



## Semenyih Waste To Energy Facilities

**SUSTAINABILITY IN WEALTH CREATION IN SOLID WASTE  
MANAGEMENT THROUGH INTEGRATION OF ECO -  
TECHNOLOGY AND INNOVATION MALAYSIA'S  
PERSPECTIVE**

**FEALAC - 13 & 14<sup>TH</sup> NOVEMBER 2012**

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# LANDFILLS IS STILL THE MAIN SWM DISPOSAL MEANS IN MALAYSIA



M Star On line  
Friday December 24, 2010

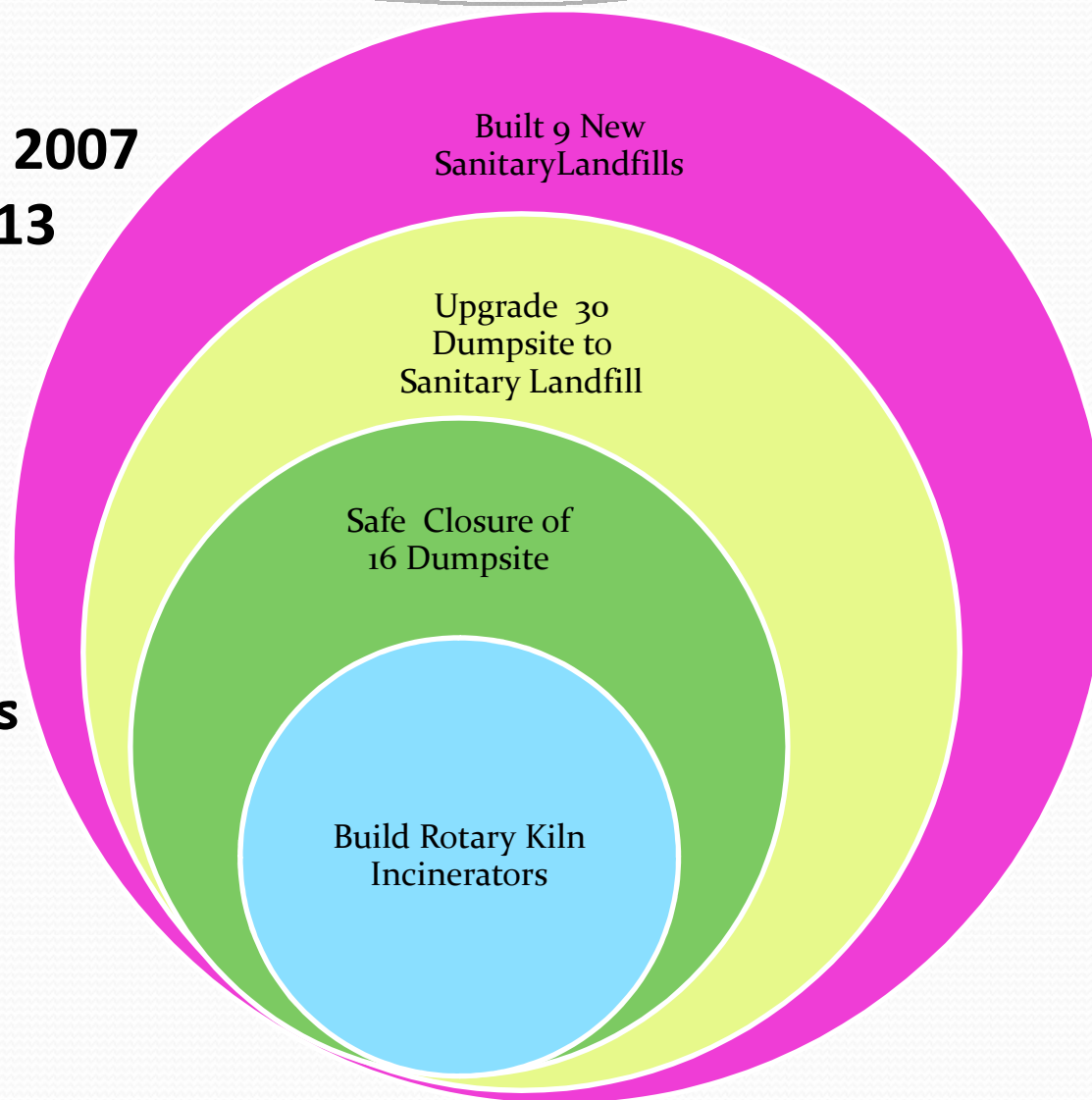
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# Business As Usual Plan

- Solid Waste Management Act 2007
- Target for Implementation 2013

1. Build 9 New Sanitary Landfill
2. Upgrade 30 dumpsites to SL
3. Safe Closure of 16 Dumpsite
4. Built 5 Rotary Kiln Incinerators



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SOURCE: JPSPN

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# UNSUSTAINABLE – PUBLIC FUNDED



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[www.mnr.go.th](http://www.mnr.go.th)



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



# THE DILEMMA

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# Track Record of Incinerators in Malaysia

Broga Incinerator & TOPS Labuan Scrapped

7 Island Incinerators not in operation

5 New Mini Incinerators has yet to operate



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# The ISSUE

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# CURRENT EMPHASIS FOCUS ON IMPROVEMENT ON WASTE COLLECTION AND NOTHING MUCH DONE TO IMPROVE WASTE DISPOSAL – 95% GOES TO LANDFILL

**WASTE  
GENERATION**  
21,000 tons/day

**WASTE  
COLLECTION**  
18,000 tons/day

**LANDFILL/  
DUMPSITE**  
18,000 tons/day



**95%**



# UNSUSTAINABLE, ENVIRONMENTAL DEGRADATION & LOSS OF PRECIOUS RESOURCES



LEACHATE



ILLEGAL BURNING



FOUL SMELL/UNSIGHTLY VIEWS



LANDFILL GAS FIRES



UNHYGIENIC ENVIRONMENT



POTENTIAL ENERGY RECOVERY

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# OUR SOLUTION

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# ECO - INTEGRATED SYSTEMS



Sanitary Landfill



Power Plant



VALUE ADD



Waste Treatment  
& Fuel Preparation



Material/Resource  
Recovery



Leachate Treatment

**REDUCE**

**RECOVER**

**REUSE**

**RECYCLE**

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# WHAT HAVE WE ACHIEVED?

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# GENERATE 48.9 million KwH/ Export 30.5 Million KwH of RE



POWER PLANT



BOILER



TURBINE



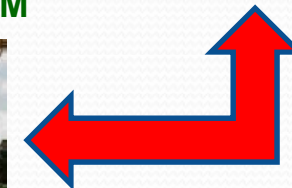
GENERATOR



POLLUTION CONTROL SYSTEM



CHIMNEY WITH CEMs SYSTEM



As at 30 Oct 2012

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**REDUCE 765,502 tons of CO<sub>2</sub>**

**0.58 kg  
CO<sub>2</sub>/kWh**



**CONVENTIONAL  
POWER PLANT**

**0.138 kg  
CO<sub>2</sub>/kWh**



**RDF POWER PLANT**

**As at 30 Oct 2012**

**Life Cycle Analysis Comparison done by Sirim**

**Publication : International Sustainability Journal for Innovation – January 2011**

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**1,000 TONS MSW/DAY & 13MWe = REDUCTION OF 300,000 TONS CO<sub>2</sub>  
ANNUALLY**





# PRODUCE RE-ENGINEERED FUEL (RDF) AS FOSSIL FUEL REPLACEMENT



**Fluff Form**



**Palletize Form**

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# Increase Recovery of Recycling Materials Through Mechanization



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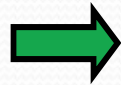


# RECOVER 22,600 TONS OF RECYCLABLES

- Organics to composting/fuel
- Recover **METALS, PLASTICS, RECYCLABLES**



**Film Plastic**



**Resin**



**Products**

As at 30 Oct 2012

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# TREATED 80,210 TONS OF LEACHATE INTO STANDARD 'A' WATER



As at 30 Oct 2012

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# REUSE & RECYCLE TREATED LEACHATE

## TREATED LEACHATE USED FOR MSW TRUCK & PLANT WASHING



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# ENVIRONMENT FRIENDLY & EXTEND LIFESPAN OF LANDFILL

OPEN DUMPSITE  
BEING USED  
EARLIER



**BEFORE**

SITE WAS EARLIER  
A SAND MINING PIT  
BEFORE  
CONSTRUCTION OF  
FACILITY



VIEW OF SITE AFTER  
CONSTRUCTION OF  
FACILITY



**AFTER**

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# AVOID LEACHATE CONTAMINATION INTO WATER SOURCE

**BEFORE**



**AFTER**



**Effluent Treatment Plant**



**Bio-Indicator Pond**

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# BETTER RESOURCE RECOVERY – PARADIGM SHIFT

**BEFORE**



**AFTER**



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**“THROUGH MECHANIZATION”**





# NOT ONLY PRODUCING RENEWABLE ENERGY BUT ALSO SOLVING ENVIRONMENTAL PROBLEMS



WASTE





# OUTPUT AND OUTCOME OF RRC-WTE

## TANGIBLES



Renewable Energy



Healthy Society

## INTANGIBLES



Better Use of Land than Landfill  
Avoid Future Environment Cleanu

## ENERGY

## SOCIETY



## ECONOMY

## ENVIRONMENT



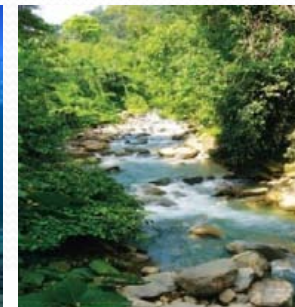
Jobs/Businesses



Recover and Recycle Resources



Beautiful Environment



collaboration with



# DRIVERS THAT LEAD TO INTEGRATED SOLUTION

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**MIND SET CHANGE**



**Commercial Waste**



**Medical Waste**



**Household Waste**



**E-Waste**



**Agricultural Waste**



**IS THIS  
OR IS IT RESOURCES?**



**Industrial Waste**



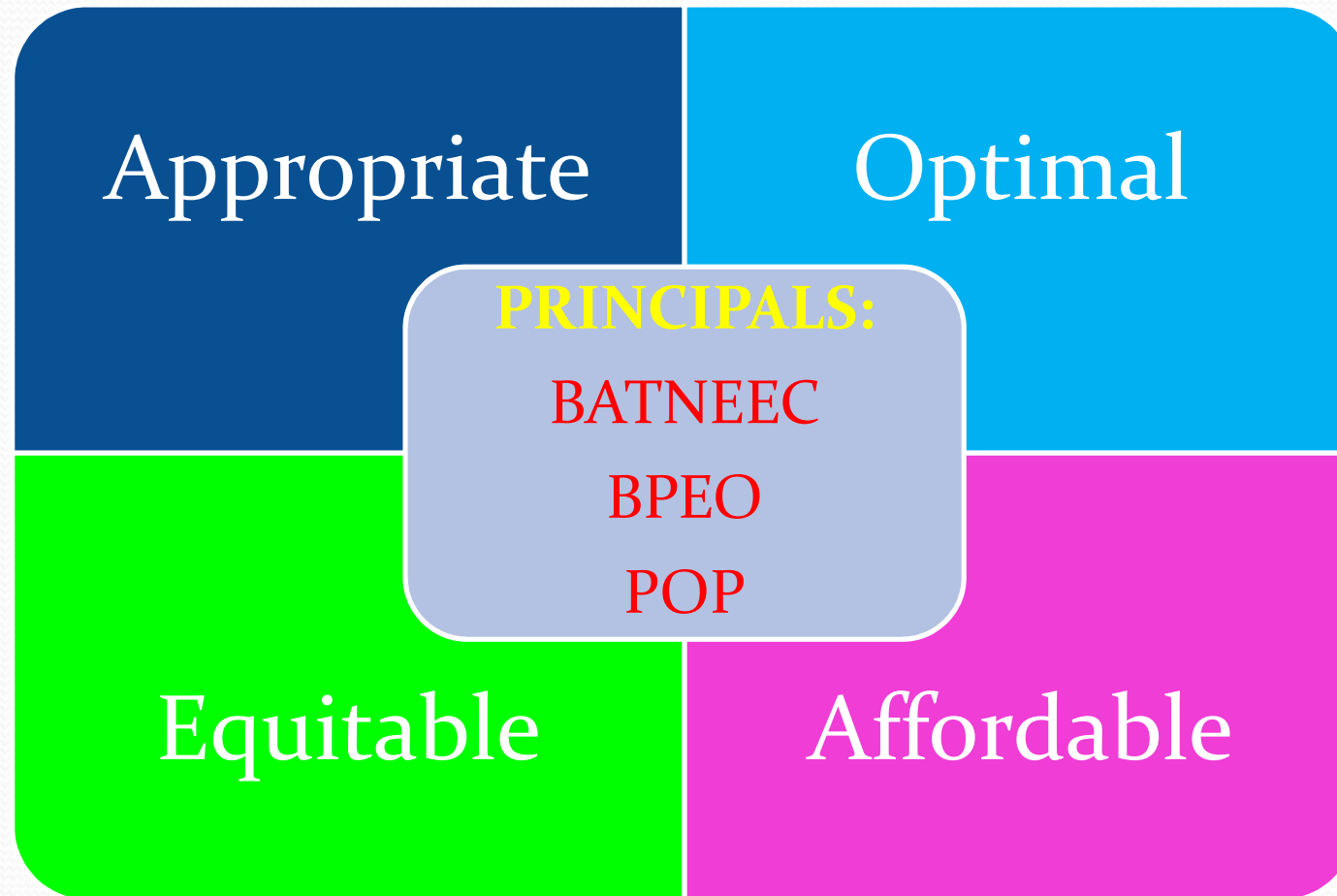
**CDW Waste**

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# THE FOUNDATION FOR OUR SUSTAINABILITY



**BAATNEEC** - Best Available Technology Not Entailing Excessive Cost  
**BPEO** - Best Practicable Environmental Option  
**POP** - Principal of Proximity

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# The Drivers

- Design of an integrated system that meets local requirements and affordability of the population
- Design a system that allows for flexibility for optimization in value and reduction in cost
- Solving real situation and inclusive, not piece meal basis
- Solving all aspects of environmental issue: leachate, smell, ground water contamination, methane emission, eye sore
- Maximizing material extraction and producing renewable energy source/fuel
- Focus on Bankability and not just viability or feasibility

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# The Drivers

- Create professional jobs which were previously dominated by scavengers only
- Business Model Create a multiplier effect in the economy and contributes towards Increase in the GDP.
- A good platform for PPP initiative
- Optimal value creation in the disposal can provide a “negative subsidy” to the “Collection Dilemma” cost through the Value Chain
- A good and structured Business Model can attract bigger Capital Market Players/ Investors for Green Business.
- Good Investments Incentives and Supportive Policies will stimulate and enhanced the development of eco- business

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# AWARDS RECEIVED

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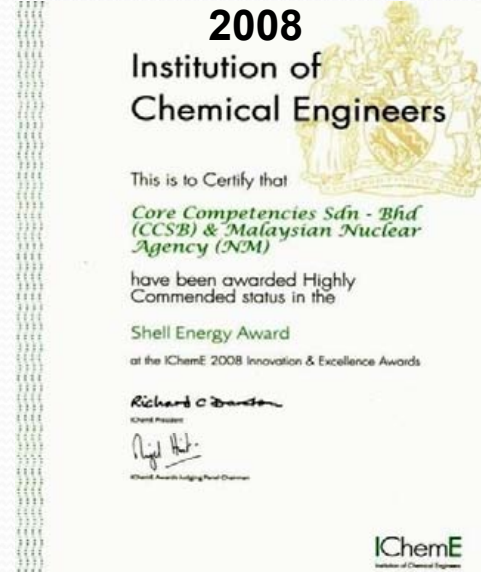


# AWARDS RECEIVED

**ANUGERAH INOVASI PENYELIDIKAN SILVER MEDAL FROM SEOUL  
BERSAMA (AIPB) INTERNATIONAL INVENTION FAIR (SIIF) 2004**



**ICHEM E SHELL ENERGY  
INNOVATION & EXCELLENCE  
AWARD 2008**



**TOP RENEWABLE  
ENERGY  
PLANT AWARD  
ILLINOIS, USA  
MAY 2011**



**GOLD MEDAL FROM CHINA ASSOCIATION  
OF PATENT 2004**



**FROST & SULLIVAN  
INDUSTRIAL TECHNOLOGY AWARD 20**



**OUTSTANDING  
INVESTEES  
COMPANIES  
AWARD  
FROM MVCA  
25 March 2011**

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# IS THERE ANY OPPORTUNITY?

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# MSW CURRENT POSITION

## STATISTICS

21,000 TONNES/DAY  
GENERATED

60% TO 70%  
COLLECTED

>95% TO LANDFILLS

,<5% RECYCLED

47% ORGANIC WASTE

15% PAPER/CARDBOARD

14% PLASTICS

4% METAL

3% GLASS/CERAMIX

**= 290**

OPEN DUMPSITES –  
ENVIRONMENTAL TIME  
BOMB

**= 7**

SANITARY LANDFILLS  
NEEDS IMPROVEMENT

**5 being build  
7 not operation  
= 12**

INCINERATOR  
FAIL TO OPERATE  
COMMERCIALY



**= 176**

( In Operation )

**= 114**

( Closed )



TOPS?  
BROGA?  
SMALL  
INCINERATORS?

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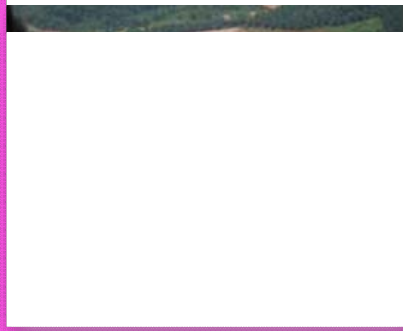
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# COMPARISON TO NATIONAL STRATEGIC PLAN FOR PERIOD 2004-2020

## RE-FOCUS



SANITARY  
LANDFILL

22 SITES



TRANSFER  
STATION

45 STATIONS



MRF/MBT/RDF

7 FACILITIES



THERMAL  
TREATMENT/  
INCINERATOR

6 + 2

### ESTIMATED COST

- CAPEX – RM 15.6 BILLION
- OPEX – RM 14.4 BILLION

**SAVINGS/RE-ALLOCATION OF RESOURCES  
OF RM25 BILLION!!**

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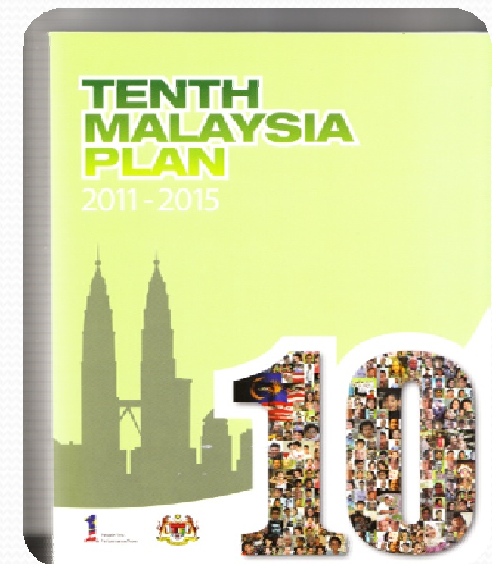
# TENTH MALAYSIA PLAN (2011-2015)

**The Government will complete restructuring efforts in this SWM sector with the federalization of solid waste management and public cleansing and full enforcement of the Solid Waste and Public Cleansing Management Act 2007**

## **The key determinants:**

- **Solid Waste Management Act 2007 implemented in Sept 2011**
- **Ensuring that waste is managed in a sustainable manner.**
- **Renewable Energy Act Approved in 2010**
- **Adopt the Fit –In Tariff Mechanism in 2010 under RE Act 2011**
- **Establish Sustainable Energy Development Authority in 2010**
- **Green Technology Financing of RM1.5 billion approved in 2010**
- **Launching of the Economic Transformation Program in 2010**
- **Additional Fund of RM2 billion being added in 2012**
- **Malaysian Debt Venture established a RM300 million Green Fund**

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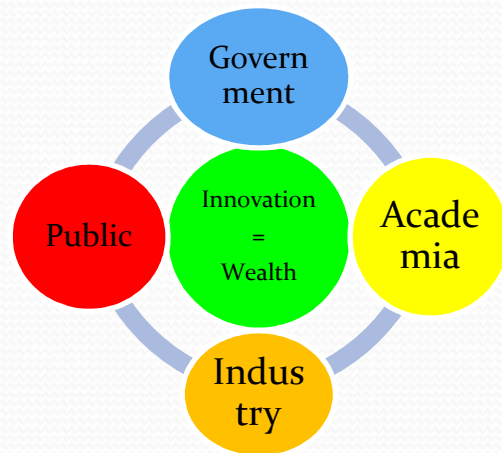


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# TRANSFORMATION INTO THE INNOVATION ECONOMY



“To achieve the bold ambitions that have been set out, **we will need to change the way we have been doing things.** In other words, we will have to innovate.”

*- Prime Minister of Malaysia*

“Using creativity as a building block, innovation results in activities that allow one to **tap new sources of revenues** which were not previously possible.”



“To become an innovative Nation, **we need a mental transformation in the Government, industry and the education sector.** This is to shape the attitude of our future generations.

**This is our mission.”**

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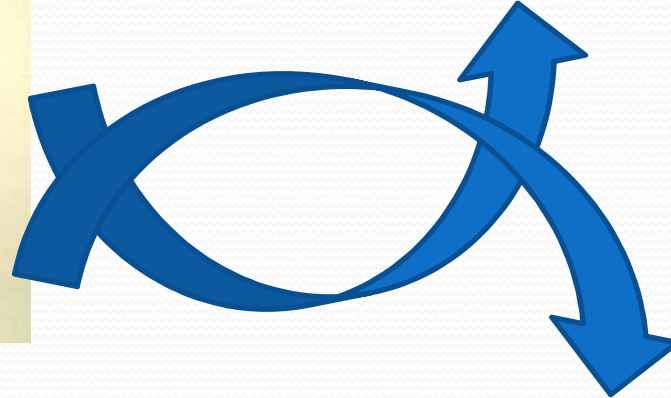


# DECISION ! DECISION!

PPP

## PUBLIC PRIVATE PARTNERSHIP

- Risk Sharing
- Gain Sharing



**POLITICAL WILL ?  
MINDSET CHANGE ?**

## PIRATIZE PROCUREMENT PROCEDURE

- Privatise the Gains
- Socialize the Loss

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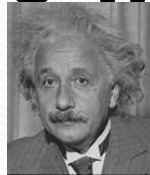
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# QUOTE

**‘ The world is a dangerous place, not because of those who do evil, but because of those who look on and do nothing. ’**



**Albert Einstein**

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# THANK YOU



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