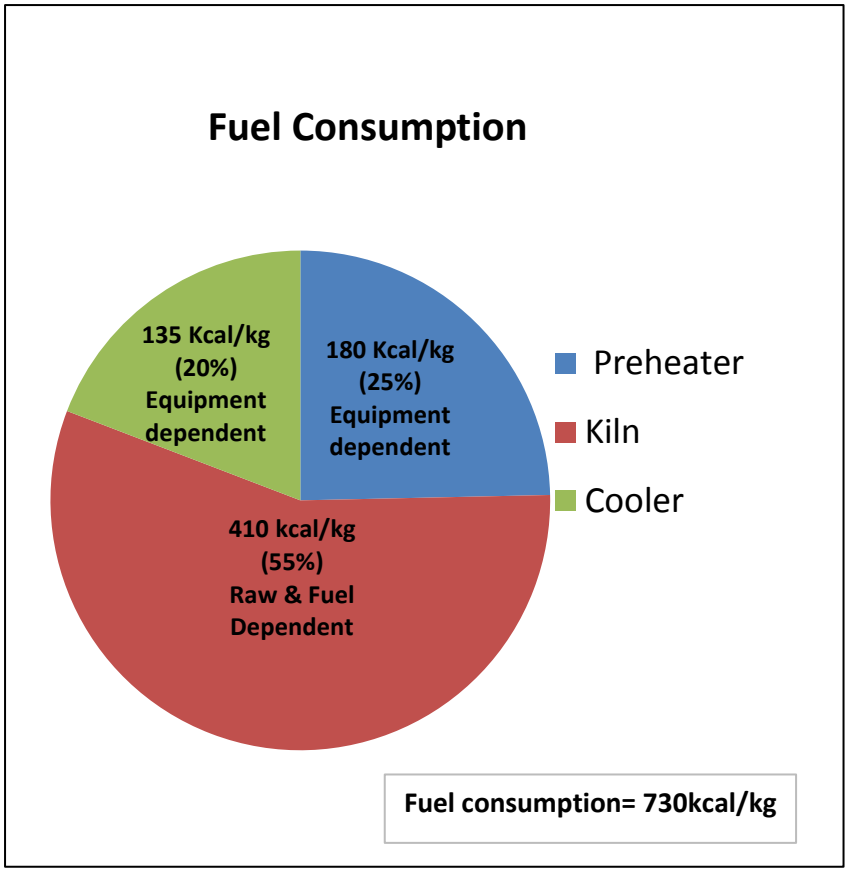
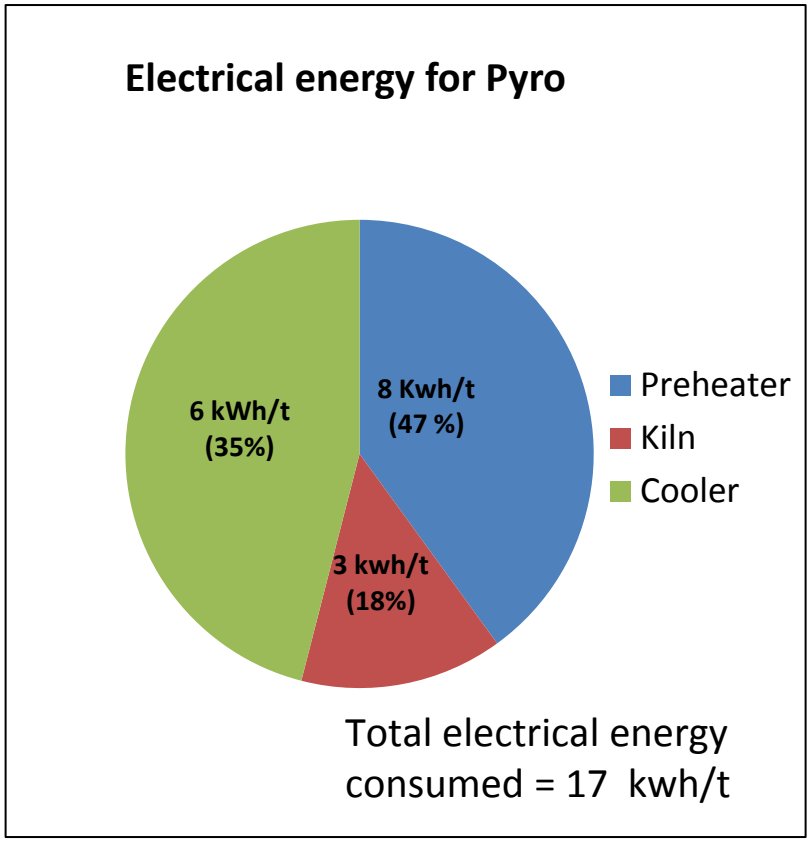
IKN

ENGINEERING THE FUTURE

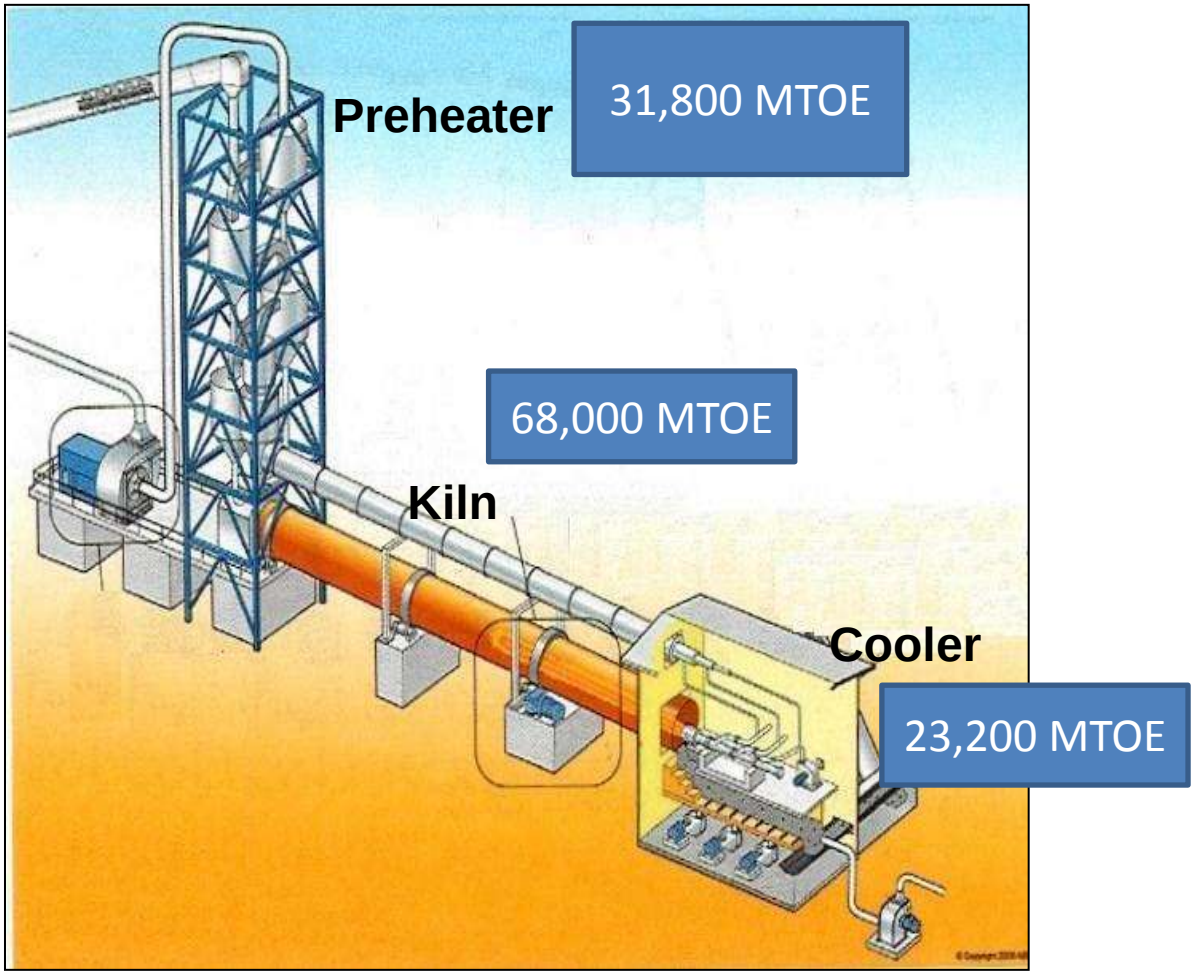
30% reduction in energy by cooler modification with IKN Pendulum cooler

Energy consumption of a kiln line





Pyro Line



Current challenges

- High Clinker temperature — 200 °C
- Low efficiency — 65 %
- Higher Power consumption (fans, drive, crusher and CV fan) — 6 kWh/t
- Maintenance cost — Rs.9 /ton
- Unscheduled Stoppages — 1 to 2/year

Reasons for the Challenges!

➢ High Clinker temperature	loading too high for the used technology
➢ Low efficiency	technology not made for the increased requirements
➢ Higher Power consumption (fans, drive, crusher, CV fan)	higher pressure and drive power used to compensate inferior design
➢ Maintenance cost	price for operating at the absolute max
➢ Unscheduled Stoppages	equipment operating at 150% of design

How to conquer the challenges?

✓ High Clinker temperature	new grate design able to **handle high load**
✓ Low efficiency	new grate design **geared for high** efficiency
✓ Higher Power consumption (fans, drive, crusher, CV fan)	new grate design with **high and equal** precision to avoid **unwanted pressure drop** (useless pressure drop because of protective layer or regulators)
✓ Maintenance cost	new grate design able to operate at high demand
✓ Unscheduled Stoppages	new grate design made to operate more than 355 days at max load

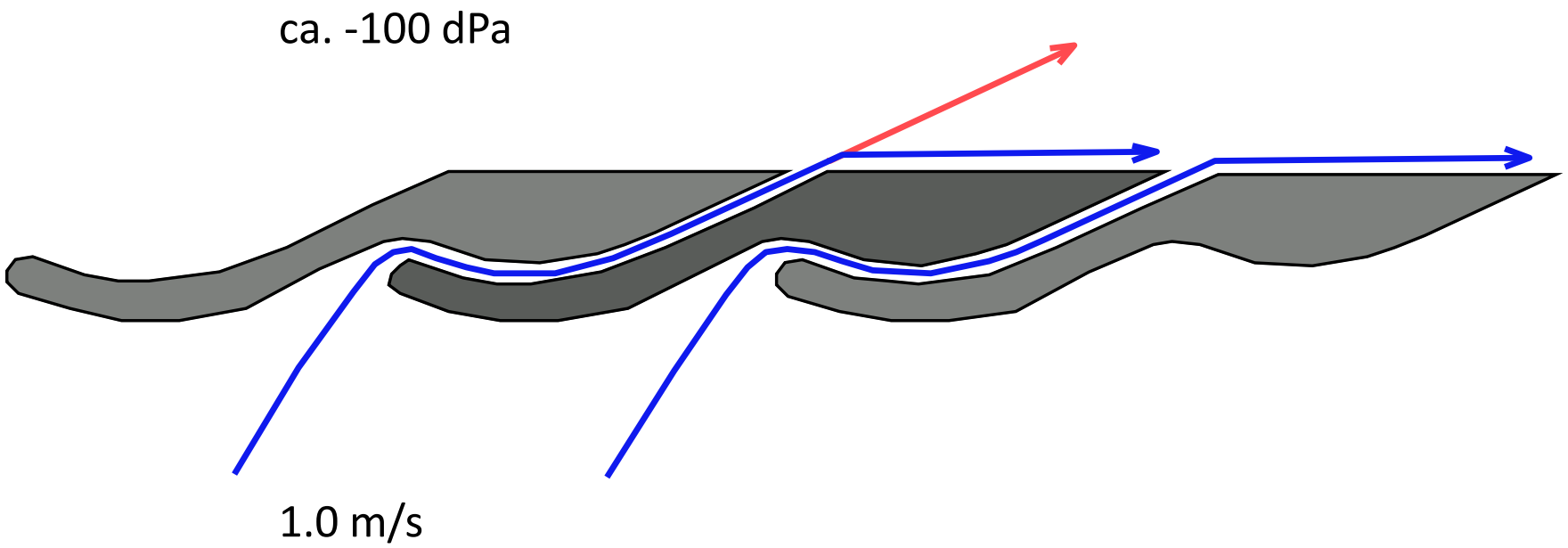
IKN way
to address
the challenges

- ✓ Grate Design to handle High Load with high Efficiency
  - ❖ Horizontal Aeration (COANDA effect)
  - ❖ Fixed inlet distribution system (KIDS)

- ✓ Low Power Consumption
  - ❖ Full control of all gaps by special design and Pendulum suspension (LPS), thus making any throttle tool unnecessary

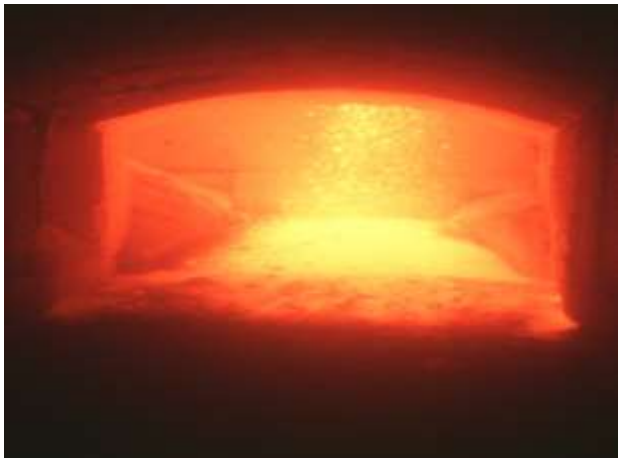
- ✓ Low Maintenance Cost and High Availability
  - ❖ Wide grates with slow forward and quick backward motion
  - ❖ Less mobile rows
  - ❖ A special Hydraulic drive located outside the cooler

Coanda Effect



KIDS

(Klinker Inlet Distribution System)

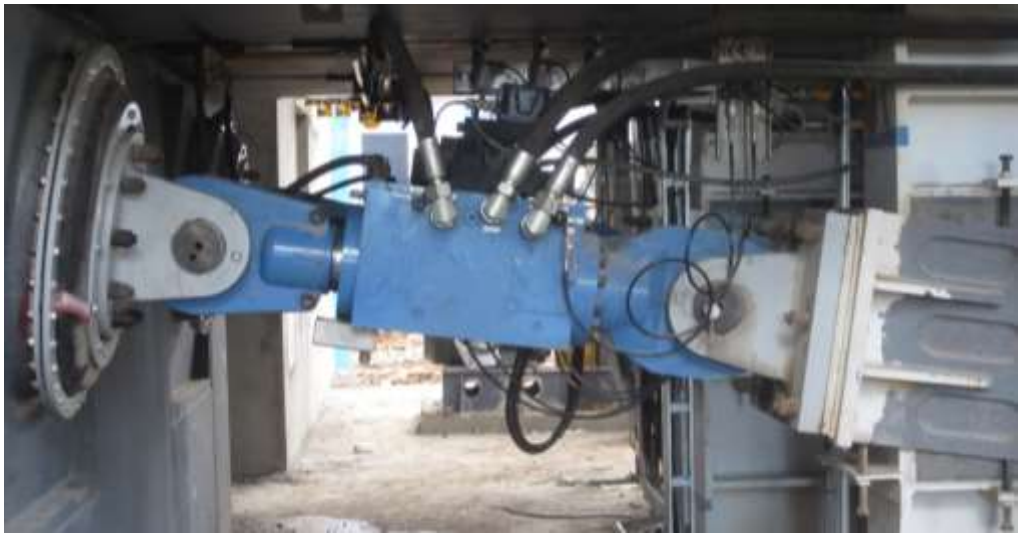


- ✓ Uniform distribution of clinker
- ✓ Excellent heat recuperation
- ✓ Coanda effect adds transport capacity to the clinker bed avoiding special blaster

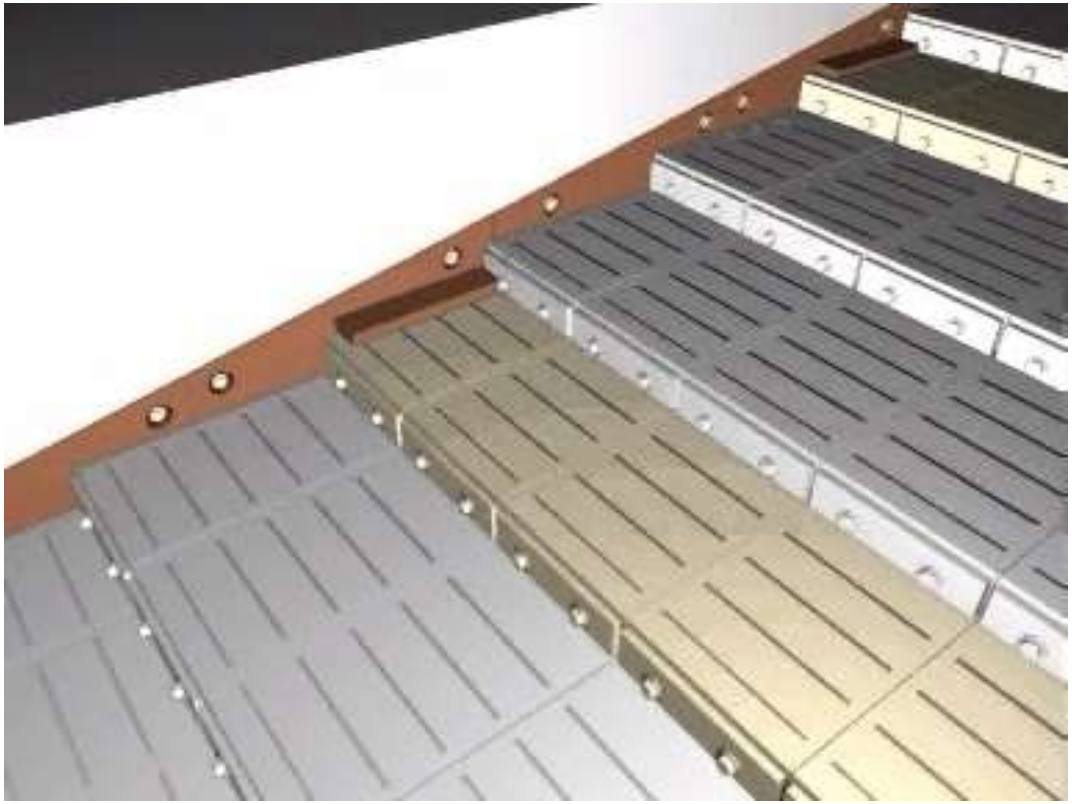
Special hydraulic drive

- ✓ Upto 5000 tpd single drive cylinder and upto 10,000 tpd two drive cylinders are sufficient. Beyond 10,000 tpd coolers need only four cylinders.

- ✓ All cylinders are fitted outside the cooler and hence Easy for inspection and maintenance



Simple enough: Every 3rd row movable



Roller crusher

- ✓ Less dust emission to the vent air
- ✓ Perfect sealing against false air from the clinker conveyor
- ✓ Smaller range of particle size distribution after the crusher

Case study - 1

Cooler replacement in UTCL, Rajashree#3

- Existing cooler has been replaced with energy efficient IKN Pendulum Cooler.
- Main reason for modification was to improve the energy efficiency of the plant.

Case study - 1

Cooler replacement in UTCL, Rajashree#3

Operation parameters by comparison after IKN upgrade:

S.No	Parameters	Before IKN	After IKN	Savings/ advantages	MTOE
1	Power kWh/ton	5.5	3.75	1.75	241
2	Cooler losses (zero deg C Kcal/kg)	135.8	105	30.8	4962
3	Clinker temperature (deg C)	181	61	120	
4	Fuel	40% Pet coke	100% Petcock	Able to fire 100% petcock now	

Case study - 2

JK Lakshmi Cement Ltd

Operation parameters by comparison after IKN upgrade:

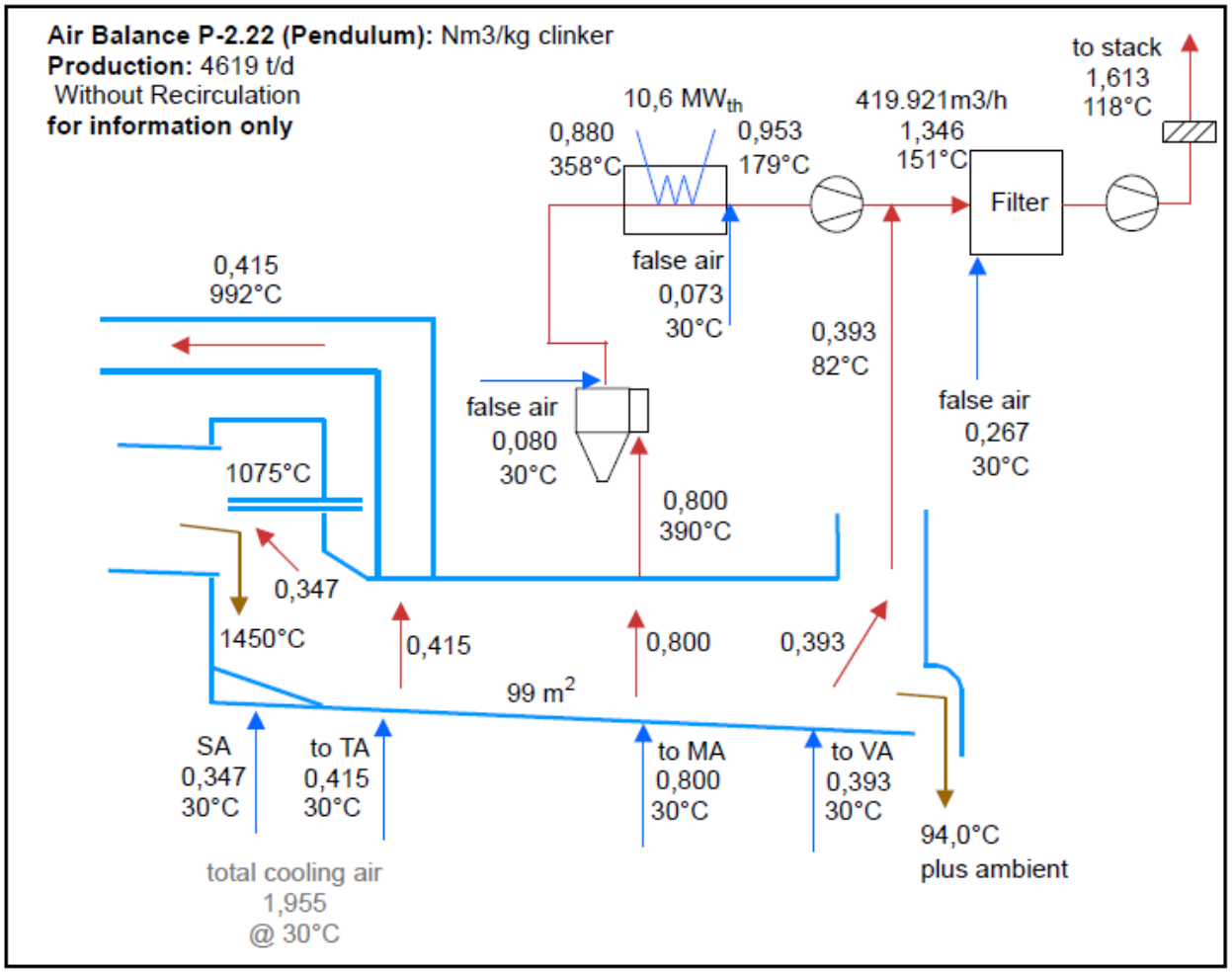
S.No	Parameters	Before IKN	After IKN	Savings/ advantages	MTOE
1	Power kWh/ton	4.6	2.8	1.8	298
2	Cooler losses (zero deg C Kcal/kg)	158	139	19	3292
3	Clinker temperature (deg C)	193	100	73	

Case study - 2

JK Lakshmi Cement Ltd – Recirculation of Hot vent gases

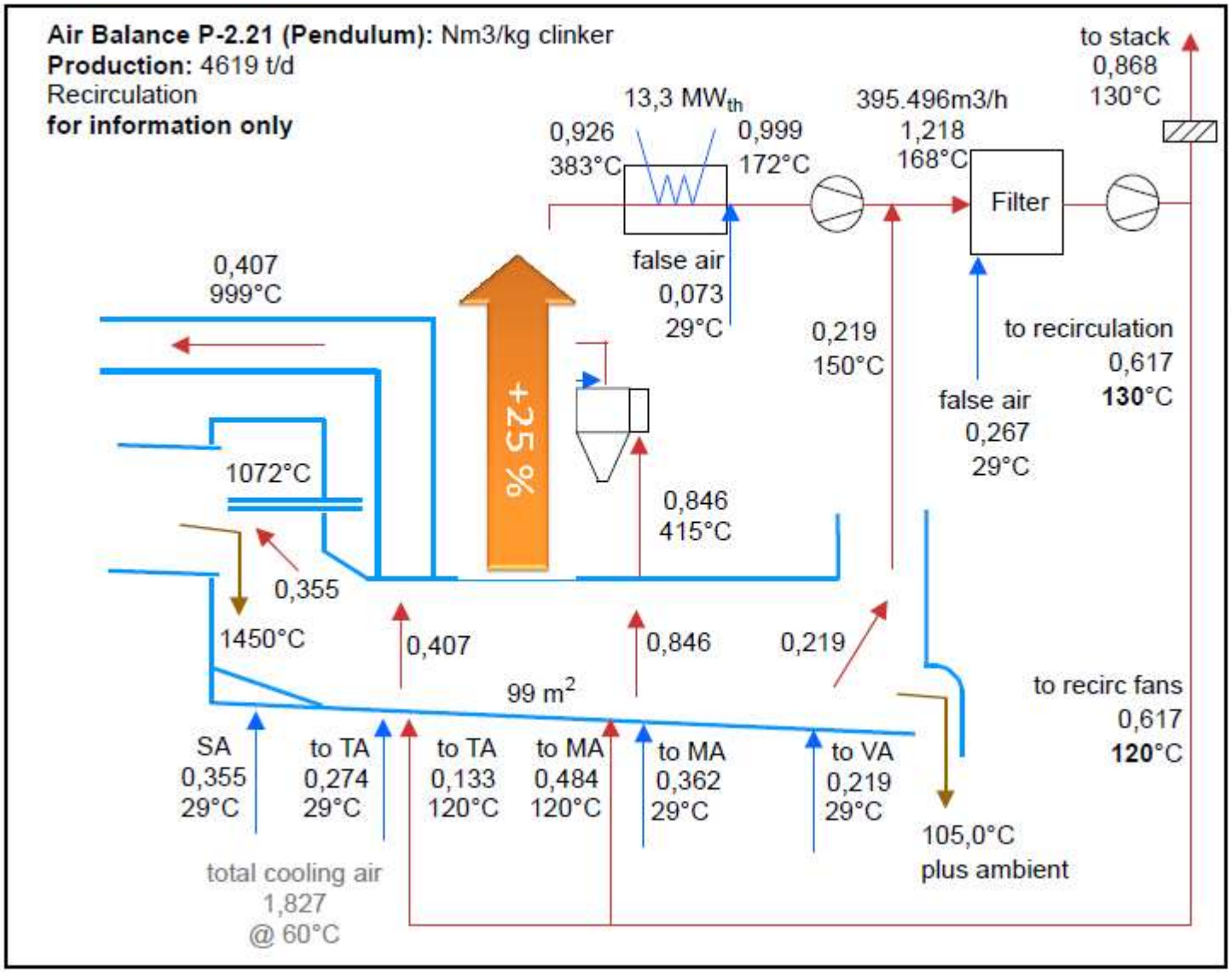
Case study - 2

JK Lakshmi Cement Ltd – Standard cooler operation



Case study - 2

JK Lakshmi Cement Ltd – Recirculation of Hot vent gases



vent

Make Indian cement plant world class - Green

If all the 250 MTPA clinker produced is cooled by IKN coolers

(based on savings of power by 1.5 kWh/t on average)

YOU can supply free power for 9 months for a city like Jodhpur

Make Indian cement plant world class - Green

Savings of Thermal = 20 kcal/kg cl (on average)

Savings in Coal if all clinker in India is cooled by IKN = 20.000 Wagons of coal per year

Make Indian cement plant world class - Green

Let US make Indian cement plant green

Let US save our resourses for our children

IKN

ENGINEERING THE FUTURE

…cool down

Thank you for your attention!

For more information, please contact:
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