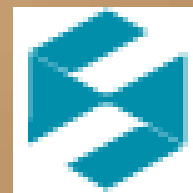


Development of a Technical Directory for Major Industries and Buildings for ASEAN Member Countries

Seminar on the Promotion on Energy Efficiency and Conservation
(PROMEEC) Industry in Southeast Asia
Thailand, 17 November 2006



Development of a Technical Directory

Phase 2 of PROMEEEC Activities

Implementation of Energy Audits and Recommended Improvements in Each Country

- Follow Up Survey to Find Actual Status
- Study on Barrier and Measures
- Consulting for Implementation

Dissemination of Technologies and Practices

- Preparation of Technical Directory
- Establishment of Database
- Workshop for Dissemination

Development of an “ASEAN Energy Management System”

Why Develop a Technical Directory?

- Introduce and promote technologies and best practices on EE&C available in the world and in ASEAN
- Encourage further investments in technologies and best practices
- Help create the market
- Promote a culture of increased efficiency
 - Savings
 - Employment
 - Environmental Protection



The Technical Directory

- Designed to be user friendly
- Available for all users as it is web based
- Displays a wide coverage of technologies and best practices
- Updated regularly
- Open for expansion

Contents of the Technical Directory

- Overview of Technology or Practice
 - Name of Technology
 - Energy Source/Practical Use
 - Outline and Effects
- Technical Description
 - Principle
 - Features
 - Mechanism
- Successful Cases
 - Energy Saving and Cost
 - Companies/Organizations

The background of the slide features a warm, orange-toned photograph of an industrial facility. On the left side, a set of metal stairs with railings leads upwards. On the right side, there are more complex industrial structures, including what appears to be a spiral staircase or a series of interconnected walkways and platforms. The overall atmosphere is industrial and technical.

Status of Compilation

- 50 Technologies for Industries

- Operation
- Heat exchange
- Machinery and equipment
- Energy saving equipment
- Welding

- 33 Technologies for Buildings

- Operation
- Regulator
- Air conditioning
- Electricity
- Steam drain
- Lighting improvement

Technologies for Industries

Application of Heat Pumps to a Fractionator

Boiler Re-circulation scrubber pump

Capacitor

Caustic soda production process, Brine electrolysis heat recovery line preheater

Caustic soda production process, Energy-saving ion-exchange membrane electrolyzer

Caustic soda production process, Improvement of active cathode for ion-exchange membrane method electrolyzer

Caustic soda production process Reduction of electrolytic electricity of brine electrolyzer

Circulating Fluidized Bed (CFB) Boiler Technology

Clean Boiler Waterside Heat Transfer Surface

De-inking Module Pumps

Development of Energy Conservation Technology for Manufacturing Plastic Products through Process Omission

Development of Energy Saving Distillation, Technology through Internal Heat Exch.

Development of Fundamental Technologies for Next-Generation Satellites

Development of Welding Technology of Steel Conservation Structures for Energy

Energy saving improvement of blowers and pumps

Energy saving of vacuum pump for paper-making machine

Fan Pump Impeller

Technologies for Industries

Heating Furnace Using Regenerative Burner

The integrated gasification combined cycle (IGCC) produces electricity from a solid or liquid fuel

High efficiency dehydrator for dryer of paper-making machine

High efficiency inverter driven screw compressor

Improvement of vacuum condenser

Improve Your Boiler's Combustion Efficiency

Installing power recovery turbines for heavy fraction oil hydro cracking plant

Install Removable Insulation on Valves and Fittings

Introduction of clinker pre-grinding roll crusher (Cement Production Finishing Section)

Ladle heating apparatus with regenerative burners

Overhead Vapor Chiller System

Power and Steam Balance System

Power receiving/transforming equipment

Primary Fan Pump Motors

Recover Heat from Boiler Blow down

Reducing excess air through modification to furnace dampers

Semiconductor Application Chip Project

Sensors for Smart Controller and Transfer Pump Motor Controller

Use Low-Grade Waste Steam to Power Absorption Chillers



Technologies for Buildings

Absorption Chiller

AC equipped with heat pipe

Use of water chilled in cooling tower during winter to cool telecommunications equipment rooms

Adjustment of air ratio in Boiler

Automatic Operation Control for Escalator

AVR with load management system

Building Automation System (BAS

Cogeneration System

Control of outlet temperature of cold water from chiller depending on the season

Control of the number of Elevators operating during nighttime

Daylight sensors' on-and-off control of lights near the windows

Diversion of emergency power generator to co-generation equipment

Drain water heat recovery

Energy Saving Module (Abbotly)

Environmental Energy Utilization System

Light Save (LSA2000B)



Technologies for Buildings

Outdoor Air Cooling

High-efficiency Gas Fired Air Conditioning System

Installation of inverters to cold water pumping system

Installment of automatic controllers to ducts of individual rooms

Insulate Steam Distribution and Condensate Return Lines

Placing of water saving type valve disc

Process Heating System

Repair and maintenance of cooling tower

Reflector Light

Segmentation of lighting circuit

Solar Photovoltaic power generation

Technological Development for a Small, Highly Efficient Natural Gas Co-Generator

Test for Pumping System Efficiency

Variable speed drive on Air Conditioning System chilled water pump and condenser

Water Cooled Evaporative Air Conditioning

Water saving

Examples in the Technical Directory

Buildings

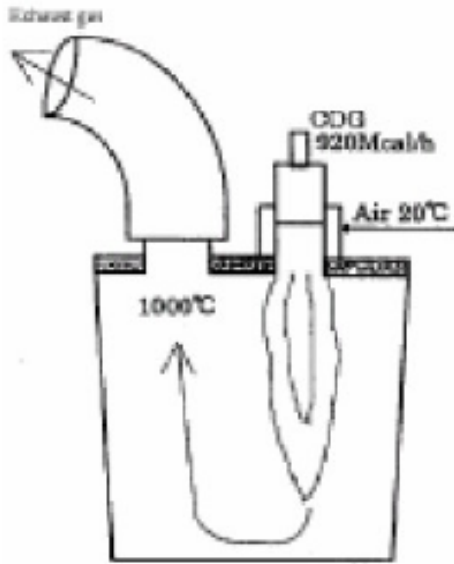
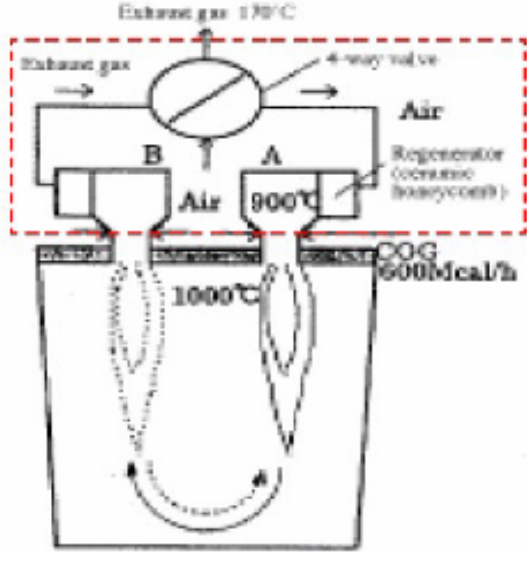
TECHNICAL DIRECTORY			
Building 2.2		AC equipped with heat pipe	Energy Source
Industry classification			Electricity
Building / ALL			Practical Use
Technology Classification			1999
Operation AC			
Outline	Air Conditioning unit equipped with heat pipe specially designed for Tropical Climate (Tougher than Sub Tropic) The Climate Difference • Sub Tropic - Hot and Dry - Low wet B • Tropic Hot and humid		
Principle & Mechanism	<div><div>Conventional Type (AC + Heater) - Consume electricity for heater - Base AC Capacity</div><div>A C equipped with Heat Pipe - No electricity for heater - Smaller AC Capacity</div></div> <div><div><p>CONVENTIONAL AIR CONDITIONING WITH HEATER</p></div><div><p>AIR CONDITIONING WITH HEAT PIPE</p></div></div>		
Structure explanation, shapes, and/or System diagram	<div><div>Principle of Heat Pipe In one end part coolant absorbs heat and evaporates, in the other end, coolant dissipates the heat and condenses</div><div><p>HEAT IN</p><p>HEAT OUT</p></div><div><div>The Use of Heat pipe in AC Hot and humid outer air is pre-cooled by heat pipe. Dehumidified and undercool</div><div><p>80°F → A</p><p>70°F</p><p>55°F</p><p>65°F → B</p><p>Pre-Cool</p><p>Re-heat</p></div></div></div>		

Examples in the Technical Directory

Effectiveness of the improving measure	<p>AC Equipped with Heat Pipe used in Tropic Climate</p> <ul style="list-style-type: none"> • Comfort Zone SNI can be maintained. • AC Capacity can be reduce by 15~20%. • Operation cost can be reduce by 20~30%. • Room RH can be controlled <60%, to prevent the grow of Fungi and Microorganism.
Energy saving	AC Capacity can be reduce by 15~20%
Green House Gas reduction (except CO2)	Possible reduction correspondent to the reduction in electric power at power plants
Cost	0 (About the same as conventional AC)
Economical effectiveness (benefit and cost)	<p>Operation cost of AC (In case of 1HP (1kW))</p> <p>(Preconditions)</p> <p>Operation time : 15 hours/day, 300 days/year,</p> <p>Electric Power Cost : Rp.500/kW h (US\$0.055/kW h)</p> <p>(Operation cost)</p> <p>1kW x 15h/d x 300d/y x Rp. 500/kWh (US\$0.055/kWh)</p> <p>Rp. 2,250,000.-/year (US\$22)</p>
Note	<ul style="list-style-type: none"> • Contacts for further information <p>Ir. John Budi Harjanto Listijono M.Eng.Sc Universitas Katolik Indonesia ATM A JAYA, Fakultas Teknik Jurusan Teknik Mesin PT Metropolitan Bayu Industri</p>

Examples in the Technical Directory

Major Industries Iron & Steel

Industry - 1.27			
Industry classification		Ladle Heating Apparatus with Regenerative Burners	Energy Source
Iron & Steel			Fuel
Technology Classification			Practical Use
Machinery & Equipment			1990
Outline	By incorporating regenerative burners into the apparatus to heat the refractories of a ladle which receives molten steel, a large energy saving is achieved. It also prolongs the life of the ladle refractories		
Principle & Mechanism	A regenerative burner system is occupied of a pair of burners which burn alternately for a determined time period and function as a exhaust duct while not burning. The heat of the high temperature exhaust gas is stored in the regenerator installed just after the burner, and the stored heat is used for preheating the combustion air		
Description	Heat efficiency is as low as about 30%. Since the high temperature exhaust gas is discharged without waste heat recovery. In addition, the temperature distribution inside the ladle is uneven.		By installing a regenerative burner system, the combustion air temperature of about 900°C the exhaust air temperature of 170°C, and the heat efficiency of 30% are obtained. In addition, the variation in the temperature distribution inside the ladle is improved to the level of less than about 30°C.
			
Structure explanation, shapes, and/or System diagram			

Examples in the Technical Directory

Energy Saving effect	Fuel saving of 56% correspond to montly consumption of 573×10^3 Kcal, Increase of electric power consumption by 239×10^3 Kcal per month	
Economics	Investment amount : 24 million yen	
Equitment Cost	Improvement effect : 10 million yen/year	
	Investment payback : 2 - 3 years (excluding the refractory life)	
Remark	As this apparatus has the automatic heating temperature control function, fuel consumption during working is reduced as well.	
References		Inquiry
Energy Saving, Vol 50, no 2, p 26 - 32 1998		ECCJ



Sources of Information

Reports of Energy Audits in Major Industries

Cement

Food

Pulp and Paper

Textile

Steel and Iron

Petroleum Refinery

Caustic Soda

Garment

Hydro Power Generation

Ceramics / Porcelain

Reports of Energy Audits in Buildings

Researches (i.e. ECCJ, NEDO, ASEAN organizations)

We welcome information/inputs from you!!!

Thank you very much
for your kind attention!!!



<http://www.aseanenergy.org>