



# Pollutant Release and Transfer of Kampot Cement industry

## Agenda

1. Company profile
2. SCG Vision / Policy
3. Environment protection project
4. Highlight emission and Environment protection
5. Commitment

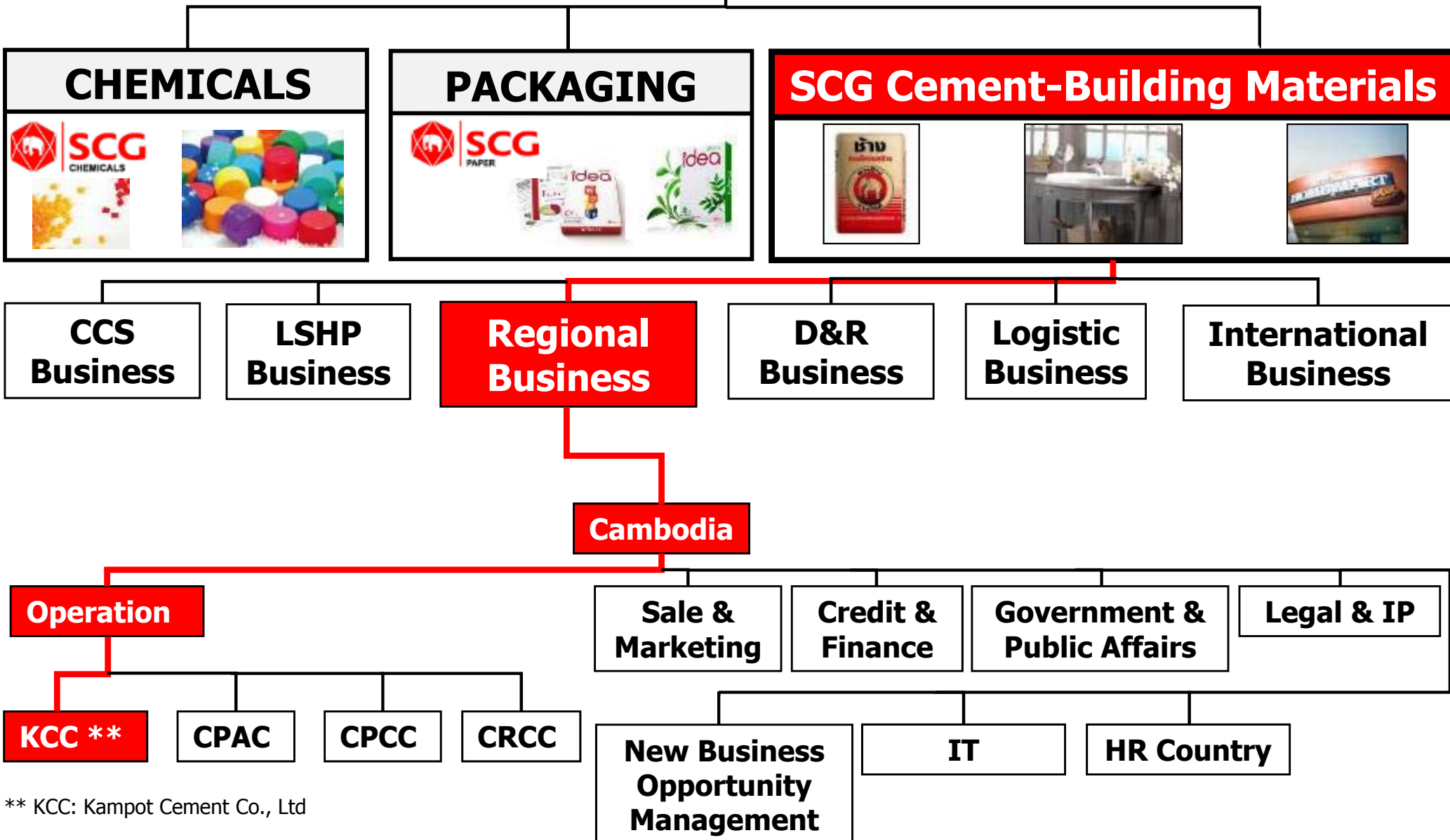


**Mrs. Khen Samrith**  
**Quality Assurance Engineer**  
**Kampot Cement Co .; Ltd**  
**26 Mar 2019**

Dongtong district , Kampot , Cambodia



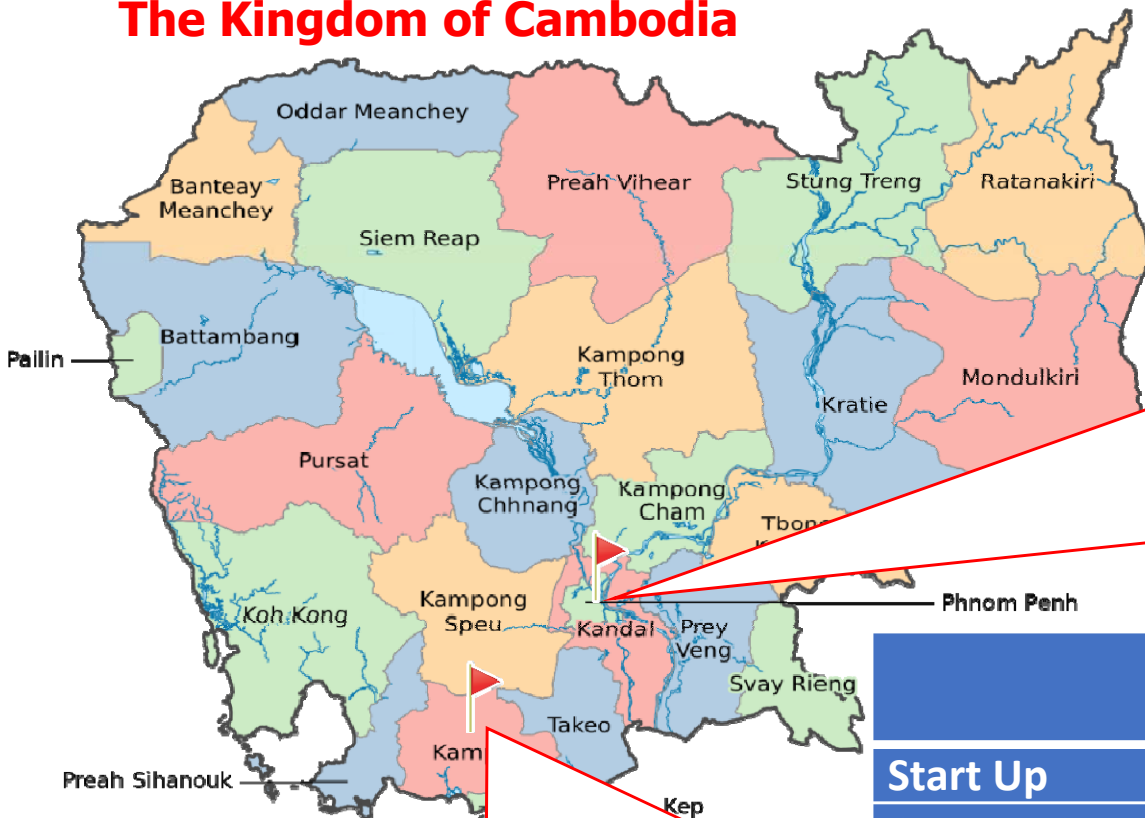
# SCG's Strategic Business Units



\*\* KCC: Kampot Cement Co., Ltd

# Kampot Cement Co., Ltd Profile (KCC)

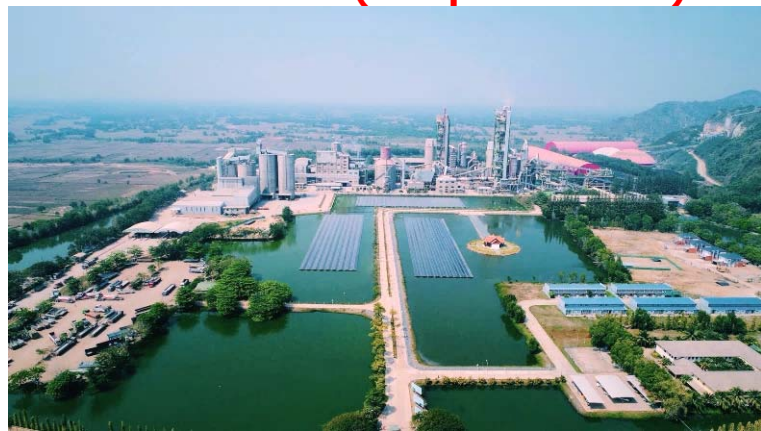
## The Kingdom of Cambodia



## Head Office (Phnom Penh)



## Cement Plant (Kampot Province)



	KCC1 (17 July 2007)	KCC2 (24 June 2015)
Start Up	Dry Process 2007	Dry Process 2015
Cement Capacity	1 MT/Y	1 MT/Y
Product Type	Portland Cement Type I and Plastering Cement	
Product Brand	SCG Cement and K Cement	
Total Area	80 hectares	
No. of Employee	323 (Average age = 29 years old)	
No. of Sub-Contractor	1,069 persons	
No. of Community	7,071 households live around plant	



## Product Type

## Application

## Cement Standard

### Portland Cement Type I

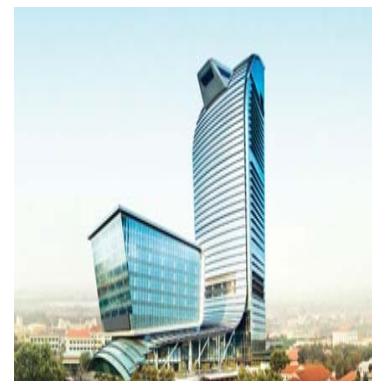
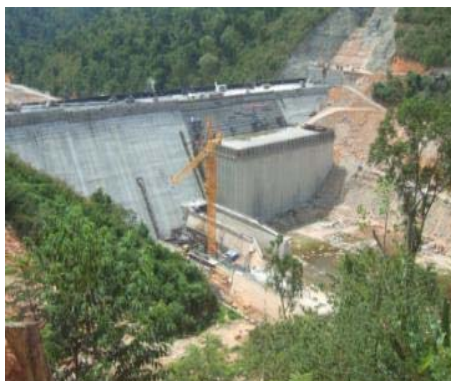


SCG Cement



K Cement

**OPC Type I:** For concrete, foundation and structure



OPC Type I (Portland cement) Standard:

- ASTM C-150
- TIS 15 PART 1-2547
- EN 197-1-CEM I 45.2 R

### Mixed Cement

**Plastering Cement:** easy work, smooth



K Plastering Cement



Super K Plastering Cement



Plastering Cement (Mixed Cement) Standard:

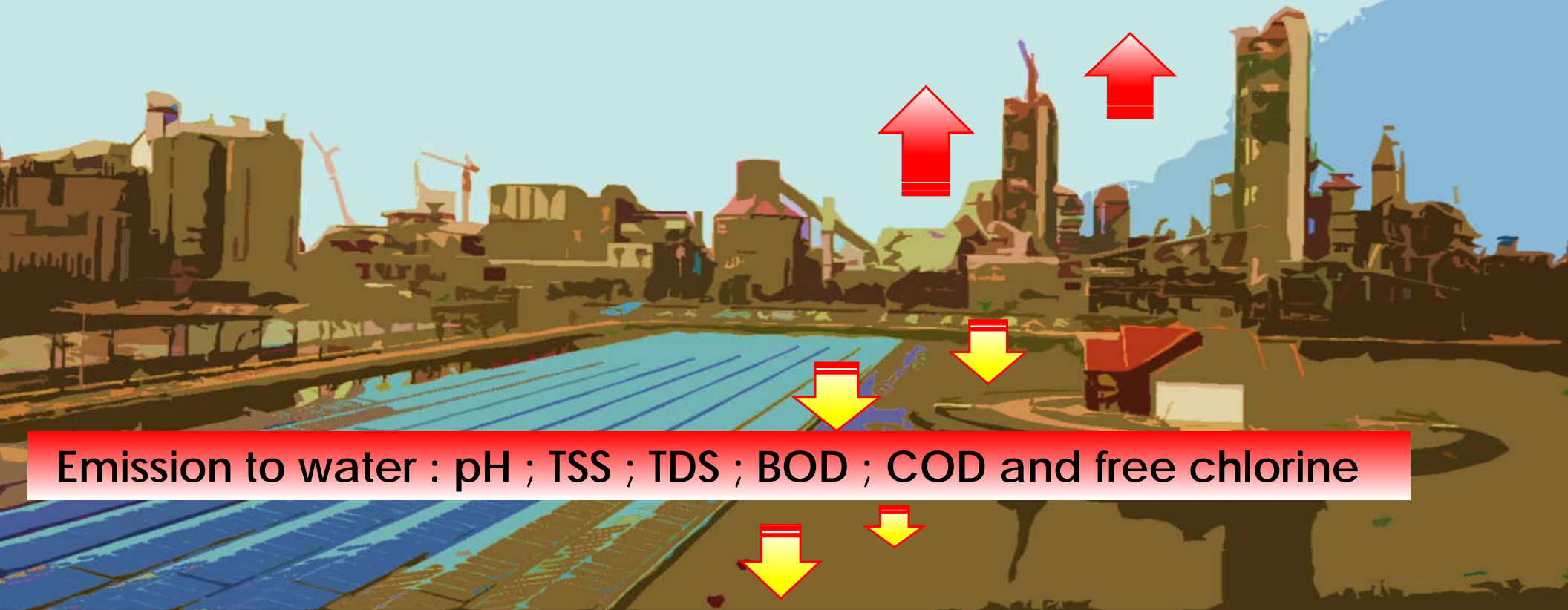
- TIS 80-2517



# Cement Industry – PRTR guideline

Cement manufacturing Emission

**Emission to air : Dust , Nox , SO<sub>2</sub> CO VOC and volatile metal**

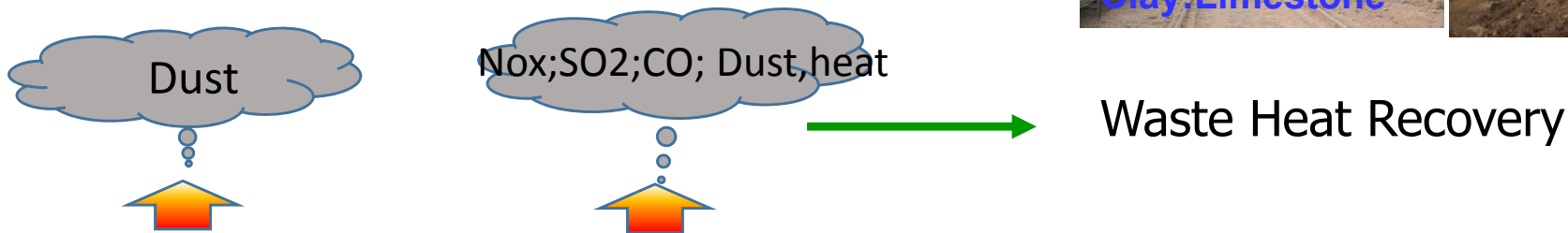


**Emission to water : pH ; TSS ; TDS ; BOD ; COD and free chlorine**

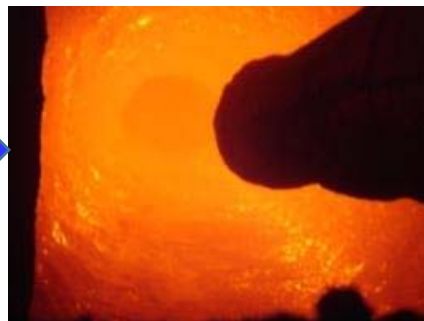
**Emission to land : S ; As; Hg ; Oil or fuel ( Not significant )**

# Raw Material consumption of cement production

Raw Material	Component	Annual Consumption (Ton)
Limestone	$\text{CaCO}_3$	3,000,000
Clay	$\text{Al}_2\text{O}_3$	320,000
Laterite	$\text{Fe}_3\text{O}_4$	86,000
Chert	$\text{SiO}_2$	45,000
Gypsum	$\text{CaSO}_4$	110,000



Raw Material Grinding



Burning process



Cement grinding



Cement Packing

# SCG Sustainable Development Framework

## Governance

- ☐ cooperate governance
- ☐ Risk
- ☐ Reporting

## Economic

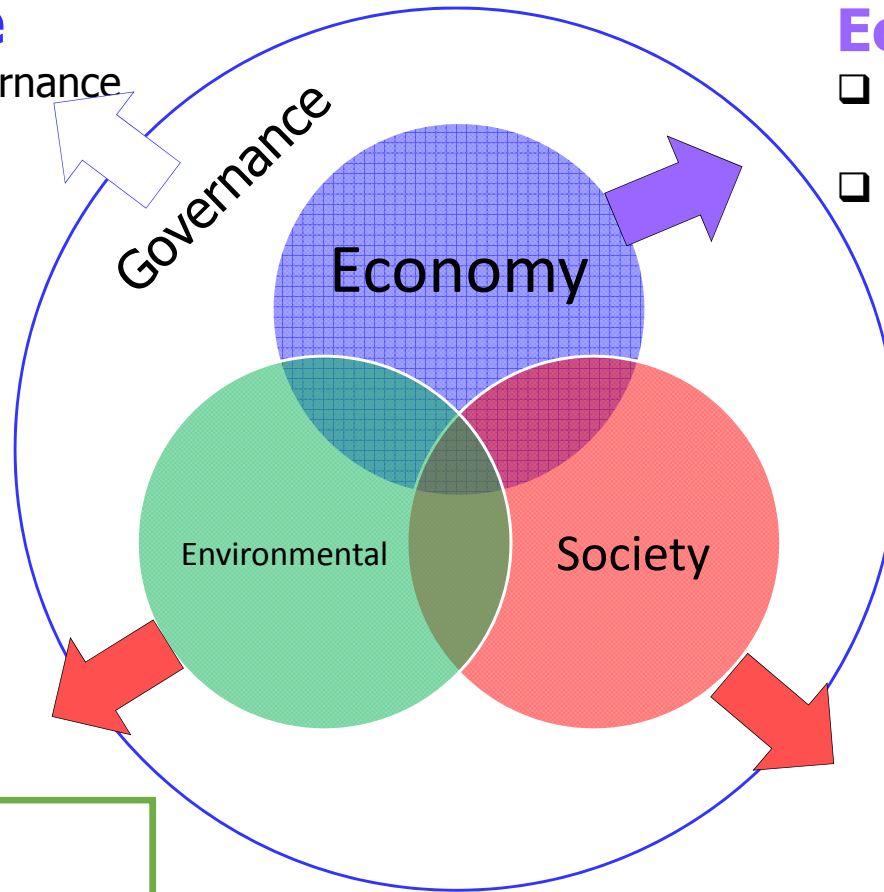
- ☐ Direct economic value generated ( Revenue )
- ☐ Economic value distributed
  - Employee wage and benefit
  - Payment to suppliers
  - Taxes

## Society

- ☐ Community investment & donation
- ☐ Labor standard and practices
- ☐ Human rights
- ☐ Human resource
- ☐ Stockholder engagement

## Environment

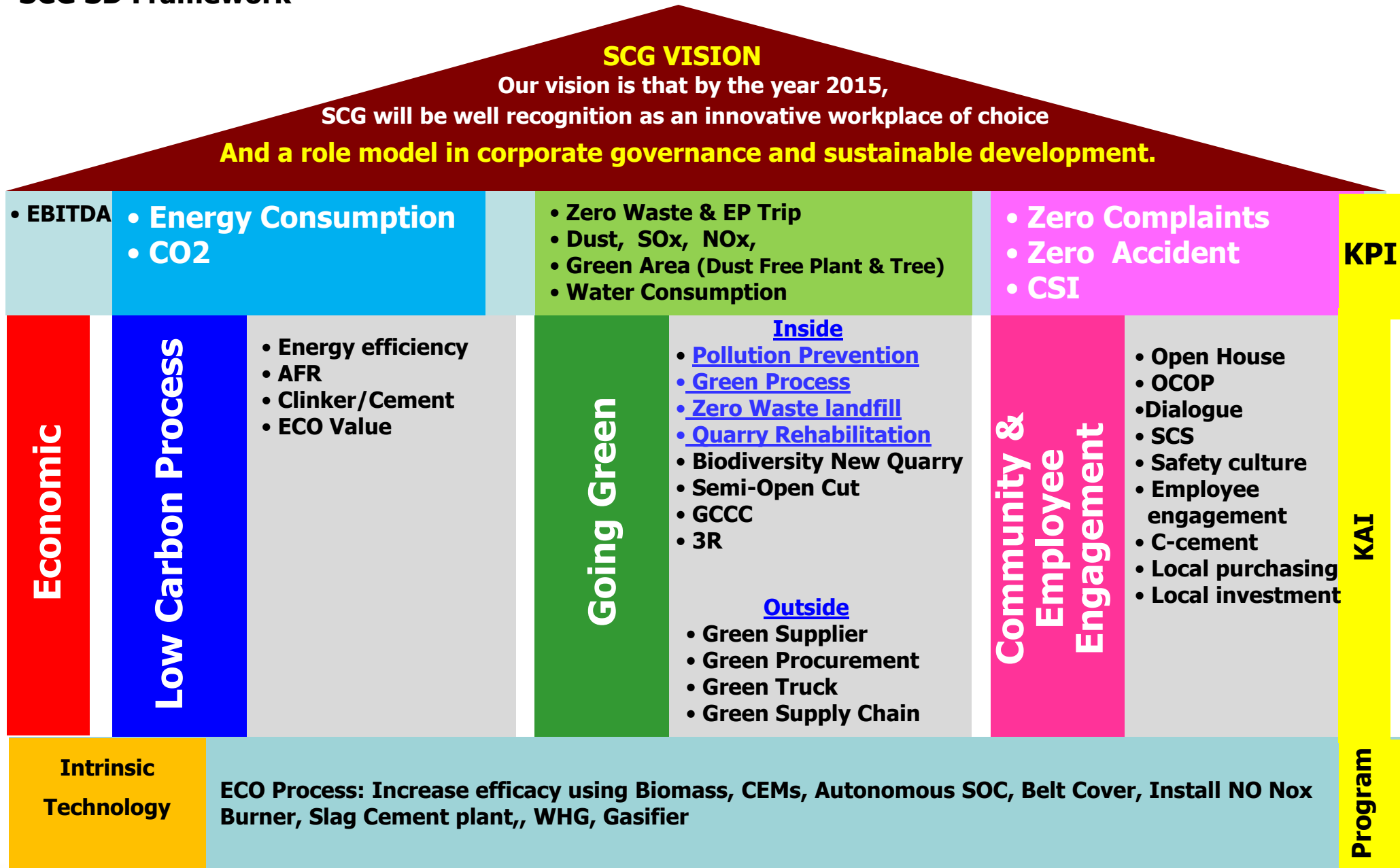
- ☐ Energy
- ☐ Climate change
- ☐ Water management
- ☐ Waste management
- ☐ Eco system / Biodiversity
- ☐ Logistics





# SCG Vision Policy and Objective

## SCG SD Framework



System: ISO9001, ISO14001, TIS18001, ISO17025, TPM, TQM → **Productivity-Quality-Cost-Delivery-Safety-Morale-Environment**

INTERNAL Do Not Distribute

# Environment Protection Project



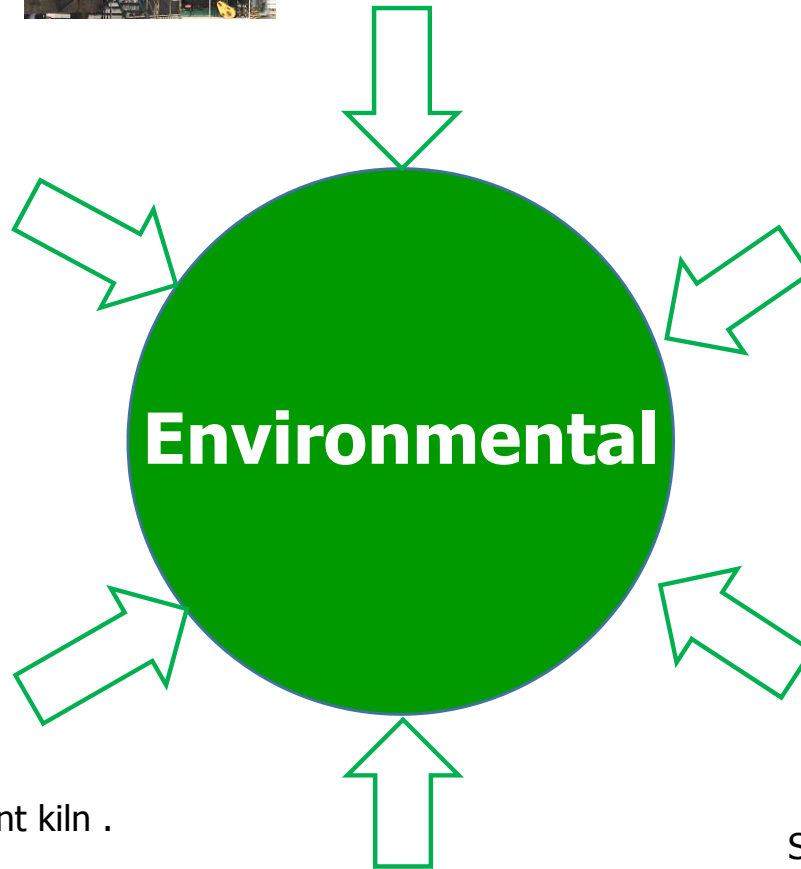
Water Consumption  
- Reuse / Reduce / Recycle.  
**Reuse : 40,000 m3/year**



Waste Management  
- Waste Co processing in cement kiln .  
**1004 tons / year .**



Waste Heat recovery Annually 64,646 Mwh  
30% power replacement ;  
**CO2 reduction : 37,623 tons CO2/year**



Eco product  
- K plastering  
- Portland Composite Cement  
**CO2 reduction : 31,779 tons/year**

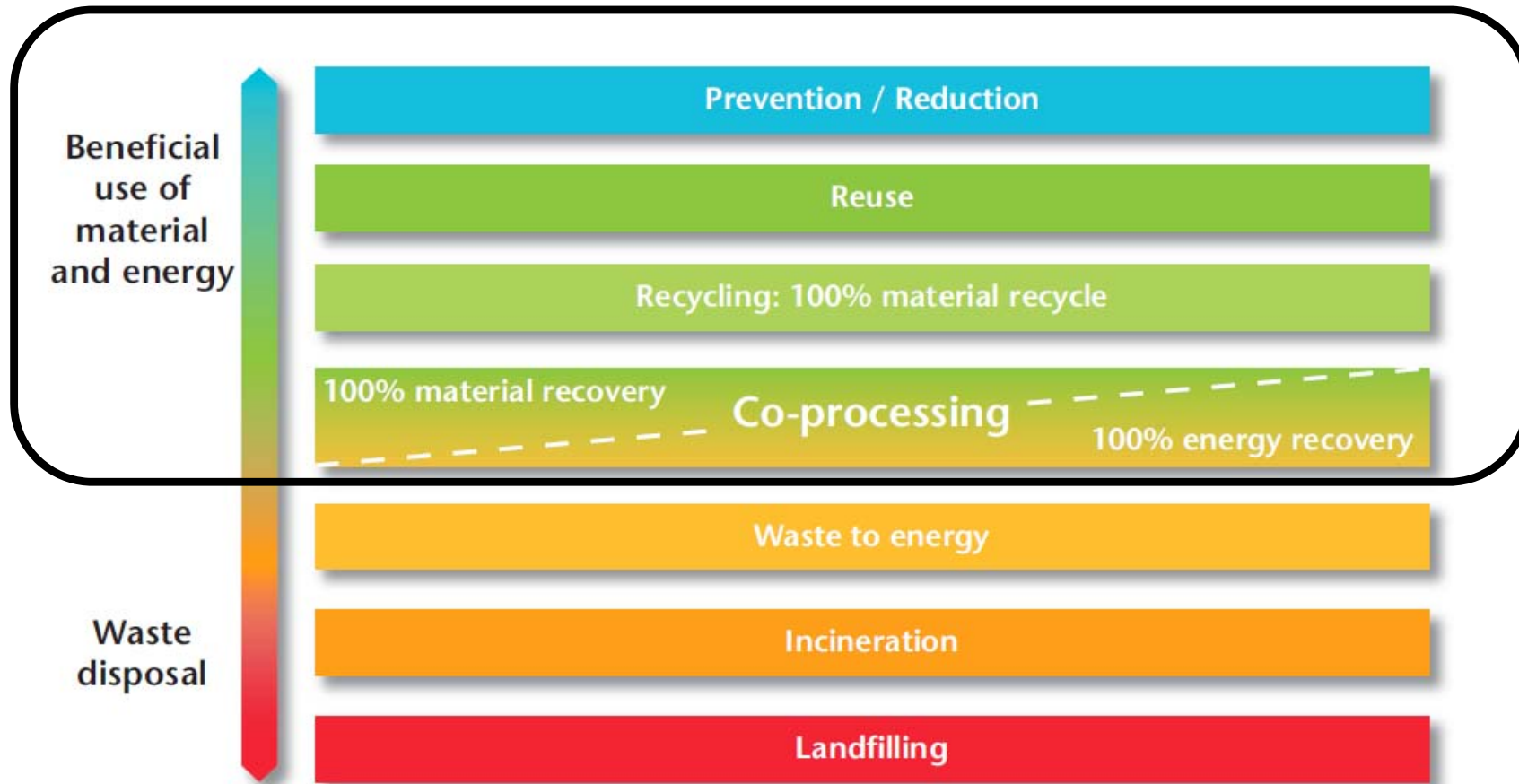


Solar power generation 30 MW/day  
**CO2 reduction : 6372 tons CO2 /year**



Natural resource  
- Replace coal by rice husk 7% by heat  
(482 GJ).  
**CO2 reduction : 46 tons/year**

# Waste Management approach



SCG prefer to manage waste by co processing ; Recycling , Reuse prevent and reduction.



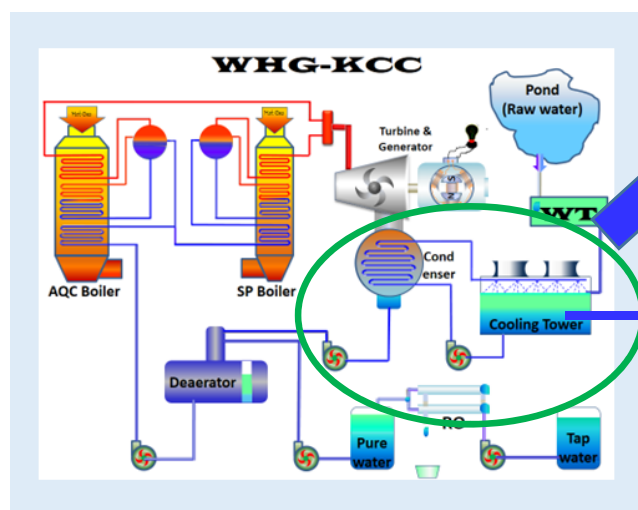
## 1. Recycling of water : Reduce water Consumption at WHG.

Parameter	Result (mg/l)	Blow down (m3/year)	Emission (Kg/year)
BOD	2.1	87600	183
COD	15.5	87600	1357

**Reduce consumption : 40,000 m<sup>3</sup>/year**

## Advantage

- Zero water pollution
- Reduce water consumption



### 3 Recycling

## Reuse



## Reuse

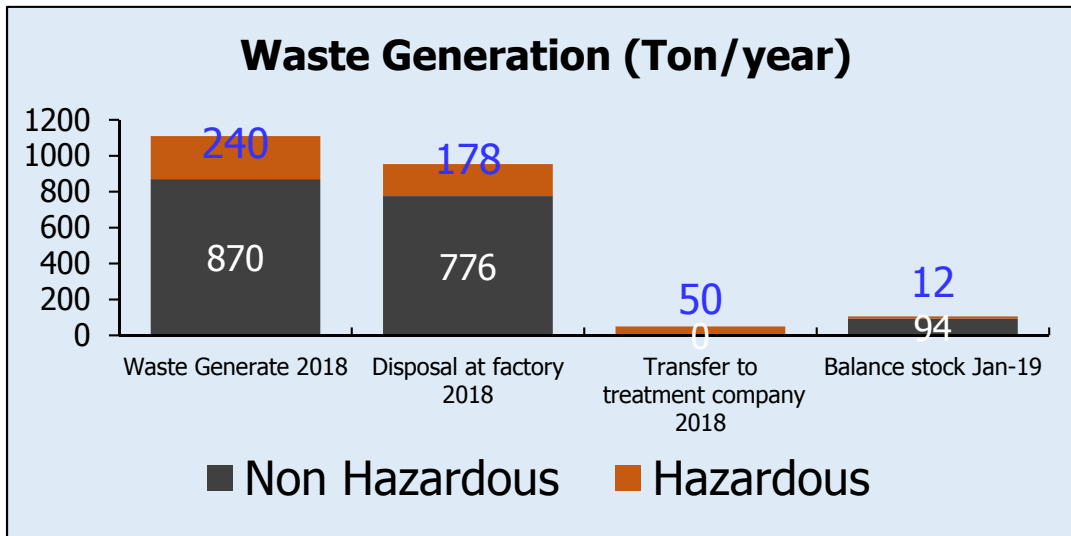


## Reuse



# Highlight Emission and Environment Protection

## 2. Co processing: Burn Solid /Household waste in cement kiln at 1450°C



### Cement Kiln

1. Higher Temperature 1,450 C  
Hot Gas Temperature 2,000- 2,200 C
2. Retention Time of Gas Burnt ~8 Sec  
and Retention Time of Raw Material  
Burnt ~ 40-60 Min.
3. No Ash Residue



### Waste



### Preparation to burn

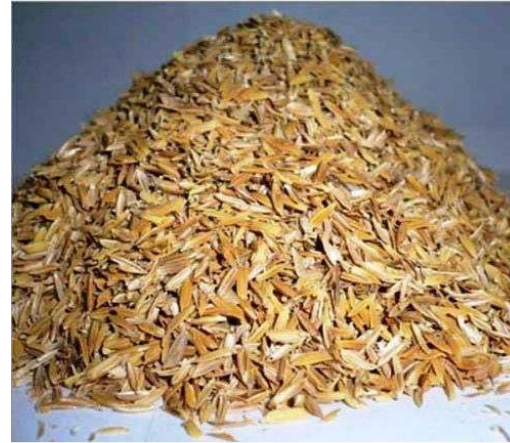


## Highlight Emission and Environment Protection

3. Co processing: Biomass usage 7% to reduce coal consumption



Gasifier



Replace coal by rice husk 7% by heat (482 GJ).  
**CO2 reduction : 46 tons/year**



# Highlight Emission and Environment Protection

## 4. Waste Heat Recovery: Waste Heat Power Generation 9.6 MW from kiln

### Advantage :

**Waste heat** recovery can provide up to 30% of a cement **plant's** overall **electricity** .



## 5. Renewable energy : Solar Power generation 7MW

### Advantage :

1. is pollution free and causes no greenhouse gases to be emitted after installation
- 2.Reduced dependence fuels
- 3.Renewable clean power.



70%	30%		100 %
EDC Power per day	WHR Power per day	Solar Power per day	TOTAL Power per day
519 MW	195 MW	30 MW	744 MW

EDC 70%

Self Power Generation 30%

# Highlight Emission and Environment Protection

## PRTR Reporting



Sampling at Stack



Dust  
Nox , SO<sub>2</sub>,CO

Dust  
Nox , SO<sub>2</sub>,CO

Heat

Heat

Parameter	KCC1 (mg/m <sup>3</sup> )	KCC2 (mg/m <sup>3</sup> )	Standard (mg/m <sup>3</sup> )	Emission (tons/y)
Dust	18	21	≤ 400	121
Nox	588	537	≤ 1000	2920
SO <sub>2</sub>	3.4	3.4	≤ 500	25
CO	217	168	≤ 1000	1150

Nov									
Receive report Month/Year	Stack Temperature	%Oxygen	Gas Velocity	Flow rate	Dust Emission Actual O <sub>2</sub>	Dust Emission rate	Operation Hour	Dust Emission	
MM/YYYY	°C	%	m/s	m <sup>3</sup> /min	mg/m <sup>3</sup>	kg/hr	hr	kg	
Nov-18	83.5	12.4	20.51	8,698.60	24.00	12.53	702	8,793.24	
Nov-18	124	8.77	15.9	6,743.43	19	7.69	715	5,493.49	

Monitoring 4 Time /year



# Highlight Emission and Environment Protection

## PRTR Reporting

### How to calculation dust (PM) emission (Kg/month )

Nov								
Receive report (Month/Year)	Stack Temperature	%Oxygen	Gas Velocity	Flow rate	Dust Emission Actual O <sub>2</sub>	Dust Emission rate	Operation Hour	Dust Emission
MM/YYYY	°C	%	m/s	m <sup>3</sup> /min	mg/m <sup>3</sup>	kg/hr	hr	kg
Nov-18	83.5	12.4	20.51	8,698.60	24.00	12.53	702	8,793.24
Nov-18	124	8.77	15.9	6,743.43	19	7.69	715	5,493.49
				-		-		-

Measurement

$$m^3/min = S(m^2) \cdot v(m/s) \cdot 60(s)$$

$$S = \pi(D^2 / 4)$$

$$D = 3m$$

Result

$$Kg/h = Q(m^3/min) \times (mg/m^3) \times 60(min) / 1,000,000$$

$$Kg = (kg/h) \times (hr)$$





# Report PRTR -2018

Reporting format for the Pollutants Release and Transfer Register					
2 Description of Facilities					
2.1 Chemicals contained in raw materials used (inputs)					
Raw material	Commercial name	CAS number	Annual consumption	Measurement Unit	Used in <sup>1</sup>
Limestone	-	-	3,000,000	Ton	
Clay	-	-	320,000	Ton	
Laterite	-	-	86,000	Ton	
Chert	-	-	45,000	Ton	
Gypsum	-	-	110,000	Ton	
Sulfuric Acid	-	7664-93-9	40	Ton	
Sodium Hypochlorite	-	7681-52-9	30	Ton	
(1): Select one of the following : Process(P),Energy production(E) or Auxiliary services (A) and add description for subprocess					
2.2 Manufactured products(outputs)					
Products	Annual production	Measurement unit	Type of process		
			Continuuous	Seasonal	
Cement Production	2,370,000	Ton	yes		
<sup>1</sup> Select one of the following : Process(P),Energy production (E) or Auxiliary services (A) and add description for subprocess					
2.3 Water consumption					
Source	Water consumption flow (m <sup>3</sup> /hour)	Consumption Volume(m <sup>3</sup> )			
		Daily	Monthly	Annual	
Water supply					
superficial	River				
	Lake				
	Sea				
	Water canal				
Underground					
Others (specify)-Pond				870,000	
Total					
2.4 Energy consumption					
Source	Unit	Consumption	Monthly consumption	Annual consumption	
Distribution network (Electricity)	Gwh		19.50	234	
Own source	Thermic(Diesel)		161	1,936	
Boiler?	Thermic(Gas)				
	Thermic(Coal)		24000	288,000	
	Thermal (wood)				
	Other(specify)				
Total					

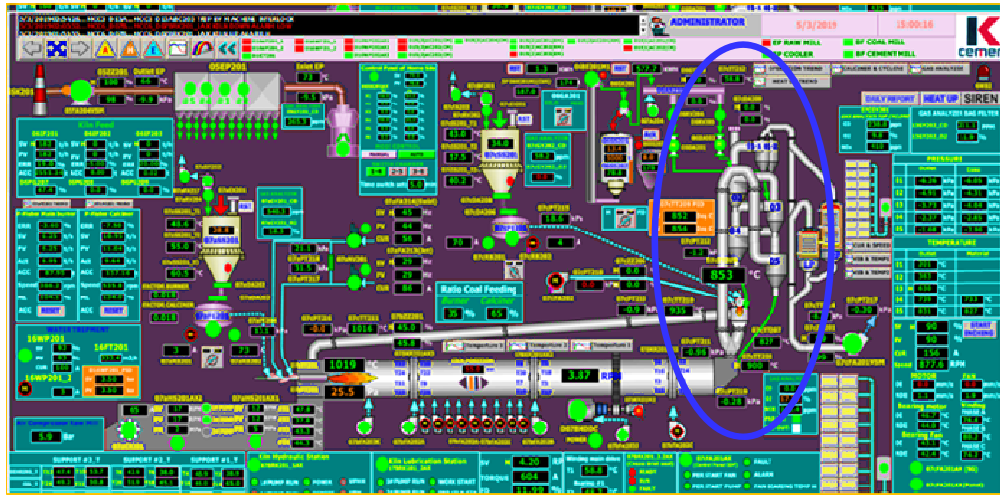
Reporting format for the Pollutants Release and Transfer Register								
3 Waste generation								
3.1 Solid Waste Generation								
Process or subprocess²	Type of waste³	Quantity (ton/year)	Quantity of waste in stock (ton/year)	Treated directly in-site		Transferred to treatment company or site landfill		
				Quantity (ton/year)	Method of Treatment	Quantity (m3/year)	Treatment Method⁴	Name of the landfill or company
Cement Process	Non Hazardous	870	94	776	burning in kiln			
	Hazardous	240	12	228	burning in kiln	50		Sarom Trading
² Process/subprocess: (Select one of the following):Process (P),Energy production(EE) or Auxiliary service (A) and add description for subprocess								
³ Type of waste: (Select one of the following): general Waste (GW);Hazardous Waste (HW);and Infectious Waste(IW)								
⁴ Treatment Method: Reuse, Recycling, Chemical treatment,Incineration,Other								
3.2 Liquid Waste Generation								
Process/subprocess	Liquid effluents		Amount of waste generated(method)		Treatment method			
	Substance or Parameter (2)	Unit	Quantity	Unit (ton/Y or m3/Y)				
Waste Heat Generation	BOD	2.1 mg/l	87600	m3/y	Recycle in			
and machine cooling process	COD	15.5 mg/l			cement process			
	TSS	5mg/l			for dust praying			
	TDS	311 mg/l			and cooling hot			
	pH	7.6			air			
Select one of the following : Process(P),Energy production(E) or Auxiliary services (A) and add description for subprocess								
3.3 Emission Release								
Process/sub-process	Substance or Parameter[9]	Air emissions (Unit: mg/Nm3, ppm, etc.)		Amount of exhaust generated		Prevention or control method		
		Conducted[10]	Fugitive[11]	Quantity	Unit (Nm3/h,...)			
Burning Process KCC1	Particulate Matter		18.00	386,496	Nm3/h	Electrostatic precipitation		
	Nitrogen Oxide		588.00					
	Sulfure dioxide		3.40			Chemical treatment		
	Carbon mono oxide		217.00					
Burning Process KCC2	Particulate Matter		21.00	257,580	Nm3/h	Electrostatic precipitation		
	Nitrogen Oxide		537.00					
	Sulfure dioxide		3.40			Chemical treatment		
	Carbon mono oxide		168.00					
Select one of the following: Process (P), Energy production (E) or Auxiliary services (A) and add description for sub-process								

# Report PRTR -2018

Reporting format for the Pollutants Release and Transfer Register							
4.1 Emissions and transfers							
Emission / transfer		chemical identity		Generation point	Emission or transfer		
		Name of the material	Name of chemical substance		Quantity	Unit	Estimation method
Emissions to:	Air	Raw Meal	Particulate Matter	Stack EP raw mill	121,194	Kg/y	Direct measurement
		Coal	Nitrogen Oxide	Stack EP raw mill	2,919,865	Kg/y	Direct measurement
			Sulfure dioxide	Stack EP raw mill	24,590	Kg/y	Direct measurement
			Carbon monoxide	Cement plant	1,150,000	Kg/y	Direct measurement
	Water		BOD		183.96	Kg/y	Direct measurement
			COD		1357.8	Kg/y	Direct measurement
	soil (land)						
Transfers to:	reuse						
	Recycle						
	coprocessing						
	Treatment						
	Incineration						
	Final disposal						
	Sewage						
	Other (specify)						

# Highlight Emission and Environment Protection

## Continuous Emission Monitoring (CEMs)-



CEMs to control

- Low CO
- Low Nox





## Green Industry Award ( received from MIME)

- Received “Green Industry Award” from Ministry of Mine and Energy (1<sup>st</sup> time of Cambodia government implementing green project by joining with United Nations Industrial Development Organization, UNIDO) .



### Green Industry Award, MIME



June, 20 2013, Kampot Cement have received Green Industry Award from Ministry of Industry, Mine and Energy at Phnom Penh Hotel.

## Green and Clean Industry award ( received from MOE)



On 22-Dec-2016 , TONLEBASSAC II restaurant H.E Eang Sophalleth Under secretary of **Ministry of Environment** provided **appreciation certificate** to Kampot cement Co.; Ltd that have done Clean Development Mechanism project on electricity Power Generation from waste heat of cement processing to promote **green and Clean industry** .





# Quality Environment ,Occupational Health and Safety Management

Environment 14001:2015



Quality 9001:2015



OHSA 18001:2007





# TPM – Excellence Award ( received from JIPM , Japan )

Award for TPM Excellence , Category A  
JIPM , Japan , 2018



## SPECIAL ANNOUNCEMENT

Dear All Values;

I am pleased to make an announcement that the 2018 TPM Awardee of JIPM, has been approved today that, our company (Kampot Cement Co., Ltd) got officially the "TPM Excellence Award".



*Congratulations!*



PASSION FOR BETTER

21,22 Dec 2018

**Safety Health and Environment is one of 8 pillars of TPM**



# Commitment

Our Managing Director commit for  
**Circular Economy** : reduce plastic usage

- Not use plastic bag
- Reuse plastic bag
- Use personal bottle etc.

**CSR : Use alternative fuel ( waste recovery )**



## INTERNAL NEWS

WE ARE SCG

ISSUE : ០១ ធ្នូ ២០១៨

សារព័ត៌មាននាយកគ្រប់គ្រងក្រុមហ៊ុន អេសស៊ីដី ប្រចាំប្រទេសកម្ពុជា

សង្គ្រោះពិភពលោកទាំងអស់គ្នា ជាមួយនឹង **Circular Economy**

“ចាប់ពីថ្ងៃទី ១ ខែធ្នូនេះតទៅ យើងនឹងចាប់ផ្តើម កាត់បន្ថយការប្រើប្រាស់ប្លាស្ទិកដែលប្រើតែម្តង រួមមាន កែវប្លាស្ទិក ដបទឹកប្លាស្ទិក និង ថង់ប្លាស្ទិក។”

ដោយសារតែប្រជាជនលើសាកលលោកបន្តកើនឡើង ខណៈពេលដែលធនធានមានកំណត់។ ការស្ទង់មតិមួយស្តីពី តម្រូវការរបស់ពិភពលោកលើធនធានធម្មជាតិបានកើនឡើងនៅឆ្នាំ 2050 តម្រូវការសម្រាប់ធនធាននឹងកើនឡើង ដល់ 130 ពាន់លានតោន ដែលត្រូវជា 4 ដងនៃចំនួនធនធានដែលមាន។ កាលពីមុនយើងបានប្រើម៉ូដែល **Make-Use- Return** ដោយមិនមានការគ្រប់គ្រងលើការកសាងសំណល់ឱ្យបានត្រឹមត្រូវ នាំឱ្យមានបញ្ហាសង្គមនិងបរិស្ថាន។ ខ្ញុំសូមលើកទឹកចិត្តអ្នកទាំងអស់គ្នាឱ្យស្វិតស្វាញក្នុងការកាត់បន្ថយការប្រើប្រាស់ប្លាស្ទិកដែលប្រើតែម្តង រួមមាន កែវប្លាស្ទិក ដបទឹកប្លាស្ទិក និង ថង់ប្លាស្ទិក ដែលជាដំណោះស្រាយបំផុតដែលយើងអាចធ្វើបានឥឡូវនេះ។

**យើងទាំងអស់គ្នា អាចសង្គ្រោះ ពិភពលោកបាន**

និយាយទៅដល់ការប្រើប្រាស់ប្លាស្ទិកដែលប្រើតែម្តង រួមមាន កែវ ថង់ប្លាស្ទិក កែវកាហ្វេ និងថង់ប៊ីឡា។ ពួកវាត្រូវបានប្រើតែម្តងរយៈពេលខ្លីប៉ុណ្ណោះត្រូវបានបោះបង់។

<p>យកចំបូរដើម្បីទទួលបាននិង និយាយទៅដល់ការប្រើប្រាស់ប្លាស្ទិក។</p>	<p>ប្រើប្រាស់ប្លាស្ទិកសារធាតុឱ្យ បានច្រើនដង</p>	<p>យកដបទឹកប្លាស្ទិកទៅតាម នៅលើទៅទីប្រចាំប្រទេស</p>
<p>កុំប្រើប្រាស់ប្លាស្ទិក</p>	<p>ជៀសវាងការទទួលបានទឹកតាម ប្លាស្ទិកនៅក្នុងបន្ទប់ប្រជុំ</p>	<p>យកប្រអប់ប្លាស្ទិកទៅតាម នៅលើទៅទីប្រចាំប្រទេស</p>
<p>ការគ្រប់គ្រងកាកសំណល់</p>	<p>ទិញដំបូងបំផុតជាមុន ឬ បំពេញ (Refill)</p>	<p>បោះចោលកាកសំណល់នៅក្នុង ប្រអប់ 100% ដើម្បីយកមក ប្រើប្រាស់នៅលើប្រាសាទ</p>



**Thank You**