Experiences and Successful Cases of Technology Transfer of Environmentally Sound Technologies (ESTs) from UTM

by

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How ETS is commercialized through a spin-off formation

Outlines:

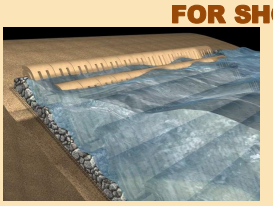
- Introduction of ETSs in UTM
- Case study of ETS-formation of a spin company.

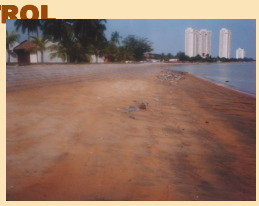
Introduction

- UTM has many ESTs but few at the commercialisation stage. They are still in the pipe lines to be commercialized (Biomass, biogas, solar power, electric powered car etc).
- Among at the commercialisation stage are:

1. Sine-lab
2. IBS low costs building
3. Advanced Thermal Control System (ATCS) for Building Air Conditioning.
4. Pine paper and pine plastics

1) SINE-SLAB : INNOVATIVE & LOW COST IMPROVED METHOD FOR SHORE EROSION CONTROL





NEED :

A unique system to prevent coastline erosion. Help riverbank stabilization and safeguard infrastructure development projects.

MARKET OPPORTUNITY :

Great opportunity to all industries, governments and construction projects

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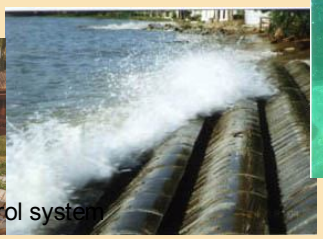
SINE-SLAB : INNOVATIVE & LOW COST IMPROVED METHOD FOR SHORE EROSION CONTROL

- Almost 30 percent of Malaysian peninsular coast has severe erosion problems.
- This incurs multi million ringgit losses

•Coastal Erosion is a Global Problem especially to Maritime Countries.

•Sine Slab safeguards our coastline against severe erosion, land and property damages.



Sine-Slab® erosion control system

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Sine-lab UTM: background

- The government has allocated multi-million Ringgit for coastal reclamation works.
- Sine -Slab® is the solution to the problem
- The award winning invention from Universiti Teknologi Malaysia (UTM) with internationally and nationally recognized in coastal erosion technologies.

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Contd

- Sine-Slab is a flexible pre-cast concrete system with special aesthetic design features.
- The product provides an efficient alternative solution to existing coastal erosion control systems since it promotes improved energy absorption and sediment accumulation.
- The solution was developed through special design considerations with laboratory hydro-dynamic modeling simulations..

Contd

- Sine Slab is successfully implemented at 1.6 km of shoreline at 3 sites in Tanjung Kling, Malacca and also in Butterworth since 1999. The site in Tanjung Kling is of particular significance as it is used to protect the eroding shoreline of Shah Beach Resort, thus protecting the property of a multimillion Ringgit business.
- Sine–Slab is patented (PI 9504122) under Registered Utility Design which covers the Commonwealth Countries.
- Has been licensed to a few companies.
- A spin-off company will be formed to actively commercialise the product.

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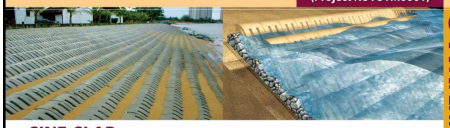
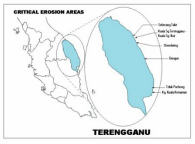


UTM INTELLIGENT PRODUCT FEATURES

SINE-SLAB :
INNOVATIVE & LOW COST WATER EROSION INDUSTRIAL DESIGN

Total length of Malaysian coastline : 4,809 km
Total eroding shoreline : 1,400.3 km

Severe coastal erosion leads to huge loss of sediments into the sea and significant lowering of the bed level



NEED

The need to safeguard our coastlines against severe water erosion, land and property damages

Run-Up in the splash zone for the determination of crest position as well as dimensions and prevention of backwash.

MARKETING OPPORTUNITIES :

Coastal erosion aggravated by wave, current attack and tidal changes during storms is significantly intensified by human interference in the coastal development activities.

- Damage to private properties
- Loss of sediments
- Lowering of the bed level

UTM INVENTION

PRODUCT ADVANTAGES

- Effective coastal protection mechanism
- Few competitors
- R&D increases market potential
- Malaysia coastal erosion:
  - Critical = 242.4 km
  - Significant = 228 km
  - Acceptable = 947 km

UTM INTELLIGENT PRODUCT FEATURES

- Flexible
- Interlocking
- Reentrant Face
- Sinusoidal shape
- Step Like Feature
- Hollow parts as canal system for drainage and sediment trap

COMPETITORS

- Selection of competitive edge
  - Quality vs Price Trade-off
  - Research & Development
  - 4 Ps / 4 Cs
  - Branding

IP (PATENT) NO :

AWARD :

- Gold Medal in World Intellectual Property Organisation (WIPO)
- Best Woman Inventor, 27th Int. Exhibition of Inventions, Geneva , Switzerland (1999)
- Gold Medal -27th Int. Exhibition of Inventions, Geneva Construction Category (1999)
- 13th Khwarizmi International Award, IROST, Iran
- National Inventors Award (1999)
- Gold Medal, Discovery University, (1999)UTM
- Innovation Quality Award, UTM (2000)
- Bronze medal, ITEX'98, MINDS/ MOSTE,
- 1st Prize, INATEX'98, UTM

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UTM INNOVATIVE & COMMERCIAL INVENTION

PRODUCT ADVANTAGES

- Reduces risk of further erosion with aesthetical enhancement approach
- designed to withstand hydraulic forces, stable, flexible and durable.
- less costly to install and maintain.
- more durable and less destructible.
- interlocking and longer lasting.
- unique, made from precast concrete using a newly patented system.
- can face competition worldwide.

COMPETITIVE EDGE

- Innovative, Eco-friendly Design with aesthetic value
- Industrialised Building System (IBS)
- Cost effective
- Improved energy absorption and sediments accumulation
- Malaysia Made Pre-cast Concrete with Interlocking, step-like feature, auto drainage, sediment trapping, thus enhancing beach stabilisation.
- Eco-friendly, Soft Solution with Vegetated cover

INSPIRING **CREATIVE** & **INNOVATIVE** MINDS

AWARDS

- Gold medal-World Intellectual Property Organization (WIPO), Geneva-Best Woman Inventor (1999)
- Gold medal- 27th Int. Exhibition of Inventions, New Techniques, New products, Geneva, Switzerland(1999) - Construction Category
- 3rd Prize, 13th Khwarizmi International Award, IROST, Iran (2000)
- National Inventor Award (1999)
- Gold medal-Discovery University, UTM (1999)
- Innovation Quality Award UTM (2000)
- Bronze Medal, ITEX'98, MINDS/MOSTI
- 1st Prize, INATEX '98, UTM
- Anak Terengganu Cemerlang (R & D), UMNO Terengganu (2003)
- Gold medal, Manufacturing Category, R & D Malaysian Public Universities (2005)

2) IBS: Industrialized building systems

- An innovative modular formwork system
- pecifically designed for the construction of low cost houses
- Developed using materials that will help to reduce the wastages in the construction industry by minimizing the conventional usage of timber.
- The saving gained is around 30% and 50% in term of cost and time respectively.

- Size : 610 sqf
- Height : 9 feet
- No. of workers used : 4-5
- Construction time : 30 days
- Number of room : 3 Bedrooms, 1 kitchen, I Living room & 1 kitchen
- Non exclusive licensing
- Forming a spin-off company

IBS - contd

- Pre-cast building components
- Main work done off-site – in factory
- Walls are strong enough, eliminate columns
- Quick build – save time and labour
- Overall savings – up to 50%
- Better quality control
- Reduced timber and wastages

IBS :contd






3) Advanced Thermal Control System (ATCS) for Building Air Conditioning.

- Malaysian office building energy consumption breakdown is about 64% for air conditioning, 12% lighting and 24% general equipment.
- Majority of Malaysian office buildings have Building Energy Index (BEI) in the range of 200 to 250 kWh/m2/yr while the Green Building Index (GBI), is only 114kWh/m2/yr (Malaysia Energy Centre)

ATCS Contd;

The objective of ATCS is:-

- To promote and market the Energy Saving Program using ATCS for air-conditioning systems in non-residential and residential buildings.
- To support national short term and long term goals for the expansion of green technologies and reduction of carbon emissions in the country.
- Formed a spin-off company and secured funding RM2m from MTDC, a goverment venture company.

ATCS Contd

The Technology:

- A control system – measures the real room temperature, and tells the air-cond system to respond to room requirement.
- The system enhanced load-matching capabilities for water cooled package air conditioning systems.
- can contribute up to 58% of energy saving.
- The technology is now used in UTM buildings.

4) Pina Paper

- Paper from pineapple leaves, which are normally wasted
- Paper is of higher quality compared to the normal pulp papers
- Utilise the normally wasted agriculture materials – increase income for farmers
- Reduce the requirement of wood pulp, ultimately reducing forest destruction
- thus could be considered a GREEN Technology

5) Pina Plastics

- A product that could replace plastics
- It is biodegradable
- Particularly suitable for packaging industry
- Reduce plastics which are non-degradable
- Raw material is the waste product of pine apple canning industry
- Overall Pina Plastics is a Green Technology, which would help the environment.
- Both Pina plastic and pina paper are looking for partners to be commercialised.

Advanced Thermal Control System (ATCS) for Building Air Conditioning: spin-offs formation.

Selection of the technologies

-25 technologies were selected out of 100.

- 10 finally selected after presented to MTDC.
- Technologies are at prototypes and most have single application.
- The technologies selected will be matching with the entrepreneurs.

Selection of Technopreneurs

- **Stage 1**: the first stage, select participants

  (*executed on March ,April and May 2009 , starting from 178 applicants*)

  - using special entrepreneurial aptitude test and interview.
- Finally 19 participants were selected but 10 were selected after they presented their business plan on the technology they will champion.
- **Stage 2** : Selected participants will undergo 3 phases of training scheduled within a six-month period: entrepreneurship and commercialisation training.

Process of forming a spin-off

- A micro credit of 10k was given to the company as seed fund for company registration, CEOs monthly allowances and other expenses within six months before the money will disburse to the companies.

- the equity share is 40% (UTM), 30 (CEOs) and 30 (inventor(s)).

- the CEOs share will be given according to their performance until the maximum of 30%.

Milestones of Symbiosis program

- There will be six milestones that will make up the company's Key Performance Index (KPI) that the selected CEO will have to meet, which are:
  i. Registration of Company;
  ii. CRDF Approval;
  iii. Fund Raising for the balance not covered under CRDF;
  iv. Setting up of Facilities;
  v. A Project-specific Task;
  vi. End of Program.

- Disbursement of shares and/or bonuses will be dependent on milestones achieved. Depending on the particular MTDC Symbiosis Programme, CEO will have 5% of the company's shares, and be awarded up to another 5% of the company's shares out of the Management Pool per milestone met.

Income sharing for UTM

- Upfront payment – licensing fees
- Equity
- Running royalty

Milestones and Share Distribution Table

	MS1 Comp Reg. (%)	MS2 CRDF Granted (%)	MS3 Granted Fund for balance not covered under CRDF (%)	MS4 Setting up of Facilities (%)	MS5 A Project-specific Task (%)	MS6 End of the Program (%)
UTSB **	90	85	80	75	70	65
Main Inventor	5	5	5	5	5	5
CEO/ Management	5	10	15	20	25	30

Note: UTSB ** will hold 25% of the inventors shares as a proxy due to General Order by Ministry of Finance that stated not more than 5% shares should be owned by government servants

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Problems

- Licensees are small companies, have financial problem to execute the project in a large scale (i.e IBS).
- Infringement of IP by licensee. UTM does not have budget allocation to pursue lawsuit for patent infringement (i.e Sine-lab).
- Market resistance from established companies.

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THANK YOU FOR YOUR ATTENTION

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