



# **TECHNOLOGY PARK MALAYSIA**

## **TPM'S PROJECT MONITORING : CASE STUDIES**

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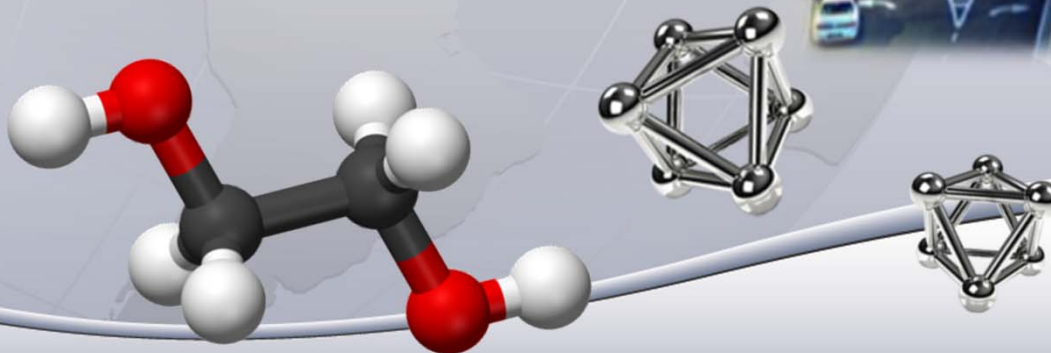


**TECHNOLOGY PARK  
MALAYSIA**

**TECHNOLOGY PARK MALAYSIA CORP.  
SDN BHD**

- Agency under MOSTI.
- Corporatised on 1st September 1996 and started its operation in Bukit Jalil, Kuala Lumpur.
- Total land area of approximately 686 acres with a gross built-up area of about 1.5 million square feet.

INNOVATION



[www.tpm.com.my](http://www.tpm.com.my)



**TECHNOLOGY PARK  
MALAYSIA**

**TECHNOLOGY PARK MALAYSIA CORP.  
SDN BHD**

## CORPORATE STRUCTURE & ACTIVITIES



**TECHNOLOGY PARK  
MALAYSIA**

INNOVATION  
HOTSPOT

**Centre for Technology Commercialisation (CTC)**

**Incubation & Innovation Centre (IIC)**



Engineering design, CNC machining, rapid prototyping & manage engineering-related projects + producing innovative engineering products & solutions.



Product development, contract research, lab services, contract manufacturing & commercialisation of nutraceutical & biopharmaceutical + process & manufacture for Biotech products.



Provision of broadband services, data centre, project management, consultancy services, manage operations & maintenance of ICT infrastructure in TPM



Provide tertiary education & specialized training programs. Offers Diploma & Degree Programs in Life Sciences Engineering, Languages etc.

[www.tpm.com.my](http://www.tpm.com.my)



## **CENTRE FOR TECHNOLOGY COMMERCIALISATION (CTC)**

- Unit under President's office
- Established to galvanize the needs of the country's key stakeholders in harnessing technology for wealth creation.
- Appointed by MOSTI on 30 August 2007 as Project Monitoring Team (PMT)
- Monitoring 34 TechnoFund projects covering Biotechnology and Industry Cluster .
- Monitoring 93 ScienceFund Projects for Industry Clusters.



# TERM OF REFERENCE

<TOR PMT 27 Mar 2008>

## APPOINTMENT OF PROJECT MONITORING TEAM (PMT)

- a) PMT will be appointed from MOSTI's agencies or any other agencies based on recommendation by the respective Cluster and approved by the management.
- b) Each PMT shall have a task force and a leader.

# ROLES AND RESPONSIBILITY

- a) To ensure compliance to terms & conditions of Project Agreement
- b) To assess technical & financial progress
- c) To make recommendation for subsequent payment based on progress of project
- d) To recommend changes as and when necessary:-
  - i) Additional allocation
  - ii) Extension of project duration
  - iii) Scope of projects
  - iv) Milestones
  - v) Project team members
  - vi) Modifications
  - vii) Suspension
  - viii) Virement
  - ix) Termination
- e) To provide guidance and support for the recipients in conducting activities related to the project as and when required
- f) To ensure recipients maintain proper record/inventory of their project at all times
- g) To propose enhancement on procedures and guidelines.

## **CONFIDENTIALITY**

- Members of the PMT shall sign the Non-Disclosure Agreement (NDA) and at all times ensure the confidentiality of any information with regard to projects under their supervision.

## **CONFLICT OF INTEREST**

- Members of the PMT shall not monitor the projects which they have interest at individual or organizational level.

# REPORTING

- **PMT should submit progress report for each project to MOSTI at least once in every 6 months. The report should consist of the following :**
  - i. Project background**
  - ii. Financial report**
  - iii. Milestone achievement report**
  - iv. Overall recommendation**

# PROGRESS MONITORING

## Project Ownership & Responsibility:-

- **While some projects are initiated by GRIs and IHLs in collaboration with private companies, some project initiated by the private companies, in collaboration or consultation with GRIs and IHLs**
- **PMT works closely with Research Management Centre (RMC) of IHLs or business units of GRIs**
- **PMT always emphasize for Project Leader to take charge and be accountable**

# PROGRESS MONITORING

## New Project:

- PMT to conduct Entrance Meeting
- The tentative agenda is as follows:

9.00am		PMT Travel from TPM-CTC.
10.00am	Project Site Visit	
11.00m	PMT Entrance Meeting	<ul style="list-style-type: none"><li>• P/Leader's Presentation: <b>Milestone and Financial Progress</b></li><li>• PMT Presentation: <b>TechnoFund Monitoring</b></li></ul>
12.30pm	PMT Exit Meeting	<p>MOSTI/PMT to discuss on the outcome of the visit.</p> <p><i>Project leader will be invited into the PMT Exit Meeting, in case of further clarification; information and/or documentation are needed; in order to complete their reporting.</i></p> <p><i>Expert Report should be completed immediately after Exit Meeting is adjourned.</i></p>

# PROGRESS MONITORING

**1. Project Leader is required to submit Progress Report to MOSTI, cc to PMT, based on the approved Schedule A, B and C as follows:-**

TechnoFund Agreement	Currently used by PMT
Milestone Achievement Report (MAR)	<p>&lt;<a href="#">MOSTI MAR</a>&gt; Via email MOSTI-Biotech-Normaizatul 02Apr2010.</p> <p>MAR, Section A-I: written (<b>Note: Please attach the supporting document (PO, invoice, receipt, cheque copy and bank statement)</b>) For claim by P/Leader and Collaborator claim, both parties to suggest tentative date and time for an <b>Finance Verification Visit</b>, which could be done in their office or in TPM. For Finance Verification Visit, all parties is required to bring along all <b>original</b> supporting documents.</p>
Audited Financial Report (AFR)	<p>Audited Financial Report (AFR): to assure MOSTI that all expenses paid was made only for the project progress, not any other purposes. <b>should reflects the same information as on MAR: Financial Report, Section A-I.</b> The rule of the thumb for AFR:-</p> <ul style="list-style-type: none"> <li>•Company: to engage &lt;<a href="#">certified auditor</a>&gt; to provide such report.</li> <li>•IHL / GRI: to liaise with &lt;<a href="#">internal auditor</a>&gt; for such report.</li> </ul> <p>For progress payment, since Finance Expert report will be used as the basis for PMT recommendation to MOSTI, P/leader and Collaborator to email their completed &lt;<a href="#">Payment Verification</a>&gt; to Ms Kamsina. If the completed Payment Verification is satisfactory, only then can Finance Expert can provide the tentative dates for Finance Verification Visit.</p>

# PROGRESS MONITORING

2. Once PMT received instruction from MOSTI, PMT will conduct **Finance Verification Visit** and then **Technical Verification Visit**. The tentative agenda for **Verification Visit** is as follows:-

Date & Time	Agenda	Activities
<b>Day 1</b>		
2.00pm		<p>PMT Travel from TPM-CTC, Level 1, Enterprise 4.</p> <p><i>Panels are welcomed to travel together with PMT via van. TPM-CTC-RajaFauziah will book the van.</i></p> <p><i>Due to time constraints, Panel may choose to fly. But, please do own flight booking. All expenses incurred e.g. flight ticket; hotel accommodation etc., can be claimed via Honorarium Form (HF) provided.</i></p> <p><i>Please provide sufficient notice for preparation work.</i></p>
		<p>Check into _____ Hotel.</p> <p><i>TPM-CTC-RajaFauziah will do the booking and notify all parties.</i></p>
<b>Day 2</b>		
9.00am		<p>PMT Travel from _____ Hotel.</p> <p><i>In case any of the Panel is flying in the morning, please provide sufficient notice, so that PMT can arrange with Project Team to fetch from the airport.</i></p>
10.00am	Project Site Visit and Verification	On-site project audit and verification on milestone achievement.
1.00pm		Lunch
2.00pm	Project Progress Presentation by Project Leader	<ul style="list-style-type: none"> <li>• Presentation on <b>Milestone Achievement Report (MAR)</b></li> <li>• Presentation on <b>Financial Report (FR)</b> and recommendation for subsequent payment</li> </ul>
4.00pm	MOSTI/PMT Exit Meeting	<p>MOSTI/PMT to discuss on the outcome of the visit.</p> <p><i>Project Leader will be invited into the PMT Exit Meeting, in case of further clarification; information and/or documentation are needed; in order to complete their reporting.</i></p> <p><i>Expert Report should be completed immediately after Exit Meeting is adjourned.</i></p>

# PROGRESS MONITORING

3. Once PMT received reports from all Experts, PMT will submit Project Monitoring Report (PMR) to MOSTI:

## Forms:-

Cluster	Currently used by PMT
Biotechnology	< <a href="#"><u>PMR Biotech 28Dec2009</u></a> >
Industry	< <a href="#"><u>PMR Industry 11Aug2008</u></a> >

# PMT EXPERT PANEL

- One (1) TPM **Financial Expert** and two (2) outside **Technical Experts** appointed to each project
  - Expert stay with same project throughout
  - Expert chosen based on relevant field to project
- <[Surat Lantikan Expert](#)>, <[NDA Expert](#)>, <[TOR Expert](#)>,  
<[Expert Panel List](#)>
- Reporting to MOSTI:-

No.	Currently used by PMT
1	TPM < <a href="#">TEMR 11Aug2008</a> >
2	TPM < <a href="#">FEMR 11Aug2008</a> >

*Based on PMT Invitation Letter: Expert Report should be completed immediately after Exit Meeting is adjourned.*

*Based on TOR Expert: Experts are required to submit their report within three (3) days after each projects monitoring and evaluation sessions.*

*Corporate Finance & Management Services Division (CFMSD) Memo 04 Nov 2009: Effective immediately, all finance Expert members for the TechnoFund projects MUST submit their FEMR within one (1) month after coming back from fieldwork. Please strictly adhere to this instruction regardless of whether full supporting document are secured form project Leaders (after efforts being made to acquire them)*

# CASE STUDIES



# ***PRODUCTION OF VARIOUS LOW COST EDDY CURRENT PROBE FOR TUBES INSPECTION***

**TF0206D113, PRODUCTION OF VARIOUS LOW COST EDDY CURRENT PROBE FOR TUBES INSPECTION****Project Descriptions:**

- Eddy Current technique is one of the Non Destructive Testing (NDT) methods based on inducing electrical currents in the material being inspected and observing the interaction between those currents and the material. Eddy current are generated by electromagnetic coils in the test probe and monitored simultaneously by measuring probed electrical impedance.

**Objective of project :**

- To develop various prototype of low-cost eddy current probe for tube inspection.
- To do promotion and marketing of the locally produced eddy current probe locally and internationally.
- To locally produce eddy current probes with international standards performance in accordance.
- To provide local NDT companies an alternative supply which is currently imported.





**TF0206D113, PRODUCTION OF VARIOUS LOW COST EDDY CURRENT PROBE FOR TUBES INSPECTION**

**Milestone Achievement**

No.	Milestone	Project activities	Completion Date	Completed (Yes/No)
1.0	Upgrading the existing database on heat exchanger	<ul style="list-style-type: none"><li>• Technical survey assessment of heat exchanger/boiler in various locations</li></ul>	14 Jun 2008	Yes
2.0	Theoretical and practical consideration of probe design	<ul style="list-style-type: none"><li>• Calculation, Simulation</li><li>• Fabrication</li></ul>	14 Nov 2008	Yes
3.0	Final probe design	<ul style="list-style-type: none"><li>• Fabrication</li></ul>	14 Dec 2008	Yes
4.0	Probe Testing	<ul style="list-style-type: none"><li>• Eddy current inspection in lab and field</li></ul>	14 May 2009	Yes
5.0	Regulatory and standard requirement	<ul style="list-style-type: none"><li>• Electrical/electronic compliance standard from national standard</li><li>• Feedback from researchers involving in probe fabrication</li></ul>	14 May 2009	Yes
6.0	Commercialization of product	<ul style="list-style-type: none"><li>• Participation in trade fairs and exhibition</li></ul>	14 Oct 2009	Yes
7.0	Simulated of eddy current probes	<ul style="list-style-type: none"><li>• Purchasing of eddy current testing simulation system, data acquisition and accessories.</li></ul>	14 Nov 2010	Yes
8.0	Facilities for multiple size of probe	<ul style="list-style-type: none"><li>• Purchasing of raw materials for probe fabrication<ul style="list-style-type: none"><li>i) Precision body probe (14mm)</li><li>ii) Socket LEMO</li></ul></li></ul>	31 Mar 2011	Yes
9.0	Project completion	<ul style="list-style-type: none"><li>• Prepare end of Project Report</li></ul>	30 Sept2012	Yes



**TF0206D113, PRODUCTION OF VARIOUS LOW COST EDDY CURRENT PROBE FOR TUBES INSPECTION**

Criteria based on PMT'S TOR	Actual
Technical progress	Management process and accountability have been appropriately implemented by the group members following the project plan and in accordance with the specified milestones. Roles, responsibility and reporting of collaborator have been clearly identified and executed to the benefits of the project.
Financial progress	Financial of project was on track and all expenses were justified.
Additional allocation	None.
Extension of project duration	Commencement: 15 Oct 2007 , Completed: 14 Oct 2009 1 <sup>st</sup> Extension date: 15 June 2010 2 <sup>nd</sup> Extension date: 31 Mar 2011.
Scope of projects	No changes.
Milestones	Adding two(2) milestone; milestone 7 and milestone 8.
Modification	Modification of activity and milestone 7 and 8.
Suspension	Not applicable.
Virement	Yes, budget under other milestone vire to milestone 7 and 8.
Termination	Not applicable.
Guidance and support for the recipients in conducting activities	Minimal.
Maintain proper record/ inventory	have a committed team member to handle all project's requirement.



**TF0206D113, PRODUCTION OF VARIOUS LOW COST EDDY CURRENT PROBE FOR TUBES INSPECTION**

***Challenging Issues***

- Project extension. Two times apply for project extension : PMT recommended project leader application to revise the end of project date first on 15 Jun 2010 and second on 31 Mar 2011
- Budget virement. Virement of budget allocation was necessary to ensure that other much needed activities could be carried out.
- Revise milestones. Project leader added two(2) new milestone s namely milestone 7 and milestone 8, to ensure all projects objectives achieved within stipulated project period.



**TF0206D113, PRODUCTION OF VARIOUS LOW COST EDDY CURRENT PROBE FOR TUBES INSPECTION**





# ***DEVELOPMENT OF AUTOMATED SOLAR CELL TESTING AND SORTING EQUIPMENT***

***TF1008D139, DEVELOPMENT OF AUTOMATED SOLAR CELL TESTING AND SORTING EQUIPMENT*****Project Descriptions:**

- The project is to improve the quality yield and productivity of solar cell manufacturing while reducing upfront capital costs by providing a technology platform that support significant manufacturing scale-up.
- To accomplish this, efforts will be focused on the design and development of vision inspection module, electrical testing module and automatic sorting module which can be stand alone module or fully integrated into one equipment for inline (being part of the continuous production line) and offline applications.

**Objective:**

- To develop high speed solar cell testing and sorting equipment which are flexible for application and manufacturing scale up.
- To be innovative in technology advancement and R&D.
- To collaborate with institute higher learning in R&D and development of patentable technology and innovation.
- To become a world major designer and producer of testing and sorting automation for the photovoltaic industry.



**TF1008D139, DEVELOPMENT OF AUTOMATED SOLAR CELL TESTING AND SORTING EQUIPMENT****Milestone Achievement**

No.	Milestone	Project activities	Completion Date	Completed (Yes/No)
1.0	Cell Front & Rear Side Inspection Module	<ul style="list-style-type: none"><li>• Market Survey, Benchmarking and Conceptual Design.</li><li>• Purchase of Pilot Plant Equipment - 3D Laser Triangulation Measurement Apparatus.</li><li>• Purchase of Pilot Plant Equipment - Color Spectrum Measurement Tools</li><li>• Purchase of Pilot Plant Equipment - Instrumentation and Control</li><li>• Development of Front Side Vision Module</li><li>• Development of Rear Side Vision Module</li></ul>	28 Jun 2009	Yes
2.0	Theoretical and practical consideration of probe design	<ul style="list-style-type: none"><li>• Market Survey, Benchmarking and Conceptual Design</li><li>• Purchase of Pilot Plant Equipment - 3D Modeling CAD / CAM Software</li><li>• Purchase of Pilot Plant Equipment – Cell Efficiency Measurement Tool</li><li>• Purchase of Pilot Plant Equipment - Calibration and Measurement Software</li><li>• Development of Input Stacker</li><li>• Development of Pick &amp; Place Module</li><li>• Development of Micro-crack Vision Module</li><li>• Purchase of Pilot plant Equipment – Cell Thermography Measurement Tool</li></ul>	31 Dec 2009	Yes
3.0	Auto Unloader Automation Module, Patent Filing and Marketing Promotion	<ul style="list-style-type: none"><li>• Market Survey, Benchmarking and Conceptual Design</li><li>• Development of Conveyor Module</li><li>• Development of Output Stacker</li><li>• Development of Pick &amp; Place Module</li><li>• Purchase of Pilot Plant Equipment – Electro-Luminescence Measurement Tools</li><li>• Purchase of Pilot Plant Equipment – ARC Coating Thickness Measurement Tool</li><li>• Patent Application and Filing</li><li>• USAINS Consultancy</li><li>• Oversea Exhibition for Sales Promotion</li></ul>	31 Sep 2010	Yes



**TF1008D139, DEVELOPMENT OF AUTOMATED SOLAR CELL TESTING AND SORTING EQUIPMENT**

Criteria based on PMT'S TOR	Actual
Technical progress	Good control over project implementation by project leader. Project implementation is consistent with the project objectives
Financial progress	Project team provided relevant and complete information on all financial transactions related to the project. All expenses are supported with accurate, complete and legible documents such as invoice, contract agreement and Delivery Order(DO).
Additional allocation	None.
Extension of project duration	Commencement: 01 Mar 2009, Completed: 31 Aug 2010. 1 <sup>st</sup> Extension date: 31 May 2011
Scope of projects	No changes.
Milestones	Revise project milestone. Original 8 milestone. After revision only 3 milestones.
Project team members	Project team demonstrates a high technical knowledge and competency in carrying out the project. A lot of knowledge and experience has been gained by the project group during the development of automated solar cell testing and sorting equipment.
Modification	Modification of activity and milestone 7 and 8.
Suspension	Not applicable.
Virement	Yes, budget under other activity vire to other activity much needed
Termination	Not applicable.
Guidance and support for the recipients in conducting activities	Minimal.
Maintain proper record	have a committed team member to handle all matter related to the project.



**TF1008D139, DEVELOPMENT OF AUTOMATED SOLAR CELL TESTING AND SORTING EQUIPMENT**

***Challenging Issues***

- One time project extension : PMT recommended extension of end-of-project date to 31 May 2011.
- One time budget Virement. PMT recommended application to revise milestone and budget to support the achievement of the projects' objectives. Virement of certain budget to other much needed activities.



## **DEVELOPMENT OF AUTOMATED SOLAR CELL TESTING AND SORTING EQUIPMENT**





***THE DEVELOPMENT OF TECHNOLOGIES FOR  
THE PRODUCTION OF TROPICAL OYSTERS  
CRASSOSTREA SPP***



## ***THE DEVELOPMENT OF TECHNOLOGIES FOR THE PRODUCTION OF TROPICAL OYSTERS CRASSOSTREA SPP***



### **Project descriptions:**

- This project will focus on refining and improving the oysters towards a superior product, which is comparable if not better than imported oysters. All operations will be carefully developed and monitored to maintain the highest standard of purity and excellence. This project is aiming at developing technologies to produce a product (oysters), which the consumer is going to find safe to eat, in the desired shape and size and with the right texture and flavour best for the local and export market.

### **Objective:**

- Develop the technologies for the production of oysters in a large commercial scale (up-scaling production).
- Develop the technologies for the production of a superior product, with desired shape and size with the right texture and flavour (superior product).
- Develop the technologies for oyster culture during the nursery stage using modern methods such as upwelling, downwelling and rain-don systems (selecting the right technology)
- Compare the performance of hatchery-produced seeds cultured using different culture system i.e. off-bottom culture and on-bottom culture (selecting the right culture system).
- Selecting the suitable culture sites for commercial scale oyster culture, in terms of its carrying capacity (selecting the right culture location).
- Establish a health management protocol, which will be the most effective method to eliminate contamination that is harmful to human, to produce a product which is safe to eat (sanitation standard).



Criteria based on PMT'S TOR	Actual
Technical progress	The team showed an overall excellent performance with satisfactorily documented milestone activities physically and financially.
Financial progress	Project Leader commit financially, did not depend entirely on TechnoFund disbursement.
Additional allocation	P/Leader letter 25 May 2009: requested for additional funding of RM350,000.00, but rejected by MOSTI.
Extension of project duration	Commencement: 20 Aug 2007. Initial 19 Aug 2008. 1 <sup>st</sup> extension 31 Dec 2009, 2 <sup>nd</sup> extension 31 Dec 2010.
Scope of projects	No change.
Milestones	No change.
Modification of milestone	NA
Project Suspension	NA
Virement	NA
Termination	NA
Guidance and Support for the recipients in conducting activities	Minimal
Maintain proper record/inventory	Employ Company Secretary to assist them.

**Beyond TechnoFund:-**

- PMT invite them to participate in MOSTI NICE 31 Oct 2009
- PMT arranged Meeting with MTDC on 11 May 2011 for further development
- PMT visit LKIM on 23 Feb 2010, for contract farming development



### *Milestone Achievement*

No.	Milestone	Project activities	Completion Date	Completed (Yes/No)
1.0	Refinements of brood-stock	Brood-stock conditioning at an economical cost.	19 Nov 2007	Yes
2.0	Refinements of larval culture	Optimize larval culture conditions research work	19-May-08	Yes
3.0	Refinements of settling process	<ul style="list-style-type: none"><li>• Optimize settling rate research work</li><li>• settling experiments to produce spats with regular size and shape.</li></ul>	19-Jun-08	Yes
4.0	Refinements of nursery systems	<ul style="list-style-type: none"><li>• Optimize juvenile rearing conditions research works</li><li>• Specific culture conditions to produce juveniles with superior texture and taste</li></ul>	19-Jun-08	Yes
5.0	Grow out system	<ul style="list-style-type: none"><li>• Optimize grow-out rearing conditions research work</li><li>• Specific culture conditions to produce marketable oysters with superior texture and taste</li></ul>	30-Nov-09	Yes
6.0	Sanitation management	Sanitation control for post harvest oysters	31-Dec-09	Yes



## *Challenging Issues*

### **Project extension:-**

- Commencement: 20 Aug 2007.
- Completed date: Initially 19 Aug 2008 ( thought could be completed within 1 year).
- 1<sup>st</sup> extension: Supplementary Agreement 25 Jan 2009, project extension until 31 Dec 2009.
- 2<sup>nd</sup> extension: MOSTI letter 14 Dec 2010, approved project extension until 31 Dec 2010.



**Pilot plant: Nursery**



**Shucked oysters**



**Plankton Culture**



**Up-welling System**



**'Coke-bottle' System**



**Raft-rack Hanging**



# ***LARGE-SCALE PRODUCTION OF REFINED AND FRACTIONATED ESSENTIAL OILS***

INNOVATION  
HOTSPOT

**TF0106A122, LARGE-SCALE PRODUCTION OF REFINED AND FRACTIONATED ESSENTIAL OILS****Project description:**

- The project shall include production of raw material for production of refined and fractionated essential oils for the flavor, fragrance, aromatherapy and pharmaceutical industries.
- The proposed project shall have the following components:-
- Staggered planting of selected essential oil plants – 200 ha of patchouli and 100 ha cinnamon (exciting at Budayatama Corp. Sdn Bhd)
- Mechanized post harvest bulk handling – Bulk receiving and weighing, quality, grading, drying, shredding and conveying to distiller system
- Automated distiller system – Based on Kuala Linggi distillation plant design with improvement of features, such as increase in capacity, better essential oil recovery and reduced fuel cost.
- Secondary processing – Fractional distillation of essential oils for production of refined essential oils and valuable fractions for use in the perfumery, flavour, pharmaceutical and chemical industries.
- Waste material handling – Conversion of wastes into useful products, such as composting and mulching material.
- Standardization of essential oils – Establishment of Malaysian Standards for essential oils
- Packaging & marketing of essential oils – Packaging, branding and involvement of business partner with international marketing outlets.

**Objective:**

- To establish pilot scale facilities for post harvest handling, distillation system, fractionation system, packaging and marketing of essential oils
- To produce high quality refined and fractionated essential oil





Criteria based on PMT'S TOR	Actual
Technical progress	As per Schedules.
Financial progress	<p>Specific activities such as irrigation &amp; patchouli planting were under estimated initially in the project costing due to the hilly and undulating nature of the land allocated and also due to the rising cost of sprinklers, valves, pipes &amp; fittings.</p> <p>Activities for the pilot plant and solar dryer such as TNB connection from pilot plant to sub-station, TNB deposit, air conditioning units, electrical wiring, grill for laboratory, conveyor system were not budgeted in original request. Similarly, the laboratory equipments for product evaluation were not included.</p>
Additional allocation	Entity letter 04 Nov 2008: requested for Additional Funding, as some parts of milestones was overlooked, but rejected.
Extension of project duration	Commencement: 13 Nov 2007. Completed date: 31 Jan 2010.
Scope of project	<p>The project team needs to:-</p> <ul style="list-style-type: none"><li>- Be focussed of the products they want to market and not to be too deviated</li><li>- Be focussed on the type of crops they want to plant and develop products</li><li>- Do some feasibility studies as to market demand</li><li>- Workout a proper business plan and strategies</li><li>- Aggressively promote their products and branding</li><li>- Install racks in the solar dryer to maximise space for drying</li><li>- Acquire a GC-MS for quality control</li><li>- Extend the space for the laboratory or preparation room.</li></ul>



Criteria based on PMT'S TOR	Actual
Milestones	No change.
Project team members	Entity signed agreement with Collaborator on 1 Feb 2008.
Modifications	NA
Suspension	NA
Virement	NA
Termination	NA
guidance and support for the recipients in conducting activities	Minimal
Maintain proper record	Was advised to have a dedicated person (Company Secretary / Finance Manager) to assist them.

**Beyond TechnoFund:-**

- PMT invite them to participate in MOSTI NICE 31 Oct 2009



### ***Milestone Achievement***

No.	Milestone	Project activities	Completion Date	Completed (Yes/No)
1.0	Crop establishment	farm road repair irrigation (20 roll @ 600/roll) Fertilization (@3/plant) Replanting Pruning (@0.5/plant) small tractor	Feb 2008	Yes
2.0	Land Preparation	land preparation @Rm100/acre farm road Irrigation	Feb 2008	Yes
3.0	seedling multiplication	planting of parent plants (36,000 plants) plant maintenance seedling multiplication (480,000 plants) plant maintenance	Aug 2008	Yes
4.0	crop planting & maintenance	crop planting (480,000 plants) crop management Fertilization pest & disease (lump sum) harvesting (lump sum)	Mar 2009	Yes
5.0	completion of post harvest handling system	acquisition of 4 units solar dryer storage area acquisition of weighing bridge acquisition of chipping machine	Mar 2008	Yes



## *Milestone Achievement*

No.	Milestone	Project activities	Completion Date	Completed (Yes/No)
6.0	completion of pilot plant buildings, fabrication of distillation system and acquisition of fractional distillation system	agreement with contractor for pilot plant buildings design of pilot plant (1 unit essential oil extraction building, 1 unit waste treatment building, pump house, toilet, store and electrical works) completion of construction of pilot plant buildings agreement with fabricator of distillation system (20 UPV, 20 condensers, 20 oil separators, water pump system, 1 Gentry system, Catwalk, boiler system and related pipings) fabrication of distillation system installation and commissioning of distillation system and related items at site endorsement by JKKP completion of trial run agreement with supplier for supply of fractional distillation system & gas Chromatograph acquisition of fractional distillation system issuance of milestone report	Oct 2008	Yes
7	waste treatment and standard compliance	Acquisition of silage tank Acquisition of raw material: IMO, molasses, etc. Construction of silage preparation & storage area Construction of compost preparation area	Jun 2008	Yes
8	Market testing and evaluation	Product evaluation (essential oil, refined essential oil, silage and compost) Packaging and branding	May 2009	Yes
9	Marketing & promotion	Market promotion internal & external through trade fairs, exhibition, etc.	Dec 2008	Yes
10	Operational cost and Project End	TnT (7*500*12) consultation services (pilot plant production manual) project management fees (2%) utility (fuel, electricity) consumables intend for project report) professional services (Audit & Legal)	Nov 2008	Yes

*Case Study: Large-Scale Production of Refined and Fractionated Essential Oils*



## *Challenging Issues*

### **Financial requirements were underestimated during project planning:**

- Specific activities such as irrigation & patchouli planting were under estimated initially in the project costing due to the hilly and undulating nature of the land allocated and also due to the rising cost of sprinklers, valves, pipes & fittings.
- Activities for the pilot plant and solar dryer such as TNB connection from pilot plant to sub-station, TNB deposit, air conditioning units, electrical wiring, grill for laboratory, conveyor system were not budgeted in original request. Similarly, the laboratory equipments for product evaluation were not included.

### **Scope of project: ( The project team needs to:)**

- Be focused of the products they want to market and not to be too deviated
- Be focussed on the type of crops they want to plant and develop products
- Do some feasibility studies as to market demand
- Workout a proper business plan and strategies
- Aggressively promote their products and branding
- Install racks in the solar dryer to maximise space for drying
- Extend the space for the laboratory or preparation room.

### **Manpower shortage:**

**Maintain proper record/inventory:** Was advised to have a dedicated person (Company Secretary / Finance Manager) to assist them.

# THANK YOU

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