WELCOME NOTE

JP STEEL PLANTECH CO.

YOKOHAMA, JAPAN

&

STEEL PLANTECH ENGINEERING INDIA (P)LIMITED ,
KOLKATA

WELCOMES

ALL DELEGATES AND THE AUDIENCE

TO

ENERGY SUSTAINIBILITY CONCLAVE ARRANGED BY
BENGAL CHAMBER OF COMMERCE

JP Steel Plantech Co. (SPCO) Chronology

April 2001 Established with integration of the iron&steel plant Sales Divisions of NKK(now JFE), SHI and Hitz

April 2002 Consolidated the three(3)companies Engineering Divisions of the iron&steel plant and equipment

April 2003 Consolidated the Sales Department of KHI's iron&steel plant business

April 2004 Consolidated the Engineering Division of KHI's iron&steel plant business

Corporate Profile

- Established: April 01, 2001
- Capital: Japanese ¥1,995 million
  approx. US$ 20 million
- Employee: 315 (as of April, 2009)
- Headquarters: Yokohama, Japan
- Sales Amount: approx. 500 mill US$

TOPIC OF TODAY

WASTE HEAT RECOVERY AND UTILISATION IN STEEL PLANTS

INDIAN STEEL SCENARIO

- **INDIA IS POISED FOR BIG GROWTH IN THE STEEL INDUSTRY**
- **LATEST GOAL BEING TALKED OF IS TO PRODUCE 250 MTPA STEEL BY 2025**
- **BENJAMIN FRANKLIN SAID THE FOLLOWING:**

"FAILING TO PLAN IS PLANNING TO FAIL"

- **WE NEED TO LOOK AT THE REST OF THE WORLD AND LEARN FROM THEM**

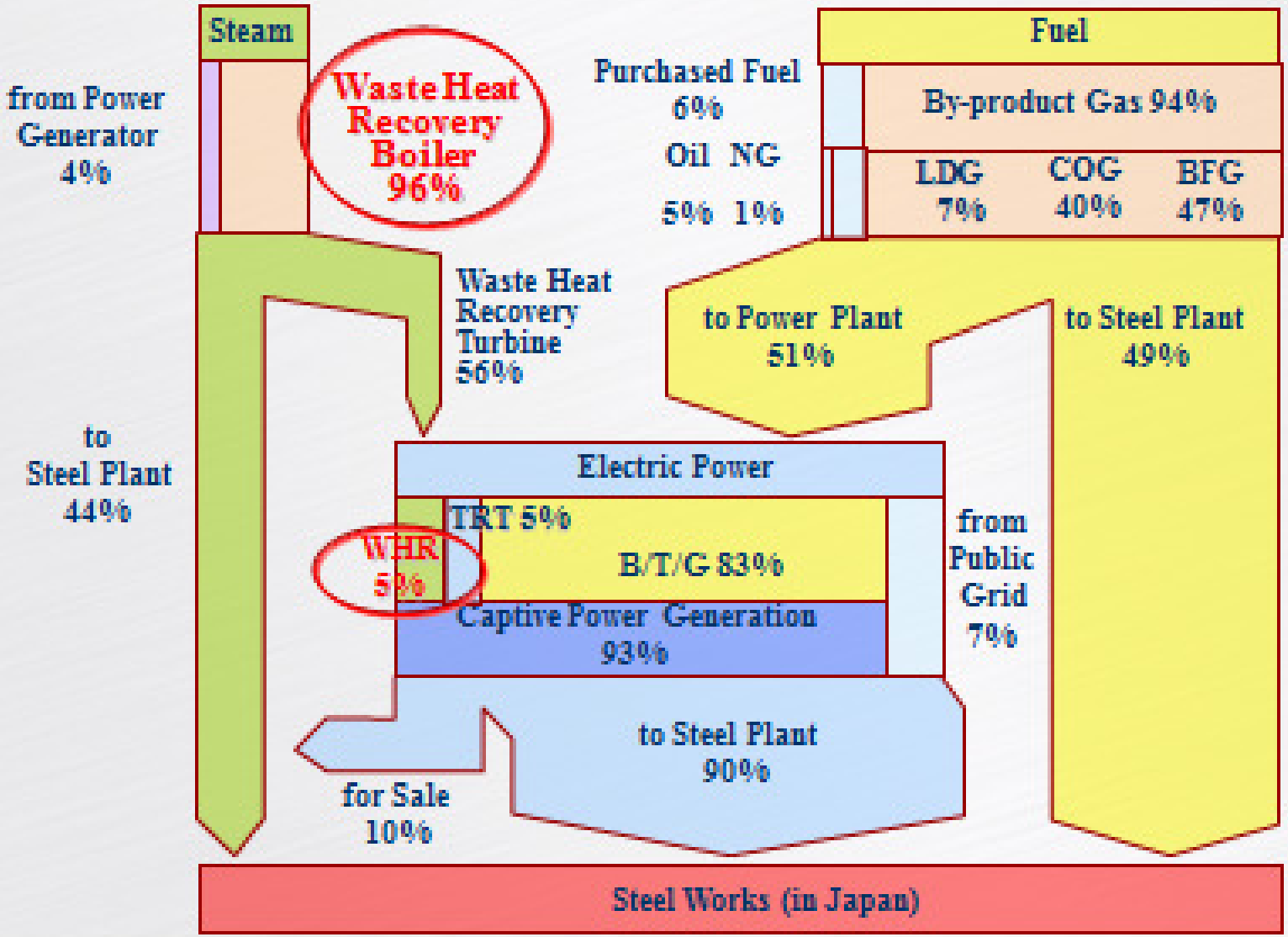
ENERGY INTENSITY

- **SPECIFIC ENERGY CONSUMPTION IN INDIA**

NAME OF STEEL PRODUCERS	SPECIFIC ENERGY CONSUMPTION (Gcal/tcs)
INDIAN AVERAGE	6.45 to 8.5
SAIL	6.78 (Q1 2013)
TATA	6.2
RINL	6.27
JINDAL,RAIGARH(DRI BASED)	5.4

- **GLOBAL BEST ACHIEVABLE SPECIFIC ENERGY CONSUMPTION IS 4.5 Gcal/tcs**

Energy Balance at Integrated Steel Works



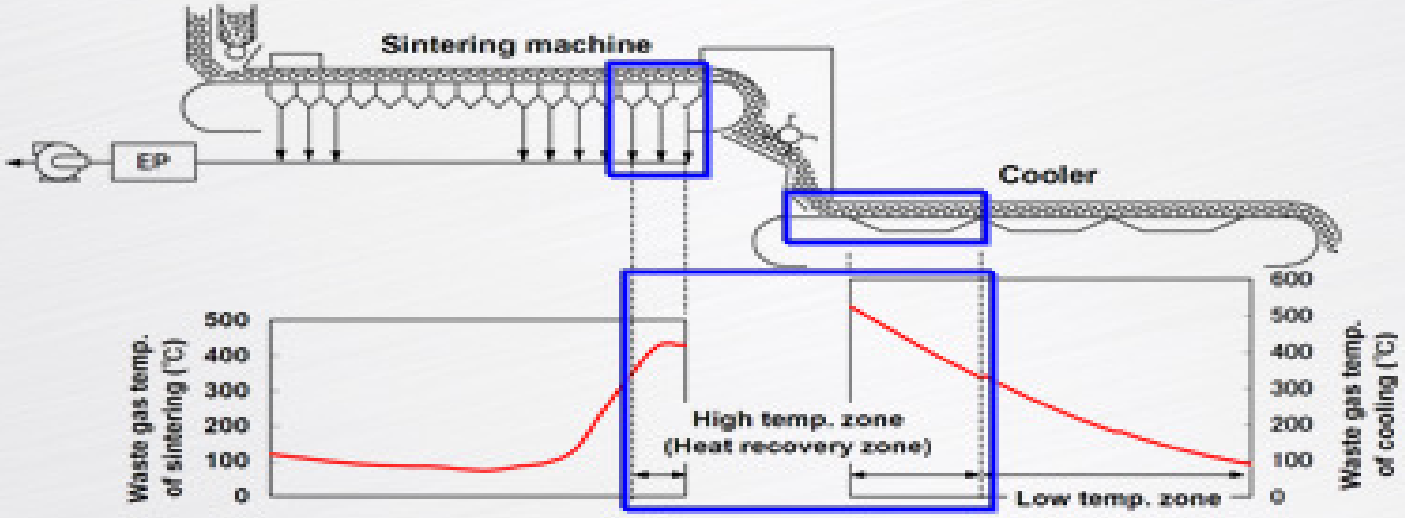
SPCO's AVAILABLE TECHNOLOGIES

- **SPCO UNDER THEIR UMBRELLA POSSES THE FOLLOWING WASTE HEAT RECOVERY TECHNOLOGIES FOR INTEGRATED STEEL PLANTS.**

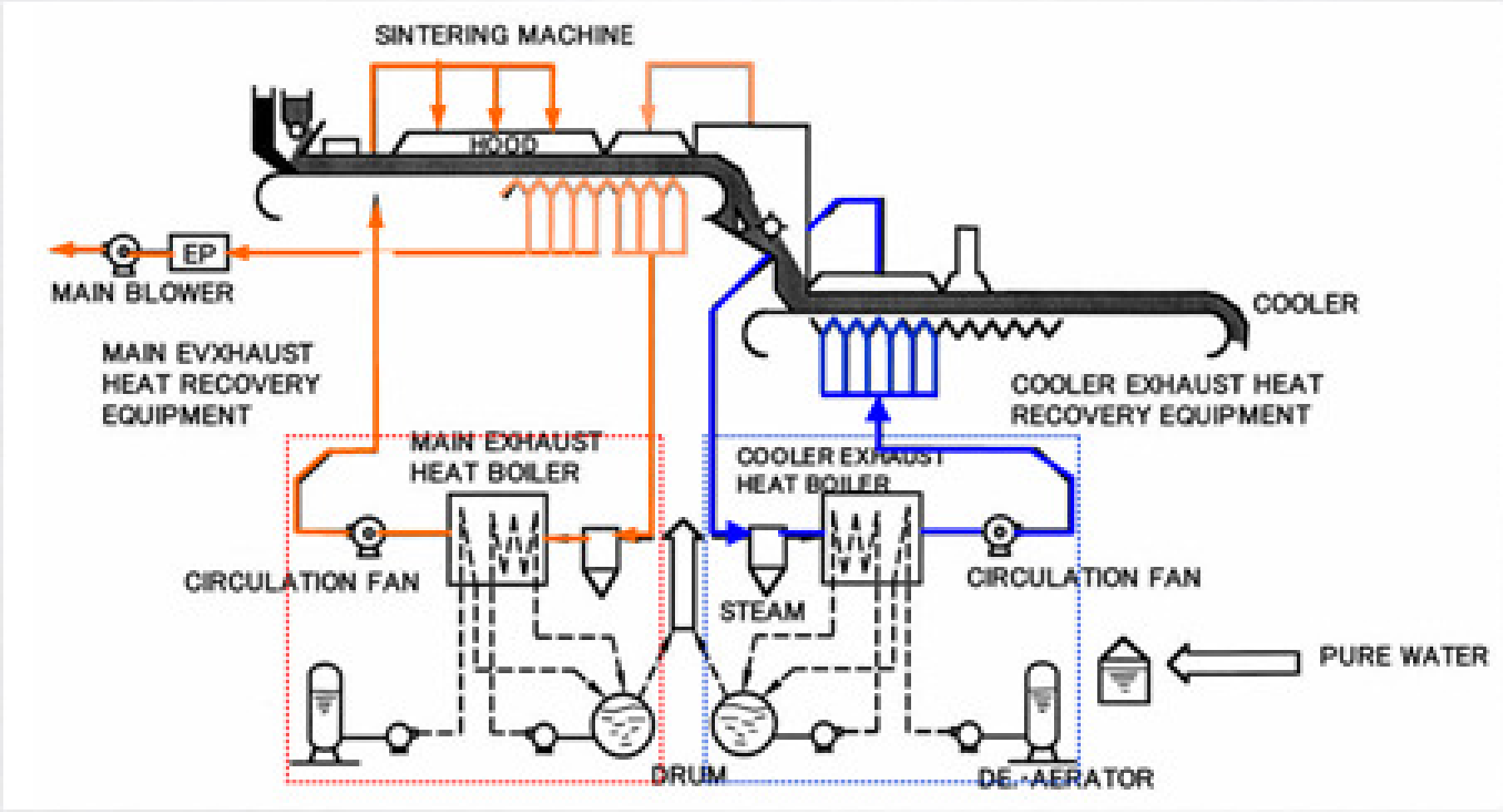
- **WHRS FOR SINTER PLANT**
- **WHRS FOR BOF SHOP(OG SYSTEM)**
- **WHRS FOR EAF(ECORECS)**
- **WHRS FOR COKE DRY QUENCHING(CDQ)**

WHRS FOR SINTER PLANT

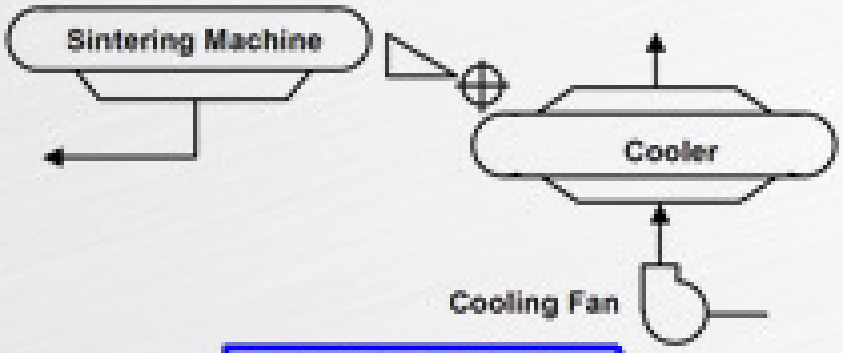
Gas Temperature Distribution



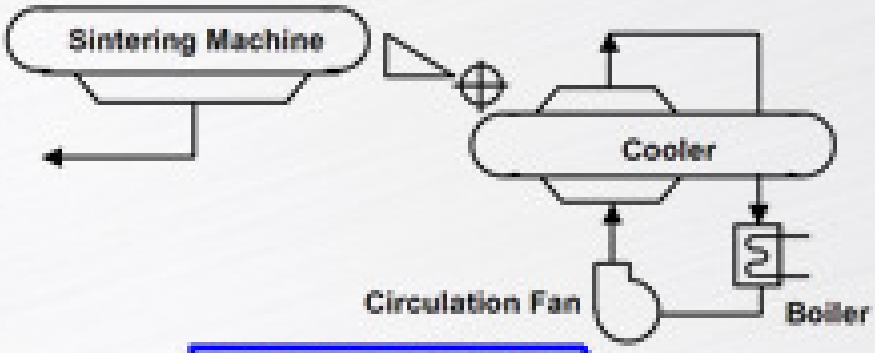
Facility Configuration of WHRS



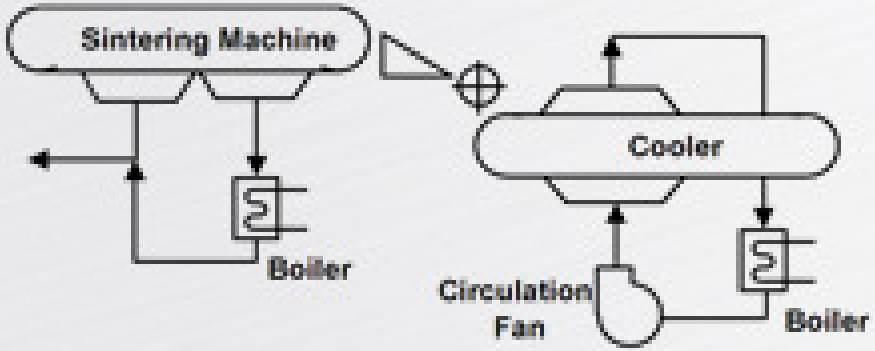
Various Facility Configuration of WHRS



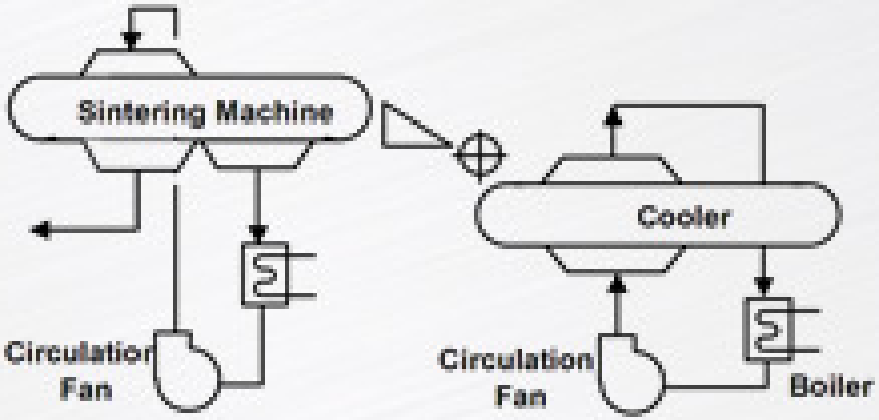
Case-1 : without WHRS



Case-2 : Cooler WHRS

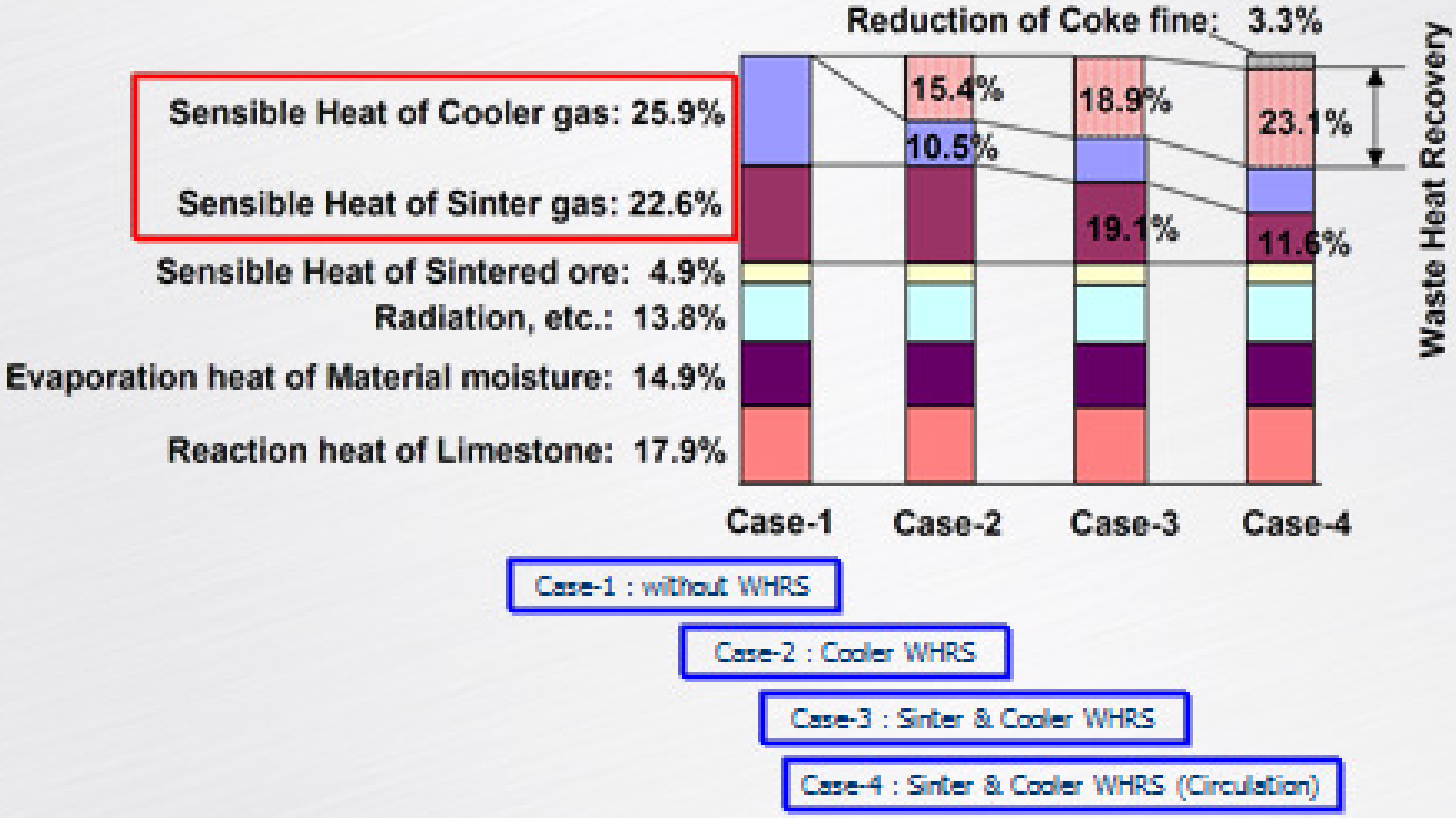


Case-3 : Sinter & Cooler WHRS



Case-4 : Sinter & Cooler WHRS (Circulation)

Heat Balance of Various WHRS



Comparison of Energy Recovery (1)

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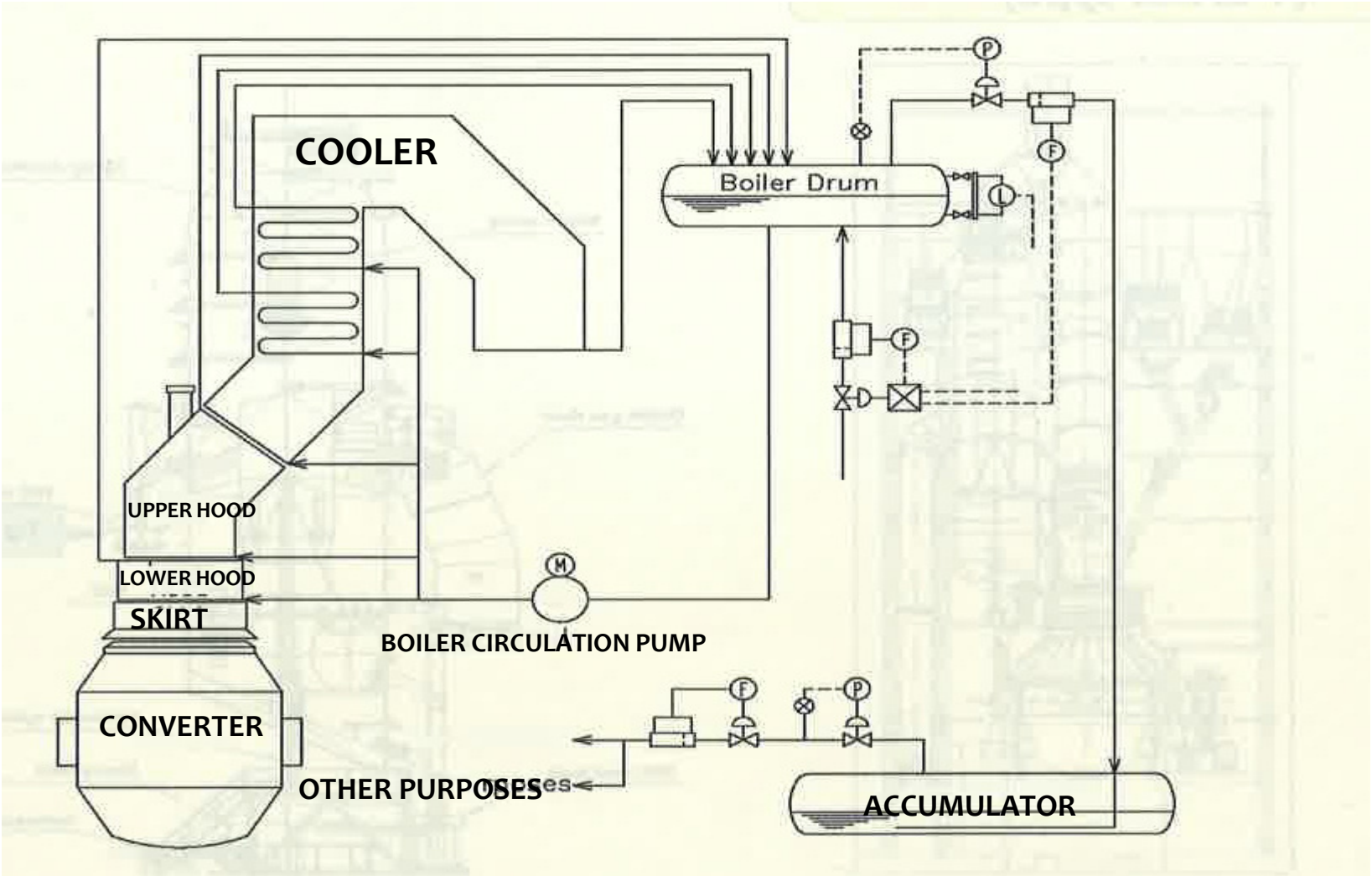
Items				Circulation		Non-Circulation	
Cooler	Temperature Zone			High	Low	High	Low
	Sinter Ore	Input	t/h	800		800	
		Temp. at inlet	℃	600		600	
		Temp. at outlet	℃	108		72	
	Cooling Gas	Flow rate	km³N/h	650	800	480	970
		Temp. before	℃	180	25	25	25
		Temp. after	℃	444	225	425	190
	Leakage Ratio	Under trough	%	30	30	30	30
		Above trough	%	20	20	20	20
	Fan Power		kW	2,690		2,000	
Boiler Turbine Generator	Off Gas	Flow Rate	km³N/h	569		420	
		Inlet Temp.	℃	352		337	
		Outlet Temp.	℃	200		205	
	Recovered Steam		t/h	40		26	
	Recovered Power		kWh	7,100		4,600	

NEDO PROJECTS-RINL INDIA

- **WE ARE THE FIRST TO BRING IN INDIA A PROJECT OF POWER GENERATION FROM OFF GAS OF SINTER COOLER.**

- **20.6 MW POWER WILL BE GENERATED FROM 2 SETS OF SINTER COOLERS (2 X 312 m2 SINTER PLANT)**

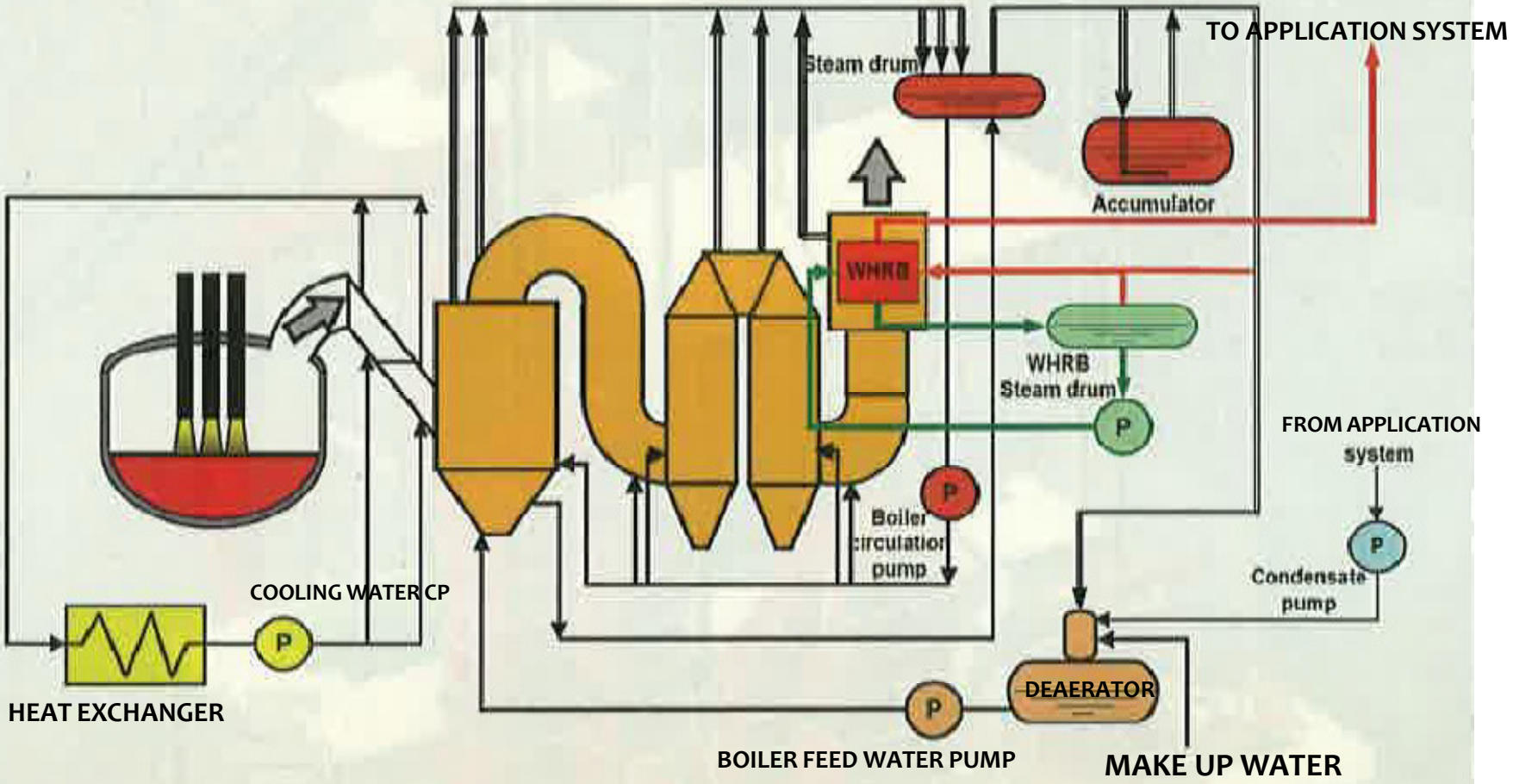
WHRS for BOF SHOP (OG SYSTEM)



WHRS FOR BOF SHOP (OG SYSTEM) Contd….

- **STEAM RECOVERY INTENSITY IS 70-100 KG/TON OF LIQUID STEEL IF THE SYSTEM OF HEAT RECOVERY BY BOILER IS DEPLOYED.**
- **SO FOR A 150 TON CONVERTER WHERE 130 TON LIQUID STEEL IS PROCESSED APPROXIMATELY 9 TON TO 13 TON OF STEAM CAN BE GENERATED PER HEAT USING SPCO's TECHNOLOGY.**
- **SPCO HAS BUILT 189 nos OG SYSTEMS SINCE 1962 WORLDWIDE.**
- **IN JAPAN 86 UNITS ARE RUNNING OUT OF WHICH 32 UNITS ARE PROVIDED WITH WHRB SYSTEM.**
- **FUNDAMENTALLY OG SYSTEM IS UTILISED FOR CONVERTER GAS COOLING,GAS CLEANING AND SEQUESTERING THE HIGH CV CONVERTER GAS AS FUEL.**

WHRS for dri-eaf



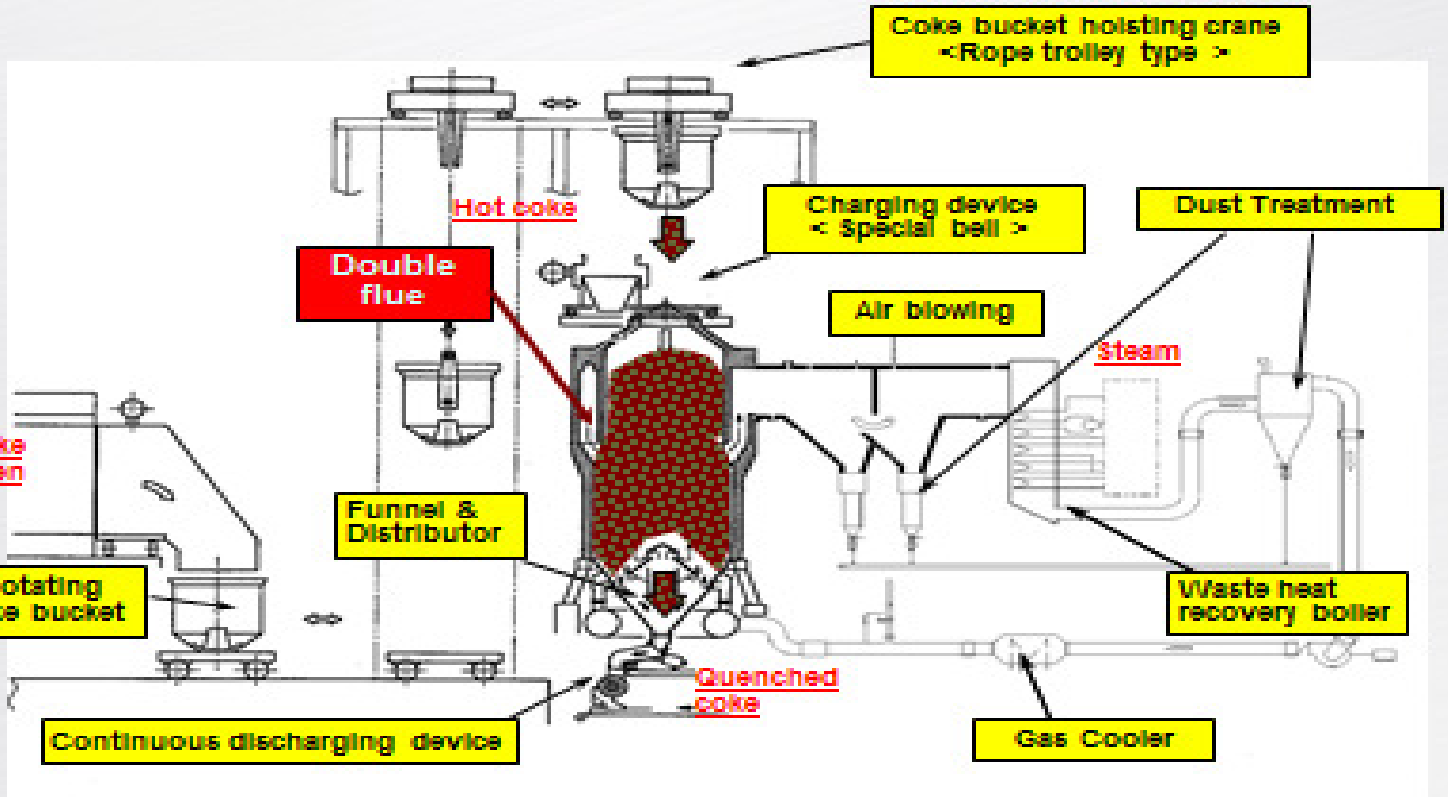
WHRS FOR DRI-EAF CONTD…

- **EAF UTILISES INPUT POWER APPROX 600 -770 KWH/TON FOR DRI MELTING wrt 400 KWH/TON FOR SCRAP MELTING EAF. HENCE OFF GAS HEAT ENERGY IS HIGHER IN CASE OF DRI MELTING FURNACE.**

- **FOR A STANDARD DRI EAF (160 TON/CHARGE) WITH TTT 46 MINUTE AND POWER ON 40 MINUTES 180 KG/HR/TON OF STEEL CAN BE GENERATED AMOUNTING TO 17.5 KWH/TON OF STEEL AT BACK PRESSURE TURBINE USING SPCO'S DRI-EAF_WHRS**

WHRS FOR COKE DRY QUENCHING

Advanced Technology of SPCO-CDQ



CONVENTIONAL CDQ VS SPCO'S ADAVANCED CDQ TECHNOLOGY

- **IN LAST FEW YEARS CDQ HAS BECOME POPULAR IN INDIA AND NOW THERE IS A TECHNOLOGICAL SHIFT FROM CONVENTIONAL COKE WET QUENCHING TO COKE DRY QUENCHING.CDQ SAVES LOT OF WATER WHICH GETS EVAPORATED DURING WET QUENCHING OF COKE AND ALSO GIVES RISE TO HIGH DUST POLLUTION WHICH IS CONTAINED SOMEHOW FROM 400 gm/tc TO ABOUT 50 gm/tc BY DEPLOYING HOODED SUCTION.**

- **DRY QUENCHING NOT ONLY ELIMINATES THIS PROBLEMS BUT ALSO IMPROVES THE COKE QUALITY FOR A MORE STABLE BF OPERATION**

COMPARISION FOR A 112 TPH COKE COOLING FACILITY

ITEM DESCRIPTION	EXISTING MULTICHAMBER CDQ TECH. IN INDIA	SPCO'S ADVANCED TECHNOLOGY
NO OF UNITS	56 TPH X 2 + 1 HOT STANDBY + 1 COLD STAND BY	112 X 1 TPH + 1 STAND BY
TOTAL YEARLY DUST EMMISSION	161.9TONS/YR	5.5 TONS/YR
POWER GENERATION	11.98 MW	17.33 MW
BLEED GAS	NEEDS CO BURNING IN THE STACK	NO CO BURNING IN STACK IS REQUIRED

Steel Plantech

Thank you very much

for your kind attention!

(Arigato Gozaimashita.)

JP Steel Plantech Co.

Yokohama, Japan

Steel Plantech Engg. India Pvt. Ltd.