IN ONE HUNDRED HUASHIN

Co-processing activities in Huaxin

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SD Director of Huaxin Combodia

Histroy & Milestones of Huaxin Cement

1907 — Hubei cement plant founded (in Huangshi, Hubei)

1939-1946 — Relocated to Hunan Chenxi and Yunnan Kunming as WWII broke out

1946-1993 — Moved back to Huangshi, Hubei and change name to “Huaxin Cement Plant”

1993 — Restructured to shareholding and create Huaxin Cement Company Ltd.

1999 — Strategic partnership built between Huaxin and Holcim

2003 — Went out of Huangshi and build a plant in Yichang, Hubei

2005 — Expanded to RMX, AGG and ECO businesses

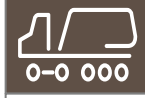
2012 — Branched out of China and built first overseas cement project (Tajik)

2015 — The merger of LafargeHolcim and Huaxin in China

2016.08 — Signed framework agreement in relation to the purchase of non-listed assets of LAFARGE CHINA

Business sections

Through last 20 years' high-speed development, Huaxin has become a vertically integrated company with more than 150 subsidiaries in China, Central Asia, Southeast Asia and Africa.



Cement
Since 1907

- *44 cement plants (56 kiln lines)*
- *15 grinding plants*
- *100 Mtpa*
- *46 WHR lines*

Packaging
Since 1994

- *Heat-sealed bags*
- *500 mil. bags per year*

Equipment
Since 2000

- *50,000 tpa*
- *Cement Equipment*
- *Eco Equipment*

EPC
Since 2001

- *4 cement plants EPC per year*

RMX
Since 2005

- *58 mixing stations*
- *23.3 mil. m^3 per year*

Eco
Since 2007

- *23 Eco plants*
- *5.5 Mtpa*
- *11 Eco projects*

AGG, Brick, Sand
Since 2011

- *8 AGG plants*
- *26 Mtpa*
- *1 brick plant*

Mortar
Since 2017

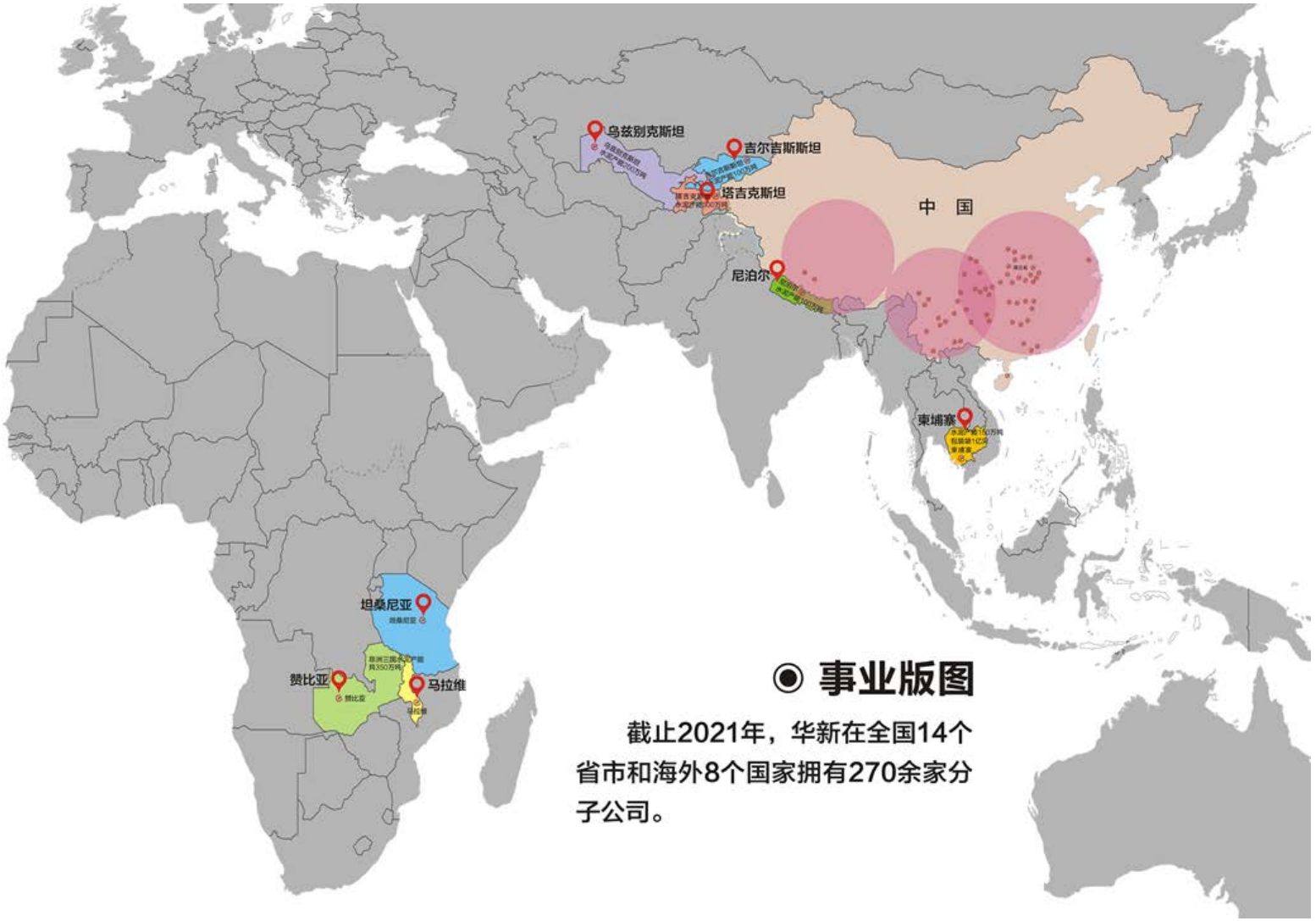
- *Functional mortar*
- *1 mortar plant*
- *50,000 tpa*
- *2 mortar projects*

UHPC
Since 2018

- *Start promoting in China*

- *More new business development in the future...*

Huaxin's business has covered 14 provinces and municipalities in China and 8 overseas countries



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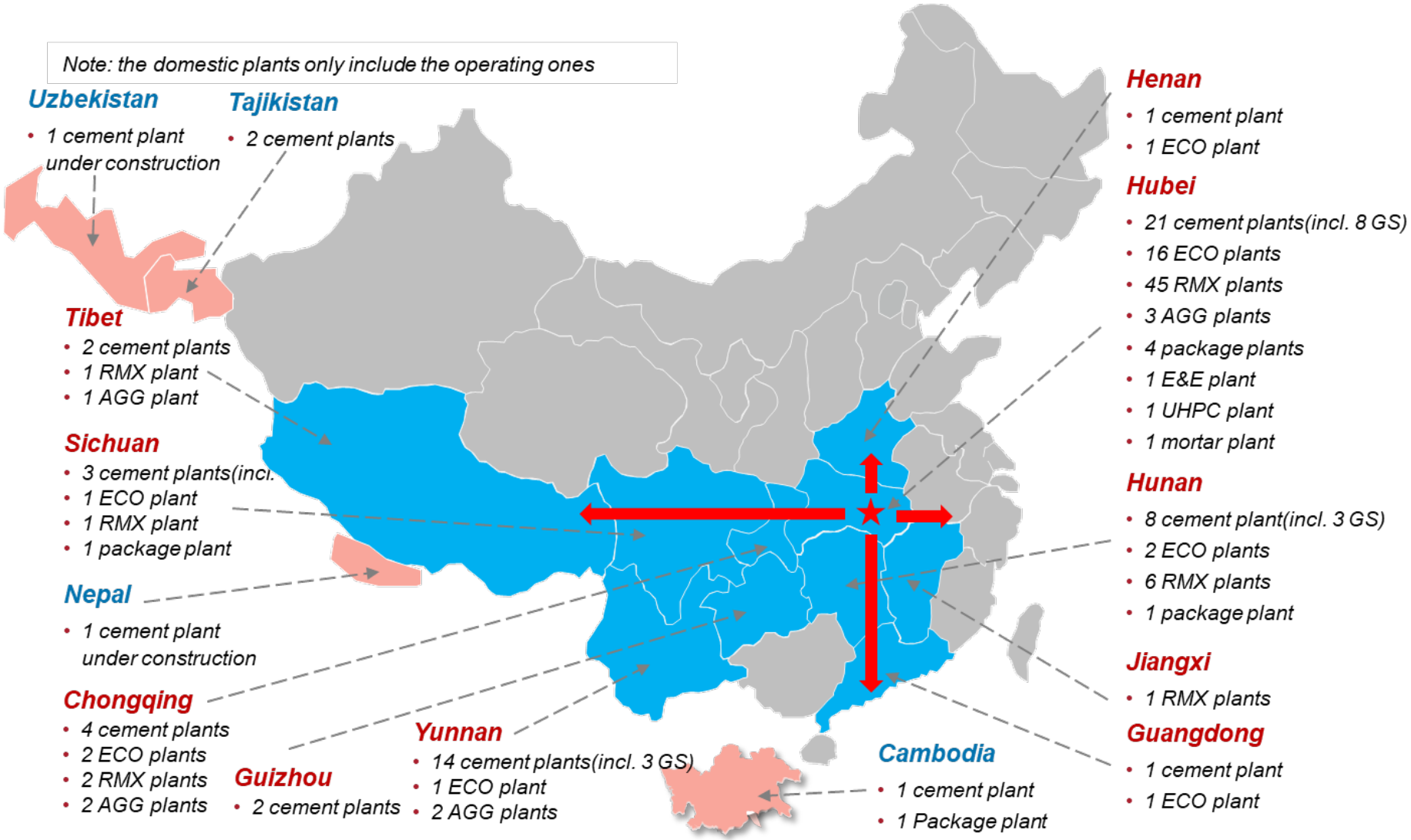
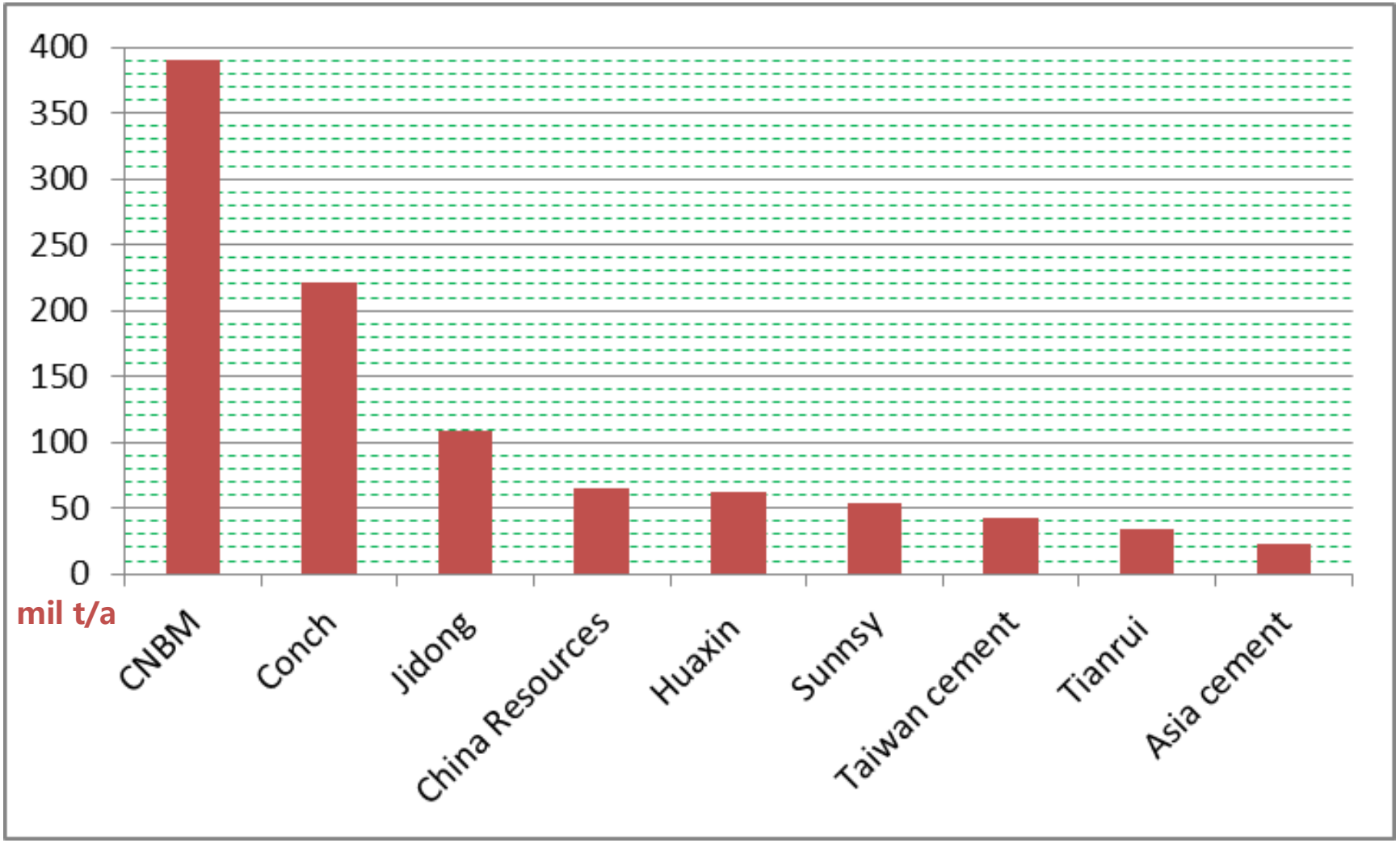


Huaxin keeps the 5th cement player in China cement industry based on clinker capacity for many years



Development of Huaxin ECO business

2007

National pilot project on co-processing of POPs in Cement Kiln (Sino-German cooperation project) **Huaxin Eco business started**

2008

As the first cement plant in China **engaging in directly co-processing SS of 80% water content in the Kiln**

2009

9 Storage /Disposal Permits for IHWs been granted,; Only 2 cement plants at national wide had such permission

2010

Floating debris from Three Gorges collected and co-proceed in a cement plant of Huaxin; **High profile for Huaxin Eco in Environmental Business**

2011

- Win a contract from Wuxue Government on co-processing of 200 t MSW /d
- Becoming an pioneer company in pre and co-processing of MSW
- 15 IHW disposal permits

2012

- Win a disposal contract totaling 450,000t of CS;
- Win a disposal contract of 1000t MSW/d at Wuhan

2013

- Commissioning operation of Wuhan plant (1000 t MSW/d)
- 0.5 mio. tons of wastes pre and co-processed
- 15 MSW projects granted by various governments
- The revenue from the Eco business reached RMB 110 mio.

2014

- Successful completion of disposal of totaling 0.5 mil tons of CS
- More than 15000 tons of IHW pre and co-processed
- Win a 2000t MSW/d contract from Wuhan government

2015

- Commissioning operation of Zhuhai Plant (1000tMSW/d)
- Successful completion of disposal of totaling 0.65 mil tons of CS

2016

- Successful development of ISW disposal business with Unilever
- Promotion of co-processing capability

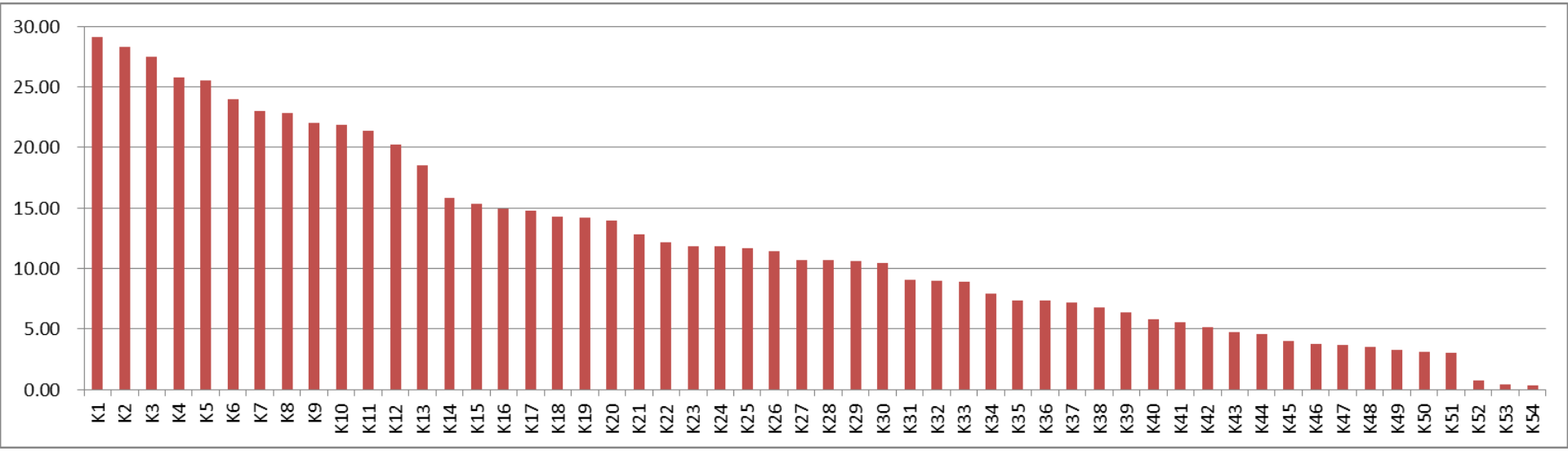
Waste streams

- MSW: municipal solid waste
- SS: sewage sludge
- FW: floating material
- CS: contaminated soil
- HIW: hazardous industry waste
- IW: industry waste

Huaxin ECO business

- MSW: 4.34 mil t/a
- SS: 0.75 mil t/a
- HIW: 0.54 mil t/a
- CS: 0.22 mil t/a
- Others: 0.32 mil t/a

TSR in Huaxin



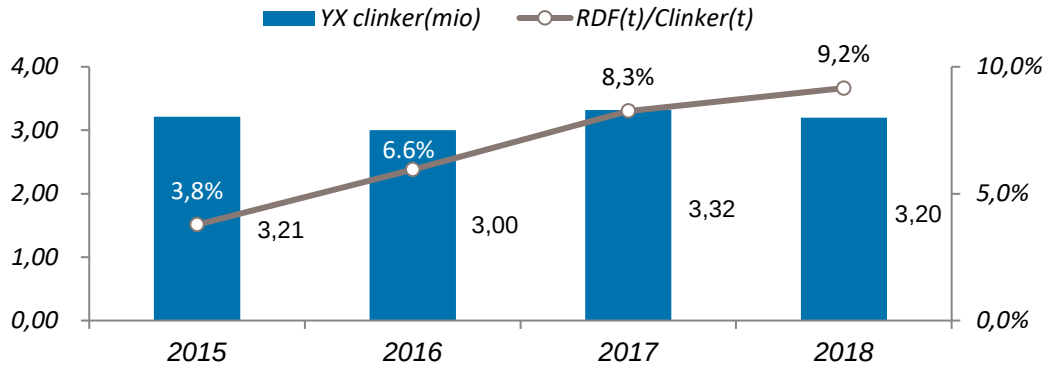
- TSR varies from nearly 30% to less than 1%;
- TSR depends on the availability of AF & kiln size;
- Most of kilns on the above list with clinker capacity 4000-5000t/d;

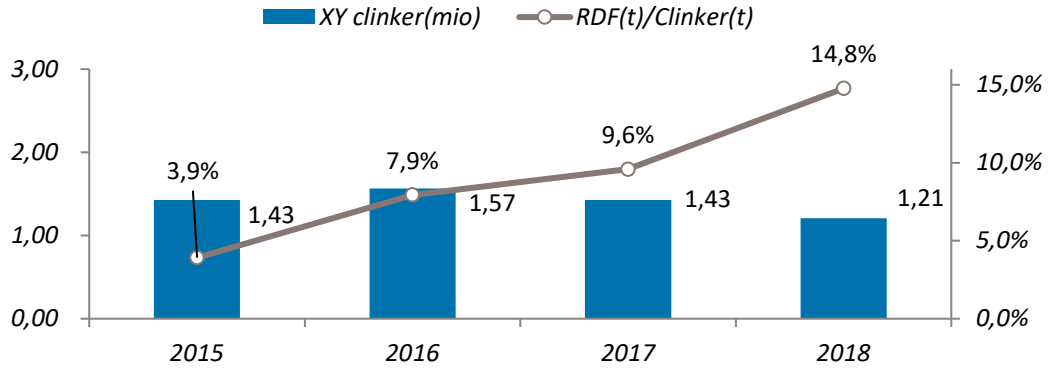
Through continuous research and development, the 5000tpd kiln line RDF disposal capacity reaches 850tpd (1500tpd MSW)

In China, without sorting at source, the waste composition of each region varies greatly, and the water content is high.

RDF calorific value after ecological pre-treatment is 1500-3000kcal/kg

YX plant has a combined RDF disposal capacity of about 950t/d in 2018; the increase in co-processing capacity has not affected the clinker production.





XY plant RDF co-processing amount is about 570t/d and the proportion of RDF/t clinker has reached 15%..

MSW pre-processing platforms

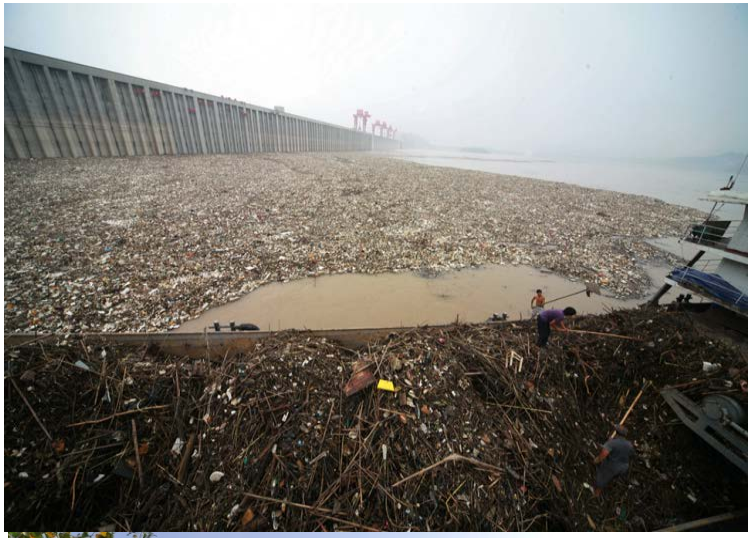
SS pre-processing platforms

HIW pre & co-processing platforms

CS pre & co-processing platforms

IW pre-processing platform

FM pre & co-processing platforms



Learnings from OPTOCE project _ Background

- About the kiln system
  - ✓ Capacity: 5000t/d
  - ✓ Production: 5200-5500t/d
  - ✓ 5-stage, double string preheater & precalciner
  - ✓ Bypass system

- About RDF(CMSW)
  - ✓ Moisture: 47.8%
  - ✓ NCV:1955 kcal/kg
  - ✓ Ash: 11.52%
  - ✓ Cl: 0.142%
  - ✓ F: 1.83 mg/kg
- About FM
  - ✓ Moisture: 46.63%
  - ✓ NCV:2223 kcal/kg
  - ✓ Ash: 4.02%
  - ✓ Cl: 0.062%
  - ✓ F: 2.18 mg/kg

- contain around 10-15% plastic,

Learnings from OPTOCE project _ Pilot testing

Table 1: testing conditions

Date	Test condition	Sampling
22 Dec 2020	Co-processing floating materials	From 12h, the floating materials were fed by the conveyor belt at a rate of 13tph.
		Between 14-22h, the staff of Huaxin (Zigui) and the sampling company took samples of the exit gas, coal, kiln feed, floating materials, clinker, kiln dust and bypass dust.
23 Dec 2020	Co-processing RDF	From 8h, RDF was fed by the conveyor belt at a rate of 13tph. Between 10-18h, the staff of Huaxin (Zigui) and the sampling company took samples of the exit gas, coal, kiln feed, floating materials, clinker, kiln dust and bypass dust.
24 Dec 2020	Baseline condition (coal only)	Between 8-16h, the staff of Huaxin (Zigui) and the sampling company took samples of the exit gas, coal, kiln feed, clinker and kiln dust.
After the test		Samples were labelled and sent for chemical and other analysis.

Learnings from OPTOCE project _ Pilot testing

Table 2: characteristics of floating material and RDF used in the pilot test		
Parameters	**Floating material**	**RDF from Zigui**
Share of plastic waste (%)	13.91	12.27
Heat content (kcal/kg)	2223	1955
Estimated co-processing volumes in 2020 (t)	46,800	102,960
Estimated co-processing volumes of the plastic waste fraction in 2020 (t)	6510	12,633

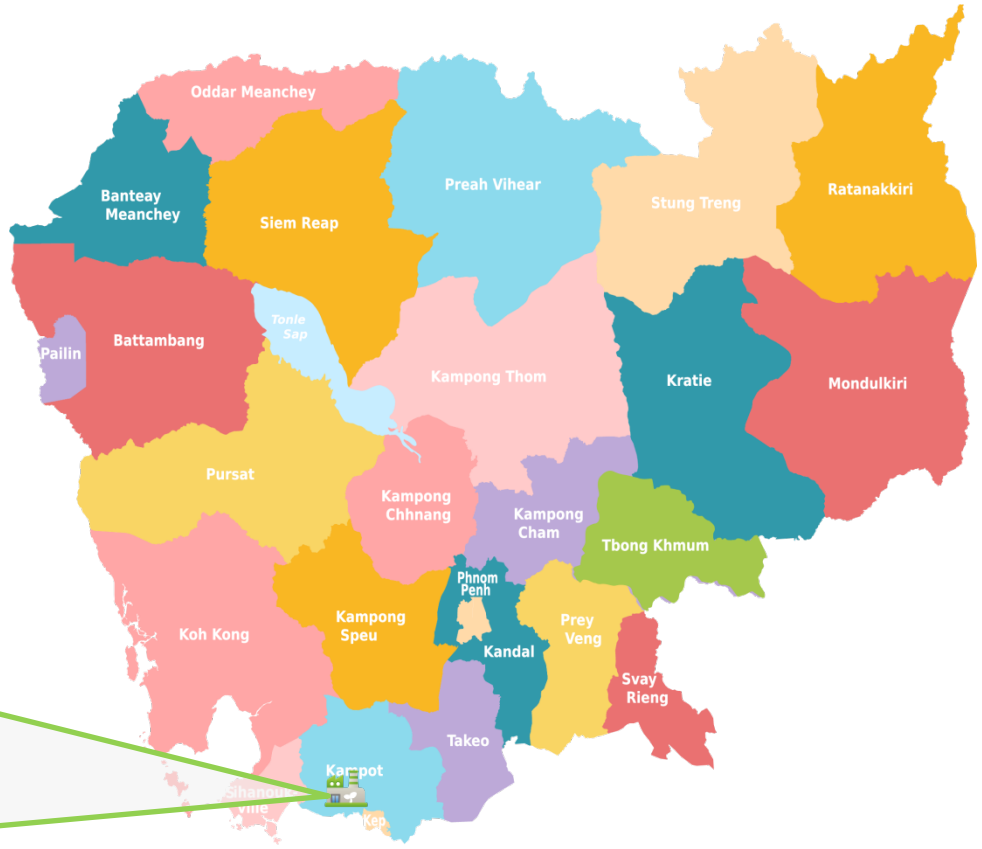
Learnings from OPTOCE project _ Conclusion

- The coal consumption for each ton of clinker produced decreased by 10.47 % & 6.44% in co-processing floating material and RDF respectively;
- Thermal substitution rates (TSR) were 9.62% & 8.25% respectively;
- Clinker production keeps the same level during the test;
- The clinker produced complied with the quality limits specified in “Portland cement clinker” (GB/T 21372-2008);
- The concentration of air pollutants was in compliance with the limits specified in GB30485-2013 in all three conditions；
- Although the chlorine content was higher in the floating material and RDF, it did not cause an increase in the dioxin emissions;
- Both particulate and gaseous heavy metals were sampled and analyzed in the test, and showed to be lower than the limits stipulated in GB30485-2013;

Co-processing activities in Huaxin Cambodia

Introduction of Huaxin Cambodia	
Location	Kampot Procince, Cambodia
Start up	February, 2015
Capacity	Clinker: 3600TPD Cement:4200TPD
Total Area	100 Hectares
Employee	415(90% are local staff)

KINGDOM OF CAMBODIA



Co-processing activities in Huaxin Cambodia

BIOMASS FUEL USE IN HUAXIN CAMBODIA

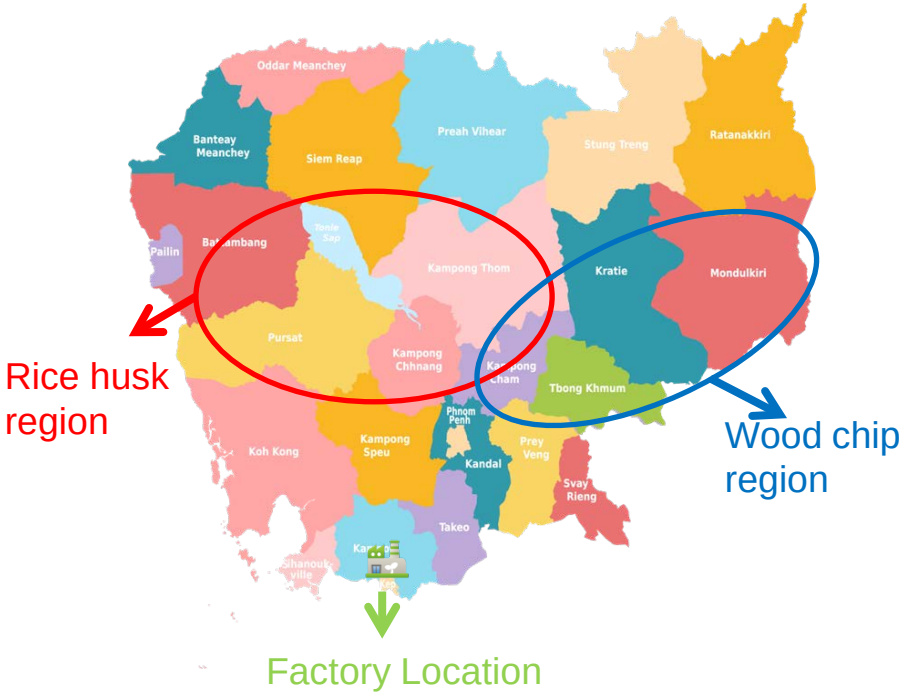
Wood Chip

Rice Husk

Bagasse

Biomass Particle

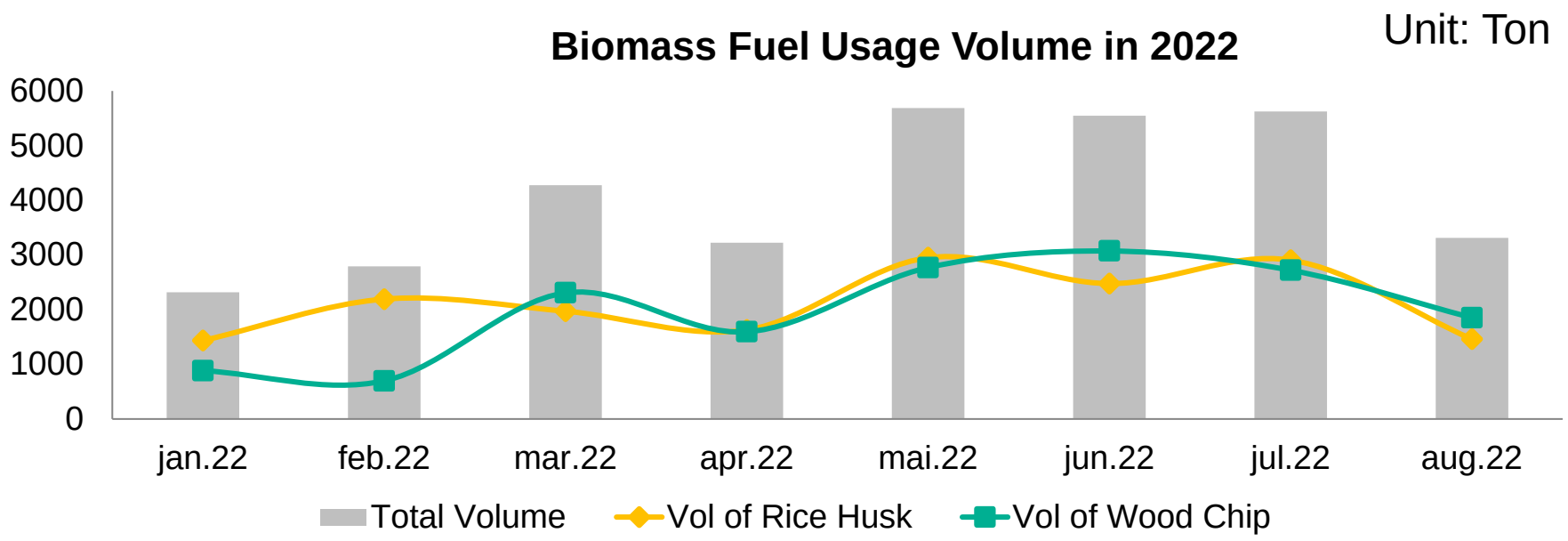
Cambodia is an agricultural country with abundant biological resources such as wood and agricultural plants.



Co-processing activities in Huaxin Cambodia

32000 Ton	15000 Ton	15%	30000 Ton
Biomass Fuel Usage	Coal Replacement	TSR	CO_2 Ruduction

Unit: Ton



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