

SAMPLE

FOR DISCUSSION

DRAFT

Questionnaire of Surveillance (Cement Industry in Brazil)

for

Program on Energy Efficiency and Conservation (EE&C) Promotion in

Energy Intensive Industry by Benchmark Approach

under

Japan – Brazil Cooperation Project on

Energy Efficiency and Conservation (EE&C) in Energy Intensive

Industry and Appliances

April 2020

Ministry of Mines and Energy

The Energy Conservation Center, Japan

(Note)

This is a sample of the “Questionnaire” to survey the energy intensive industry in Brazil.

This sample is for MME, EPE and the industrial associations such as SENAI-CNI etc. to understand what kind of information and data will be required for analysis to identify the baseline and to implement the “Program-2”.

(Background of Survey)

This survey is conducted under the Japan – Brazil Cooperation Project on Energy Conservation established in December 2019 between the Ministry of Mine and Energy of Brazil (hereinafter referred to as “MME”) and the Ministry of Economy, Trade and Industry of Japan (hereinafter referred to as “METI”). This project is the “Project on Energy Efficiency and Conservation (EE&C) of Energy Intensive Industry and Appliances” which is consisted of the two programs as follows.

(Program-1) Improvement in Standard and Labelling of Electrical Appliances including Air Conditioners etc.

(Program-2) EE&C Promotion in Energy Intensive Industry by the “Benchmark Approach” under Energy Management System (EnMS)

This project is implemented by The Energy Conservation Center, Japan (hereinafter referred to as “ECCJ”) jointly with the Brazilian organizations especially with EPE and SENAI-CNI for Program-2. The survey is for the Program-2. The Program-2 aims at developing and establishing the following.

- (1) Standardized procedure with criteria of the “Benchmark Approach” which could be incorporated in the EnMS
(This will include EE&C targets (benchmarks) for the Brazilian cement industry to aim at achieving.)
- (2) Useful tools such as the database and the guideline of energy conservation and effective technologies and equipment
- (3) Identification of technologies / equipment for Brazilian cement industry to achieve the EE&C targets (benchmarks)
- (4) Opportunity to match cement companies and suppliers of the identified effective technologies / equipment

In order to start the Program-2, the project team would like to investigate the actual status and conditions of the cement industry in Brazil for our understanding and for identifying the “baseline” through analyses.

(Purpose of Survey)

This questionnaire is drafted by ECCJ in order to investigate the actual status of energy efficiency, energy use and energy conservation measures of the Brazilian Cement Industry, for the purpose of implementing the “Program – 2” to promote energy conservation in the cement industry.

(Request)

We would like the EPE and/or the Cement Association as a representative of the Brazilian cement industry to fill the questionnaire probably with cooperation from some cement manufacturing companies.

General Information and Data Regarding Brazilian Cement Industry

Please fill in blue cells of the following tables.

1. Cement Production : Capacity and The Actual Results of whole Brazilian Cement Industry

	2017	2018	2019
A. Capacity (t / y)			
B. Actual Production (t/y)			
C. Availability (B*100/A) (%)			
(Breakdown of Products)			
Portland Cement (t/y)			
Clinker (t/y)			
Mixed Cement (Total) (t/y)			
(Breakdown)			
Silica Cement (t/y)			
BF Slag Cement (t/y)			
Fly Ash Cement (t/y)			
Others (t/y)			
D. Number of Companies			
E. Number of Plants			
F. Amount of Sales (US\$/y)			

Breakdown by Production Process

	2017	2018	2019
1. Wet Process			
Number of Plants			
Production (t/y)			
2. Dry Process			
Number of Plants			
Production (t/y)			
(Breakdown)			
2-1. SP Type			
Number of Plants			
Production (t/y)			
2-2. NSP Type			
Number of Plants			
Production (t/y)			
2-3. Others (Specify type(s))			
Number of Plants			
Production (t/y)			

2. Energy Efficiency Indicators and The Actual Results of Whole Brazilian Cement Industry

The following table requests to fill data of the typical energy efficiency index.

Please fill the actual results which are available for sharing among the member companies of the concerned association(s) and/or are published by the association(s).

Energy Performance Indicators : Actual Results / Benchmark (BM) of Cement Industry

	2017	2018	2019
1. Unit Thermal Energy Consumption (GJ/t-Clinker)	(BM)	(BM)	(BM)
2. Unit Electrical Energy Consumption (kWh/t-Clinker)	(BM)	(BM)	(BM)
3. Recovered Energy			
Electrical Energy (kWh/t-Clinker)			
Thermal Energy (GJ/t-Clinker)			
4. Alternative Fuel (GJ/t-Clinker)			
(Breakdown)			
4-1. Waste Tire			
4-2. Biomass Fuel			
4-3. Waste Oil			
4-4. Other Fuel from Wastes			

3. Questions : Promotion of Introduction of Energy Management System (EnMS)

3-1 Status : Introduction of EnMS (Based on ISO 50001)

Industrial association(s) for and the related association(s) for cement industry promote or recommend cement manufacturing companies to introduce EnMS ?

YES

→ Are there any plans or programs to promote EnMS based on ISO 50001 ? YES / NO

→ How many companies have been certified for ISO 50001 ?

NO

→ Are there any plans to promote EnMS ? YES / NO

3-2 System to Share Best Practices in Energy Conservation

Are there any system(s) or program(s) by the association(s) to share information of best practices in energy

conservation in cement industry, especially among member companies ?

YES

→ Please describe the name(s) of the system(s) and/or program(s)

NO

→ Are there any plans or ideas to develop such system or program ? YES / NO

4. Issues to Promote Energy Conservation

Please describe issues for the cement industry in Brazil to promote energy conservation, if any.

4-1 Issues to Promote Energy Conservation

(Management)

(Technology)

(Finance)

(Business Market)

(Others)

4-2 Issues Related to Companies including Member Companies

(Top Management)

(Technical Level)

(Mutual Cooperation)

(Others)

4-3 Issues Related to the Brazilian Government

(Regulation)

(Support System)

(Others)

4-4 Issues Related to Energy Market

(Electric Power)

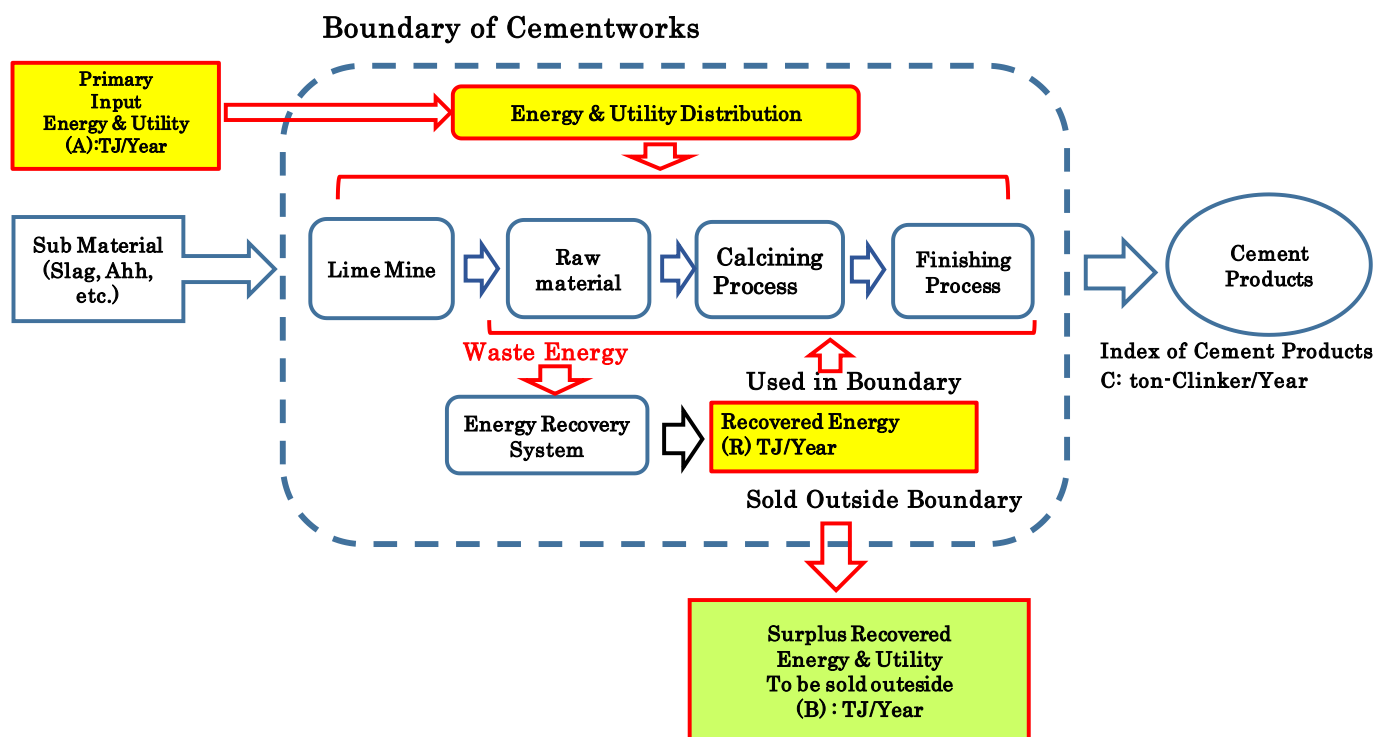
(Coal)

(Oil and Natural Gas)

(Renewable Energy)

Part-1: Data to determine Benchmark Index

P1-1 Definition of Scope of Data : Configuration of Cement Work and Benchmark Index



P1-2 Key Data

P1-2-1 Kind of Raw Materials and Annual Consumption of whole cement industry (Ton/Year)

Please fill-in blue cells.

	2019	2018	2017
Lime Stone			
Slag			
Fly Ash			
Other material -1 (If any, please specify)			
Other material -2 (If any, please specify)			
Other material -3 (If any, please specify)			

P1-2-2 Annual Energy/Utility Consumption

Please fill in the following Table (Table-1,2,3,4,5) of the next page with the data of whole cement industry.

Procedure to fill-in following Tables (Table-1,2,3,4,5)

1. Double click the Table to activate embedded EXCELL Sheet.
2. Fill-in blue cell (and yellow cell when necessary).

(Legend)

Blue cell (Input cell)	Blue cell is "INPUT CELL", please fill-in blue cell.
Yellow cell	Yellow cell is previously filled with typical or theoretical value, if you use another value, please replace the value.
Green cell	Green cell is automatically calculated.

Table-1 Primary Consumed Energy (A)

Energy / Utility	Unit	Calorific Value per Unit (GJ/Unit)	2019		2018		2017	
			(Unit/y)	(TJ/y)	(Unit/y)	(TJ/y)	(Unit/y)	(TJ/y)
			A1: Thermal Fuel				0.0	
(Breakdown)								
Coal	(ton)	26.6		0.0		0		0
Steam	(ton)	3.34944		0.0		0		0
Diesel Oil	(KL)	38		0.0		0		0
Gasoline	(KL)	33.37		0.0		0		0
A2: Electricity	(Mwh)	3.6		0.0		0		0
A3: Alternative Fuel				0.0		0.0		0.0
(Breakdown)								
Waste Tire	(ton)	33.2		0		0		0
Waste Oil	(KL)	40		0		0		0
Other Fuel from Waste	(ton)	26.6		0		0		0
Biomass Fuel	(ton)	26.6		0		0		0
Primary Consumed Energy				0.0		0.0		0.0

Table-2 Sold Energy Supplied Outside of Boundary (B)

Energy / Utility	Unit	Calorific Value per Unit (GJ/Unit)	2019		2018		2017	
			(Unit/y)	(TJ/y)	(Unit/y)	(TJ/y)	(Unit/y)	(TJ/y)
			B1: Steam	(ton)	3.34944		0.0	
B2: Electricity	(Mwh)	3.6		0.0		0		0
Primary Consumed Energy				0.0		0.0		0.0

Table-3 Recovered Energy by Energy Conservation System/Equipment (R)

Recovered Energy / Utility	Unit	Calorific Value per Unit (GJ/Unit)	2019		2018		2017	
			(Unit/y)	(TJ/y)	(Unit/y)	(TJ/y)	(Unit/y)	(TJ/y)
			R1: Steam	(ton)	3.34944		0.0	
R2: Electricity	(Mwh)	3.6		0.0		0		0
Primary Consumed Energy				0.0		0.0		0.0

Table-4 Annual Production (C)

Annual Production	Unit (ton-Clinker Equivalent)	2019	2018	2017

Table-5 Benchmark Index (Calculated)

				2019	2018	2017
Unit Total Energy Consumption	(A-B)/C*1000 (GJ/T-Clinker)			-	-	-
Unit Thermal Energy Consumption	(A1-B1)/C*1000 (GJ/T-Clinker)			-	-	-
Unit Electricity Consumption	(A2-B2)/C*1000 (Kwh/T-Clinker)			-	-	-
Unit Alternative Fuel Consumption	A3/C*1000 (GJ/T-Clinker)			-	-	-
Recovered Energy						
(Electricity)	R2/C*1000 (Kwh/T-Clinker)			-	-	-
(Steam)	R1/C*1000 (T-steam/T-Clinker)			-	-	-

Part – 2 Clarification of Factors to Affect Energy Efficiency

P2-1 Technology : Status of typical energy (fossil fuel) conservation facilities of cement works

Please check the items of typical technologies and equipment already introduced or planned to introduce in the Brazilian cement industry

The following table is the survey of current status regarding installation of typical energy (fossil fuel) conservation facilities of cement plant. Please fill-in the number of installed and under planning facilities (A) and under planning facilities (B).

No	Name of typical energy conservation facility for cement plant	(A)Number of Installed or Under Construction facilities	(B)Number of Under Planning facilities
1	Introduction of Vertical Roller Mill for Pulverizing Raw Material		
2	Introduction of Vertical Roller Mill for Pulverizing Coal		
3	Vertical Roller Type Mill for Pulverizing Slag		
4	Introduction of Suspension Preheater (SP)		
5	Low Pressure Loss Type Suspension Pre-heaters (Low pressure loss of cyclone applied for 5 - 6 stage of cyclones. This will reduce the total pressure drop)		
6	5 Stage Cyclones for Suspension Pre-heaters: (The 5 stage of cyclones is replaced with the 4 stage of cyclones, which will reduce the waste gas temperature)		
7	Introduction of New type Suspension Preheater (NSP) (1) - Direct Calcining Process (Direct calcining type equipped with burner)		
8	Introduction of New type Suspension Preheater (NSP) (2) - Fluidizing Bed Type Calcining Process (Equipped with the fluid bed type calciner)		
9	Shaft Type Cement Kiln (Consisted with vertically arranged small NS, fluidized bed type cement kiln and fluidized bed type clinker cooler.)		
10	Introduction of High Efficiency Clinker Cooler (with the air flow distribution control, which results in improvement in cooling efficiency and the recovery of thermal energy of clinker)		
11	New Type Clinker Cooler (air flow distribution is controlled so as to homonize air permeability through clinker layer.)		

	(The clinker cooler where air flow distribution is controlled so as to homonize air permeability through clinker layer.)		
12	Introduction of Pre-Grinder to Pulverize Clinker to Finish Cement		
13	Introduction of High Efficiency Separator to Finish Cement (The clinker cooler with the air flow distribution control)		
14	Vertical Roller Type Mill for Pulverizing Clinker (Replaced with the tube mill)		
15	Utilization of Municipal Solid Waste for Raw Materials and Fuel (Eco-Cement Plant)		
16	Introduction Outside Circulation System of Rejected Materials for Vertical Mill (This system will reduce power consumption of the gas circulating blower for the vertical mill.)		
17	Utilization of Waste Tire (as Alternative Fuel) - Tire Charging System		
18	Utilization of Waste Plastic as Fuel for Clinker Making		
19	Waste Heat Recovery - Power Generation System		

P2-2 Conditions

Please describe the typical conditions of the Indonesian cement industry to affect energy efficiency by the following categories.

P2-2-1 Raw Materials (Lime stone, sub-materials and mixed materials)

P2-2-2 Fuel (Coal and the other fuels)

P2-2-3 Products including Product Mix

P2-2-4 Supplied Energy (Electric Power etc.) and Utilities (Water etc.)

P2-2-5 Others

P2-3 Future Plan to Improve Energy Efficiency

Please itemize and/or describe key plans of improvement measures for the cement association to recommend member companies to apply or to jointly develop with member companies.

	Specific Recommended Measure	Targeted Year
Short Term Plan		
	Activities by Association (Standardization etc.)	
	Improvement in Operation and Maintenance	
	Introduction of New Technology & Equipment	
Mid-Term Plan		
	Activities by Association (Standardization etc.)	
	Improvement in Operation and Maintenance	
	Introduction of New Technology & Equipment	
Long-Term Plan		
	Activities by Association (Standardization etc.)	
	Improvement in Operation and Maintenance	
	Introduction of New Technology & Equipment	

Contacts

Name of Association

Address

Contact Person

Name :

Position :

Phone :

e-mail: