



BIOTECHCORP
MALAYSIAN BIOTECHNOLOGY
CORPORATION

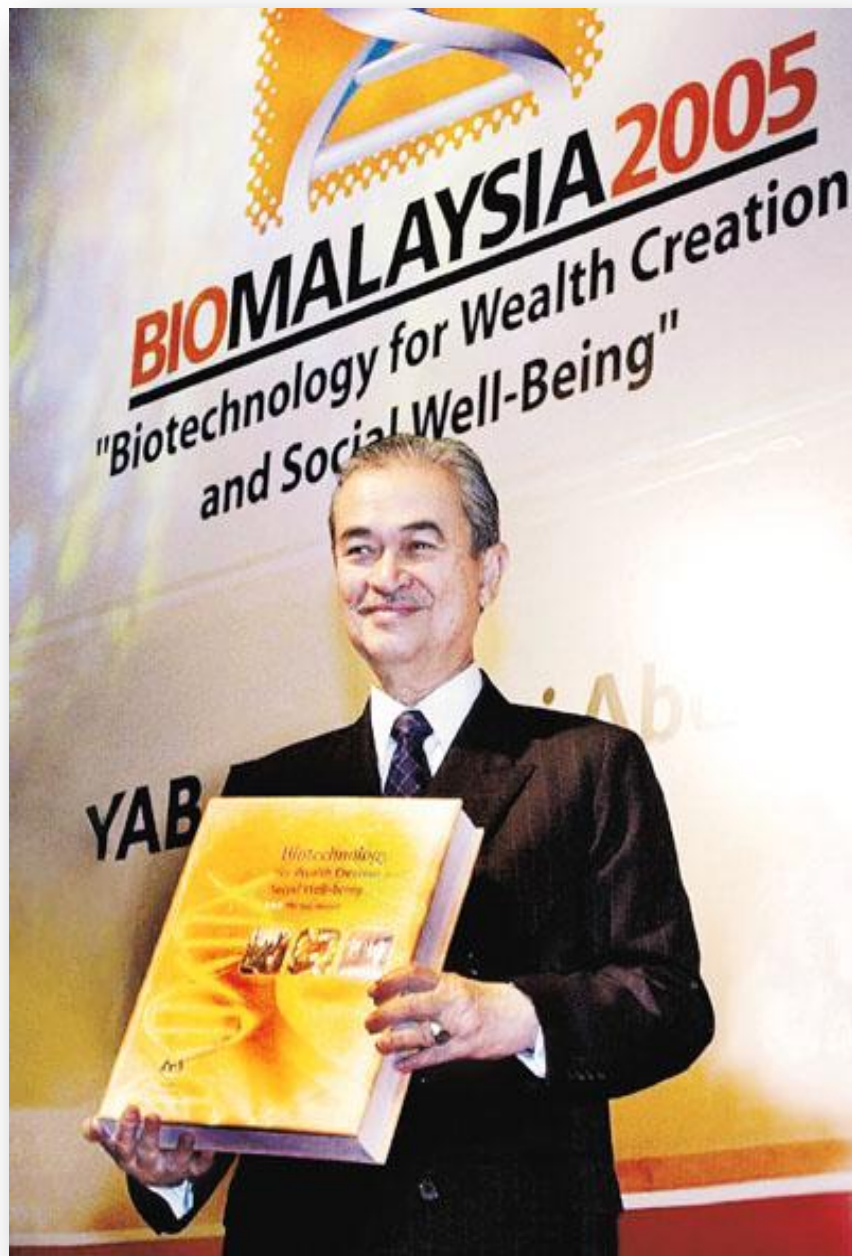
OPPORTUNITIES WITH THE MALAYSIAN BIOTECHNOLOGY CORPORATION

**University of Nottingham:
Global Research Workshop**

25 April 2012

OUTLINE

- 1. COMPANY BACKGROUND**
- 2. CHALLENGES FACED BY COMPANIES**
- 3. CURRENT TREND FOR INDUSTRIAL BIOTECHNOLOGY**
- 4. ACCESS TO FUNDING**
- 5. FEEDSTOCK AVAILABILITY**



NATIONAL BIOTECHNOLOGY POLICY

**The Malaysian Government
commits itself to undertake the role of
developer and catalyst of the country's
biotechnology sector**

2005

**Capacity
Building**

2011

Commercialization

2016

Globalization

OUR SERVICES



ONE STOP CENTRE FACILITATION

- **End-to-end Facilitation Services**
- **BioNexus Custodian**
- **Advisory**
- **Human Capital Development**
- **Government Liaison**
- **BioNexus Partners Program**

ADVOCACY

- **Conducive Eco-system**
- **Awareness**
- **Capacity Building**

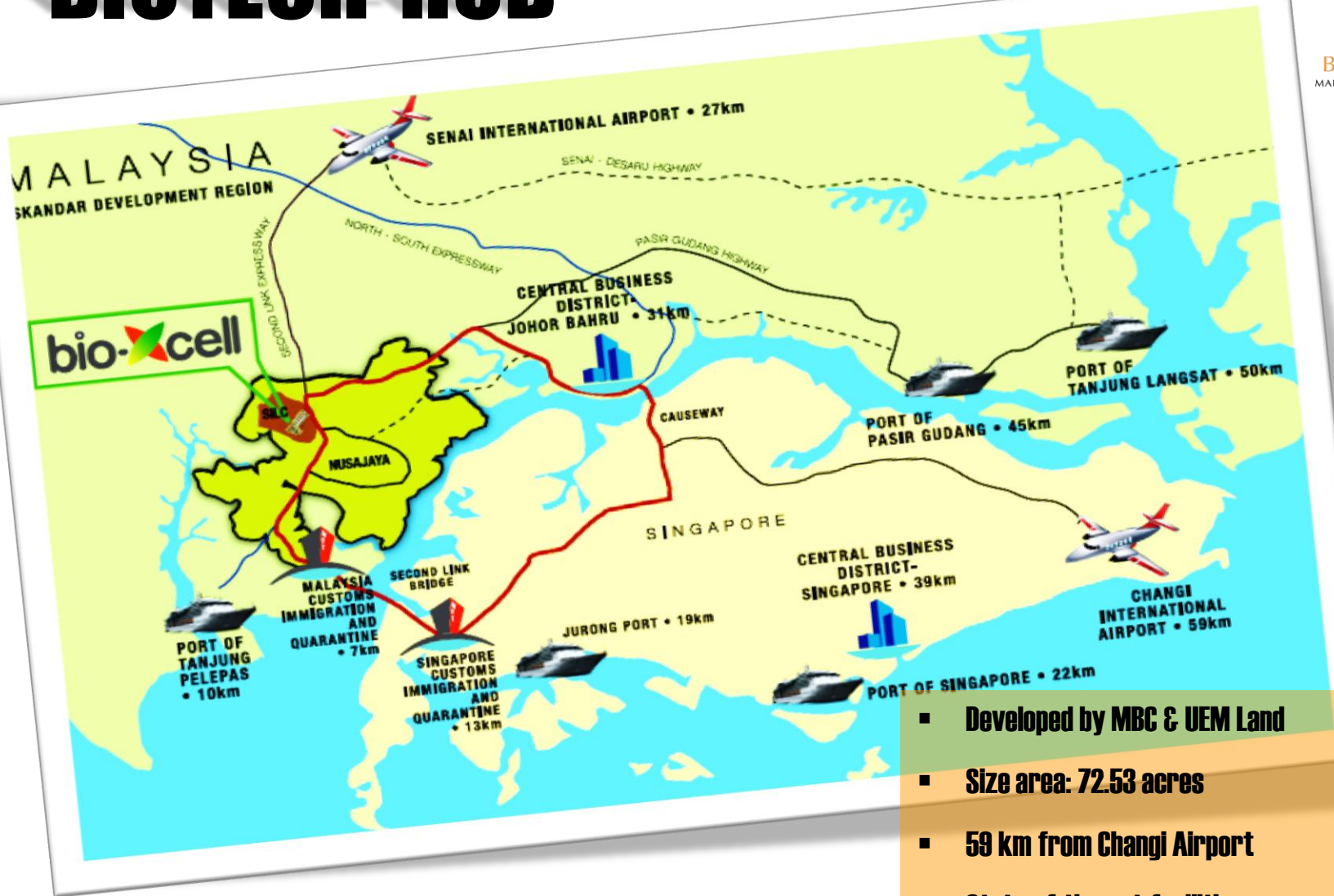
DOMESTIC DRIVEN INVESTMENT FOREIGN DIRECT INVESTMENT

- **Advisory**
- **Business Mentoring**
- **Commercialization**
- **Public-Private Partnership**
- **Technology Acquisitions**
- **Eco-system Development**

BIOTECH-HUB

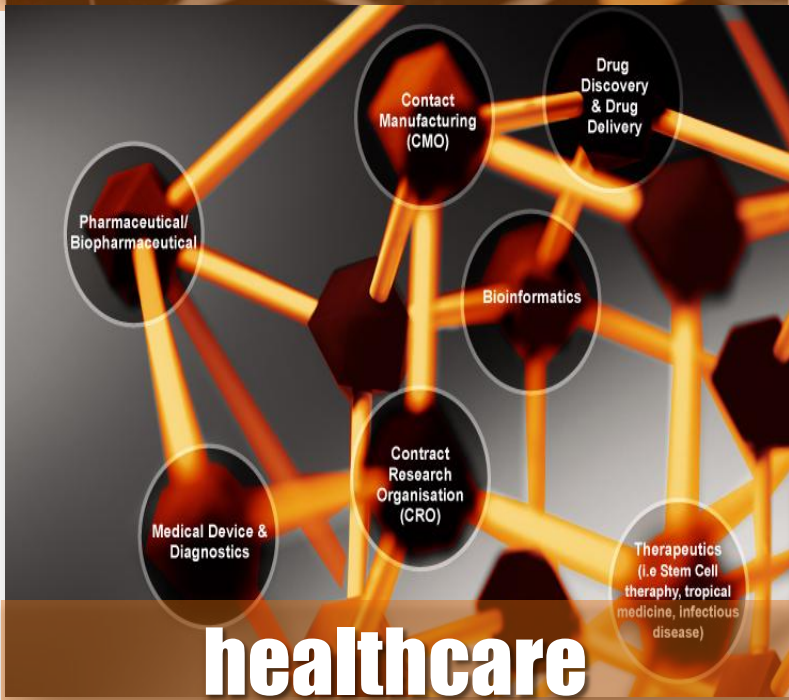


BIOTECHCORP
MALAYSIAN BIOTECHNOLOGY CORPORATION



- Developed by MBC & UEM Land
- Size area: 72.53 acres
- 59 km from Changi Airport
- State-of-the-art facilities
- 3 seaports within 50 km
- 15% K-Worker Tax Scheme

BUILT TO LEASE & CUF



Focus Areas

IB FOCUS AREAS



BIOTECHCORP
MALAYSIAN BIOTECHNOLOGY
CORPORATION

- 1. Biofuels**
- 2. Fine, Bulk & Specialty Chemicals**
- 3. Biomaterials**
- 4. Biocatalysis**
- 5. Bioremediation**



PRODUCT LANDSCAPE

BIOFUELS

- **Biodiesel**
- **Bioethanol**
- **Biogas**
- **Biobutanol**
- **Bio-oil**
- **Hydrogen**
- **Bio-DME**
- **Jetfuels**



PRODUCT LANDSCAPE

FINE, BULK & SPECIALTY CHEMICALS

- **Active compound extracts**
- **Bioacrylics**
- **Biolubricants**
- **Biosurfactants**
- **API**
- **Natural Colourants**
- **Biocides**
- **PDO**



PRODUCT LANDSCAPE



BIOTECHCORP
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BIOMATERIALS

- **Polylactic acid**

PLA

- **Polyhydroxyalkanoate**

PHA

- **Poly (3-hydroxybutyrate-co.3-hydroxyhexanoate)**

PHBH

- **Polybutylene succinate**

PBS

- **Polyhydroxybutyrate-valerate**

PHBV

- **Biodegradable packaging**



PRODUCT LANDSCAPE



BIOTECHCORP
MALAYSIAN BIOTECHNOLOGY
CORPORATION

BIOCATALYSTS

- Pulp & paper
- Fibres
- **Lignocellulosic**
- **Textiles**
- Detergent
- Animal Feed
- Food
- Leather



PRODUCT LANDSCAPE



BIOTECHCORP
MALAYSIAN BIOTECHNOLOGY
CORPORATION

BIOREMEDIATION

- MSW
- Sewerage
- **POME**
- Heavy Metal
- **River & Pond Rehabilitation**
- Industrial Spillage



2. CHALLENGES FACED BY COMPANIES

BIO-NEXUS COMPANIES



BIOFERTILIZER

EntoGeneX Industries Sdn Bhd	Research, development and commercialization of biopesticide and insecticide products.
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BIOENERGY

Jawhara Bioenergie Sdn Bhd	Research, development, production and commercialization of biogas as a renewable energy source.
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SFE

Avenue Biotech Sdn Bhd	Commercialization of natural product extracts using Supercritical Fluid Extraction technology and undertakes its related research and development activities
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ENZYMES

Airestec Innovations Sdn Bhd	Commercialisation of enzyme-based product for the cleaning and decontamination of Heating, Ventilation and Air Conditioning (HVAC) system and to undertake its related research and development activities.
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BIOPOLYMER

Return 2 Green Sdn Bhd	Research, development, production and commercialization of biodegradable packaging products.
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ISSUES

FEEDSTOCK

- **Availability**
- **Price**

FORMULATION

- **Standardization of microbe concoction**
- **Effective microbe development**
- **Conversion of cellulosic biomass**

REGULATORY

- **Product registration (esp GM microbes)**
- **Validation**

PROCESS/EQUIPMENT

- **Optimisation**
- **Alternative technologies**

FUNDING

JV Partners

3. CURRENT TREND FOR IND. BIOTECH.

PROJECT FRONTIER



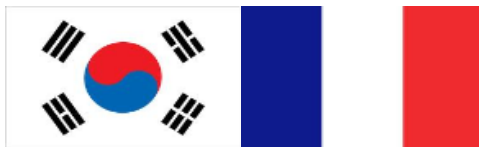
Investment:
USD 666 million

Product:
biomethionine

Technology:
microbial fermentation & enzymatic

Site-Location:
Kertih, Terengganu

Country Origin:



Korea

France

Japan



Investment:
USD 16.7 million

Product:
bioethanol

Technology:
Enzymatic & fermentation

Site-Location:
Tannameran, Selangor

Country Origin:



Investment:
USD 200 million

Product:
High-protein animal feed

Technology:
Microbial fermentation

Site-Location:
Sabah

Country Origin:



Norway

BIO-NEXUS COMPANIES



Investment:
USD 67 million

Product:
Bioethanol
Bioisoprene

Technology:
Microbial fermentation

Site-Location:
Bio-Xcell, Johor

Country of Origin:



United States



Investment:
USD 50 million

Product:
1,3-propanediol

Technology:
Microbial fermentation

Site-Location:
Bio-Xcell, Johor

Country of Origin:



France



Investment:
USD 36 million

Product:
Natural Sweetener

Technology:
**Solvent extraction
& enzymatic**

Site-Location:
Enstek, Negeri Sembilan

Country of Origin:



Russia



Investment:
USD 250 million

Product:
Nutritional lipids
Specialty fats

Technology:
Enzymatic

Country of Origin:



Malaysia

4. ACCESS TO FUNDING

FUNDING

INSTITUTION

FUNDING PROGRAM

FUNDING MECHANISM



Commercialisation of Research & Development Fund (CRDF)

Business Start-up Fund (BSF)

Technology Acquisition Fund (TAF)

- Partial grants with a maximum of RM500,000 or 90% of the eligible expenses (whichever is lower).
- Flexible funding via Convertible Notes (CN) and/or Preference Shares at a maximum of RM5.0 million or 90% of the recognised project cost or whichever is lower.
- 5 years repayment of 3.5% interest.
- Partial grants with a maximum of RM2 million or 50% of the eligible expenses (whichever is lower).



CIP 500

- Grants of up to a RM500,000



Greentech Financing Scheme

- Soft loans up to RM50 million per company.
- Rebate 2% interest rate



Technofund / Innofund

- Grants up to RM 3 million

FUNDING



INSTITUTION

FUNDING MECHANISM

Venture Capital (VC)



Malaysian Life Science Capital Fund



- To nurture and develop the technology sector and the venture capital market in Malaysia.
- Quantum between RM 50,000 to RM 40 million
- MLSCF seeks visionary companies, which target markets where the opportunity exists to make significant and dramatic improvements.
- MDV Financing quantum is between RM250,000 to RM2 million
- 5 projects may be funded based aggregate limit of RM2 million

Financial/Institutional Investors

Banks



Developmental Banks



Bank Pembangunan

Institutional Investors



Private Investor

Individuals



5. FEEDSTOCK AVAILABILITY

Agricultural Feedstock

Oil Palm Fronds (OPF)

Dry **54 million tonnes**

- Sugar **34 million tonnes**
- C6: **20 million tonnes**
- C5: **14 million tonnes**



Empty Fruit Bunches (EFB)

Dry **7 million tonnes**

- Sugar **4 million tonnes**
- C6: **2.4 million tonnes**
- C5: **1.6 million tonnes**



Palm Oil Mill Effluent (POME)

Effluent **57 million m³**

- Biogas **1.6 billion m³**
- CH₄: **958 million m³**



Oil-Palm Based Feedstock

Crude Palm Oil (CPO)

17 million TPA

CPO Price USD 1,000 / t (as of Dec'11)*

Palm Oil millers 417 mills

Palm Olein (PO)

13.5 million TPA

Price USD 1050 / t FOB (as of Mar'11)**

Palm Stearin (PS)

3.6 million TPA

Price USD 960 / t (as of Mar'11)**

Palm Fatty Acid Distillate (PFAD)

800,000 TPA

Price USD 850 / t FOB (as of Mar'11)**

Palm Oil Refineries 17 plants

Refined Glycerine

219,600 TPA

Price USD 750 / t (as of Dec'11)

Oleochemical plant 17 plants

Oleochemical total capacity 2.7 million TPA

ISSUES

- **Availability**
- **Consistency in supply**
- **Long term contract**
- **Price**
- **Conversion technologies**
- **Local R&D support**

CONCLUDING REMARKS

- **Need for local expertise & HR in IB biotechnology**
- **To address feed stock issues**
- **More funding required for biotech projects**
- **Need for alternative feedstock**

THANK YOU