
Biocon Sdn Bhd	Non-BioNexus Status company	600+	Biocon's plant in Johor has expanded access to affordable rh-insulin therapy for Malaysians, which leads to a significant reduction in healthcare cost attributed to diabetes for the government. With its recent plant expansion, Biocon has increased its capacity as a premier insulin solution provider at the global level.

Key Success in 2017: Biomedical Technology & Diagnostics

The biomedical technology and diagnostics vertical currently contributes the highest revenue compared to other subsectors in Malaysia's healthcare bio cluster.

To benefit the nation with improved medical care, Healthcare Bio supported the following BioNexus Status companies and non-BioNexus Status companies in biomedical technology and diagnostics subsector.

KEY SUCCESS UNDER BIOMEDICAL TECHNOLOGY & DIAGNOSTICS IN 2017

Company	Subsector	Job Creation	Benefits to Malaysians
3D Instrument Sdn Bhd	BioNexus Status company	29	3D Instrument is the only Malaysian medical device company that provides a complete solution for Trauma Sector in Malaysia. The company established manufacturing facility in Penang that is certified ISO13485 and 9001 to produce a full range of biocompatible orthopaedic devices.

Key Success in 2017: Summary

**BIONEXUS
STATUS
COMPANIES****RM82 Million**
DDI investment**49 jobs created****NON-BIONEXUS
STATUS
COMPANIES****RM1+ Billion**
DDI and FDI investment**600+ jobs created**

Healthcare Bio

Moving Forward

The Healthcare Bio division will focus on the following plans and initiatives to continue supporting the nation's healthcare bio cluster to improve the health, quality of life, and life expectancy of the people, while creating new job opportunities and contributing to the nation's bioeconomy as a global and regional healthcare hub.

PLANS

1. Achieve the objectives of the National Biotechnology Policy (NBP) and Bioeconomy Transformation Programme (BTP) towards creating a new engine of growth for Malaysia to achieve developed nation status.
2. Position Malaysia as a global/regional Healthcare Bio Hub using the value chain approach.
3. Develop a holistic Healthcare Bio ecosystem using the value chain approach.

INITIATIVES

1. Increase the multiplier effects on the economy and positive impact on the income and welfare of the people by developing socio-economy focused programmes.
2. Actively realise investments through project implementation and conduct communication outreach to increase the visibility of Bioeconomy Corp's activities in Healthcare Bio industry.
3. Develop and implement ecosystem-based pipeline building initiatives to build a conducive environment for the Malaysian healthcare sector.





CREATING SUSTAINABLE SOLUTIONS FOR A SUSTAINABLE FUTURE

BioIndustrial

Industrial biotechnology (BioIndustrial) currently stands as one of the most promising and exciting driving forces of bioeconomy that is often referred to as the third wave in biotechnology, coming after the waves of agricultural biotechnology and healthcare biotechnology.

The solutions which emerge from industrial biotechnology hold immense potential to meet the world's growing demand for food, feed, fuel, and materials with greener solutions that prevent pollution, conserve resources, and reduce cost, which offer a path to a much anticipated low-carbon future.

BioIndustrial

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BioIndustrial

Leveraging Malaysia's Bio-Based Resources to Become a Key Global Player

As a country rich in the biological resources needed to produce and process materials, chemicals, and energy that can be alternatives to fossil-based energy and products, Malaysia stands at the brink of breaking through to become a key player in the global industrial biotechnology field.

In line with the National Biotechnology Policy (NBP) and the Biotechnology Transformation Programme (BTP), the BioIndustrial division of Bioeconomy Corp continuously:

- Promotes and integrates Malaysia's bio-based resources with national and global industrial biotechnology platforms.
- Engages industry players to create awareness, interest, structure partnering, and collaboration to foster new investments.
- Promotes sustainable business operations by providing supporting services that add value to the existing manufacturing sectors towards reducing greenhouse gas emission, landfills, wastewater effluents, and manufacturing costs.

The BioIndustrial division promotes and supports the following six key focus areas of industrial biotechnology:



Bulk, Fine & Specialty Chemicals



Biofuel



Biomaterials



Bioremediation



Biocatalyst



Bioingredients

BioIndustrial

Key Project in 2017: Bulk, Fine & Specialty Chemicals



BULK, FINE & SPECIALTY CHEMICALS

New Sustainable Solutions

Production of bulk, fine, and specialty chemicals from bio-based feedstock through:

- ✓ Fermentation
- ✓ Chemical conversion
- ✓ Enzymatic conversion

Traditional Non-Sustainable Productions

Substitute and complement production of bulk, fine, and specialty resources from non-renewable resources:

- × Crude oil
- × Natural gas

The demand from the global chemicals industries for bio-based/green products promote the growth of the bulk, fine, and specialty chemicals focus area.

In 2017, the BioIndustrial division supported the following non-BioNexus Status company in the bulk, fine, and specialty chemicals focus area to produce sustainable solutions for the global chemicals industry.

KEY PROJECT UNDER BULK, FINE & SPECIALTY CHEMICALS IN 2017

Company	Status	Origin (FDI/DDI)	Investment (RM Million)	Activity	Outcomes
Profes Lipid Sdn Bhd	Non-BioNexus Status company	DDI	6.9	<ul style="list-style-type: none"> • Production of extra red palm olein. • Production of extra red palm stearin. 	Set up an extra red palm olein and extra red palm stearin plant at Semenyih, Selangor.



Key Projects in 2017: Biofuel

BIOGAS & BIOGAS DERIVATIVES

New Sustainable Solutions

- ✓ Production of biogas from decomposition of organic matter from waste.
- ✓ Converting biogas into renewable energy source through anaerobic digestion.
- ✓ Using biogas in further downstream processes for biochemical production.

Traditional Non-Sustainable Productions

Reduce dependency on production of gas and energy from non-renewable resources:

- × Crude oil
- × Petroleum
- × Natural gas
- × Coal

With non-renewable energy sources depleting and leaving a harmful impact on the environment, there is a rising demand and need for sustainable biogas as a renewable energy source and component in biochemical production.

In 2017, the BioIndustrial division supported the following BioNexus Status and non-BioNexus Status companies in the biogas and biogas derivatives focus area to produce sustainable energy.

KEY PROJECTS UNDER BIOFUEL IN 2017

Company	Status	Origin (FDI/DDI)	Investment (RM Million)	Activity	Outcomes
Green & Smart Sdn Bhd	BioNexus Status company	DDI	30.5	<ul style="list-style-type: none"> • Development and commercialisation of anaerobic reactors and biological systems for treatment of various wastes. • Applies in-house technology for treatment of palm oil mill effluent to become biogas. 	Set up two biogas plants to be converted into electricity generation based on the feed-in-tariff model.
GLT Bio Sdn Bhd	Non-BioNexus Status company	DDI	9.0	Biogas plant.	Set up a biogas power generation plant with total capacity of 1.2 MW in Kulim, Kedah based on the feed-in-tariff model.

Key Project in 2017: Biomaterials



BIOMATERIALS

New Sustainable and Renewable Materials

Production of:

- ✓ Bioplastic
- ✓ Bioadhesive
- ✓ Biofibre
- ✓ Biocomposite
- ✓ Hybrid materials

That are derived from:

- ✓ Vegetable oil
- ✓ Sugar
- ✓ Starch produced from renewable resources
- ✓ Biomass
- ✓ Combination of bio and fossil-based materials for physical strength with renewable content

Traditional Non-Sustainable Materials

Offers alternative materials to common non-renewable materials:

- × Fossil-based plastic
- × Fossil-based polymers
- × Polystyrene
- × Styrofoam

The demand from the global materials industries for sustainable and renewable products promotes the growth of the biomaterials focus area.

In 2017, the BioIndustrial division supported the following non-BioNexus Status company in the biomaterial focus area to produce sustainable solutions for the global materials industry.

KEY PROJECT UNDER BIOMATERIALS IN 2017

Company	Status	Origin (FDI/DDI)	Investment (RM Million)	Activity	Outcomes
Eco Palm Paper Sdn Bhd	Non-BioNexus Status company	DDI	269.5	Development, production, and commercialisation of corrugated medium paper using Empty Fruit Bunch (EFB).	Set up a manufacturing facility to product corrugated medium paper using EFB.

BioIndustrial

Key Project in 2017: Bioremediation



BIOREMEDIATION

New Innovative Sustainable Processes

Promotes new innovative and sustainable waste management processes to remediate air, water, and land pollutants such as Municipal Solid Waste (MSW), sewerage, agriculture, and industrial waste.

These innovative and sustainable processes explore potential valuable byproducts from the bioremediation processes, of which key components include:

- ✓ Application of biological processes
- ✓ Environmental friendly
- ✓ Safe

Traditional Processes

Traditional process of remediation uses chemical and mechanical treatments that:

- × Are non-sustainable
- × Cause potential harmful effects

Bioremediation is the use of biological processes to solve an environmental problem such as contaminated soil or groundwater, or removing pollutants from oil spills and better management of sewage, agriculture, and industrial waste.

In 2017, the BioIndustrial division supported the following non-BioNexus Status company in the bioremediation focus area to treat pollution and manage waste globally.

KEY PROJECT UNDER BIOREMEDIATION IN 2017

Company	Status	Origin (FDI/DDI)	Investment (RM Million)	Activity	Outcomes
Indah Water Konsortium Sdn Bhd	Non-BioNexus Status company	DDI	33.0	Bio-based water treatment.	Set up a bio-based wastewater treatment facility.



BIOCATALYST

New Biological Catalyst-Assisted Manufacturing Processes

Promotes the use of biocatalysts in the manufacturing processes that are:

- ✓ Environmentally friendly
- ✓ Potentially cost-saving
- ✓ Sustainable

Traditional Chemical Catalyst-Assisted Manufacturing Processes

Substitute the use of chemicals in manufacturing processes that:

- × Cause potential risk in operations
- × Have potential higher operating costs
- × Are non-sustainable

Biocatalysts are a safe, cost-effective, and sustainable solution to improve manufacturing processes across various industries, including the food and beverage, animal feed, textile, detergent, and medical industries.

In 2017, the BioIndustrial division supported the following BioNexus Status company in the biocatalyst focus area to improve manufacturing processes across various industries.

KEY PROJECT UNDER BIOCATALYST IN 2017

Company	Status	Origin (FDI/DDI)	Investment (RM Million)	Activity	Outcomes
Zymeratics Sdn Bhd	BioNexus Status company	DDI	4.5	<ul style="list-style-type: none"> Commercialisation of enzyme and its related services. Research and development activities in enzymes and related services. 	Set up a manufacturing facility to produce enzymes at a commercial scale.



BioIndustrial

Key Project in 2017: Bioingredients

BIOINGREDIENTS

New Sustainable and Renewable Ingredients

Production of active components and basic ingredients to be used for food, beverage, nutraceuticals, and cosmetics that are generated by plants and extracted to provide:

- ✓ Natural flavours
- ✓ Natural fragrances
- ✓ Natural colourants

Traditional Ingredients

Substitutes the use of chemical-based ingredients including:

- × Artificial flavours
- × Artificial fragrances
- × Artificial colourants

Bioingredients can improve the function and health impact of food, beverage, nutraceuticals, and cosmetics, as well as introduce new production routes that are more efficient and sustainable.

In 2017, the BioIndustrial division supported the following non-BioNexus Status company in the bioingredients focus area to improve the health and safety of ingredients used by various industries.

KEY PROJECT UNDER BIOINGREDIENTS IN 2017

Company	Status	Origin (FDI/DDI)	Investment (RM Million)	Activity	Outcomes
Global Specialty Ingredients Sdn Bhd (GSO)	Non-BioNexus Status company	DDI	15	Production of anti-clouding agent for palm olein.	Set up an anti-crystallising production plant (food emulsifier plant) at Bandar Bestari, Klang, Selangor.

Key Success in 2017

The World's First Bio-based Chemical Manufacturing Plant

On 30 July 2017, BioNexus Status company Verdezyne Sdn Bhd held a groundbreaking ceremony for its VerdePalm Plant at BioXCell Biotechnology Park in Iskandar Puteri, Johor.



The first-of-its-kind plant would use palm oil to produce 6,000 tonnes of Dodecanedionic Acid (DDDA) annually, a renewable bio-based chemical that can be used as an alternative to petroleum-derived chemicals across various industries – from automotive parts and toothbrush bristles to cosmetics and fragrances.

As the first commercial-scale renewable chemicals manufacturing facility, VerdePalm Plant will be a catalyst of change in the production of non-consumable products that positions Malaysia as one of the key global players in the development and production of green and bio-based technologies and innovation.

Sime Darby is one of the investors in Verdezyne Inc. (US-based industrial biotechnology company), a parent company of Verdezyne Sdn Bhd which owns VerdePalm Plant. As of the end of 2017, the construction of VerdePalm Plant is approximately 40% complete and is projected to be complete by the end of October 2018.



Reducing Fossil-Based Plastic Bags & Polystyrene in Federal Territories

On 1 September 2017, a ban on conventional plastic bags in favour of biodegradable and compostable plastics bags and food containers officially took effect in Malaysia's federal territories.

To support the environmental initiative by the Ministry of Federal Territories, Bioeconomy Corp collaborated with SIRIM QASS International Sdn Bhd to promote the SIRIM Eco-Labelling Certification schemes, which include:



- **SIRIM ECO 001:2016**
for degradable and compostable packaging materials.
- **SIRIM ECO 009:2016**
for biomass based products for food-contact applications.

This collaboration on eco-labelling supports the ministry's initiatives by encouraging companies to adopt bioplastic technologies that are eco-friendly for their packaging and products.

Since the introduction of **SIRIM ECO 001:2016** and **SIRIM ECO 009:2016**, a number of conventional plastic companies successfully adopted bioplastic technologies to certify their products as eco-friendly, enabling them to sell their products in federal territories of Malaysia.

BioIndustrial

Moving Forward

The BioIndustrial division will focus on the following plans and initiatives to nurture and accelerate the growth of Malaysian bio-based and biotechnology companies that support the development of industrial biotechnology.

PLANS

1. Adopt industrial biotechnology as a platform to leverage Malaysia's natural bio-based resources for the development and commercialisation of value-added innovative products and services.
2. Adopt industrial biotechnology as a strategic solution to provide renewable energy, reduce carbon emission, and provide environmental protection as part of a pivotal role in the RMK-11 in pursuing green growth for sustainability and resilience.
3. Continue nurturing local industrial biotechnology players for global commercialisation to enable them to generate higher revenue, capture larger markets, and create international branding.

INITIATIVES: BULK, FINE & SPECIALTY CHEMICALS

1. Tap into the availability of bio-based second-generation feedstocks from the palm oil industry, agriculture (biomass), domestic, and industrial waste.
2. Utilise the industrial biotechnology platform to promote manufacturing and commercialisation of value-added products and services in Malaysia, such as cheaper and sustainable feedstocks, to global key players.

INITIATIVES: BIOENERGY AND BIOREMEDIATION

1. Utilise the industrial biotechnology platform to reduce up to 40% of greenhouse gasses emission.
2. Utilise the industrial biotechnology platform to increase the share of renewable energy in the country through non-fossil-based energy, including:
 - Biofuels, biogas, and biomass
 - Bioremediation of polluted areas
 - Anaerobic digestion of waste
 - Converting biogas into renewable energy in the form of electricity, Compressed Natural Gas (CNG), and Liquefied Natural Gas (LNG)
 - Bioplastics

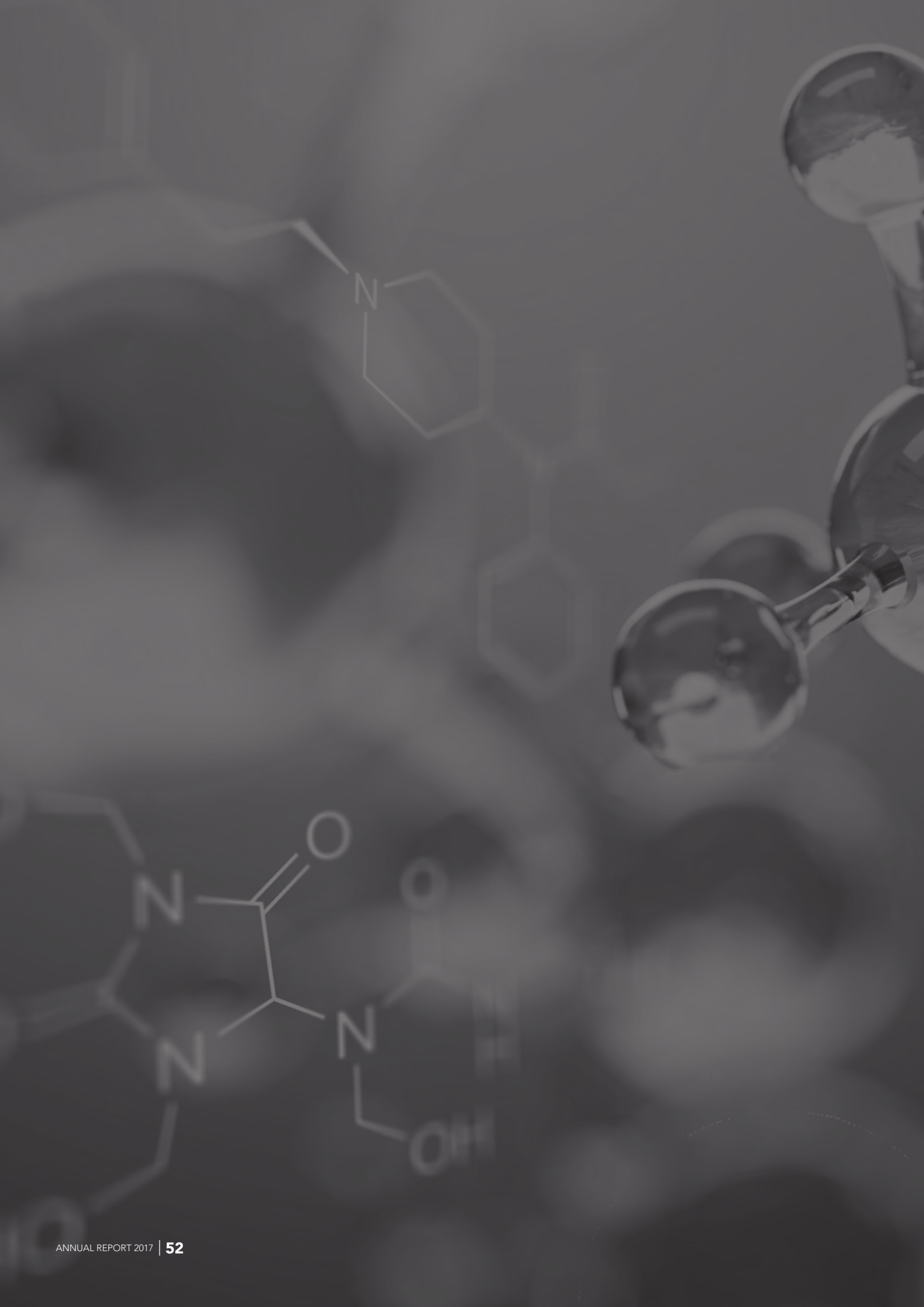
INITIATIVES: BIOCATALYST

To support the growth of current enzyme market leaders by encouraging exploration of many new types of enzymatic reactions or biocatalysts offering new possibilities to reduce manufacturing costs, improve quality and yield, and enhance sustainability profile of manufacturing processes.

INITIATIVES: BIOINGREDIENTS

To promote the use of enzymatic methods, microbes, Supercritical Fluid Extraction (SFE), and fermentation methods to extract natural flavours, fragrances, and colourants from plant, yeast, and microbe materials.







TOWARDS A GLOBAL HIGH INCOME BIOECONOMY

Programmes & Delivery Management

Bioeconomy is at the heart of many technological advances with the potential to address many global challenges, from alleviating food crises to tackling environmental change.

In line with Malaysia's National Biotechnology Policy (NBP) to propel the country's social and economic transformation through biotechnology, our Programmes & Delivery Management division managed 77 trigger projects as of December 2017 which will be a game changer for Malaysia's growth and contribution to the global forces of bioeconomy.

Programmes & Delivery Management

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BioNexus Evaluation Department

Malaysia as a Global Brand in Biotechnology

BioNexus Status is a special status awarded to qualified international and Malaysian biotechnology companies that undertake value-added biotechnology and/or life sciences activities. The status bestows fiscal incentives, grants, and other guarantees to assist their growth and accelerate their contribution to grow the overall bioeconomy.

As Malaysia enters its last stage of the National Biotechnology Policy (NBP), BioNexus Status companies play a more prominent role on bioeconomy development efforts that drive the growth and prosperity of the nation, as well as push Malaysia forward to become a global brand in biotechnology.

The BioNexus Evaluation Department (BED) is responsible to evaluate and conduct risk assessment on applications for BioNexus Status and various incentives from biotechnology companies in the following three focus areas:

BioNexus Status Focus Areas



BioNexus 3.0: Aligning with OECD Inclusive Framework

In order to address the issue of base erosion and profit shifting, the Organisation of Economic Cooperation and Development (OECD) and the G20 countries introduced Base Erosion and Profit Shifting (BEPS) Action Plan as international taxation standard. The plan consists of 15 actions to address BEPS issues.

Malaysia in principal has committed to implement and to adhere to this standard. Under this commitment, Malaysia officially joined the OECD Inclusive Framework (IF) on BEPS as Associate Members.

Following this commitment, BED has reviewed its BioNexus Status Framework to ensure consistency with global tax practices as well as alignment with the Nexus Approach under the BEPS Action Plan 5: Forum on Harmful Tax Practices.

The result of the review and alignment process of the BioNexus Status Framework has led to BioNexus 3.0 which primarily affects the application process and tax eligibility criteria of BioNexus Status.

BIONEXUS 3.0

BioNexus 3.0 application process (COMPLETED)

- Introduced a more comprehensive BioNexus Status application form
- Introduced a shorter period of evaluation process

Tier-based incentives for BioNexus Status (ONGOING)

- Introduced a dynamic tier-based tax incentive system

BioNexus Evaluation Department

Key Success in 2017

11

New BioNexus
Status Companies

113.9

Million of Approved
Investments

427

New Jobs
Created

149

Knowledge Workers
Cultivated

BioNexus Evaluation Department

Companies Awarded the BioNexus Status in 2017

Company	Benefits of being awarded BioNexus Status		
	Accelerates global commercialisation and innovative R&D activities for:	Number of new jobs created in 2017	Approved investments in 2017 (RM Million)
Zymeratics Sdn Bhd is a Malaysian-grown customized enzyme boutique manufacturer that produces enzymes for various industrial applications.	Enzymes	20	4.5
I-Green (M) Sdn Bhd is dedicated to use natural ingredient extracts in everyday commercial products.	Aloe vera standardised extracts-based products	45	9.9
Malaysian Vaccines and Pharmaceuticals Sdn Bhd is a veterinary vaccines manufacturer in Malaysia, with over 25 years experience in animal healthcare.	Veterinary vaccines	91	1.0
Q Plant Tech Sdn Bhd supplies seedlings and plant tissue culture for key agriculture areas.	High quality planting material through tissue culture techniques	38	2.3
GK Aqua Sdn Bhd is revolutionising the prawn farming industry by applying cutting edge broodstock management and innovative prawn farming technologies.	Male monosex freshwater prawn using biotechnology	15	3.3
Quangrow Sdn Bhd supplies elite planting materials through mass propagation via tissue culture techniques.	High quality planting material through tissue culture techniques	43	0.6
Cell Tissue Technology Sdn Bhd is a tissue engineering firm centred on advanced medical technology.	Tissue-engineered human skin and contract assay services	43	11.0

BioNexus Evaluation Department

Companies Awarded the BioNexus Status in 2017

Company	Benefits of being awarded BioNexus Status		
	Accelerates global commercialisation and innovative R&D activities for:	Number of new jobs created in 2017	Approved investments in 2017 (RM Million)
Viramatix Sdn Bhd has developed peptide-based therapeutics which are effective against all seasonal and pandemic influenza viruses.	Drug development and discovery, peptide-based therapeutics, and licensing activities	20	71.0
Yenher Biotech Sdn Bhd develops and produces environmentally-friendly animal health products for livestock farmers.	Animal feed ingredients via fermentation process	51	3.6
Aqua 77 Sdn Bhd develops breeding and grow out protocols for the cultivation of Longtooth grouper.	Shrimps and marine fishes using biotechnology	33	2.8
J and J Aquatech Sdn Bhd is an agriculture company focusing on marine fishes.	Marine fishes and its fingerlings using biotechnology	28	3.9

BioNexus Evaluation Department

Moving Forward

Moving forward, BED will focus on the following two key initiatives to provide incentives for biotechnology firms and ensure alignment with global tax practices:

1. **Aligning the BioNexus Status Framework** according to OECD's BEPS Action Plan 5.
2. **Increasing awareness** of the revised BioNexus Status Framework by conducting awareness sessions with BioNexus Status companies and new applicants.

Bioeconomy Transformation Programme

Fostering Growth, Strength & Innovative Solutions

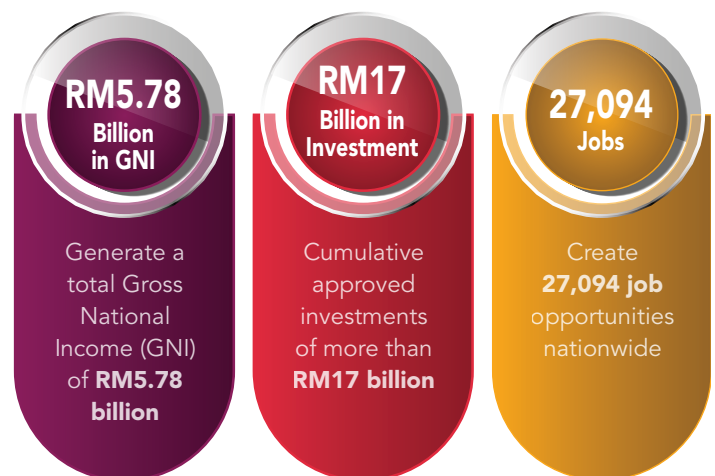
Endorsed by Malaysia's National Bioeconomy Council and launched by the then Prime Minister, Datuk Seri Najib Tun Razak on 30 October 2012, the Bioeconomy Transformation Programme (BTP) is a platform for the private sector to channel and maximise commercial opportunities in bio-based industries.

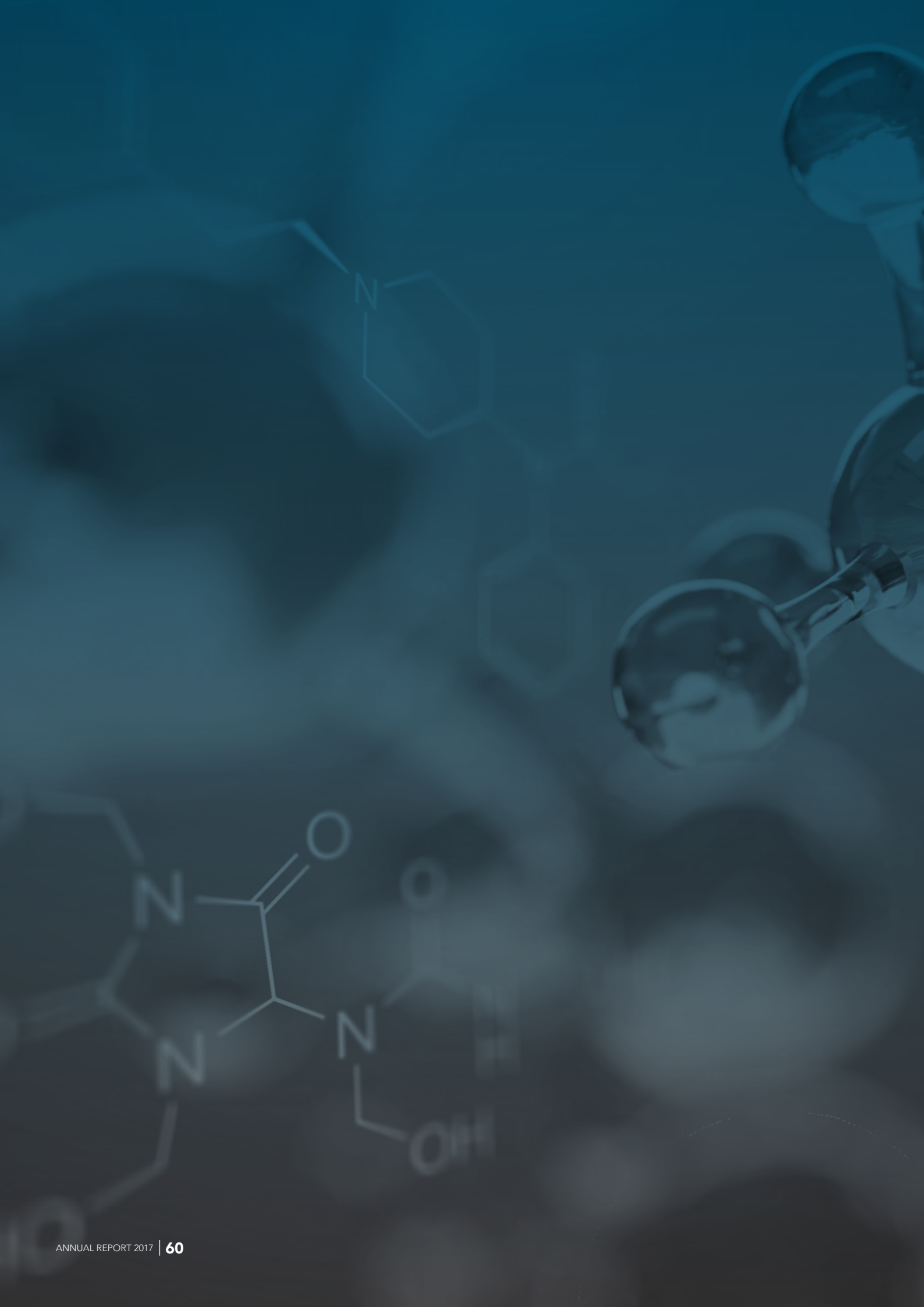
BTP supports new and established companies in the private sector by facilitating networking opportunities, collaboration with government stakeholders, commercialisation of research and development (R&D), and showcasing new bio-based projects and technologies which raises Malaysia's profile as an investment destination.

Through these efforts, we accelerate the development of local bio-based businesses while creating new jobs and business opportunities as well as improve the income of the people.

Helping to elevate the nation's bioeconomy also benefits the Malaysian people through the resulting biotechnology and bio-based products and services which can improve health, and generate sustainable and renewable industry solutions.

How BTP's Trigger Projects Contribute to Creating Economic Value by 2020





Contributing to the National Biotechnology Policy (NBP)

BTP's vision is to develop Malaysia into a high income bioeconomy by 2020 by implementing the strategies outlined in the NBP. In particular, BTP focuses on three out of nine thrusts outlined in the NBP, which are:



AgBiotech



BioIndustrial



Healthcare Bio

By focusing on these three thrusts, BTP creates the biotechnology and bio-based economic ecosystem and value chain to support the commercialisation of R&D in bio-based industries.

Bioeconomy Transformation Programme

AgBiotech

Today, biotechnology has spurred the local agriculture sector in new directions of growth previously not possible, allowing the AgBiotech sector to accelerate in its economic contribution and create employment opportunities across the nation.

Since the establishment of BTP in 2012, new AgBiotech focus areas have rapidly flourished across Malaysia, from high-value bioingredients to high-value food varieties and bio-based farm inputs, providing rapid market growth and spearheading job opportunities particularly in rural areas.

AgBiotech

- Focus Areas**
- Bio-based Farm Inputs
 - High-Value Bioingredients
 - High-Value Food Varieties
 - High-Value Horticulture Inputs

Key Success of Trigger Projects in 2017

In 2017, the BTP Steering Committee approved the following BTP trigger projects under the AgBiotech focus areas:

FOCUS AREA: BIO-BASED FARM INPUTS

Project title	GNI in 2020 (RM Million)	Cumulative GNI by 2020 (RM Million)	Investment by 2020 (RM Million)	Total employment by 2020 (persons)
Production and Commercialisation of Compost and Biofertiliser Utilising Garden and Landscape Waste	4.14	15.17	7.68	43
Production of Biofertiliser from Biogas Sludge and Empty Fruit Bunch (EFB) at 5 Sites	9.15	24.06	20.00	40
Production and Commercialisation of Bio-based Animal Health Products	5.62	10.78	21.28	24
Total New Contributions in 2017	18.91	50.01	48.96	107

FOCUS AREA: HIGH-VALUE BIOINGREDIENTS

Project title	GNI in 2020 (RM Million)	Cumulative GNI by 2020 (RM Million)	Investment by 2020 (RM Million)	Total employment by 2020 (persons)
Research, Development and Commercialisation of Natural Colourant	1.28	2.68	2.70	20
Total New Contributions in 2017	1.28	2.68	2.70	20

FOCUS AREA: HIGH-VALUE FOOD VARIETIES

Project title	GNI in 2020 (RM Million)	Cumulative GNI by 2020 (RM Million)	Investment by 2020 (RM Million)	Total employment by 2020 (persons)
Setting Up of an Integrated Fruit Production Facility in Dengkil	46.18	153.16	66.98	464
Expansion of Grey Oyster Mushroom Facility in Tangkak, Johor	2.13	3.82	3.17	33
Setting Up of a Mushroom Production Facility in Seberang Perai, Penang	1.24	3.70	5.06	127
Development of Fully Integrated Aquaculture Facilities	5.96	30.39	42.0	90
Production and Commercialisation of MD2 Pineapples using Tissue Culture Seedlings Materials	26.54	54.40	17.44	242
Development of Integrated Tilapia Facilities	11.23	24.44	51.58	140
Total New Contributions in 2017	93.28	269.91	186.23	1,096

FOCUS AREA: HIGH-VALUE HORTICULTURE INPUTS

Project title	GNI in 2020 (RM Million)	Cumulative GNI by 2020 (RM Million)	Investment by 2020 (RM Million)	Total employment by 2020 (persons)
Production and Commercialisation of RevoTropix Paulownia Trees	11.49	14.70	12.17	62
Research, Development and Commercialisation of Ornamental Plants and Cash Crops	0.83	2.95	1.10	31
Total New Contributions in 2017	12.32	17.65	13.27	93

Total Impact of BTP's AgBiotech in 2017

GNI in 2020

RM125.79 Million

Cumulative GNI by 2020

RM340.25 Million

Investment by 2020

RM251.16 Million

TOTAL EMPLOYMENT BY 2020:
1,316 persons

Bioeconomy Transformation Programme

BioIndustrial

In Malaysia, the growing BioIndustrial sector provides new market and employment opportunities as companies and investors collaborate to produce new manufacturing ways and solutions based on biology to integrate with existing technology and transform process industries.

As a platform for the private sector to maximise commercial opportunities, the projects under BTP's BioIndustrial focus areas thus herald a new era of monumental change in how Malaysia contributes to the forces of bioeconomy on a global scale.

BioIndustrial

Focus Areas

- Industrial Bioeconomy Upstream Inputs
- Biochemicals from Renewable Resources
- Biomaterials from Renewable Resources
- Bioremediation

Key Success of Trigger Projects in 2017

In 2017, the BTP Steering Committee approved the following BTP trigger projects under the BioIndustrial focus areas:

FOCUS AREA: INDUSTRIAL BIOECONOMY UPSTREAM INPUTS

Project title	GNI in 2020 (RM Million)	Cumulative GNI by 2020 (RM Million)	Investment by 2020 (RM Million)	Total employment by 2020 (persons)
Setting Up of Two Biogas Power Generation Plants with Total Capacity of 3.9 MW based on the Feed-in-Tariff (FiT) Model	8.62	62.34	30.50	16
Setting Up of a Biogas Power Generation Plant with Total Capacity of 1.2 MW in Kulim, Kedah based on the Feed-in-Tariff Model	1.39	5.71	9.00	11
Total New Project Contributions in 2017	10.01	68.05	39.50	27

FOCUS AREA: BIOCHEMICALS FROM RENEWABLE RESOURCES

Project title	GNI in 2020 (RM Million)	Cumulative GNI by 2020 (RM Million)	Investment by 2020 (RM Million)	Total employment by 2020 (persons)
Production and Commercialisation of Specialty Food Ingredients	17.34	41.61	24.41	28
Setting Up of Extra Red Palm Oil Production Facility	1.71	2.90	6.50	15
Total New Project Contributions in 2017	19.05	44.51	30.91	43

FOCUS AREA: BIOMATERIALS FROM RENEWABLE RESOURCES

Project title	GNI in 2020 (RM Million)	Cumulative GNI by 2020 (RM Million)	Investment by 2020 (RM Million)	Total employment by 2020 (persons)
Development, Production, and Commercialisation of Corrugated Medium Paper using Empty Fruit Bunch (EFB)	17.39	60.67	269.51	141
Total New Project Contributions in 2017	17.39	60.67	269.51	141

FOCUS AREA: BIOREMEDIATION

Project title	GNI in 2020 (RM Million)	Cumulative GNI by 2020 (RM Million)	Investment by 2020 (RM Million)	Total employment by 2020 (persons)
Setting Up of Bio-based Wastewater Treatment Facilities	1.31	0.67	33	13
Total New Project Contributions in 2017	1.31	0.67	33	13

Total Impact of BTP's BioIndustrial in 2017

GNI in 2020

RM47.76 Million

Cumulative GNI by 2020

RM173.90 Million

Investment by 2020

RM372.92 Million

**TOTAL EMPLOYMENT BY 2020:
224 persons**

Bioeconomy Transformation Programme

Healthcare Bio

The Healthcare Bio sector consists of numerous focus areas which produce staple products ranging from medicines to medical devices as well as standardised herbal products. In addition, these focus areas also feature more exotic fares such as cellular-based medicine and even service providers such as companies doing contract research and clinical trial services. In recent years, Malaysia's Healthcare Bio sector has entered a period of significant growth with the entry of multiple strategic and high-impact projects especially in the Biopharma and Biomedical Technology focus areas. New challenges in the form of the 4th Industrial Revolution would see further transformation of the Healthcare Bio sector.

To ensure success in the focus areas of Healthcare Bio, BTP continuously looks for avenues where it can create the bioeconomy economic ecosystem and value chain while ensuring that inputs from the 4th Industrial Revolution are taken into consideration.

Healthcare Bio

- Focus Areas**
- Biopharmaceuticals
 - Drug Discovery and Pre-Clinical Services
 - Molecular Screening and Diagnostics
 - Stem Cells and Regenerative Medicine
 - Bio-based Materials
 - Biocompatible Medical Devices

Key Success of Trigger Projects in 2017

In 2017, the BTP Steering Committee approved the following BTP trigger projects under the Healthcare Bio focus area:

FOCUS AREA: BIOCOMPATIBLE MEDICAL DEVICES				
Project title	GNI in 2020 (RM Million)	Cumulative GNI by 2020 (RM Million)	Investment by 2020 (RM Million)	Total employment by 2020 (persons)
Production and Commercialisation of Biocompatible Orthopaedic Medical Devices	4.19	9.73	21.01	29
Total New Project Contributions in 2017	4.19	9.73	21.01	29

Total Impact of BTP's Healthcare Bio in 2017

GNI in 2020

RM4.19 Million

Cumulative GNI by 2020

RM9.73 Million

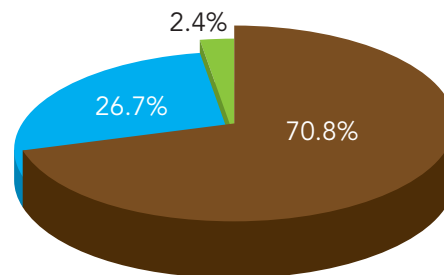
Investment by 2020

RM21.01 Million

TOTAL EMPLOYMENT BY 2020:
29 persons

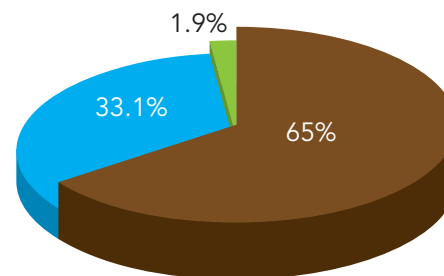
Bioeconomy Transformation Programme

Key Success Summary In 2017



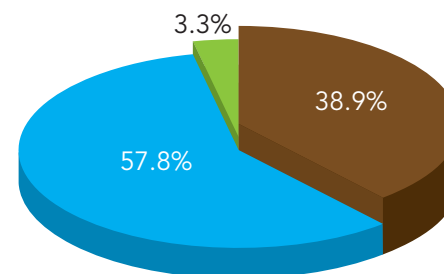
Overall GNI in 2020

RM177.74 Million



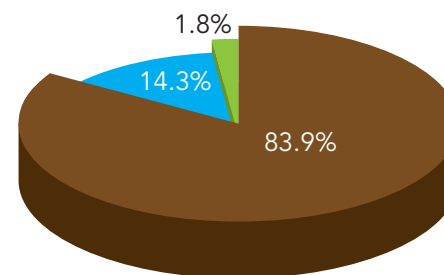
Cumulative GNI by 2020

RM523.88 Million



Investment by 2020

RM645.09 Million



Total employment by 2020

1,569

■ AgBiotech ■ BioIndustrial ■ Healthcare Bio

Bioeconomy Transformation Programme

Seminars & Awareness Programmes

BTP organises key awareness projects to:

- Make both private and public sectors aware of the programmes and initiatives offered by Bioeconomy Corp
- Act as a networking platform to create stronger collaborations between the private and public sectors
- Facilitate avenues for higher participation of private and public sectors in BTP, Bioeconomy Community Development Programme (BCDP), and BioNexus initiatives
- Act as an accelerator to achieve the targeted impacts for bioeconomy growth as outlined by the nation's National Biotechnology Policy (NBP)

Bioeconomy Day 2017

14 March 2017

Intercontinental Hotel, Kuala Lumpur

An annual event which provides awareness on programmes and initiatives available under Bioeconomy Corp. This event also involved a forum on development of a sustainable bioeconomy ecosystem in Malaysia, sharing of success stories on bio-based companies that have been facilitated by Bioeconomy Corp as well as an industry engagement and business matching session.

BioBorneo and Bioeconomy Day 2017

9 May 2017

Imperial Hotel, Kuching, Sarawak

First held in the year 2012, BioBorneo has since been hosted alternately between Sarawak and Sabah, annually. Jointly organised by the Ministry of Science, Technology and Innovation of Malaysia (MOSTI), Bioeconomy Corp, and the Sarawak Biodiversity Centre, the theme for this year's forum was "Driving Bioeconomy for Rural Transformation".

EVENT HIGHLIGHTS | 14 Mar 2017



Bioeconomy Day 2017 was launched by YB Datuk Wira Dr. Abu Bakar Mohamad Diah, Deputy Minister of MOSTI.



Award presentation to BTP project owners and BioNexus Status companies.



Forum on Developing a Sustainable Bioeconomy Ecosystem in Malaysia.



Participants get involved in a valuable industry engagement and business matching session.

EVENT HIGHLIGHTS | 9 May 2017



BioBorneo and Bioeconomy Day 2017 was launched by YBhg. Datuk Seri Dr. Mohd Azhar Hj. Yahaya, Secretary General of MOSTI.



Participants getting involved with Plenary Session 1: Driving Bioeconomy for Rural Transformation.



Ahmad Helmi Abdul Halim, Senior Director of MIMOS Berhad presented on a topic, "Utilising ICT as Accelerator of Bioeconomy in Malaysia".



Participants learn about Bioeconomy Corp's programmes and initiatives during the workshop session.

Bio-Agropreneur Programme 2017 12 September 2017 Kuala Lumpur Convention Centre

In an effort to maximise bioeconomy's growth potential, Bioeconomy Corp organised the Bio-Agropreneur Programme during BioMalaysia 2017 to provide awareness to the public on the existing programmes and initiatives under the Ministry of Agriculture and Agro-based Industry (MOA) and Bioeconomy Corp, which can benefit bio-agropreneurs.

EVENT HIGHLIGHTS | 12 Sep 2017



Bio-Agropreneur Programme 2017 was officiated by YBhg Tan Sri Zakri Abdul Hamid, Chairman of Bioeconomy Corp.



Presentation by Bioeconomy Corp on BCDP.



Exchange of Documents and Launch of BCDP Projects.



Presentation by MOA on the Initiatives and Programmes for bio-agropreneurs.



Forum on Development of Bio-Agropreneur Ecosystem.

Bioeconomy Transformation Programme

Research, Papers & Reports

BTP provides a platform for the government and leading industry players to work in tandem to set the national agenda for the application of biotechnology in three out of nine thrusts outlined in the NBP; namely AgBiotech, BioIndustrial, and Healthcare Bio.

The goal is to put in place the structural conditions required and develop the necessary mechanisms to ensure that policies have the flexibility to adapt the new market and global opportunities of commercialisation.

In 2017, BTP worked on the following to contribute to these objectives:

Bioeconomy Corp Progress Report 2016

- Comprehensive updates on current issues in domestic and international markets of bio-based industries in 2016.
- A promotional instrument to raise awareness of Bioeconomy Corp's programmes and schemes.

Bioeconomy Corp Progress Report 2017

- Comprehensive updates on current issues in domestic and international markets of bio-based industries in 2017.
- A promotional instrument to raise awareness of Bioeconomy Corp's programmes and schemes.

Towards A Bioeconomy Nation: Rethinking Industries

- The article highlights the influences of bioeconomy and its impact to Malaysia as the country continues to strive ahead towards attaining a high-income nation status.

Bioeconomy Malaysia Report: The Influences of Bioeconomy and its Structural Changes in Malaysia: 2005 – 2015

- The report is to analyse the influences of bioeconomy and its structural changes to the Malaysian economy from year 2005 to 2015.

UN-FAO: Assessing Bioeconomy Contribution to Countries' Economy

- Prepared by UN FAO team with inputs from FAO International Sustainable Bioeconomy Working Group (ISBWG) with Zurina Che Dir as a member.
- Report on bioeconomy priorities, with the agri-food focus area identified as a priority for middle income countries like Malaysia.

Bioeconomy Transformation Programme

Moving Forward

BTP anticipates that 2018 will see ongoing difficult global economic conditions and shifting investment policies which will continue to limit foreign direct investments (FDI) into Malaysia. This indicates that investments and growth in the bio-based sector will primarily be driven by domestic direct investments (DDI).

To move forward under these anticipated circumstances, BTP's plans for 2018 include:

1. Leveraging identified DDIs

BTP will collaborate with external and internal stakeholders, including economic corridors and other agencies.

2. Promoting further geographical balance of BTP trigger projects

BTP will aim to improve the number of trigger projects in states which currently have small numbers of projects. These target states include Melaka, Kelantan, and Sarawak.

3. Raising awareness of bioeconomy

In order to target DDIs, BTP will continue striving to raise and promote awareness of the nation's bioeconomy through events such as Bioeconomy Day, BioMalaysia, and BioBorneo.

4. Facilitating funding for BTP projects

BTP will collaborate with the Funding Advisory and Biotechnology Commercialisation Fund (BCF), as well as engage with other investment agents such as economic corridors, to facilitate funding for BTP projects aligned with the BTP and bioeconomy agendas.

BTP will give greater priority to funding for the following focus areas, which were identified to experience growth on the domestic front based on internal analysis and insights:

- Industrial Bioeconomy Upstream Inputs
- Biochemicals from Renewable Resources
- Biomaterials from Renewable Resources
- High-Value Bioingredients

- High-Value Food Ingredients
- High-Value Horticulture Inputs
- Biopharmaceuticals
- Biocompatible Medical Devices

5. Conducting trainings and seminars

BTP will conduct a new initiative of trainings and seminars related to:

- securing financing,
- creating market access to further enhance engagement with the public, and
- addressing the needs and pressing challenges faced by BTP companies.

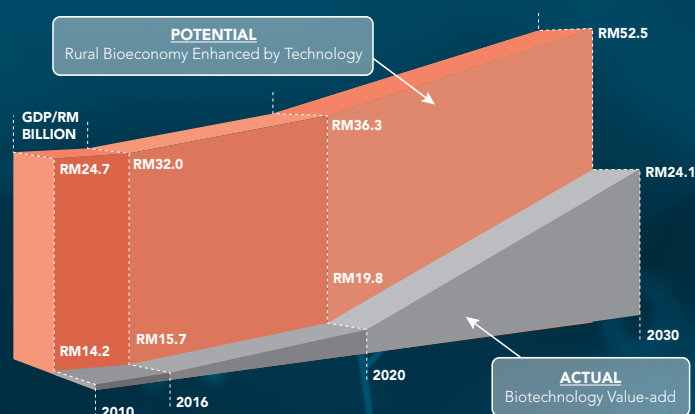
Economics & Stakeholder Engagement

Strengthening Rural Bioeconomy as a Key Bioeconomy Driving Force

The Bioeconomy Community Development Programme (BCDP) is spearheaded by Bioeconomy Corp's Economics & Stakeholder Engagement department.

BCDP primarily focuses on elevating the socio-economic status of rural communities by developing relevant idle lands through the application of biotechnology. In doing so, BCDP opens up a new avenue for wealth generation for participants through bioeconomy and positions rural bioeconomy as a major contributor to the nation's bioeconomy agenda.

Rural bioeconomy plays a significant role as a central upstream component in production. Based on stimulated growth rate of 15%, rural segments of the bioeconomy can contribute RM24.1 billion to the Malaysian Gross Domestic Product (GDP) in 2030. This could reach RM52.5 billion and beyond by 2030 through proper strategic direction, facilitation and nurturing of advanced bio-based technology across the sector.



Rural bioeconomy has significant potential to be developed as a major contributor to the nation's economic growth.

By positioning itself as the prime mover in the implementation of BCDP, Bioeconomy Corp aims to leverage Malaysia's comparative advantage in natural resources to tap into many breakthrough opportunities in the upstream agriculture positioned within rural bioeconomy. This simultaneously ensures guaranteed income for rural communities while improving livelihoods through the rising forces of rural bioeconomy.

Economics & Stakeholder Engagement

Optimising the Nation's Bioeconomy by Targeting the Upstream Production Value Chain

As a supplier of raw materials, rural bioeconomy plays a key role in the future design of the downstream bioeconomy sector.

BCDP's holistic approach on the upstream production value chain has a cascading impact across the entire bioeconomy by securing a steady, high-quality local source of raw materials.

Bioeconomy Corp aims to uplift rural bioeconomy and shape the industry by applying elements of bio-based technology into this upstream sector. These bio-based technologies include innovations such as marker assisted selection (MAS), tissue culture, and extraction of active compounds to improve quality and yield of raw materials.



Economics & Stakeholder Engagement

Expanding the Bioeconomy with Bio-based Technology

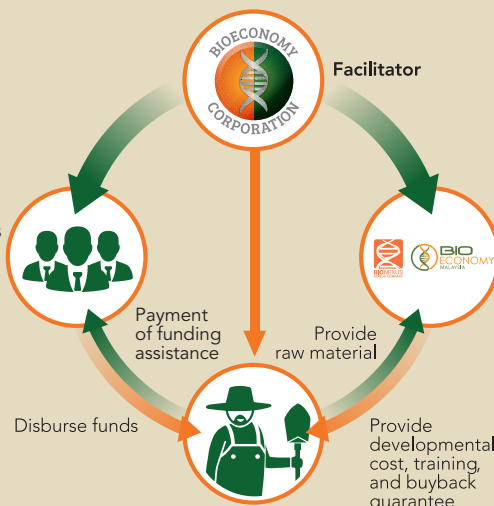
Bioeconomy Corp has strengthened the upstream production value chain by injecting business model innovations into conventional contract farming models such as the inclusion of a “buyback guarantee”.

This initiative ensures rural communities receive direct transfer of knowledge, training and technology from anchor companies in the bioeconomy sector, raising the skill level of participants to become bio-agropreneurs. As a result, the rural bioeconomy can provide a constant supply of improved outputs that enable downstream companies to expand production capacity, address new markets, and further drive demand for raw materials which continually expands the nation’s overall bioeconomy.

BCDP Business Model Innovation

Mechanism

- 1** Funding Agencies disburse funding for BCDP Projects to cooperatives/associations/participants
- 2** Cooperatives/associations/participants will utilise funding for training and necessary farming purchases
- 3** Guaranteed buyback by BioNexus Status companies and/or BTP Trigger Project owners from the participants to ensure guaranteed income to the participants
- 4** BioNexus Status companies and/or BTP Trigger Project owners will provide technical/training assistance to the cooperatives/associations/participants
- 5** Cooperatives/associations/participants will pay back the funding assistance to the funding agencies
- 6** Bioeconomy Corp, as the lead agency, facilitates BCDP



The application of bio-based technologies and buyback guarantee agreement in BCDP projects provide a distinct advantage over other conventional contract farming.

Benefits of BCDP

PARTICIPANTS / COOPERATIVES / ASSOCIATIONS



- 1** Potential additional income for the participants
- 2** Increase multiplier effects on the economy, positive impact on the income, and welfare of the people
- 3** Guaranteed income for contract farmers through buyback agreement from BioNexus Status companies and/or BTP Trigger Project owners
- 4** Link community with the bio-based industry



BIONEXUS STATUS COMPANIES / BTP TRIGGER PROJECT OWNERS



- 1** Increase revenue for BioNexus Status companies and/or BTP Trigger Project owners
- 2** Obtain sustainable supply and high-value raw materials
- 3** Increase import substitution to the country

Economics & Stakeholder Engagement

Projects in Malaysia



2015	2016	2017
342 participants	405 participants	2,117 participants
1,624 lives indirectly impacted	1,944 lives indirectly impacted	9,527 lives indirectly impacted



Economics & Stakeholder Engagement

Moving Forward

Implementation of BCDP has played a crucial role in improving rural economies and livelihoods of the bottom 40 per cent household income group (B40 household). To continually enhance inclusiveness and improve the household income of B40, BCDP will focus on developing the following four strategies:



Leveraging on bio-based companies

- Leveraging on BioNexus Status companies and/or BTP Trigger Project owners as anchor companies to provide buyback guarantee, training, and technical/technology for BCDP projects.



Strategic stakeholder partnerships

- Increase participation of farmers, cooperatives and/or associations in BCDP through collaborations with relevant Ministries, Agencies, States, Corridors and Universities/ Research Institutions.



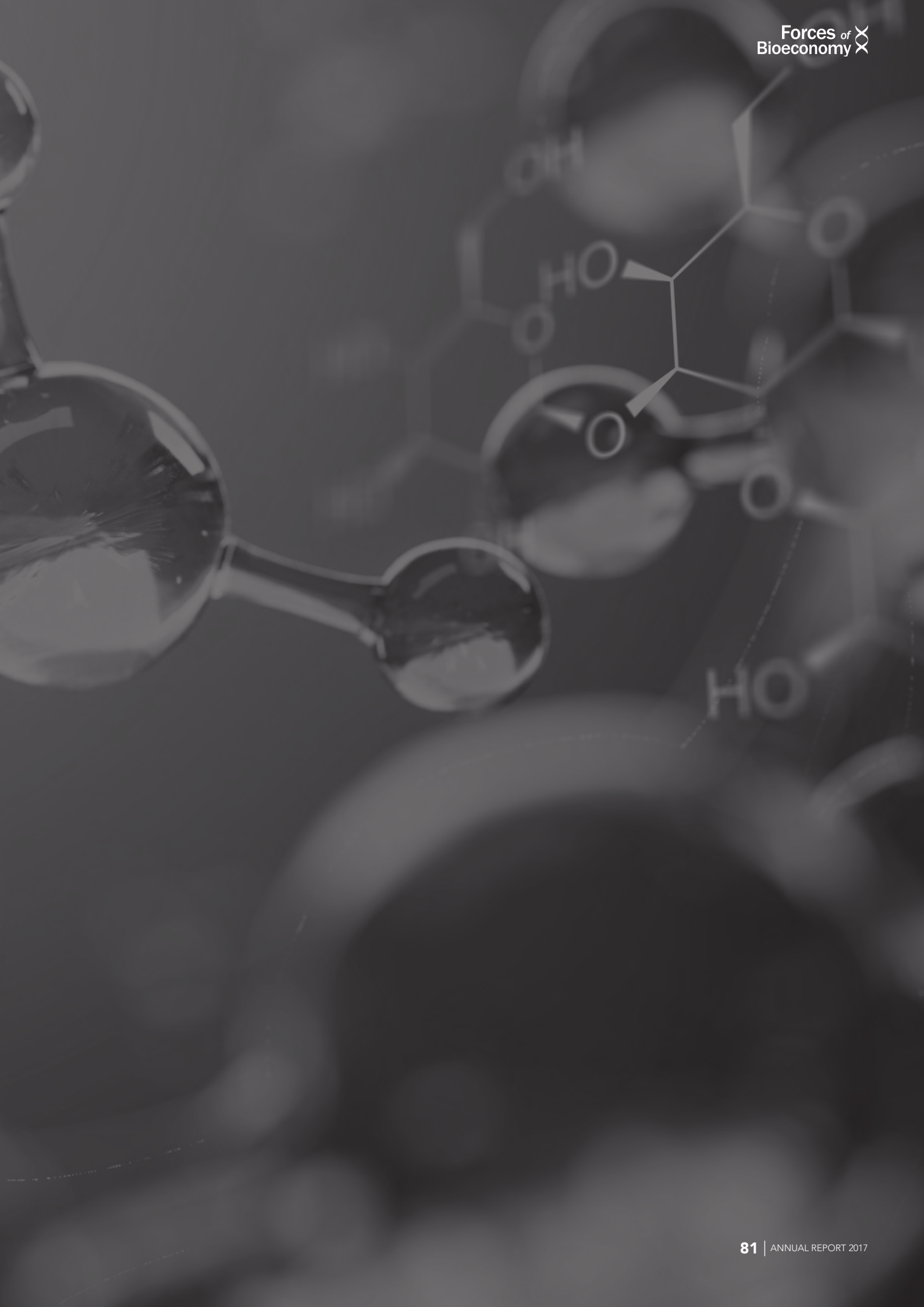
Focus on strategic sub-sectors

- High-Value Herbs, Seeds Production, Aquaculture, Pineapple Farming, Mushroom Farming, Bee Farming, Biomass Waste, High-Value Horticulture.



Funding and incentives

- Leveraging on existing funding and incentives available under existing programmes.







BUILDING WORLD-CLASS BIO-BASED COMPANIES

Business Advisory & Development

Malaysia is the second country in Asia and first country in South East Asia to announce a national bioeconomy initiative. Having entered the last phase of Malaysia's National Biotechnology Policy (NBP), the focus of our Business Advisory and Development division is on globalising the business of BioNexus Status companies, developing human capital in biotechnology, and positioning Malaysia as an internationally competitive player in bioeconomy.

Business Advisory & Development

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Commercialisation & Entrepreneurship

Creating Awareness & Business Opportunities in Biotechnology

Malaysia's bio-based industry is set to grow at a faster pace as most players have moved on from acquiring relevant technologies to producing actual goods in big volumes.

Unlike previous years, 2017 saw more companies increasing their production volume. This made it an ideal time for BioNexus Status companies, who are now producing bio-based products to enter global markets.

To do this, our Commercialisation & Entrepreneurship department has focused on organising projects and initiatives which position key BioNexus Status companies on an international stage, connect them to global markets, and capture potential investments.

Key Projects in 2017

The following projects and initiatives were conducted in 2017 to meet these objectives and fulfil the vision of positioning Malaysia as an internationally competitive player in bioeconomy.

Build Your Own Product Pavilion at BioMalaysia 2017 Kuala Lumpur Convention Centre 11-13 September 2017

Build Your Own Product (BYOP) Pavilion was a dedicated area which allowed companies to:

- Promote their services and sell products under their own brand
- Connect with large Malaysian retailers to tap into mass distribution
- Recruit independent agents/stockists to expand distribution into niche areas
- Increase public awareness of homegrown bio-based services and products

BioNexus Status companies that participated in BYOP Pavilion:

1. **Persona Kosmetik Sdn Bhd** - homegrown champion of bio-based healthcare and cosmetics
2. **Algaetech International Sdn Bhd** - a pioneer in production and commercialisation of algae-derived high-value products suitable for nutraceutical purposes
3. **BioAlpha R&D Sdn Bhd** - an agro-based health supplement company leveraging on local resources and contract farming
4. **Hopematic Sdn Bhd** - a leading GMP certified manufacturer specialising in health food, traditional herbal supplements, and herbal-based powder drinks
5. **Tropical Bioessence Sdn Bhd** - a manufacturer of essential oils and herbal extracts from Malaysian local medicinal and aromatic plants
6. **Proliv Life Sciences Sdn Bhd** - producer of preclinical evidence-based traditional medicine and supplements
7. **Orchid Life Sdn Bhd** - a leader in tropical agrobiotechnology

Potential deal value captured in BYOP Pavilion: RM3.7 million

Market Access Initiative

Market access initiatives allowed BioNexus Status companies to:

- Increase awareness of their products and services to the global market
- Enhance and accelerate their commercialisation activities
- Open opportunities for investments
- Increase public awareness of homegrown bio-based services and products

Organised participation of BioNexus Status companies in three market access initiatives:

1. **Caexpo Naning, China** - 12-15 September 2017
2. **Business Matching during BioMalaysia 2017** - 11-13 September 2017
3. **Closed-door session with Vitacare Pharmacy** - 23 October 2017

Potential deal value captured in 2017 market access initiatives: RM1.4 million

Product Launches

Product launches allowed BioNexus Status companies to:

- Highlight their contribution in adopting bio-based innovations
- Raise standards of locally-made products
- Increase public awareness of homegrown bio-based services and products

10 new products by eight BioNexus Status companies were successfully launched in 2017:

1. **PREMIA Astaxanthin Eggs**
by Algaetech International Sdn Bhd
2. **SUTRA ROSE – Personal Care Products**
by Tropical Bioessence Sdn Bhd
3. **Cordyceps Sinensis**
by Ligno Biotech Sdn Bhd
4. **Moringa Berry and Noni Berry -**
by Bio Tree Biotechnology Sdn Bhd
5. **BioArth**
by Hopematic Sdn Bhd
6. **Careena and Elescaid**
by Proliv Life Sciences Sdn Bhd
7. **Nevgro**
by Ganofarm R&D Sdn Bhd
8. **MAGIXZYMAX Super Radiator Flush**
by Airstec Sdn Bhd

SUPERB Fund by TERAJU

Skim Permulaan Usahawan Bumiputera (SUPERB) provides a grant of up to RM500,000 to finance aspiring Bumiputera entrepreneurs and companies incorporated less than three year, with innovative and creative business ideas.

Bioeconomy Corp is the collaborating agency and serves as part of the SUPERB Selection Committee. Our responsibilities include:

- Serving as a panel member in SUPERB audition, SUPERB semi-final pitching, and SUPERB Monitoring Committee
- Disbursing the grant to SUPERB grant recipients
- Nurturing, mentoring, and monitoring SUPERB grant recipients in accordance to milestones approved by the SUPERB Monitoring Committee

Bioeconomy Corp nurtured the following 13 SUPERB winners in 2017:

1. Kamuda Sdn Bhd
2. APC Nature Farm Sdn Bhd
3. SHE Empire Sdn Bhd
4. Addin Aquaculture Sdn Bhd
5. Maiza Integrated Resources Sdn Bhd
6. Louis Eco Farm Sdn Bhd
7. Euryvative Sdn Bhd
8. Decoponix Sdn Bhd
9. Bioanalytical Quest Sdn Bhd
10. Mutiara Figs Sdn Bhd
11. Glycobio International Sdn Bhd
12. Chenda Agrotech Sdn Bhd
13. Rekasihat Sdn Bhd

Commercialisation & Entrepreneurship

Moving Forward: Business Opportunities

To continue driving Malaysia forward as a global bioeconomy force, the following plans and initiatives will be continued:

BioMalaysia

BioMalaysia is an annual premier biotechnology event in Asia Pacific and the largest trade exhibition of biotechnology in Malaysia. The event aims to:

- Create global market access for BioNexus Status companies
- Strengthen Bioeconomy value chain via public-private collaborative programmes
- Provide a platform for business-to-business (B2B) networking and business-to-consumer (B2C) activities
- Increase the number of entrepreneurs and companies in the area of bio-based industry
- Advocate the bioeconomy agenda to the rakyat
- Promote the IR4.0 and TN50 agenda
- Launch new products of BioNexus Status companies



Commercialisation & Entrepreneurship

BioShoppe: Focus Areas

Bioeconomy Corp created BioShoppe as the commercialisation platform for products from BioNexus Status companies. Initiated in 2013, BioShoppe is present in seven stores nationwide as of the end of 2017:

- **SutraShoppe, Subang**
B-20-G, Komersial Arena Bintang, Seksyen U5, Jalan Zuhai U5/178, 40150 Shah Alam, Selangor
- **SutraShoppe, Shah Alam**
78, Jalan Renang 13/26, Tadisma Business Park, 40100 Shah Alam, Selangor
- **SutraShoppe, Seremban 2**
No 65-G Jalan S2 B21, Pusat Dagangan Seremban 2, Seremban, Negeri Sembilan
- **Super Pharmacy Megastore**
Section 19, Petaling Jaya, Selangor
- **Bioeconomy Corp HQ**
Level 16, Menara Atlan, Jalan Ampang, Kuala Lumpur
- **BioShoppe (Operated by Prumera Sdn Bhd)**
Lot G-02, Ground Floor, Urban Transformation Centre (UTC) Alor Setar, Kedah
- **Pusrawi**
Lot 15B, Level 5, MTBD, KL International Airport (KLIA), 64000 Sepang, Selangor

Attract and develop new bio-based entrepreneurs

ATTRACT



INCREASE

Increase market access and commercialisation of bio-based products in Malaysia

BIOSHOPPE Focus Areas



DEVELOP

Develop BioNexus Status companies to become successful and competitive entrepreneurs



PROMOTE

Promote and market high-quality bio-based products produced by BioNexus Status companies



ENHANCE

Enhance accessibility of BioNexus Status products to the public through exposure in the retail environment

Commercialisation & Entrepreneurship

BioShoppe: Key Success in 2017

BioShoppe Corner Launch

In collaboration with Tropical Bioessences Sdn Bhd, we successfully launched a BioShoppe corner to promote over 150 types of bio-based products at two locations:

- SutraShoppe, Shah Alam in January 2017
- SutraShoppe, Subang in August 2017

Sabah Construction Fair 2017, 24-26 February 2017

Sabah Construction 2017 is the first trade event of its kind in Sabah's construction history. BioShoppe's participation at this event provided a platform to promote and showcase bio-based wellness products to consumers who interact with government authorities, consultants, contractors, subcontractors, specialised contractors, manufacturers, suppliers, traders, and transportation.

BioShoppe Entrepreneur Training, 7-8 March 2017

In collaboration with Majlis Reka Bentuk Malaysia, we successfully organised a training session to enhance entrepreneurship skills of BioNexus Status companies on branding, advertising, and developing strategic directions for BioShoppe.

Bioeconomy Day, 14 March 2017

Bioeconomy Day is designed to maximise the growth potential of the nation's bioeconomy and identify new bio-based projects as well as business opportunities. A BioShoppe awareness session at this event educated consumers and industry players on the benefits of wellness bio-based products.

BioBorneo 2017, 9 May 2017

Themed "Driving Bioeconomy for Rural Transformation", BioBorneo 2017 aimed to explore bioeconomy opportunities in Borneo. This event provided us a platform to introduce BioShoppe products to the bio-based industry in Sarawak and other regional areas.



National Innovation & Creativity Economy Expo 2017 (NICE'17)

NICE'17 was organised by MOSTI. This event served as a platform for the government and industrial sectors to introduce and promote awareness on the benefits of bio-based products and innovations to visitors of the event.

Bioeconomy Corp (BioShoppe Unit) led the wellness cluster in NICE'17 which consisted of various agencies and ministries, as well as businesses showcasing and educating visitors on all aspects of wellness. While serving as a platform for business development, the wellness cluster exemplified how Malaysia's wellness industry has developed and showcased the quality of local wellness products and services available in our country.

Moving Forward: BioShoppe

BioShoppe will focus on the following plans and initiatives to fulfil our main objective of bringing high-quality products produced by BioNexus Status companies and market them under various strategic marketing programmes to enhance their market coverage:

PLANS

1. Promote bio-based wellness products.
2. Develop strong platforms to market and promote bio-based wellness products.

INITIATIVES

1. Identify and actively participate in impactful exhibitions.
2. Identify and collaborate with relevant third parties to showcase and promote the wide range of BioShoppe products.
3. Develop a BioShoppe Online Platform to create easy access for consumers to purchase BioShoppe products.

Regulatory Advisory

Promoting a Progressive Regulatory Framework

Thrust 7 of the NBP emphasises the requirement of a solid and balanced regulatory framework for the development of biotechnology in Malaysia.

In 2017, Bioeconomy Corp continued its engagement initiatives with relevant regulatory authorities to uphold a progressive regulatory framework for the biotechnology sector in accordance with Thrust 7 of the NBP. Bioeconomy Corp provides regulatory advisory and facilitation in six key focus areas.

SIX FOCUS AREAS



1. Biosafety

The Biosafety Act 2007 was introduced to regulate the release and import of living modified organisms (LMOs) and products of such organisms in Malaysia. The Act came into force on 1 December 2009, and was followed by the Biosafety (Approval and Notifications) Regulations in November 2010.



2. Access and Benefit Sharing

The Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilisation to the Convention on Biological Diversity is an international agreement which aims to share the benefits from utilisation of genetic resources in a fair and equitable way. This includes appropriate access to and transfer of genetic resources and relevant technologies.

After a long-drawn consultation process between the federal and state governments which took many years, the Access to Biological and Benefit Sharing Act 2017 was passed by Parliament on 1 August 2017. The Act aims to regulate access to the country's biological diversity and natural resources, as well as enhance existing provisions and laws on forests, wildlife, fisheries, and international trade of endangered species.



3. Intellectual Property

The Intellectual Property Corporation of Malaysia (MyIPO) is responsible for the development and management of intellectual property system in Malaysia. Under Phase 3 of the NBP, focus will be placed on initiatives for companies to monetise their intangible assets and leverage their IP portfolios to obtain financing.



4. Pharmaceutical and Medical Device Regulations

Bioeconomy Corp actively engages with the following relevant regulators and ministries to regulate pharmaceutical and medical devices in the biotechnology sector:

Pharmaceutical Regulations

- Product registration/notification:
National Pharmaceutical Regulatory Agency (NPRA)
- Poison license application:
Ministry of Health (MoH)
- Medical practices and facility setup:
Private Medical Practice Control Section (CKAPS), MoH
- Clinical trial application:
Malaysian Research Ethics Committee (MREC), MoH
- Clinical trial application related to stem cells:
National Stem Cell Research and Ethics Subcommittee (NSCERT), MoH
- Food regulation compliance and facility accreditation:
Food Safety Quality (FSQ), MoH
- Import permit of cell tissues/application:
Disease Control Division (KLIA), MoH
- Clinical research framework:
Clinical Research Management (CRM)
- Import permit of microbes:
Department of Agriculture (DoA), Ministry of Agriculture (MoA)
- Cells related to gene modification:
Department of BioSafety, Natural Resource Environment (NRE)

Medical Device Regulations

- Establishment of licensing and product registration for medical device and in-vitro diagnostics (IVD):
Medical Device Authority (MD), MoH



5. International Accreditation

Bioeconomy Corp actively engages with the following relevant regulators and ministries to oversee international accreditation in the biotechnology sector:

- Good Laboratory Practices (GLP):
National Pharmaceutical Regulatory Agency (NPRA), MoH
- Good Manufacturing Practices (GMP):
NPRA, MoH
- Malaysian Good Laboratory Practices (MyGLPC), BNP laboratories and other BioNexus Status companies' facilities accreditation:
**Department of Standard Malaysia (JSM),
Ministry of Science, Technology and Innovation (MOSTI)**



6. Expatriate Services

Bioeconomy Corp is designated as a Monitoring Agency (Regulatory Body) for the applications of Employment Pass for the bio-based industry. We also provide advisory and facilitation for employers applying for related immigration passes for their expatriate employees.

Regulatory Advisory

Key Projects in 2017



BIOSAFETY ACT 2007

FOCUS AREA: BIOSAFETY

Bioeconomy Corp continues to work closely with the Department of Biosafety, Ministry of Natural Resources & Environment (MONRE) to ensure that the industry, including BioNexus Status companies, comply with the Biosafety Act. Our role includes providing advisory and facilitating submissions for biosafety notification and approval from BioNexus Status companies and potential investors.



ACCESS TO BIOLOGICAL RESOURCES AND BENEFIT SHARING ACT 2017

FOCUS AREA: ACCESS AND BENEFIT SHARING

The Access to Biological and Benefit Sharing Act 2017 was passed by Parliament on 1 August 2017. Bioeconomy Corp was involved in providing industry feedback with regards to the financial mechanisms as well as the drafting of regulations for the Act.



MyIPO

FOCUS AREA: INTELLECTUAL PROPERTY

Bioeconomy Corp continues to support MyIPO by promoting awareness of their IP financing initiatives to BioNexus Status companies and encouraging them to actively access and utilise the online IPR marketplace launched by MyIPO.



REGULATORY ADVISORY AND FACILITATION SERVICES, AWARENESS TALKS AND SEMINARS

FOCUS AREA: PHARMACEUTICAL AND MEDICAL DEVICE REGULATIONS

Alongside providing regulatory advisory and facilitation services to BioNexus Status companies, Bioeconomy Corp organised regulatory talks and seminars with NPRA during Bioeconomy Day and BioMalaysia events. The regulatory team is also actively engaged with MDA on the application of licensed establishment and product registration for medical devices and IVDs.



HARMONISATION OF STANDARDS AND TECHNICAL REQUIREMENTS IN ASEAN

FOCUS AREA: PHARMACEUTICAL AND MEDICAL DEVICE REGULATIONS

To support and assist Malaysian delegates (regulators) in the development of harmonising framework, Bioeconomy Corp engaged and participated in the following ASEAN Technical Working Group (TWG) meetings:

- 27th ACCSQ THMS PWG in Da Nang, Vietnam, 15-19 May 2017
- 28th ACCSQ THMS PWG in Bandar Seri Begawan, Brunei, 23-27 October 2017

These meetings discussed updates on the status of the ATSC, GMP Taskforce, Head of Delegation, and the Taskforce of Regulatory Frameworks to harmonise the regulatory requirements and standards of product registration of traditional medicine and health supplements within ASEAN member countries.



INTERNATIONAL ACCREDITATION ADVISORY AND FACILITATION SERVICES

FOCUS AREA: INTERNATIONAL ACCREDITATION

Bioeconomy Corp provides continuous international accreditation advisory and facilitation services to BioNexus Status companies and BNP labs to ensure smooth business operations and expansion into international markets.



EXPATRIATE SERVICES DIVISION

FOCUS AREA: EXPATRIATE SERVICES

The Expatriate Services Division (ESD) was established under the Immigration Department of Malaysia to provide efficient, effective, and innovative services for expatriates and companies to submit expatriate related immigration matters. The Immigration Facilitation Unit processed the following categories of applications:

Employment Pass Application

- Documentation review and due diligence
- Provides consultancy and advisory
- Provides recommendation to support expatriate application

Residence Pass-Talent Application

- Documentation review and due diligence
- Provides consultancy and advisory
- Provides recommendation and no objection to support expatriate application

Regulatory Advisory

Moving Forward

Bioeconomy Corp will focus on the following plans and initiatives in each of the six focus areas of regulatory advisory and facilitation:

FOCUS AREA: BIOSAFETY

PLANS

Continuous engagement with the Biosafety Department in its efforts to advocate the development of a set of balanced and industry-centric regulations that ensure compliance and facilitates growth of the biotechnology sector.

INITIATIVES

Enhance collaboration with the Biosafety Department by organising talks and events which increase understanding on the operationalisation of the Biosafety Act and its Regulations.

FOCUS AREA: ACCESS & BENEFIT SHARING

PLANS

Enhance engagements and collaboration with the Biodiversity Section of MONRE to raise awareness of the Access to Biological Resources and Benefit Sharing Act 2017 within BioNexus Status companies and the biotechnology industry.

INITIATIVES

Co-organise a workshop on ABS for BioNexus Status companies in a first-time collaboration with the Biodiversity Unit, MONRE.

FOCUS AREA: INTELLECTUAL PROPERTY

PLANS

To leverage on IP valuation training and enhancement programmes organised by MyIPO. This will further equip our experts to assist financiers in valuing biotechnology IPs that can later be used as collateral in obtaining loans from financial institutions. Continuous advisory services on IP-related matters to stakeholders.

INITIATIVES

Continuous support of MyIPO Financing initiatives and collaboration with other partners such as MDV.

FOCUS AREA: PHARMACEUTICAL & MEDICAL DEVICE REGULATIONS

PLANS

1. Continuous advisory and facilitation services to stakeholders.
2. Active participation and the provision of input in regulatory-related committees and meetings.
3. Provision of input and participation in international forums organised by international governing bodies.
4. Strengthen relationship with stakeholders through creating and nurturing holistic partnerships.

INITIATIVES

1. Participation and contribution in the development of pharmaceutical and medical device regulations through Technical Working Groups (TWG).
2. Harmonisation of regulatory framework for ASEAN region.
3. Leveraging our strong relationship with regulatory stakeholders to continuously provide constructive inputs from the industry perspective to drive development of healthcare biotechnology.

FOCUS AREA: INTERNATIONAL ACCREDITATION

PLANS

Strengthen relationship with stakeholders through creating and nurturing holistic partnerships.

INITIATIVES

1. Continuous support of all initiatives that encourage test facilities from BioNexus Status companies and BNP laboratories to be OECD certified. This provides easy access to the international market without going through duplicative testing, thus saving cost, time, and resources as well as reduce trade barriers.
2. Continuous engagement and advisory services to BioNexus Status companies to comply with relevant GxP requirements.
3. Continuous engagement and support to relevant stakeholders on accreditation programmes and initiatives.

FOCUS AREA: EXPATRIATE SERVICES

PLANS

1. Provide advisory and facilitation to the bio-based industry in expatriate applications.
2. Enhance expatriate services in Malaysia by further engaging and collaborating with TalentCorp, Immigration Department of Malaysia, and other relevant agencies or ministries.

INITIATIVES

1. Resume expatriate application services.
2. Provide additional expatriate value-added services in the future.

BioAcademy

Creating a Pathway that Shapes the Bioeconomy

Human capital development is one of the most important driving forces of bioeconomy and is thus recognised as an essential component of the biotechnology ecosystem in the NBP.

BioAcademy acts as the premier facilitator for developing talent and nurturing talent capability within the industry. This is aligned with Thrust 5 of the Strategic Thrust of Ministry of Human Resources (MOHR), which entails the development of skilled and competent human resources.

BioAcademy's aim is to inspire graduates to pursue bright careers in biotechnology through programmes that focus on the following three key areas:

- 1 **SKILLS**
- 2 **TALENT**
- 3 **EDUCATION**

Key Success & Projects in 2017: Skills

FOCUS AREA

Skills

OBJECTIVE

To ensure an adequate supply of skilled workforce in the industry

BioTechies PROGRAMME

As the organisation assigned by the Malaysian Board of Technologies (MBOT) to cover bio-based, biotechnology, and life sciences industry, BioAcademy launched the BioTechies programme in 2017.

The programme is a short-term intensive training designed for continuous personal skill development amongst biotechnology and bio-based related graduates. This programme:

- Aims to address the skills gap issue within the biotechnology and bio-based related industry in Malaysia
- Equips biotechnology graduates and talent with a comprehensive training and in-depth hands-on practical that increase their technical skills in applying knowledge
- Delivers specific technical training programmes not widely offered by independent training providers
- Facilitates technical training programmes that give a full hands-on experience
- Offers upskilling and reskilling approaches of technical programmes

Key Success and Project Highlights of BioTechies Programme in 2017

- Successfully organised three training programmes nationwide
- Impacted a total of 77 participants

MALAYSIAN BOARD OF TECHNOLOGIES (MBOT)

As a member of MBOT, Bioeconomy Corp helps to facilitate talents within the biotechnology field to be registered as a Professional Technologist. This covers:

- **Recognition** of graduate technologists and qualified technicians
- **Recognition** of professional technologists and certified technicians
- **Accredit programmes** in Institute of Higher Learning with the involvement of Technology Expert Panel (TEP) members
- **Talent matching/Industrial chambering** for graduates and professionals
- **Industrial collaboration** with respective technology fields under the formation of TEP

MBOT MEMBER BENEFITS

- **Recognition** as a member of an upcoming professional organisation
- **Networking and interaction** with like-minded multi-disciplinary professional from public and private sectors, as well as on international platforms
- **Professional sharing** of aspiration, knowledge expertise, and enthusiasm in education and training, research and development, and industry
- **Comprehensive opportunity** in Continuing Professional Development (CPD) and lifelong learning
- **International recognition** for professional skills practice

Key Success & Projects in 2017: Talents

FOCUS AREA

Talent

OBJECTIVE

To facilitate industry talent development & capacity building

STUDIO 1310 (BIO)

First launched during BioCareer 2015 in conjunction with BioMalaysia & Bioeconomy Asia Pacific 2015, Studio 1310 is a finishing school programme to groom future talents for the working environment, as well as a platform to raise awareness of biotechnology in Malaysia.

Components of Studio 1310 (BIO) :

- On-site recruitment
- Grooming and personal enhancement
- Career coaching
- Posing for success
- Career kit and preparation
- Resume designing and name card printing

Key Success and Project Highlights of Studio 1310 (BIO) in 2017

BioAcademy conducted Studio 1310 (BIO) at:

- UniKL MICET
- Monash University
- Universiti Kebangsaan Malaysia (UKM)

BIOEDUCATION FAIR / BIOCAREER FAIR AT BIOMALAYSIA 2017

- A networking platform for bio-based industry players to connect with future talent
- An opportunity for biotechnology and life sciences graduates to explore employment opportunities
- Components of BioEducation Fair:
 - ▣ **On-site interview:** By invitation and complimentary for companies
 - ▣ **BioKerjaya:** Specialised and Personalised Advisory (SPA)
 - ▣ **Biotechies:** A short-term intensive training designed for continuous personal skill development in bio-based industries
 - ▣ **BioKerjaya portal:** An online job portal that matches employers looking for top talents with students or graduates seeking employment or internship opportunities

Key Success and Project Highlights of BioEducation / BioCareer Fair in 2017

- Total number of visitors for BioCareer @ BioMalaysia 2017: 897

BioAcademy

Key Success & Projects in 2017: Education & Knowledge Network

FOCUS AREA

Education

OBJECTIVE

To increase public awareness of biotechnology and STEM learning, as well as to increase visibility of the institution

SCIENSATION BIO

This interactive hands-on programme connects school students with BioAcademy to learn about biotechnology and experience its applications, which enables them to develop an interest to pursue higher learning in biotechnology. Through simple and fun activities, the programme :

- Helped students comprehend the importance of biotechnology in daily life based on the theme, "Biotechnology – Fuel, Feed, Heal the World"
- Promoted public understanding of the sciences of biotechnology and career choices in bio-based and biotechnology industries
- Developed public interest to pursue studies in biotechnology in line with STEM education
- Increased appreciation of how biotechnology can promote a better economy for Malaysia

Key Success and Project Highlights of Sciensation in 2017

- Sciensation BIO was showcased at NICE '17, a premier event for researchers and educators to convey to the public works relating to science, technology, and innovation
- Formed strong partnerships with University Putra Malaysia, University Kebangsaan Malaysia, RQuest Convergence, and UniKL – MICET Melaka in product demonstration and also agencies on STEM learning

LIBRARY BIO

As the only specialised library in Malaysia providing information network and knowledge-sharing in the field of bioeconomy and bio-based industry, Library BIO houses over 5,000 hard copies and online resources in bio-based life sciences. Library BIO:

- Serves as a catalyst to a competitive nation by providing access to knowledge and education
- Is a verified source that provides industry updates to stakeholders
- Expands education and knowledge dissemination through new ventures to explore the e-learning platform

Key Success and Project Highlights of Library BIO in 2017

- Collaboration with other corporate libraries, academic libraries, and knowledge centres
- Fulfilling the educational, intellectual, information and social aspirations of users through cooperative provision, superior quality library resources, and value-added services

BioAcademy

Moving Forward

BioAcademy will focus on the following plans and initiatives in each of the three focus areas to drive human capital development in bioeconomy:

FOCUS AREA	PLANS & INITIATIVES
Skills	<ol style="list-style-type: none">1. To develop short-term intensive training designed for continuous personal skill development in bio-based industries.2. To develop a continuous programme with more diverse training scope.
Talent	<ol style="list-style-type: none">1. Continuously partner with other universities to reach talents via Studio 1310.2. Promote job opportunities for graduates in biotechnology via BioKerjaya portal.
Education	<ol style="list-style-type: none">1. Develop more educational products relevant to the industry.2. Become the main source of information to stakeholders via BioIndustry Infobank.3. Develop Library BIO as a gateway for stakeholders and other trainings organised by BioAcademy.4. Inculcate interest, awareness, and appreciation among public/school students on how biotechnology impacts their daily lives through Sciensation BIO.

Funding Advisory

Supporting the Nation's Bio-Based Industry

The Funding Advisory department facilitates bio-based ventures to secure funding from various sources to support the advancement of knowledge in bio-based companies as well as providing the means required to commercialise, expand, and contribute towards growing the nation's bioeconomy.

Its key objectives include:

1. **Promoting and facilitating investments** and capital-raising for bio-based industries.
2. **Collaborating with stakeholders** in developing the funding ecosystem to support the bio-based industry.
3. **Investor relations activities** to bridge the gap between the investing community and bio-based industry players.

THREE-PRONGED APPROACH TO SECURE FUNDING

Funding Approach

- **Government Incentives & Soft Loans**
 - o Continuous engagement with government ministries and agencies
 - o Includes grants from Ministries and other government funding agencies
- **Equity Market**
 - o Continuous engagement with capital market players, corporate investors, crowd funders, and angel investors
 - o Continued collaboration with regulators and platform owners to tap into new avenues, including:
 - ▶ Recent initiatives by capital market players and regulators
 - ▶ Licensing equity of crowdfunding platforms in 2016
 - ▶ Creation of LEAP SME feeder market on Bursa Malaysia
 - ▶ Licensing of peer-to-peer lending crowdfunding platforms in 2017
- **Debt Market**
 - o Continuous engagement with lending institutions, development finance institutions, and micro-financiers

Funding Advisory

Key Projects in 2017

Sharing session with Malaysian Debt Ventures (MDV) May 2017

Jointly held with MDV at Menara Atlan, this session informed the bio-based companies attending of the various financing products and solutions provided by MDV, which they can access or apply for.

"Catch the Fund!" at BioMalaysia 2017 September 2017

"Catch the Fund!" was an interactive session held at BioMalaysia 2017. The session, which was run in collaboration with MOSTI and MTDC, was open to the public. Attending bio-based companies and the public alike gained information on:

- Processes, requirements and costs related to grants currently provided by MOSTI:
 - SMART Challenge Fund
 - InnoFund
 - Facilitation Fund
- MTDC financing products:
 - Commercialisation of Research & Development Fund (CRDF)
 - Technology Acquisition Fund (TAF)
- Biotechnology Commercialisation Fund 2.0 (BCF2.0):
 - A Bioeconomy Corp initiative promoted by the BioNexus and the Bioeconomy Transformation Programme (BTP) departments

IMPACT OF "CATCH THE FUND!"

- **21 Bio-based Companies** participated in the consultation session.
- **MOSTI grants: Nine Companies** expressed interest in MOSTI grants and requested for more information, of which three have submitted application with another two applications expected to be received.
- **MTDC funds: Seven Companies** expressed interest in MTDC funds and requested for more information.
- **BCF 2.0: Five Companies** expressed interest in BCF 2.0 and requested for more information.

"Digital Free Trade Zone" Workshop September 2017

Held in collaboration with MATRADE and SME Corporation, this workshop promoted funds and programmes under MATRADE and SME Corporation. The informative session also covered the criteria, eligibility, and application process to participate in the available programmes, thus allowing bio-based companies to capitalise on the growth of the internet economy.

IMPACT OF "DIGITAL FREE TRADE ZONE!"

- **Facilitated eTrade applications**
For companies to access grants under MATRADE's eTrade programme.
- **Five approved eTrade grants**
To date, five applications for MATRADE's eTrade programme has been successfully approved.

Collaboration with Taiwan Stock Exchange (TWSE) / Taipei Exchange (TPX) October 2017

Briefing session held by the top management of TWSE on the viability of listing on the Taiwan exchanges. The event was attended by companies identified to be ready and suitable for listing in Taiwan.

IMPACT OF COLLABORATION WITH TWSE

- To date, via engagement with TWSE and its listing partners, several companies are looking into IPO on the TWSE/TPX.

Funding Advisory

Moving Forward

The Funding Advisory team will focus on the following plans and initiatives to continually support bio-based companies and projects:

1. Building on Investor Relations to bridge the gap between funder/investors with bio-based industries
2. Promote Biotechnology to the Investing Community so they have more awareness and better understanding of the lucrative future potential of bio-based industries
3. Partner with Accelerators & Incubators by jointly organising entrepreneurship programmes to build readiness for companies to secure funding



UNLEASHING THE BRIGHT FUTURE OF BIOTECHNOLOGY

Innovation Enablement

Scientific breakthroughs in biotechnology can step up to solve the greatest challenges facing our society, whether it is finding a cure or treatment for diseases or creating renewable energy sources. In the fast-paced field of changing technology, supporting discoveries, and innovations in biotechnology are thus key to ensure research is transformed into marketable products which will drive the bioeconomy.

Government policies and industry support are pivotal to support and nurture bio-based companies to unleash the potential and promise of biotechnology in Malaysia. Under the Ninth Malaysia Plan's Biotechnology Acquisition Programme (BAP), Bioeconomy Corp initiated the acquisition of bio-based technology platforms in 2007 to facilitate the development of core biotechnology areas, unleash necessary innovations, and establish an advanced biotechnology industry in Malaysia.

Innovation Enablement

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Innovation Enablement

A Catalyst for World-Class Innovations

Companies and research institutions tirelessly strive to produce new products, technologies and services through continued R&D and innovations. However, some of these innovations are not yet commercial-ready and require assistance such as analysis/testing services, access to pilot/platform technologies, funding, market access, and collaboration with industry partners.

The Innovation Enablement division addresses these gaps by offering the following services:

1 BioNexus Partners (BNP) Laboratories

The BNP Laboratories has been established to provide analytical and technical support to bio-based companies by helping to source out their research, development and commercialisation needs through our network of laboratories and expertise. The services provided by BNP Laboratories are as follows:



Crop
Biotechnology



Medical Device &
Biopharmaceuticals



Herbal, BioCosmeceuticals
& Wellness



Bioprocess
Engineering



Food Technology
& Food Safety



Bioanalytical
Services



Genomics &
Bioinformatics



Ecotoxicity
& Environmental



Halal
Bioproduct

2 Technology Support

As part of enabling innovation in the nation's biotechnology industry, the following commercial-ready platform technologies that provide various genotyping and extraction services are made available for companies to access:

- Marker Assisted Selection (MAS) – DNA Marker development of desired traits for plant, livestock, and aquaculture breeding.
- Supercritical Fluid Extraction (SFE) – High purity extraction facility for extraction of plant components utilising supercritical carbon dioxide as the extraction media.



MAS



SFE

3 Academia-Industry Support (AIS)

Formerly known as University-Industry Partnership, the AIS division strives to advise, support, and assist researchers in the commercialisation and take-up of bio-based projects, as well as to facilitate business matching activities between university and access to funding and markets with the aim to develop bioentrepreneurs. The three main focus areas of AIS are:

- Industry-Academia Collaboration
- Facilitation of Bio-based Start-up or Spin-off
- R&D Commercialisation

Innovation Enablement

Key Projects in 2017: BioNexus Partners (BNP) Laboratories & Technology Support

Bioeconomy Corp organised a series of events in 2017 as a networking, business building and industry awareness platform for BioNexus companies, national, and international players within the biotechnology industry, as well as the general public. The objectives of the events include:

- Marketing and promotion of the two bio-based technology platform services (MAS and SFE) made available to bio-based companies.
- Creating awareness and interest in biotechnology that could lead to innovative new businesses and/or products as well as development opportunities in the bioeconomy.
- Marketing and promotion of BioNexus Partners' services to bio-based companies.
- Supporting entrepreneurs and industry players in the research, development, and commercialisation of their bio-based products by facilitating easy access to bio-based series and expertise.

The events conducted in 2017 to meet these objectives are as follows:

EVENT	DATE	VENUE
Bioeconomy Day 2017	14 Mar 2017	Intercontinental Hotel, Kuala Lumpur
GREAT 2017	6-7 May 2017	Imperial Hotel, Kuching, Sarawak
BioBorneo 2017	11 May 2017	Imperial Hotel, Kuching, Sarawak
BioMalaysia 2017	11-13 Sept 2017	KL Convention Centre, Kuala Lumpur
NICE Wellness Cluster 2017	12-17 Oct 2017	Technology Park, Kuala Lumpur



14
Mar 2017



6-7
May 2017



11
May 2017



12-17
Oct 2017

Innovation Enablement

Key Projects in 2017: Academia-Industry Support (AIS)

The Academia-Industry Support division conducted the following projects to support research universities and research institutes in 2017.

Industry Innovation Solutions Forum 8 June 2017 Focus Area: Industry-Academia Collaboration

The Industry Innovation Solutions Forum was a gathering between universities, industry players, and entrepreneurs to establish the current industry demand. The forum also acted as a business matching platform between universities and industry players.

KEY OUTCOMES & IMPACT

- The forum acted as a platform that connected a total of 12 companies, 13 universities, and 2 research institutes.
- Participants gained better understanding on the needs and limitation of academia and industry within the field of biotechnology.
- Universities gained customer insights which can be beneficially applied and invested into customer-driven R&D to create innovative solutions which meet market demands.
- Forged two potential business matchings:
 - UMP Keraglow Sdn Bhd with Furley Bioextracts Sdn Bhd
 - UMP Keraglow Sdn Bhd with Coral Waves Sdn Bhd

MBAN-Bioeconomy Corp Pitching Session 14 August 2017

Focus Area: Facilitation of Bio-based Start-up or Spin-off

This session was a unique platform for bio-based start-ups to pitch their business to angel investors in order to raise funds or secure investment.

KEY OUTCOMES & IMPACT

- Two start-ups were selected to undergo the first stage of pitching. The start-ups were:
 - She Empire Sdn Bhd
 - UMP Keraglow Sdn Bhd
- Post-session, both start-ups received advice on how to improve their business plan. They will be invited again to pitch within six months.

Bioentrepreneurs Hip Workshop 2017 16 August 2017

Focus Area: R&D Commercialisation

A collaboration between Bioeconomy Corp and International Medical University, this workshop was established to encourage private universities to commercialise their bio-based R&D to the market.

KEY OUTCOMES & IMPACT

- 33 researchers, graduates, and individuals from government agencies participated in the workshop.
- Participants gained knowledge on how to execute the following three important components required to commercialise their R&D more effectively:
 - Business model canvas
 - Building a pitching deck
 - Pitching techniques

Bioeconomy Innovation Awards 11-12 September 2017 Focus Area: R&D Commercialisation

Bioeconomy Innovation Awards aimed to award universities and/or research institutes that have developed outstanding innovative solutions to technical, social, and environmental challenges. Conducted in conjunction with BioMalaysia 2017, the awards aimed to:

- Encourage and inspire innovation in bio-based fields.
- Recognise individual and organisational achievements in developing new ideas and innovations in bio-based fields.
- Provide a platform for R&D commercialisation in bio-based fields.
- Strengthen networking between academia, industries, and government agencies.

KEY OUTCOMES & IMPACT

- Presented 30 awards to research institutes and universities for their excellence in producing commercially ready R&D.

IP Clinic 2017 11 September 2017 Focus Area: Industry-Academia Collaboration

The objective of this platform, which was targeted towards universities and research institutes, was to educate the target on intellectual property and strategy so that they can leverage the most value from their R&D when commercialising their bio-based products and services.

KEY OUTCOMES & IMPACT

- Three universities and research institutes participated, namely:
 - Universiti Malaysia Terengganu (UMT)
 - National Hydraulic Research Institute of Malaysia (NAHRIM)
 - SIRIM Berhad

Creation of New Technology-based Start-ups 12 September 2017 Focus Area: Facilitation of Bio-based Start-up and / or Spin-off, Industry-Academia Collaboration

This programme was a collaboration between universities and entrepreneurs to develop and nurture bio-based start-ups as well as to facilitate the commercialisation of products resulting from their R&D.

KEY OUTCOMES & IMPACT

- Four start-ups were nurtured under partnerships with universities to commercialise bio-based products resulting from the academia's R&D. These start-ups were also promoted and recognised during BioMalaysia 2017 during the University Start-Up Recognition session:
 - Partnership: International Islamic University Malaysia (IIUM) with Semarak 16 Sdn Bhd
Product: Bromelain-based halal cheese
 - Partnership: Universiti Malaysia Pahang (UMP) with UMP Ecopest Sdn Bhd
Product: Organic pesticide
 - Partnership: UMP with UMP Keraglow Sdn Bhd
Product: Keratin extract from chicken feathers for personal care and wound healing
 - Partnership: UMT with Akuatrop Sdn Bhd
Product: Aquaculture product – Black tiger shrimp
- An additional two start-ups joined the programme after the University Start-Up Recognition session at BioMalaysia 2017:
 - She Empire Sdn Bhd
Product: Cosmetics and wellness products from roselle extracts
 - Coral Waves Sdn Bhd
Product: Cosmetic and personal care products from sea cucumber

Biopitching 2017

13 September 2017

Focus Area: Facilitation of Bio-based Start-up and / or Spin-off

This unique platform provided bio-based start-ups and researchers to pitch their products and technologies resulting from their R&D to relevant stakeholders in the bio-based commercialisation ecosystem.

KEY OUTCOMES & IMPACT

Six products resulting from the R&D of start-ups attracted funding facilitation from the Malaysian Technology Development Corporation (MTDC):

- Taylors University
Products:
 - Seaweed-based meat analogues
 - Prochoco muesli bites
 - Reddy red rice biscuits
- University Malaya – Ecobio
Product:
 - Novel biodegradable mulch film for agriculture
- IIUM
Product:
 - Rennet-free cream cheese and ricotta cheese
- UMT – Rapid Biofloc
Product:
 - Green technology for health management in shrimp and aquaculture industry

Innovation Enablement

Key Success in 2017: BioNexus Partners (BNP) Laboratories & Technology Support

BioNexus Partners Excellence Award

BioNexus Partners Excellence Award is a recognition given to high-performing BioNexus Partner laboratories that collaborate with BioNexus Status companies and the bio-based industry. The award recognises their excellence in generating high revenue and impacting the industry through significant achievements.

This prestigious award was given during the opening ceremony event of BioMalaysia 2017. The winners of the BioNexus Partners Excellence Award were as follows:

1. Kedah BioResources Corporation Sdn Bhd (KBioCorp)

Sector: AgBiotech

KBioCorp provides biotechnology services and facilities in the Northern region to assist bio-based entrepreneurs, accelerate modern agriculture, and develop the nation's bioeconomy.

2. Biosafety and Biocompatibility Laboratory, Industrial Biotechnology Research Centre, SIRIM Berhad

Sector: Healthcare Bio

An ISO/IEC 17025 certified laboratory for mutagenicity study. The laboratory also offers biocompatibility and pre-clinical evaluations of consumer related products and health hazard assessments of industrial wastes.

3. Bioprocess Engineering Laboratory, Universiti Teknologi Malaysia

Sector: BioIndustrial

Equipped with a 1,500 litre pilot scale bioreactor for fermentation services and downstream processing facilities, the Bioprocess Engineering Laboratory services the Southern region with fermentation services and downstream processing facilities.

4. Analytical Biochemistry Research Centre (ABRC), Universiti Sains Malaysia

Sector/sub-sector: Bioanalytical services

ABRC is an ISO/IEC 17025:2005 accredited laboratory offering analytical biochemistry services and specialising in mass spectrometry.

Academia- Industry Support

Key Success in 2017:
Academia-Industry Support (AIS)

SUCCESS SUMMARY OF ACADEMIA INDUSTRY SUPPORT IN 2017

6 start-ups

Nurtured to commercialise R&D outputs of research universities and research institutes

RM1,538,002

Raised in funding and share capital to support the start-ups

25 jobs

Created in the bioeconomy

The projects and programmes led by Academia-Industry Support helped to nurture and develop six start-ups in 2017.

Company	Product commercialisation	Funding raised	Jobs created
Semarak 16 Sdn Bhd	Recombinant bromelain enzyme through the spinoff product: Halal cheese.	RM373,000 from Platcom Ventures.	4
UMP Ecopest Sdn Bhd	Rotenone Extract R&D through the spinoff product: Bio-based pesticide.	RM100,002 in share capital.	3
UMP Keraglow Sdn Bhd	Keratin extract from chicken feathers to support the "Waste to Wealth" initiative.	RM 5,000 in share capital.	3
UMT Akuatrop Sdn Bhd	Black tiger shrimp using rapid biofloc technology.	RM400,000 from UMT Jaya Holding Sdn Bhd.	4
She Empire Sdn Bhd	Roselle extract for cosmetics and wellness products.	RM500,000 from TERAJU SUPERB. RM 160,000 from MOSTI Facilitation Fund.	5
Coral Waves Sdn Bhd	Sea cucumber extracts for cosmetics and personal care products.	N/A	6

Moving Forward: BioNexus Partners (BNP) Laboratories & Technology Support

The Innovation Enablement division will focus on the following plans and initiatives to support research, development, and commercialisation of innovative bio-based products and services to establish an advanced biotechnology industry in Malaysia.

PLANS

Technology Support

1. Intensify current collaborations and strategic alliances via public-private research and development partnership, international commercial collaborations, and smart strategic alliances.
2. Commercialise high-end application produced utilising the technology platforms.
3. Intensify engagement and increase adoption and utilisation of the technology platforms by industry players, research universities, and research institutes.

BioNexus Partners Laboratories

1. Position BioLaboratory Services (BioLabs) to be more accessible to relevant industry players so they can receive the necessary support needed for their research, development, and commercialisation activities.
2. Continually expand in the potential of BioNexus Partners in an industry- and market-driven manner to provide services, expertise, and facilities that support the local and global bio-based market in various focus areas.
3. Develop human capital expertise in technical areas to nurture knowledge-based business in the bio-based industry.

INITIATIVES

Technology Support

1. Engage with the Department of Agriculture (DOA) to conduct a pilot study for durian validation, which validates different durian species through genotyping methods.
2. Venture into the healthcare industry to screen for wellness using the MAS platform technology.
3. Develop downstream consumer products using carbon dioxide extracts as the key ingredients.
4. Organise promotional events and initiating strategic collaboration with industry players for MAS and SFE platform technologies.

BioNexus Partners Laboratories

1. Facilitate digital and physical marketing of BioNexus Partners services to industry players.
2. Encourage industry- and market-driven collaboration for research, development, and commercialisation of bio-based products and services.

Moving Forward: Academia-Industry Support (AIS)

Academia-Industry Support will focus on the following plans and initiatives to support the commercialisation of bio-based research outputs by universities and research institutes in Malaysia via nurturing and supporting collaborations with start-ups.

PLANS

Continue nurturing start-ups and academic researches to commercialise the output of R&D by bridging their needs to stakeholders in the bio-based commercialisation ecosystem.

INITIATIVES

1. Organise regular Biopitching sessions.
2. Promote R&D that is ready for commercialisation to uptakers from the industry via business trade events.
3. Facilitate regulate meetings between technology transfer personnel with key industry players to obtain feedback and insights of current business trends.



OPERATIONAL

EXCELLENCE & PROTECTION

Legal & Secretarial

Legal and secretarial services are pivotal to ensure the efficient administration of the companies and implementation of decisions made by the Board of Directors, as well as to keep companies aware of and in compliance with the latest statutory and regulatory requirements. The services are also important to ensure staff personnel are aware of their rights and that the company as a whole is protected from legal issues.

Legal & Secretarial

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Legal & Secretarial

Corporate Secretarial

The Legal & Secretarial division provides the legal framework and advisory as well as company secretarial services to Bioeconomy Corp and Group of Companies, which include:

1. Malaysian Bioeconomy Development Corporation Sdn Bhd (Bioeconomy Corp);
2. Malaysian Bio-XCell Sdn Bhd (Bio-XCell); and
3. Other subsidiary companies.

To support these group of companies, the division aligns its efforts in the following focus areas:

1. Business operations;
2. Transaction matters;
3. Property and commercialisation;
4. Corporate secretarial;
5. Management of Board of Directors and its Committees; and
6. Management of other Committees of the company.

Key Projects in 2017

Date	Project	Outcomes
6 Oct 2017	Half Day Seminar on Companies Act 2016	Ensured the personnel of Bioeconomy Corp and Bio-XCell are aware of key changes made to the Companies Act 2016.
11 Dec 2017	Awareness Programme - Personal Data Protection Act (PDPA)	<ul style="list-style-type: none"> Created awareness on PDPA 2010 requirements to individuals who deal with customers' personal data.
18 Dec 2017	Second Awareness Programme - Personal Data Protection Act (PDPA)	<ul style="list-style-type: none"> Provided rules and regulations of PDPA 2010 to avoid and/or minimise the risk of customers' personal data being unlawfully used or disseminated.

Key Success Summary in 2017

CONDUCTED FOUR KEY AWARENESS PROGRAMMES ON:

1. Policy on Personal Data Protection
2. Companies Act 2016
3. Sexual Harassment Policy
4. Whistleblower Policy

Moving Forward

The Legal & Secretarial division will focus on the following plans and initiatives to continue supporting Bioeconomy Corp and Group of Companies in legal work and advisory affecting the daily operations and personnel rights of the companies as well as the management of corporate secretarial works.

PLANS

Review of Bioeconomy Corp and Group of Companies' Constitution.

INITIATIVES

1. Revision to Legal & Secretarial division's standard operating procedures.
2. Development of template agreements or documents suitable for income generation activities.
3. Knowledge enhancement and awareness programmes for personnel of Bioeconomy Corp and Group of Companies.







RAISING THE IMAGE OF BIOTECHNOLOGY

Branding & Communications

The Branding & Communications department under the Corporate Affairs division is responsible for protecting and building the reputation of Bioeconomy Corp by undertaking corporate communications and media relations initiatives. The department also strives to develop branding strategies for the organisation to attract interest in Malaysian biotechnology and bio-based industries.

Branding & Communications

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Branding & Communications

Supporting the Nation's Goals

Branding and communications play an important role in raising positive perceptions and interest in biotechnology, from encouraging talents to join the biotechnology workforce to raising consumer awareness on the quality of biotechnology products, as well as strengthening relations with relevant stakeholders both domestically and globally.

The overall approach of the Branding & Communications department of Bioeconomy Corp is to support:

1. The third phase of the National Biotechnology Policy.
2. The 8th thrust of the National Biotechnology Programme which advocates global branding as a strategic development for the bio-based industry.
3. All initiatives led by Bioeconomy Corp.

To support these areas, the department aligns its efforts in the following focus areas:

1. Communicating success stories to enhance Bioeconomy Corp's positive image as the economic development agency of the bio-based industry in Malaysia.
2. Building strong brand recognition for Bioeconomy Corp at local and international levels.
3. Strengthening internal and external communications through effective engagement with relevant stakeholders.
4. Strengthening branding and relationship with stakeholders through digital and social media.

Branding & Communications

Key Highlights in 2017

Generation of Positive Media Value	<p>Executed proactive media engagements to:</p> <ol style="list-style-type: none"> 1. Enhance cooperation and strengthen relationships with relevant stakeholders. 2. Promote Bioeconomy Corp's role as the bio-based economic development agency at local and international levels. 	Achieved coverage in national and international media worth a total media value of RM14 Million.
Management of Press Conferences	Managed meetings between media and Bioeconomy Corp's CEO via press conferences.	Organised a total of 13 press conferences covered by national media worth a media value of RM9.4 Million.
Content Development	Developed content which provided support and assistance to programmes conducted by respective divisions. This included preparation of speeches, press release, and press conference talking points.	Executed content development for a total of 21 events, worth a media value of RM13.5 Million.
Articles and Broadcast Interviews on Success Stories	Highlighted Bioeconomy Corp's initiatives and achievements through newspaper articles as well as television and radio talk-shows.	Featured success stories in eight articles and five broadcast interviews, worth a total media value of RM0.89 Million.
Media Familiarisation Tour	Facilitated media visits to the sites of selected BioNext companies and BCDP projects around Malaysia to highlight Bioeconomy Corp's role and contributions to the industry and the people.	Organised visits to four BioNext companies and five BCDP projects, worth a total media value of RM2.7 Million.
Media Engagement	Executed a networking activity for the media to strengthen engagement with Bioeconomy Corp's CEO.	Organised a casual chat session called "Sembang Santai dengan Dr. Zam" in conjunction with NICE '17, worth a total media value of RM0.42 Million.
BIOGRAPHIES	<p>Facilitated the writing and production of mini-documentaries which engaged and featured the experiences of bio-based companies to:</p> <ol style="list-style-type: none"> 1. Highlight Bioeconomy Corp's roles and contributions in the bio-based industry. 2. Attract more players to the bio-based industry. 	<p>A total of five episodes featuring bio-based companies and BCDP projects were aired on YouTube and promoted across social media, including:</p> <ol style="list-style-type: none"> 1. Episode 2: Extracting the Secrets of Wellness 2. Episode 3: Breathing Goodness into Life 3. Episode 4: Growing a Herbal Goldmine 4. Episode 5: Diving into an Ocean of Wealth 5. Episode 6: Soaring to Greater Heights
#BIOCHAT	Engaged with various bio-based players to share their experiences in the industry via short online discussions.	<p>Executed a total of 51 chat sessions, featuring various CEOs, Ministers, industry players, and communities during events, which include:</p> <ol style="list-style-type: none"> 1. BioMalaysia 2017 2. NICE '17 3. MCY Summit 2017

BioBits	Featured video snippets taken during bio-based industry and industry-related events and activities to capture the views and thoughts of the participants and VIPs in attendance.	Executed a total of 14 video snippets featuring various Ministers, industry players, and communities during events, which include: <ol style="list-style-type: none"> 1. Karnival STI Tuaran 2017 2. BCDP Project (<i>Kacip Fatimah</i>) 3. BCDP Project (Seaweed Aquaculture) 4. BCDP Project (Oyster Mushroom) 5. Expo 2017 Astana 6. VerdePalm Launch 7. BCDP Project (Rice Straw)
BioInked	Featured a series of short articles by internal stakeholders to spread updates and trends of bio-based and biotechnology industries.	Featured six articles by Bioeconomy Corp's CEO and Senior Vice Presidents, focusing on topics including: <ol style="list-style-type: none"> 1. Breakthrough Chemicals 2. Towards a Bioeconomy Nation 3. Agriculture Biotechnology - The Key to Malaysia's Sustainability, Food Security & Bioeconomy 4. Malaysia - A Bioeconomy Hub in the Making 5. Shaping the Future of Malaysia's Healthcare Bio Industry 6. My First 100 Days as CEO of Bioeconomy Corp
Communication and Tools to Support Core Business Areas of Bioeconomy Corp	Supported the branding and communications of Bioeconomy Corp projects through above-the-line advertising, social media, and websites.	Executed: <ol style="list-style-type: none"> 1. Design of marketing kits, promotional materials, and media announcements on rebranding. 2. Ensured consistency on the use of logo by internal and external stakeholders. 3. Publication of Bioeconomy Corp's news and projects via the corporate social media platforms. 4. Ensured the latest information was made available on the corporate website and social media platforms.

Branding & Communications

Key Success Summary in 2017

RM14+ Million

in generated total media value.

13 press conferences

organised between the media and CEO of Bioeconomy Corp.

76 multimedia projects

executed to raise awareness of biotechnology in the form of mini-documentaries, chat sessions, video snippets, and articles.

Moving Forward

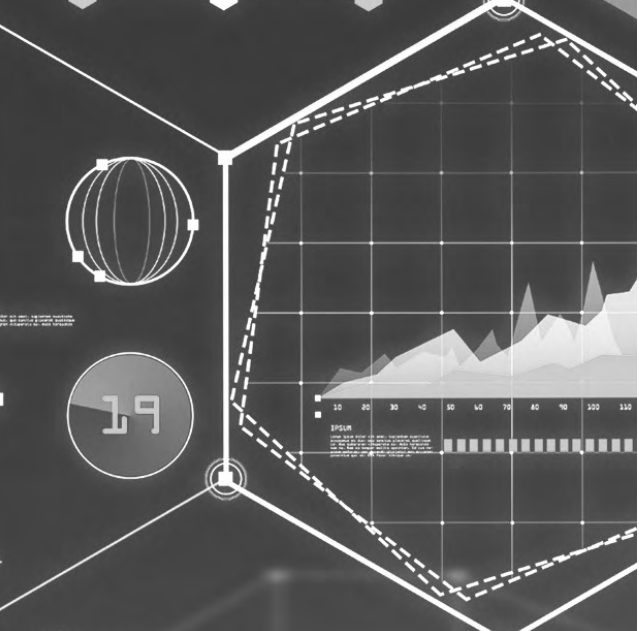
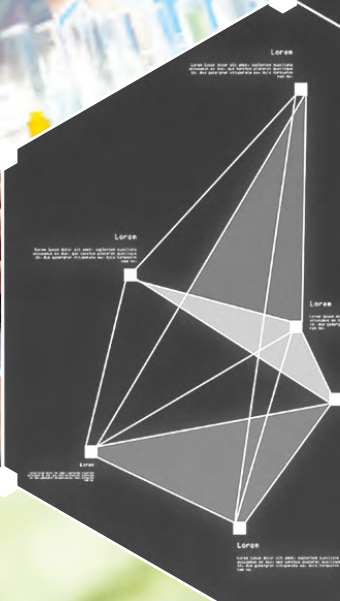
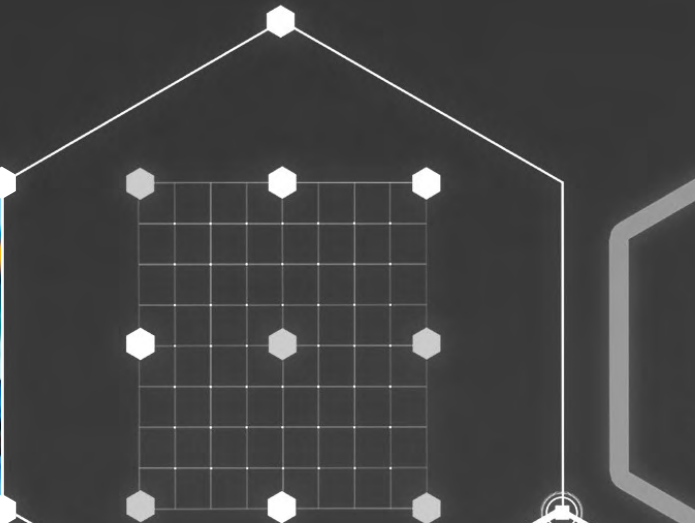
The Branding & Communications department will focus on the following plans and initiatives to continue supporting Bioeconomy Corp's mission to push forward the key driving forces of the nation's bioeconomy.

PLANS

1. Generate positive media value through promotions on targeted media platforms.
2. Build strong brand recognition for Bioeconomy Corp by measuring quality of support.
3. Establish strong engagement with internal and external stakeholders through execution of media and communications activities.
4. Strengthen branding and relationship with stakeholders through digital and social media platforms.

INITIATIVES

1. Feature Bioeconomy Corp in talkshows through discussions with bio-based industry players, and showcasing Bioeconomy Corp's programmes and initiatives.
2. Highlight Bioeconomy Corp's initiatives and achievements through print medium such as newspaper articles, columns, and advertorials.
3. Providing stakeholders monthly updates of the industry through promoting BioNews, the corporation's online news portal for biotechnology updates, via email and social media platforms.
4. Ensure relevant corporate marketing collaterals and marketing kits are always updated for accurate representation of Bioeconomy Corp.
5. Facilitate media interviews at various exhibitions and conferences to ensure visibility for Bioeconomy Corp.
6. Enhance public relations with media through media engagement to increase Bioeconomy Corp's publicity.
7. Execute content development to provide support and assistance to programmes and initiatives conducted by respective divisions.
8. Maintenance and promotion of Bioeconomy Corp's corporate website to increase the number of visitors, views, and engagement.
9. Execution of social media engagements which raise public awareness of and engagement with the biotechnology industry. These include:
 - a. Contests via social media platforms.
 - b. A series of mini-documentaries to engage the public through BIOGRAPHIES.
 - c. Short discussions engaging with bio-based industry players and featured online via #BIOCHAT.



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