

# Implementing Energy Efficiency Initiatives in Industries

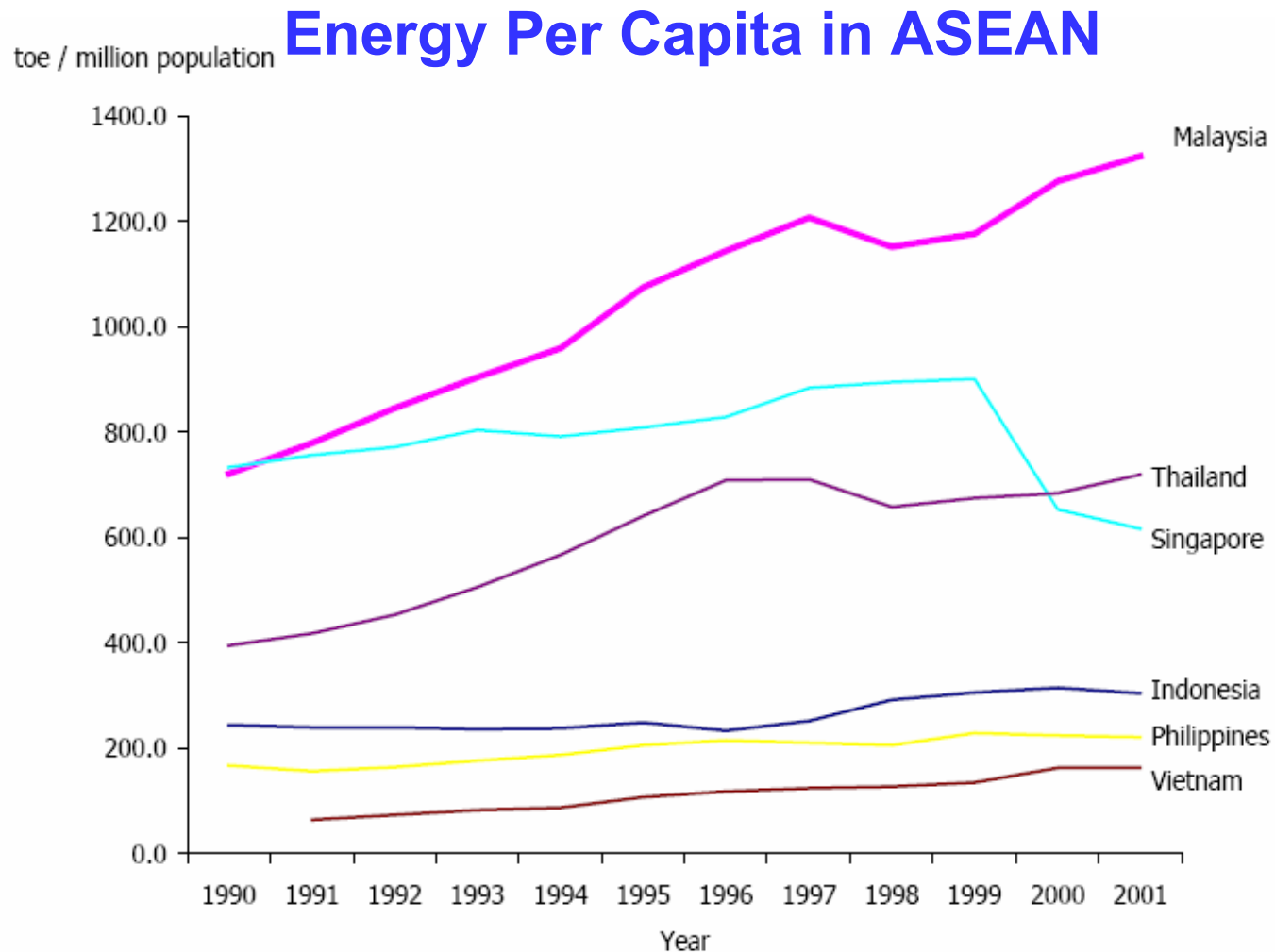
16<sup>th</sup> March 2006

# Pusat Tenaga Malaysia (PTM)

- Agent for public & private energy sectors
- Guardian/repository of national energy database
- “Think-tank” on energy through consultancy services
- Promoter of national energy efficiency & renewable energy programmes
- Lead manager & coordinator in energy research, development and demonstration projects.

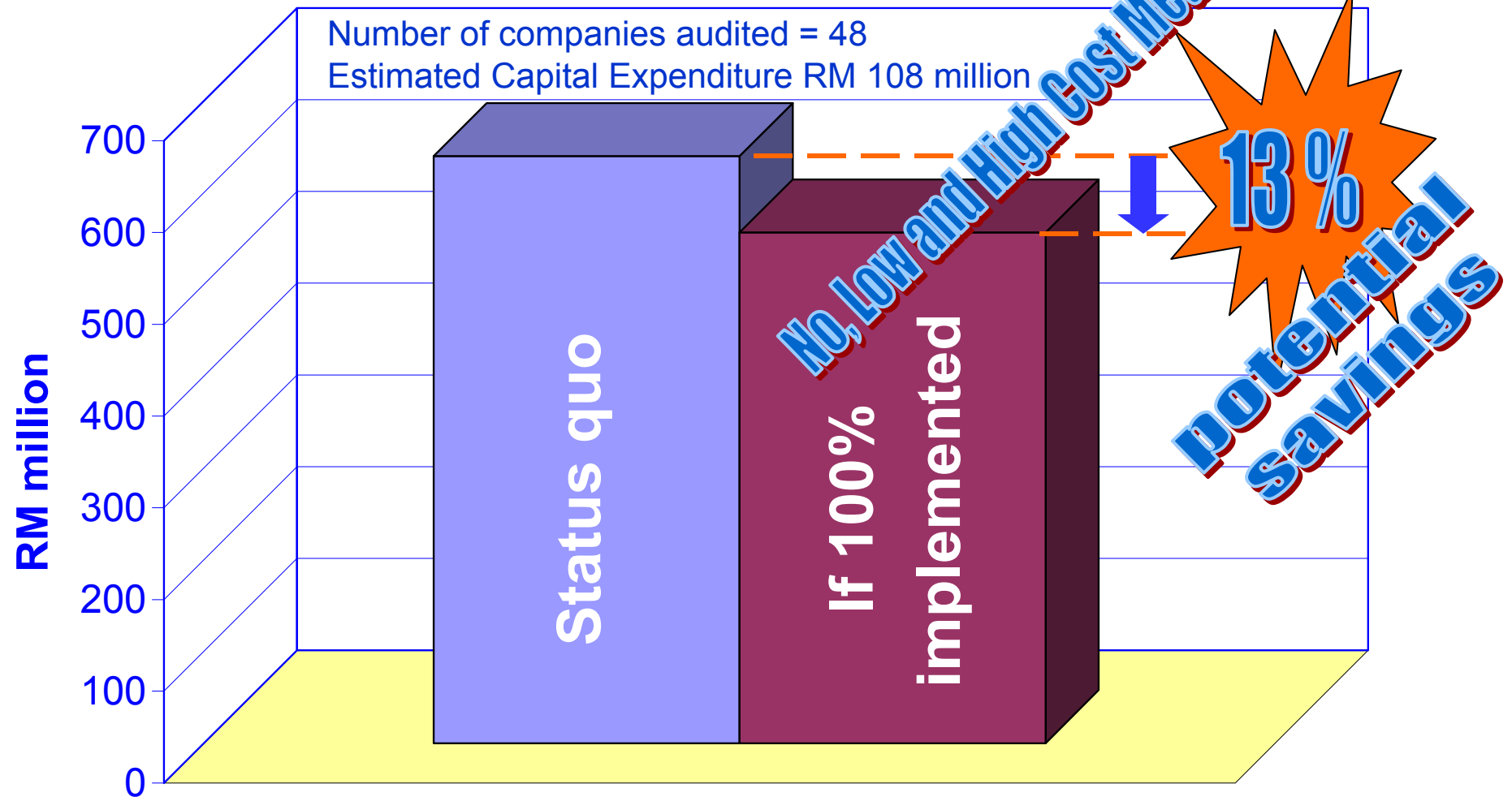


# Why Energy Efficiency (EE)



Source: APEC Energy Analysis Tools, 2003 Edition

# Why Energy Efficiency (EE)



Source: Malaysian Energy Efficiency Improvement Project (MIEEIP)

# MIEEIP-8 industrial sectors

## Community

### INDUSTRIAL ENERGY EFFICIENCY

## Sector

Wood	Rubber	Food	Pulp & Paper	Glass	Iron & Steel	Ceramic	Cement
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## Clusters

-Plyboard, -Chipboard -Medium Density Fibreboard	-Tyres -Gloves	-Cocoa Sauce -Food Oil	-Paper box -Paper board -Newsprint	-Specialty -Sheet -Container	-Billets -Bars & Rods -Iron Casting	-Tiles & Bricks -Sanitary ware -Clay Pipes	-Integrated plant
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# MIEEIP highlights

- MIEEIP aims to reduce the barriers and encourage implementation of EE improvements in the 8 energy intensive manufacturing sectors; **cement, ceramic, iron&steel, food, glass, wood, pulp&paper and rubber.**
- Audited >60 companies
- 8 Demonstration Projects have been identified
  - i. Fuel Replacement using Wood Waste (ESCO-EPC)
  - ii. Boiler Heat Recovery - Food
  - iii. Gob image analyzer / forming machine - Glass
  - iv. Tunnel Kiln Upgrading - Ceramic
- Establish e-Benchmarking facility for industry



10% reduction in:

Energy  
Consumption

Energy  
Intensity

GHG emissions

# JG Containers (Glass Containers Products)

No	Energy Savings Measure	Investment (RM)	Electricity/ Fuel Savings (%)	Payback
1	Rebuilding furnace with control systems	7.0 million	33	4 yr
2	Modification of one annealing lehr	50,000	42	1 yr
3	Water recycling	18,000	25	1 yr

**Investment RM 7.5 million**

**Annual savings 60 000 GJ/Yr**





# Cargill Kuantan

## (Palm Products, Olein and Palm Fatty Acids)

### PROPOSED BY PTM

#### No cost

Steam trap maintenance  
Steam leak maintenance  
Compressed air pipe leakages

#### Low Cost

Insulation maintenance

#### High Cost

Boiler fuel switching  
New scheme for condensate recovery system

### IN-HOUSE IDEAS

Process heat recovery  
Steam trap maintenance  
Process control  
Boiler condensate recovery

### Proposed savings

79,861 GJ/yr @ RM 3,227 k/yr

### Annual energy savings

24,000 GJ/yr @ RM 1.9 mill /yr





# ASEAN-ECCJ Energy Conservation Project



**EE&C Best  
Practices in  
Industries**

**PT Kertas Leces,  
Pulp/Paper Factory  
Indonesia**



***The Energy Conservation Center, Japan***

# PT Kertas Leces Pulp and Paper Industry

Top management's awareness on EE&C is excellent!

## 1. Trigger for energy conservation

1) Energy cost is 24% of production cost! ( 17% (2004) → 22% (2005))

2) Decreased in fuel subsidy since 2001

Recent pending problem

## 2. Cost reduction strategy on fuel cost

1) Fuel switching from oil to gas for short term (2003)

2) Fuel switching from gas to coal for long term (2006~)

## 3. Energy Efficiency & Conservation activities

1) Boiler: Increasing boiler performance by re-tubing, boiler operation from 4 to 3, additional economizers, lowering of steam pressure, etc.

2) Turbine: Increasing turbine performance by clean up of tubes and overhaul

3) Electricity: Repair the old capacitors, Installation of new capacitors

4) Replacement of new air compressor

5) Maintenance of utility devices and instrument, preventive & predictive mainte.

6) Reinforcement of production management

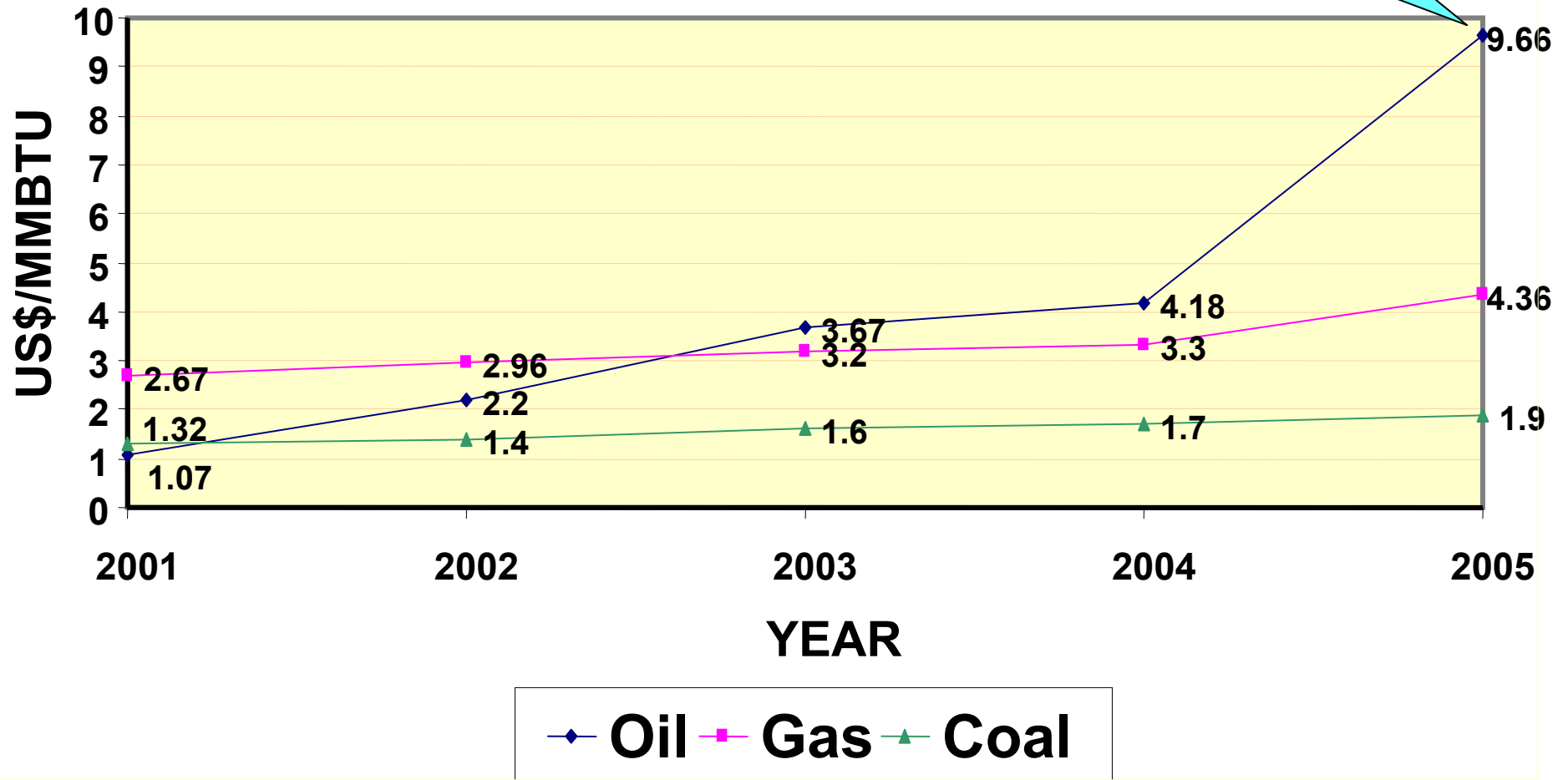


# PT KERTAS LECES of INDONESIA

## Fuel Price Increase

US\$0.37/L  
2.3 times of 2004

### FUEL PRICE



# PT Kertas Leces of Indonesia

## Results of Follow-up Energy Audit

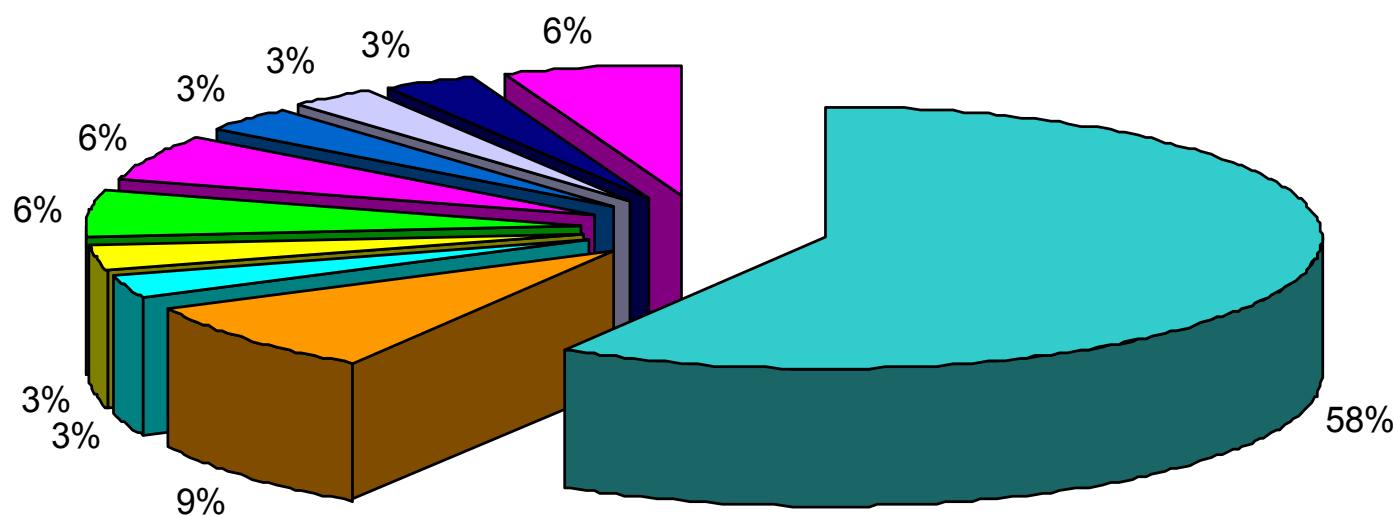
Items		Year			Improvement (2005/2001)
		2000	2004	2005	
Production	Bagasse Pulp	14,876	2,682	823	0.84
	DIP pulp	42,863	2,870	-	
	Paper (t/y)	135,717	152,482	114,273	
Energy consumption	Fuel Oil for Boilers (kL/y)	147,832	1,019	5,184	
	LPG (kg/y)	267,290	0	0	
	N-Gas (kNm <sup>3</sup> /y)	0	122,478	95,149	
	Fuel total (toe/y)	143,693	105,851	86,492	0.60
	Electricity (MWh/y)	219,628	190,936	143,669	0.65
Energy Intensity	Fuel (toe/t-paper)	1.059	0.694	0.757	0.71
	Elect. (kWh/t-paper)	1,618	1,252	1,257	0.78
Energy Price (US\$)	Fuel Oil	0.0428/L	0.1776/L	0.3937/L	9.2
	LPG	0.1479/kg			
	N-Gas		0.1179/Nm <sup>3</sup>	0.1228/Nm <sup>3</sup>	2.3
	Electricity	0.0216/kWh	0.0478/kWh	0.0501/kWh	

**Recent situation (Main problems): Shortage of bagasse, Newspaper market, Gas Supply and Increasing fuel price!**



# Kyoto Protocol: CDM Projects Development

**Proposed CDM Projects by Sectors (as at Dec.'05)**



# CDM Projects: National Approval Process

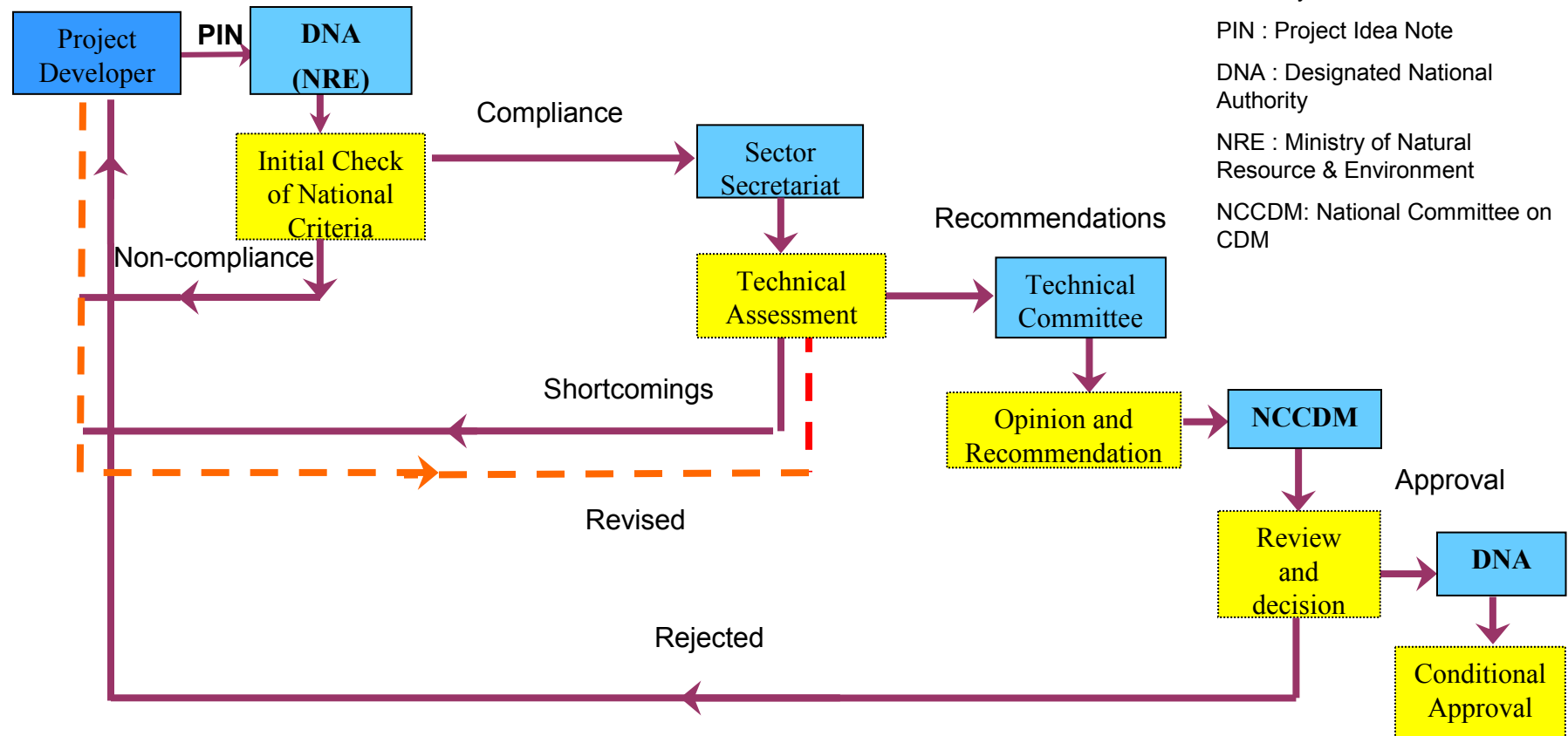
## Glossary of Terms

PIN : Project Idea Note

DNA : Designated National Authority

NRE : Ministry of Natural Resource & Environment

NCCDM: National Committee on CDM







# ENERGY MANAGEMENT

# Energy Management Teams



Energy management  
team members at  
**MALAYAWATA Steel**



**PAN-CENTURY**  
Edible Oils Sdn Bhd  
Vice President Mr PR  
Goyal



Energy Management team of  
**SILVERSTONE Berhad**



Energy Management Team at  
**JAYAKUIK** supported by key top  
management

# Why Energy Management?

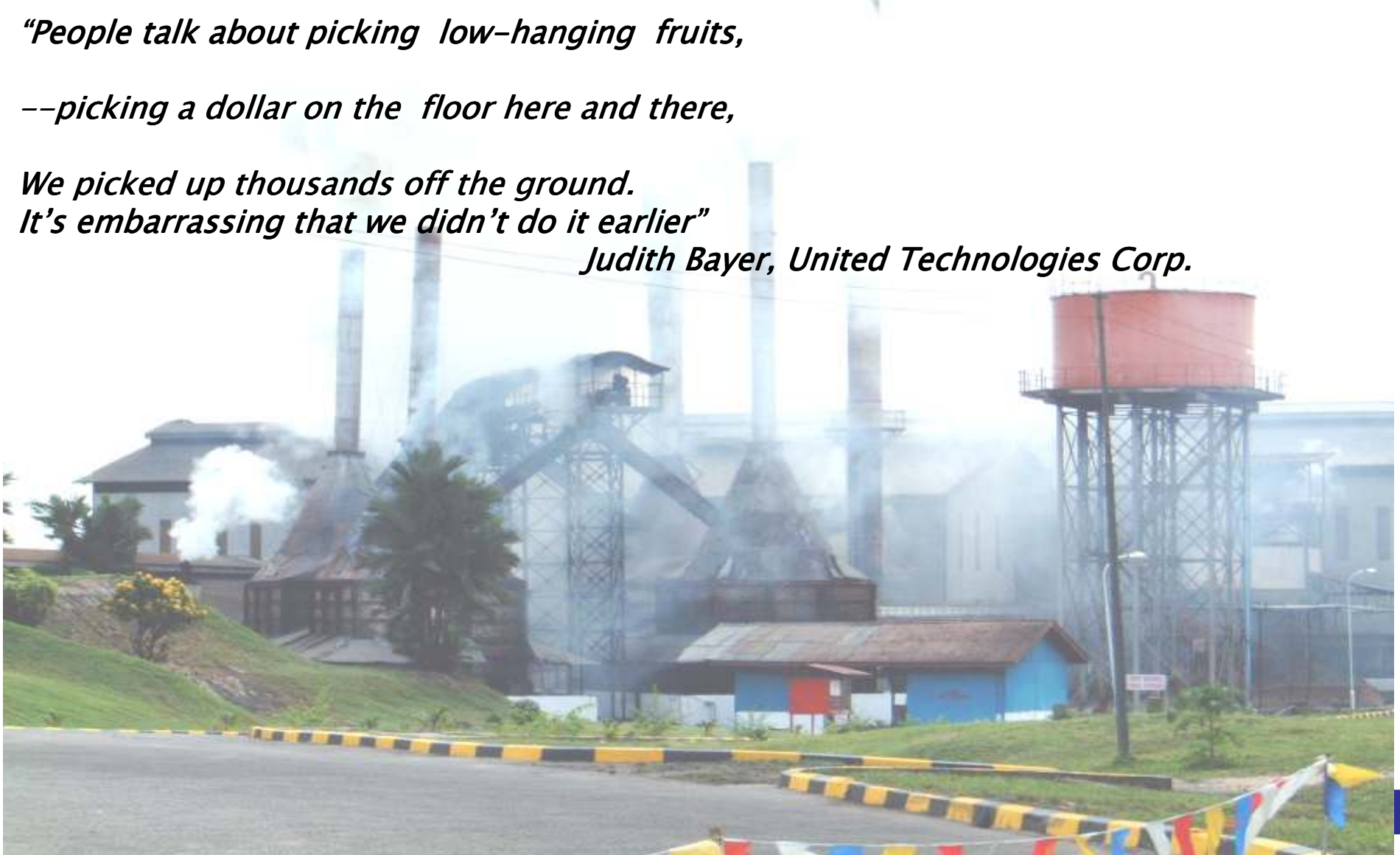
*"People talk about picking low-hanging fruits,*

*--picking a dollar on the floor here and there,*

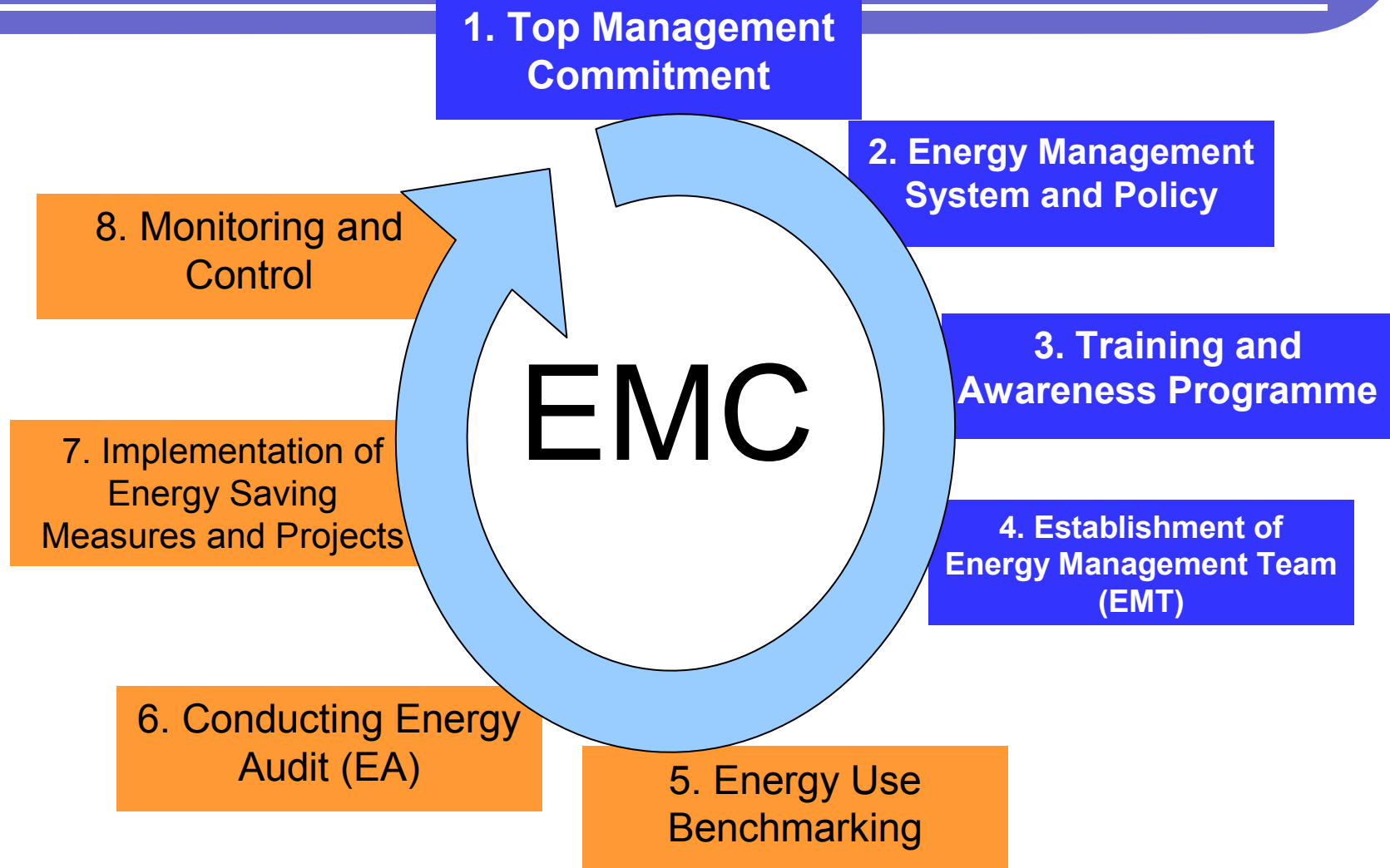
*We picked up thousands off the ground.*

*It's embarrassing that we didn't do it earlier"*

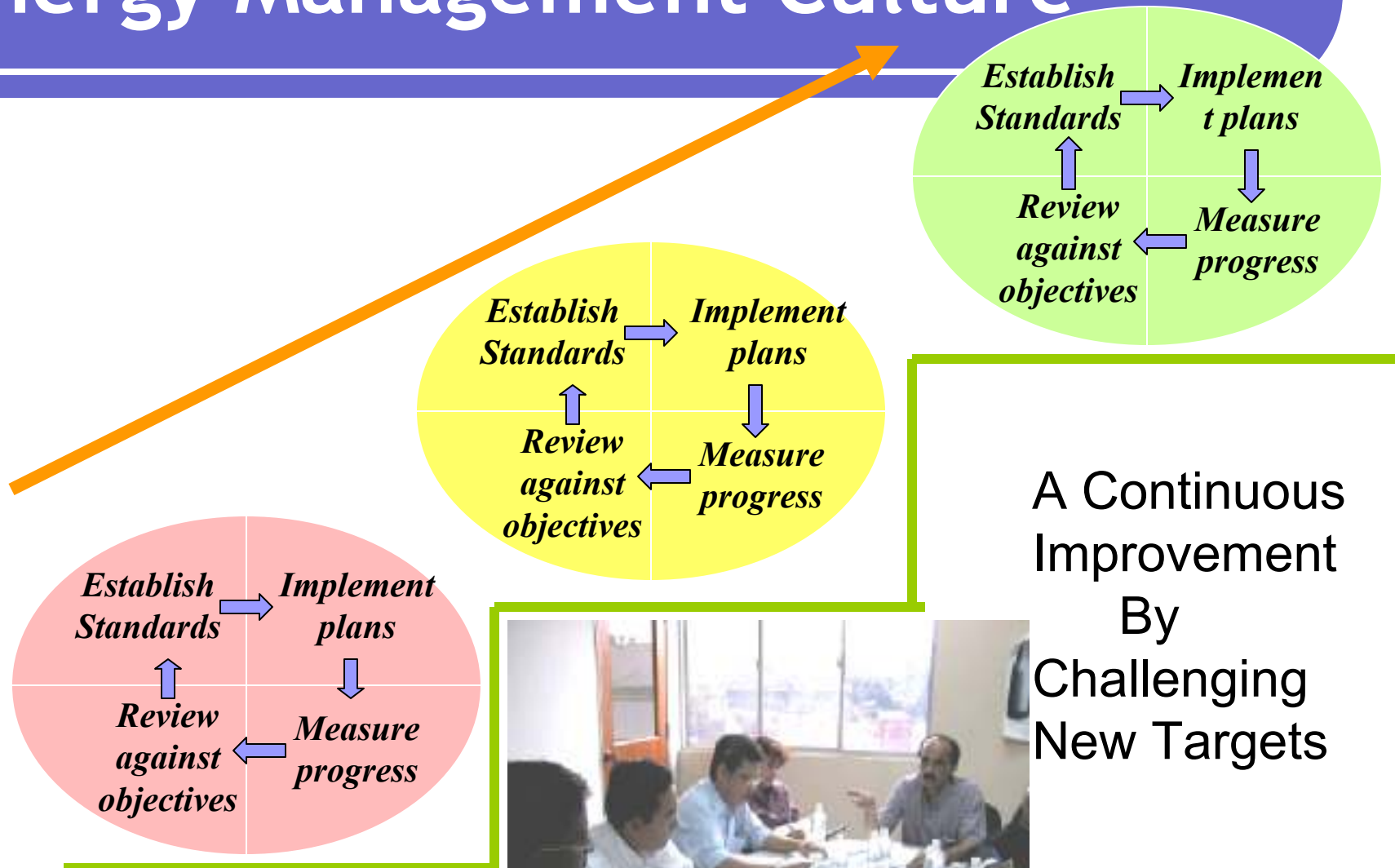
*Judith Bayer, United Technologies Corp.*



# Energy Management Cycle



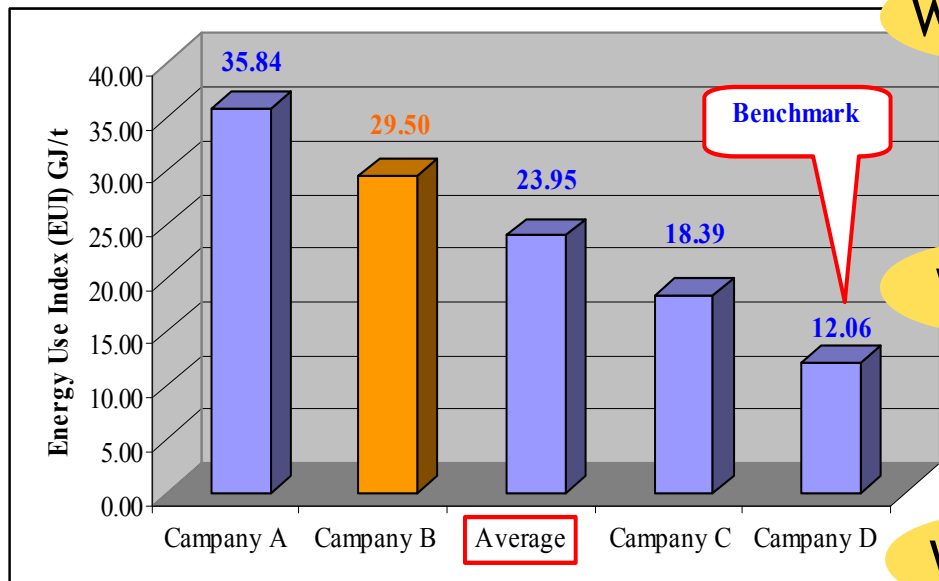
# Energy Management Culture



A Continuous  
Improvement  
By  
Challenging  
New Targets



# EE facilities - Benchmarking



Where?

- Where are you now?
- How good are you?

Why?

- Why are you at this position Vs others?
- How good can you be?

What?

- What can be improved?
- How do you get better?



# Resources for energy audits



## Auditors

Inhouse Energy auditors  
Or external consultants

## Measuring Instruments

Permanent and portable



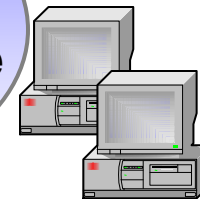
## Energy records

-consumption  
-utilisation process map




## Budget and time



## Analysis Tools Computers & Software



# Energy Saving Measures (Category)

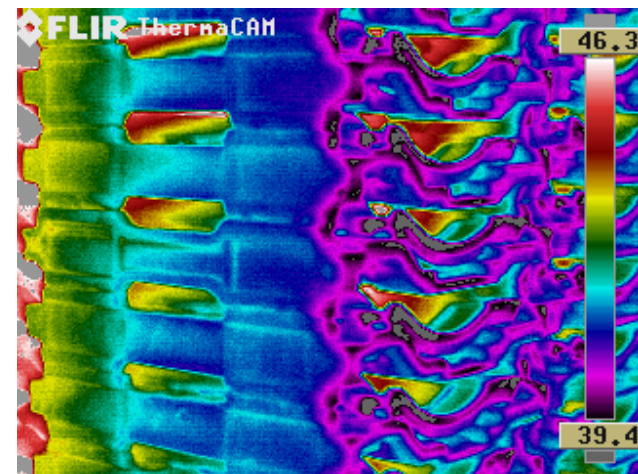
Measures	Examples	Emphasis
<b>No cost</b> 	<ul style="list-style-type: none"> <li>• Excess air improvement</li> <li>• Increasing boiler water TDS level</li> <li>• Boiler pressure setting reduction</li> <li>• Proper steam leak maintenance</li> <li>• Proper steam trap maintenance</li> </ul>	<b>Preliminary energy audit</b>  <b>Implementation by factory</b>
<b>Low cost</b> 	<ul style="list-style-type: none"> <li>• Proper insulation maintenance</li> <li>• Increase boiler combustion air</li> <li>• Boiler stoppage loss reduction</li> <li>• Boiler burner replacement</li> </ul>	<b>Preliminary audit</b> <b>Detailed audit</b>  <b>Implementation by factory</b>
<b>High cost</b> 	<ul style="list-style-type: none"> <li>• Fuel switching</li> <li>• Installation of boiler economizer</li> <li>• Improvement of condensate recovery system</li> </ul>	<b>Detailed audit, preliminary audit</b>  <b>Implementation by ESCOS</b>  <b>Incentives from government helpful</b>

# Instruments (Boiler system audit)

## Flue gas analyser



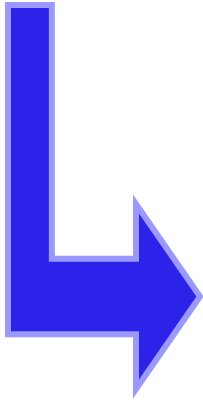
## Insulation



# Energy Records

**Monthly invoices for purchase of energy**

**Log-books with daily, weekly or monthly records**



**Co-operation with in-house staff is indispensable  
for auditing and even more important during implementation**

# Budget and Time

**Walkthrough audit: 4 to 6 weeks**

**Cost of services: Quotation base**





**MIEEEIP :: Industrial Energy Efficiency - Microsoft Internet Explorer**

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# The MIEEEIP Website

Address <http://www.ptm.org.my/mieeip/> Go Links

Home Site Directory Contact Us ? FAQ Links

## MIEEEIP

Malaysian Industrial Energy Efficiency Improvement Project

KTAK Kementerian Tenaga, Air & Komunikasi PTM Malaysia Energy Centre UNDP GEF

### ABOUT MIEEEIP

#### MIEEEIP PROGRAMMES

- ✓ Benchmarking
- ✓ Audit
- ✓ Energy Rating
- ✓ Promotion
- ✓ ESCO Support
- ✓ Demonstration Projects
- ✓ Local Equipment Manufacturers
- ✓ EE Financing

#### CASE STUDIES

#### TOOLS



**International & local Case studies on EE technologies**

Three Factories Selected As EE Demonstration Sites (10/6/04)

Three local factories have committed over RM17 million to participate in energy efficient technology demonstration projects under the Malaysian Industrial Energy Efficiency Improvement Project (MIEEEIP).

It is expected that the total annual cost savings for the three factories is about RM6.0 million, with the possibility of reducing CO2 emissions by 27,615 tonnes per year.

### Search

#### MIEEEIP news

- MIDF is Fund Manager for Demonstration Projects [Read more](#) **NEW**
- Discussion On Energy Efficient Technology Features Assessment [Read more](#) **NEW**
- NPC and PTM to synergise their efforts [Read more](#)
- Eight Equipment Manufacturers Shortlisted For Improvement Programme [Read more](#)
- MIEEEIP in Singapore to Promote EE Opportunities [Read more](#)
- Contractor Appointed for First Demo Project [Read more](#)

<http://www.ptm.org.my/mieeip/sitemap.html>

start | Internet

Inbox - Microsoft... | Q\_Cyberjaya&Pu... | MIEEEIP :: Industr... | Seminar&Workshop | PTMBuilding - Paint | 4:43 PM



# Thank You



**Our Function :**

Guarantee

Pusat Tenaga Malaysia

Malaysia One Stop Energy Centre

**About us**   **Programmes**   **Publications**   **Resource centre**   **Jobs & Opportunity**   **Contact us**   **Site directory**

**Our Services**

- Data on energy statistics
- Consultancy on industrial and building energy audit
- Consultancy on renewable energy (RE) and energy efficiency (EE)
- Consultancy on energy research projects
- Rental of energy audit equipment
- Regularly updated information on energy
- A well equipped resource centre
- In-house publications
- A complete ESCOs directory



**New PTM Building (Zero Energy Office)**

click for more info



**energy efficiency**  
**renewables energy**

9:28 AM Friday 13th January 2006

**Energy Highlights**

**Budget 2006...on Energy**

With gas reserves totaling up to 85 trillion square feet, and palm oil as a source for biofuel, Malaysia is currently formulating a policy to encourage the widespread usage and production of both this environmental friendly fuel.



Budget speech

**Energy project extended to 3 new energy-intensive sectors**

To promote energy

**PTM Membership Updates**

Currently we have a total of 102 Members:

- :: 60 Corporate Members
- :: 42 Individual Members

■ List of PTM Members

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