Pusat Tenaga Malaysia

Sustainable Energy Development

Implementing Energy Efficiency Initiatives in Industries

16th March 2006

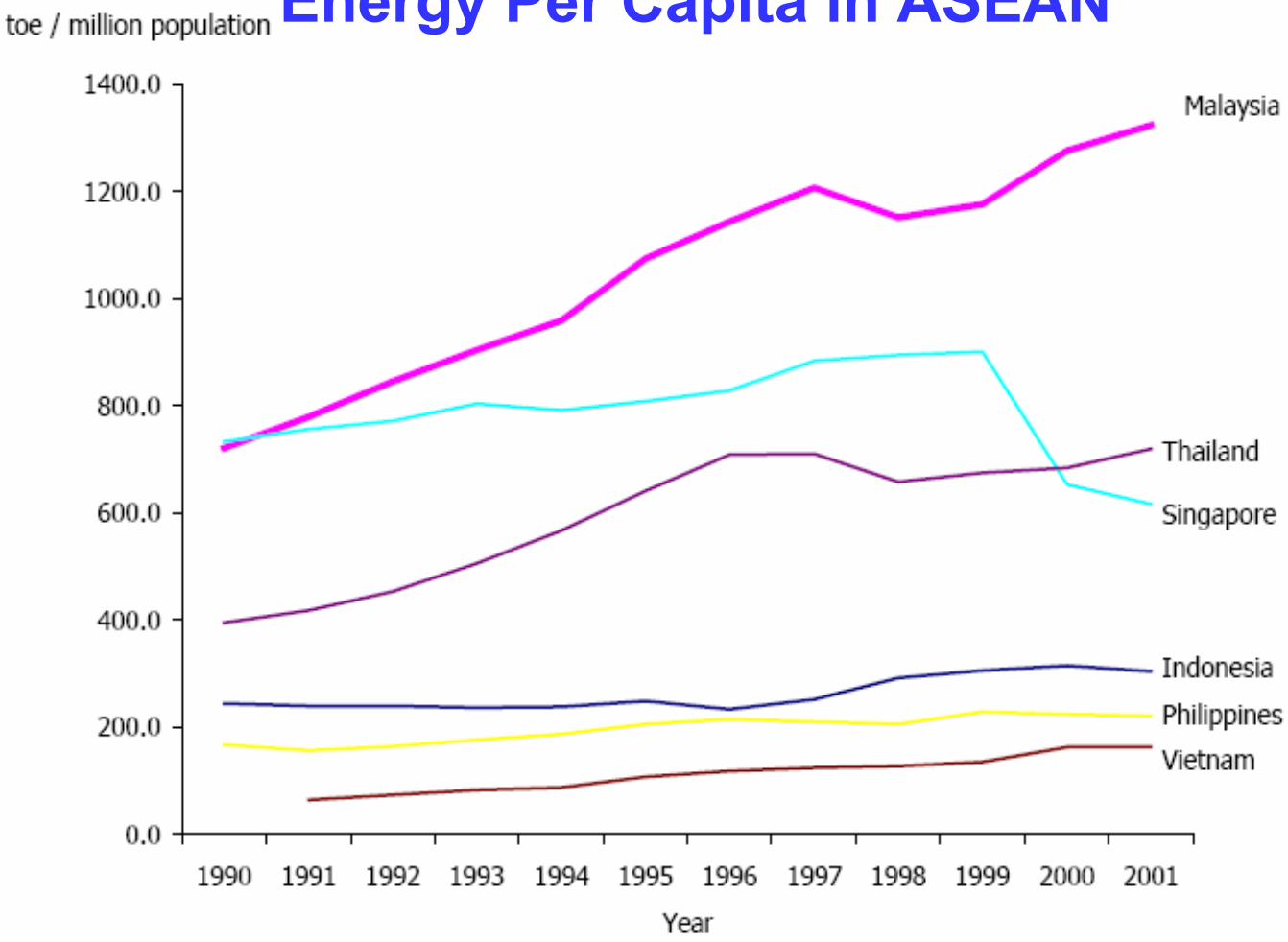
Pusat Tenaga Malaysia (PTM)

- 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.

Malaysia Energy Centre

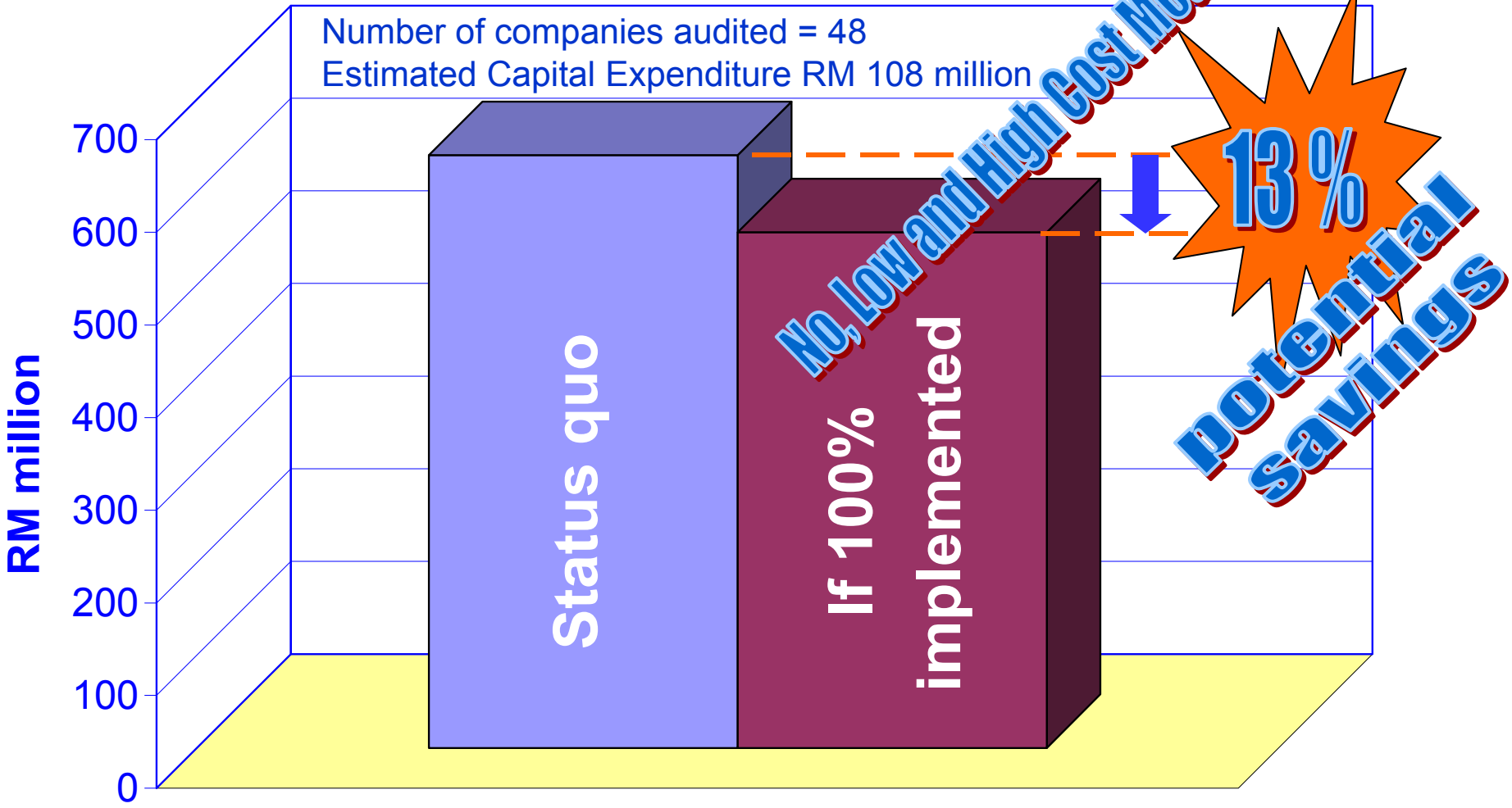
Why Energy Efficiency (EE)

Energy Per Capita in ASEAN



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

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




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

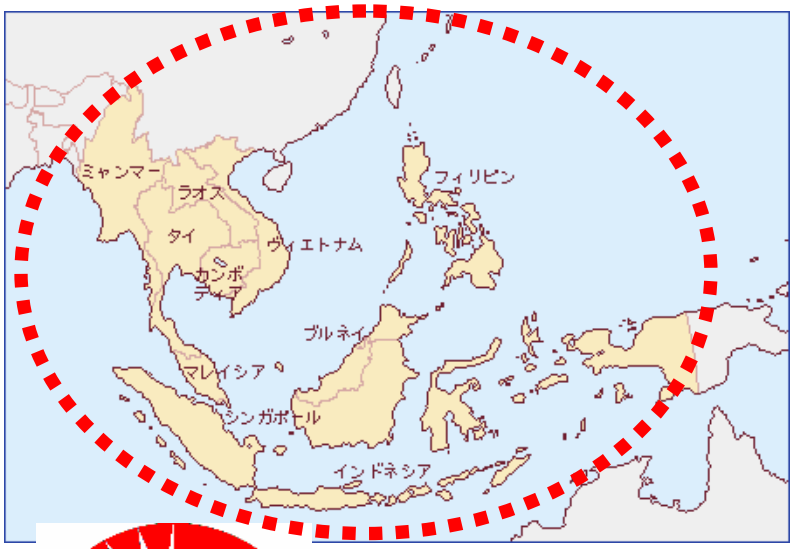
Proposed savings

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

INDONESIA

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) 2?% (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

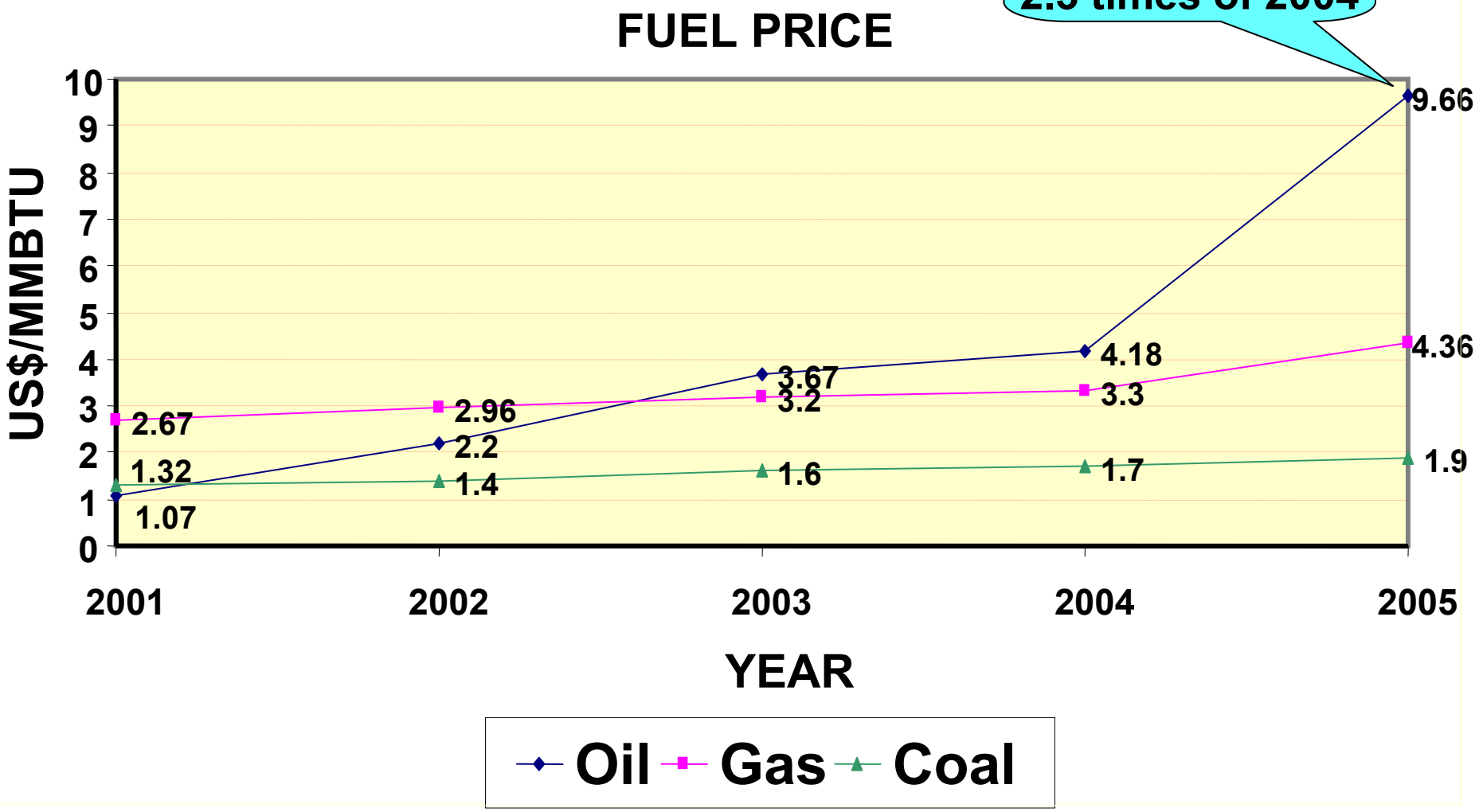
4) Replacement of new air compressor

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

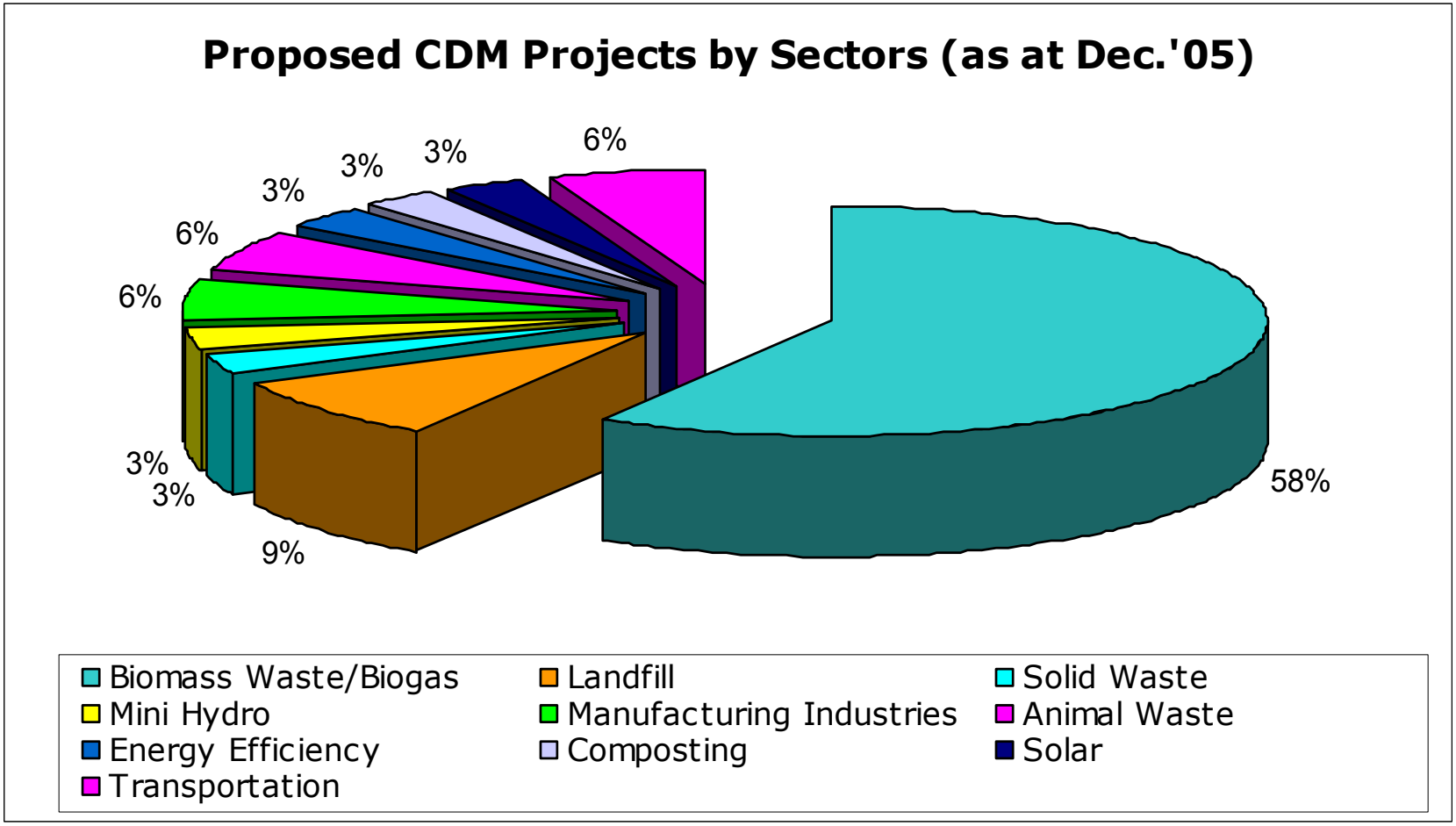


PT Kertas Leces of Indonesia
Results of Follow-up Energy Audit

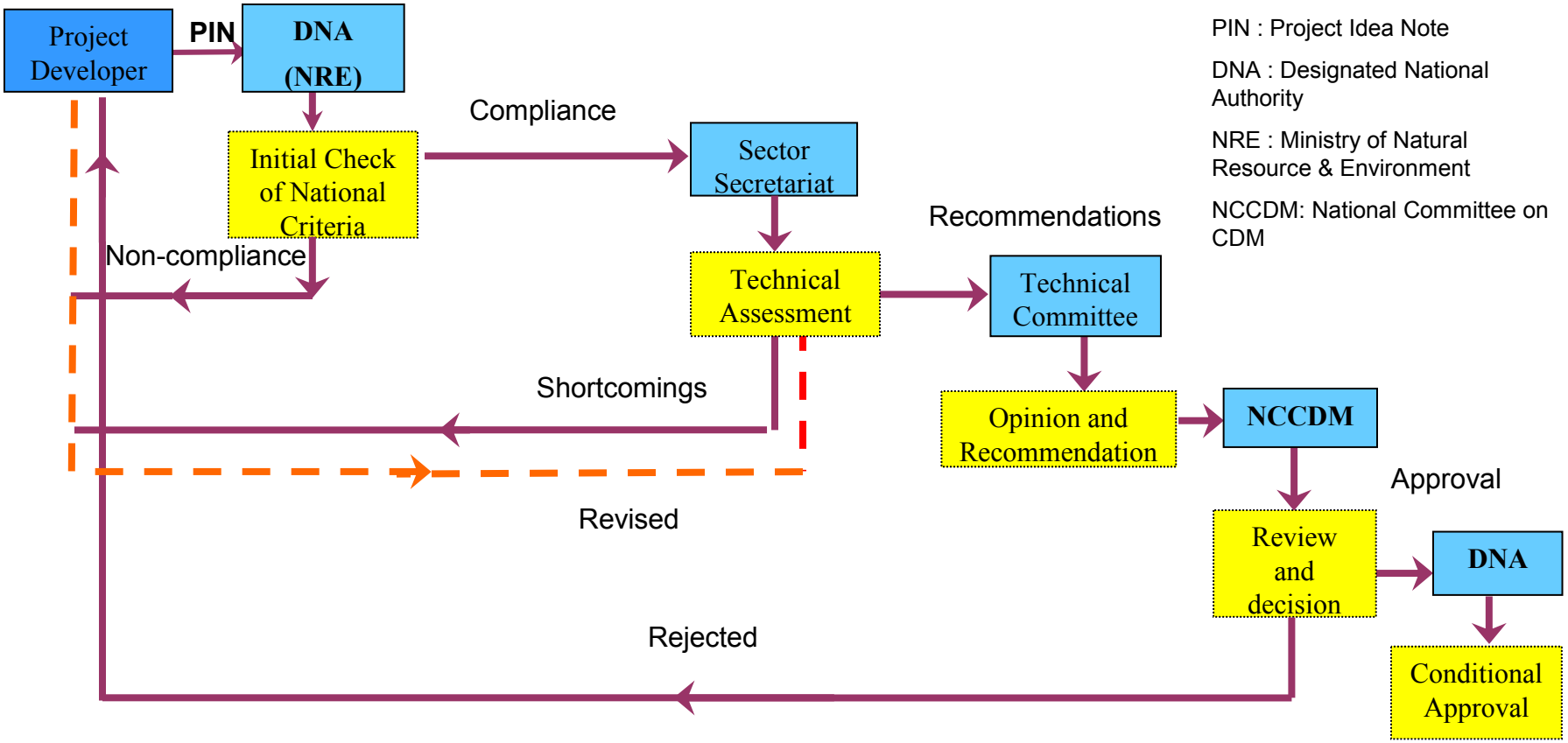
Items		Year			Improvement (2005/2001)
		2000	2004	2005	
Production	Bagasse Pulp DIP pulp Paper (t/y)	14,876 42,863 135,717	2,682 2,870 152,482	823 - 114,273	0.84
Energy consumption	Fuel Oil for Boilers (kL/y)	147,832	1,019	5,184	
	LPG (kg/y)	267,290	0	0	
	N-Gas (kNm^3/y)	0	122,478	95,149	
	Fuel total (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 LPG N-Gas Electricity	0.0428/L 0.1479/kg 0.0216/kWh	0.1776/L 0.1179/Nm^3 0.0478/kWh	0.3937/L 0.1228/Nm^3 0.0501/kWh	9.2 2.3

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

Kyoto Protocol:
CDM Projects Development



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?

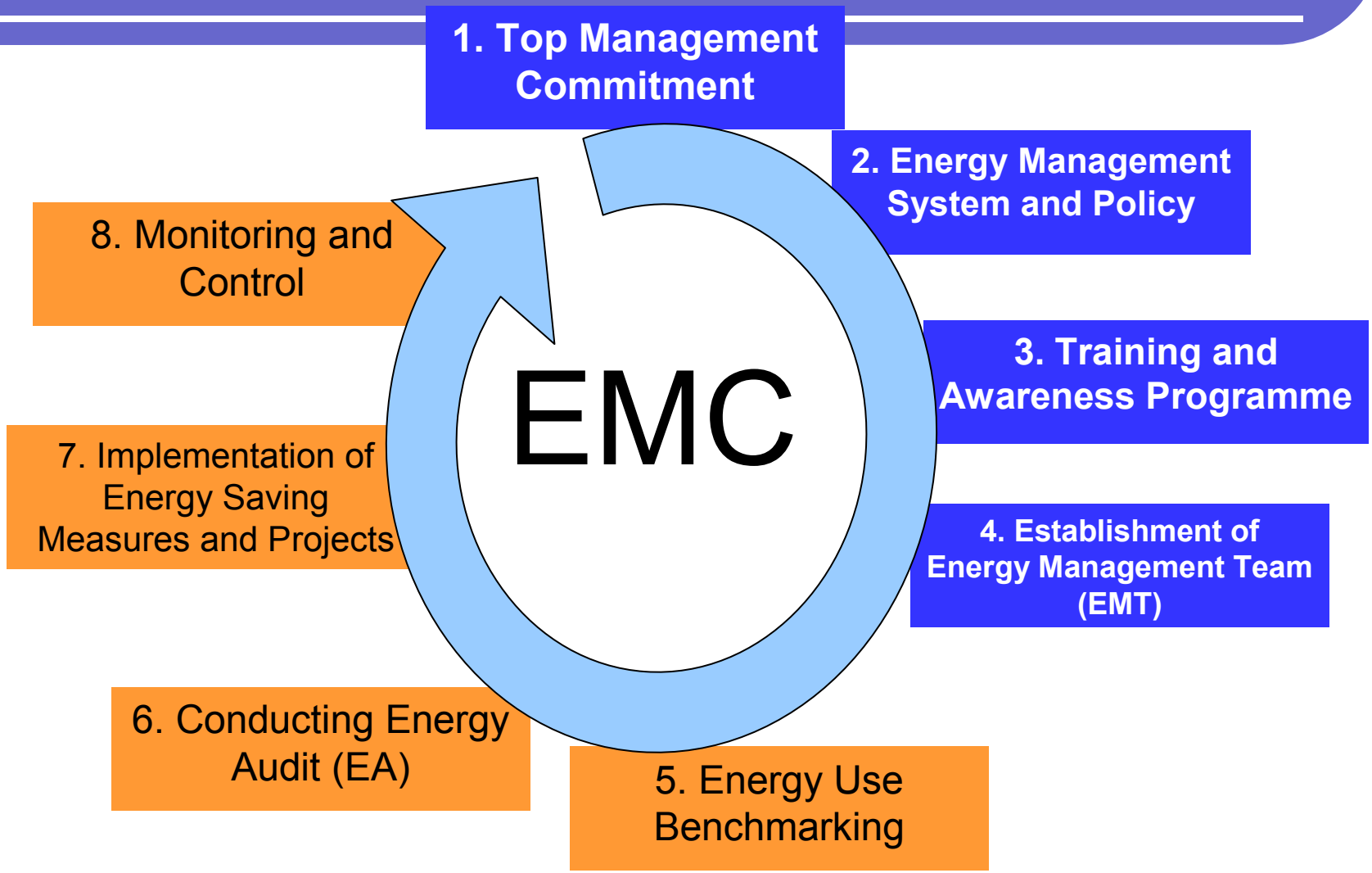
"People talk about picking low-hanging fruits,

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

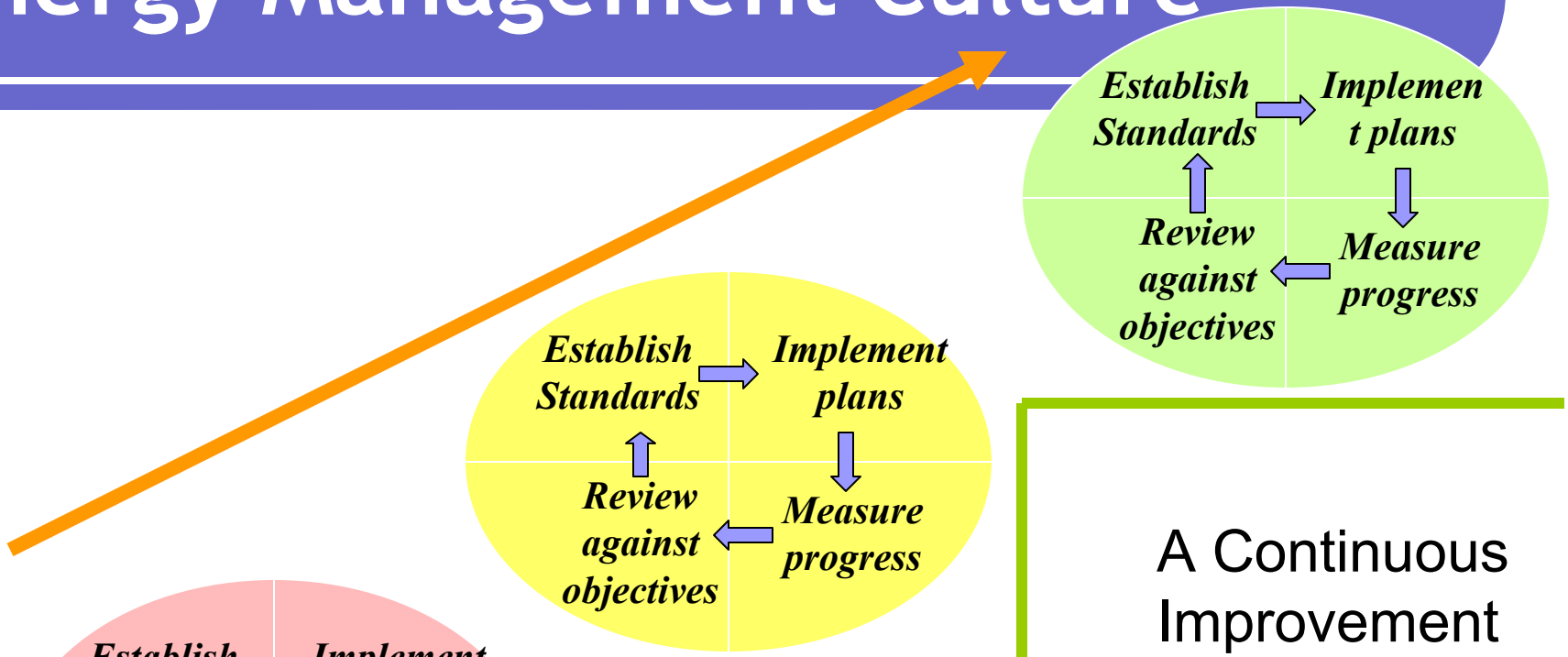
We picked up thousands off the ground.
It's embarrassing that we didn't do it earlier"

Judith Bayer, United Technologies Corp.

Energy Management Cycle

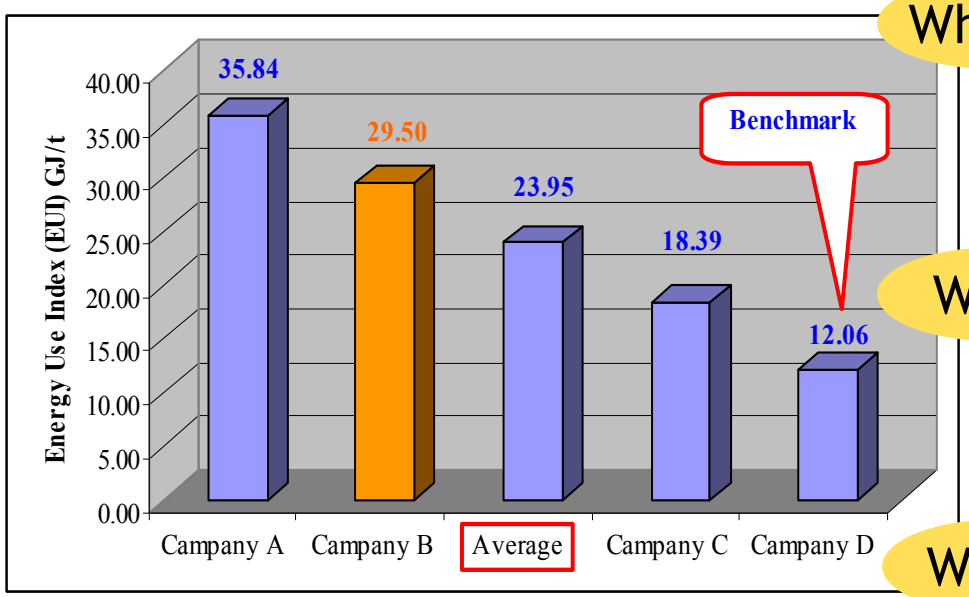


Energy Management Culture



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

Measuring Instruments
Permanent and portable

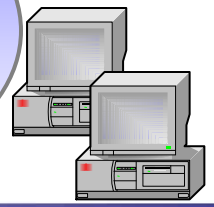
Auditors

Inhouse Energy auditors
Or external consultants

Energy records
-consumption
-utilisation process map

Budget and time

Analysis Tools
Computers & Software



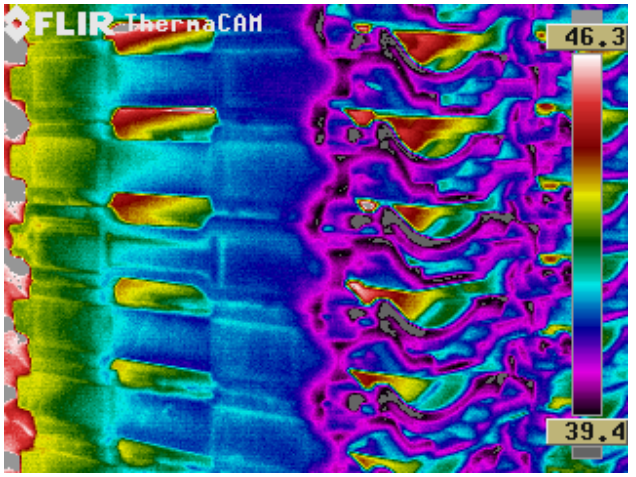
Energy Saving Measures (Category)

Measures	Examples	Emphasis
No cost 	• Excess air improvement • Increasing boiler water TDS level • Boiler pressure setting reduction • Proper steam leak maintenance • Proper steam trap maintenance	Preliminary energy audit Implementation by factory
Low cost 	• Proper insulation maintenance • Increase boiler combustion air • Boiler stoppage loss reduction • Boiler burner replacement	Preliminary audit Detailed audit Implementation by factory
High cost 	• Fuel switching • Installation of boiler economizer • Improvement of condensate recovery system	Detailed audit, preliminary audit Implementation by ESCOS Incentives from government helpful

Instruments (Boiler system audit)

Flue gas analyser

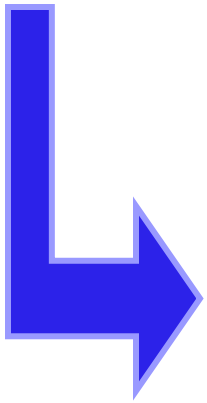
Insulation



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

The MiEEIP Website

Thank You

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