

A Case Study of the development of a WtE Project in Vietnam by China Everbright Environment

Zhuoli (Troy) Tian



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1. Company profile

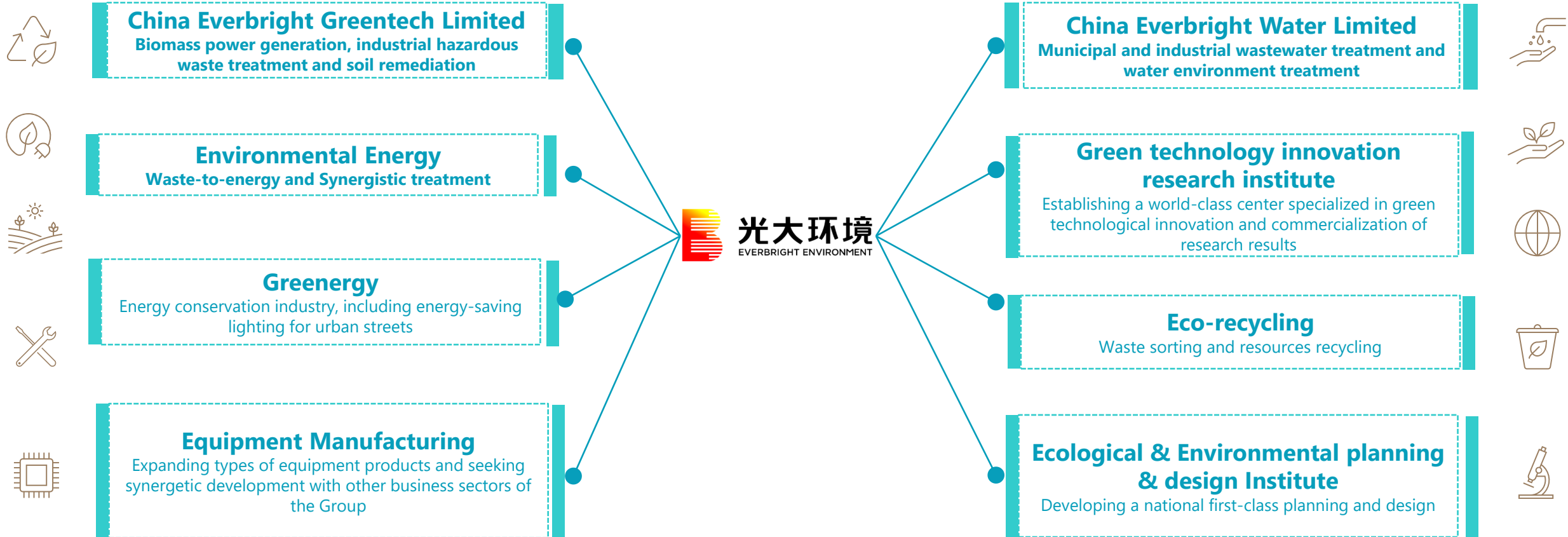


EVERBRIGHT AT A GLANCE

- China Everbright Environment Group Ltd., or Everbright Environment, the backbone enterprise of China Everbright Group, a state-owned financial holdings group, Fortune Global 500.
- Established in Hong Kong in 1993. Listed on the Main Board of The Stock Exchange of Hong Kong Limited.
- Largest environmental enterprise in China.
- The world's largest waste-to-energy investor and operator.
- Leading player in Asia's environmental protection sector.
- Total number of employees exceeding 14,000.
- In 2021, recorded a revenue exceeding HKD 50 billion (USD 6 billion) and total assets over HKD 200 billion (USD 25 billion).
- Founder of the China Everbright Belt & Road Green fund, and financial support from China Development Bank, IFC and ADB.

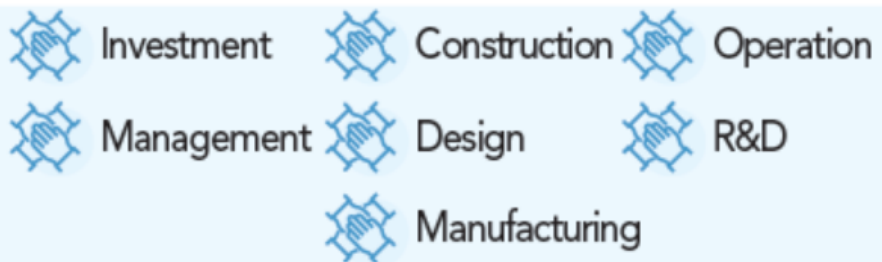


CORPORATE STRUCTURE & BUSINESS SECTORS

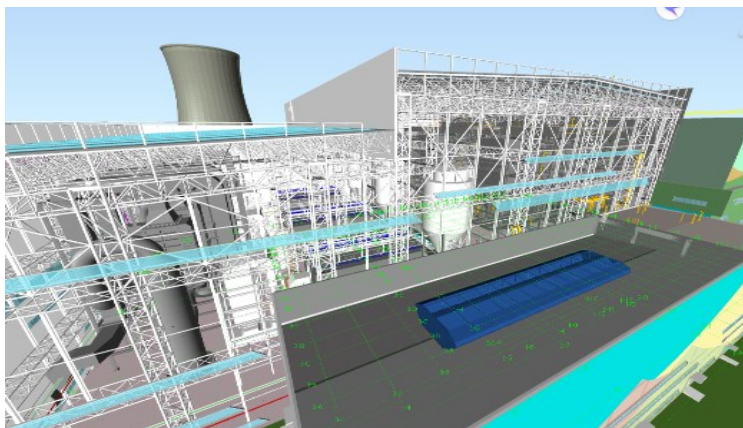


ONE-STOP ENVIRONMENTAL SOLUTION PROVIDER

Full-chain Services



Xiongan New Area Waste Integrated Treatment Project



GLOBAL FOOTPRINT

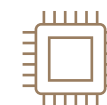


Over
520
projects

with an aggregated
investment exceeding RMB
150 billion (USD 23 billion
)



Projects in over **210**
locations across China.



Overseas business layout in
Germany, Poland, Vietnam
and Mauritius

GLOBAL FOOTPRINT



Can Tho WtE Project

the first sophisticated WtE project in Vietnam



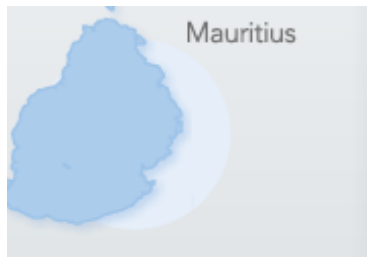
Novago sp. z o.o.

a leading solid waste processing enterprise in Poland



Schönewalde solar energy project

the biggest ground solar energy project in the east of Germany.



Mauritius sewage treatment project

the first overseas sewage treatment operation and maintenance.

WASTE TO ENERGY

WASTE
TO ENERGY

153

PROJECT

DESIGNED DAILY
WASTE PROCESSING
CAPACITY

139,150

TONS

DAILY WASTE PROCESSING
CAPACITY IN OPERATION

114,350

TONS





Changzhou Waste-to-energy Project has a designed daily waste processing capacity of 800 tonnes. Being awarded as the national AAA-rated waste-to-energy project, it is China's only waste-to-energy plant that is located most close to residential communities, operating in harmony with nearby communities that have around 100,000 residents. Changzhou Project launched the opening-up and upgrading work, which removed the fences of the project area and added amenities, such as an environmental protection popularization exhibition hall, a library, a basketball field and a garden.



Hangzhou Waste-to-energy Project has a designed daily household waste processing capacity of 3,000 tonnes. From the start of construction to the completion of the courtyard-style waste-to-energy project, the project serves as a good example of quelling the "Not in My Back Yard" (NIMBY) effect and having a positive impact on the neighboring communities, making the project a world-class benchmark.



Suzhou Waste-to-energy Project is Everbright Environment's first waste-to-energy project, which has been awarded the national AAA-rated waste-to-energy project. Phases I, II and III of the project have a combined designed daily waste processing capacity of 3,550 tonnes. The project has undergone dismantling and redevelopment work, as well as upgrading work, to boost the designed daily waste processing capacity to up to 6,850 tonnes. As the first municipal environmental protection project to be recognized as both a national environmental science popularization and education hub and an industrial tourism attraction in China's waste-to-energy industry, the project was dubbed a "Garden-like Waste-to-energy Plant" by CCTV.



Xiong'an-Everbright Eco-environmental Industry park is the world's first large-scale, integrated and semi-underground comprehensive waste treatment facility.

waste-to-energy [2,250 t/d]

Food & kitchen waste treatment [300 t/d]

Fecal treatment

[300 t/d]

Sludge drying treatment [150 t/d]

Medical waste treatment [10 t/d]

Fly ash melting

[5 t/d]

Comprehensive utilization of slag [760 t/d]

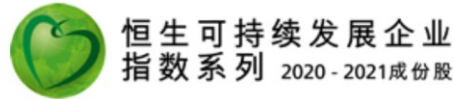
Sewage treatment [1,000 m³/ d]

CORPORATE HONORS

Member of
Dow Jones
Sustainability Indices
Powered by the S&P Global CSA

Institutional Investor
2020 ALL-ASIA EXECUTIVE TEAM
MOST HONORED COMPANY
China Everbright Environment Group Limited

Sustainability Yearbook
Member 2021
S&P Global



- ✓ **Topping** Top Ten Solid Waste Processing Enterprises in China for **ten** consecutive years
- ✓ **Topping** Top 50 Environmental Enterprises in China for **two** consecutive years
- ✓ Included in the MSCI China Index for **eight** consecutive years
- ✓ Included in the Dow Jones Sustainability Indexes for **five** consecutive years
- ✓ Included in the HSSUS for **seven** consecutive years
- ✓ Included in the FTSE4Good Index Series for **four** consecutive years



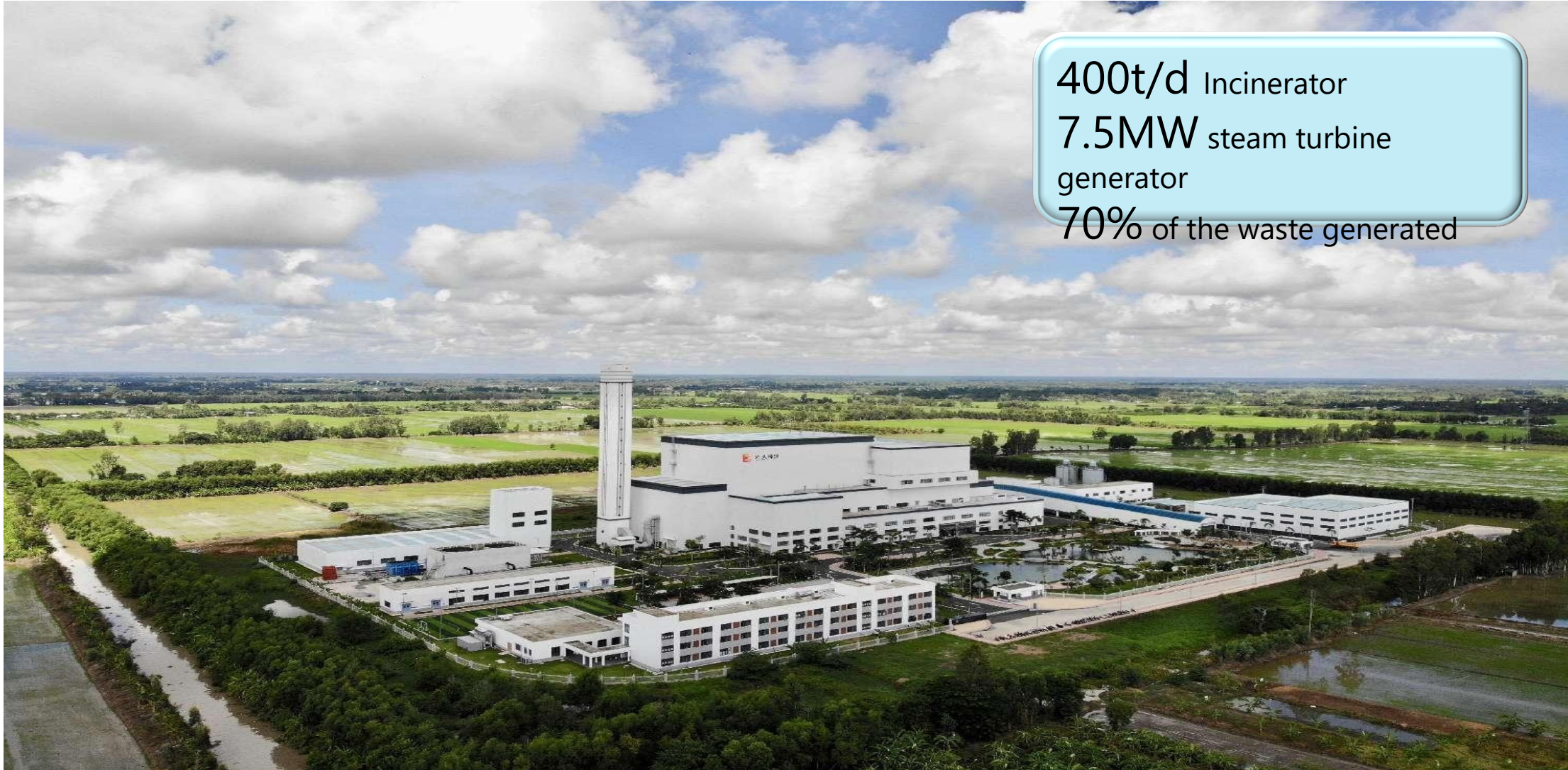
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2. Project introduction



Can Tho WtE Project



400t/d Incinerator
7.5MW steam turbine
generator
70% of the waste generated

Can Tho WtE Project

- Waste logistics is operated by the Gov.
- Waste supply schedule incl. bottom protection provision

Can Tho Gov.

Investment AGRT. 22 years
Waste supply AGRT



20% equity

CEEGL Can Tho
Energy Co. (SPV)

Loan

ADB

- Loaned to CEEGL at a preferential rate.
- CEI is obliged to apply ADB's S&E STD.in project operation

PPA

Vie South Grid

Feasibility Study

- Tariff is a flat rate at 10.05 US cents and is denominated in \$.

Thai Lai County

Land acquisition and land lease

- Land is almost leased for free and was supplied by Thai Lai County under Can Tho City.
- County Gov. helped CEEGL build on-grid transmission line.

EPC AGRT

Do not outsource

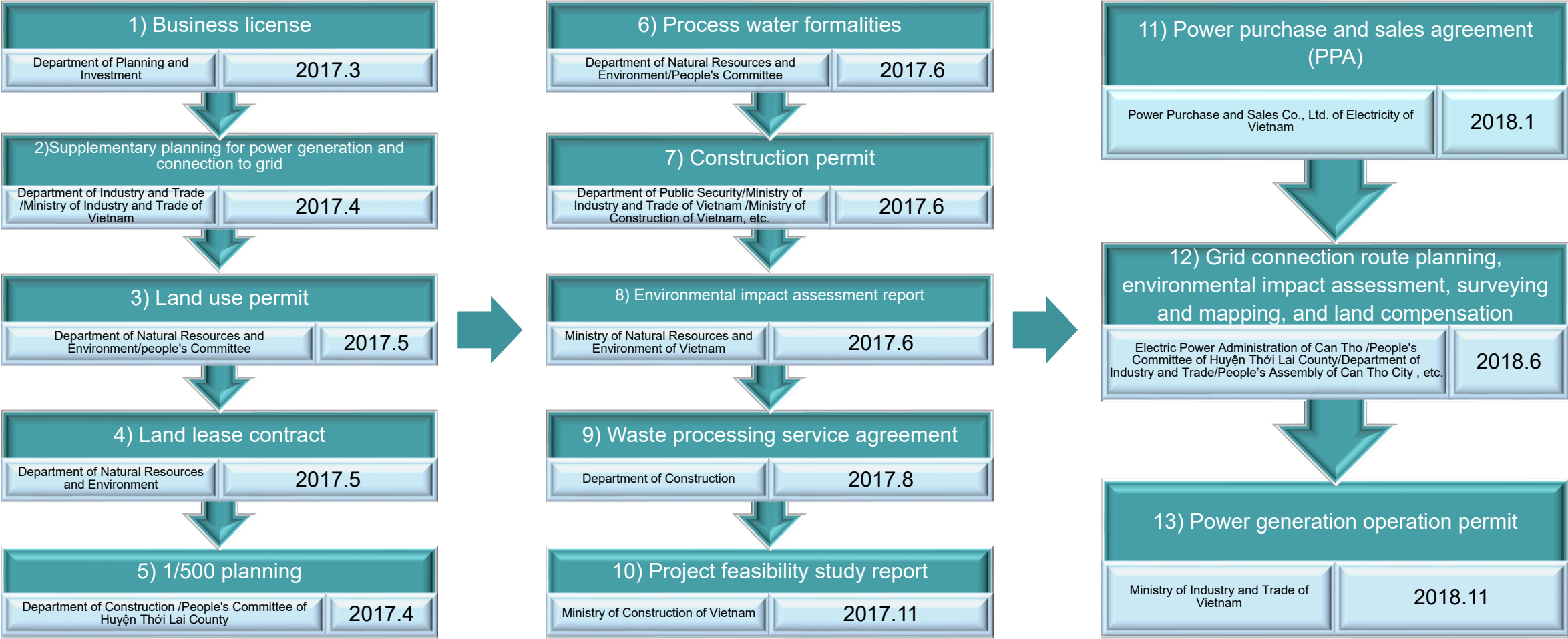
Contractor

CEEGLCan Tho Enregy Co.

- Set up a joint E&C team between CEEGL and Contractor to guarantee project construction quality

- Technical team from CEEGL
- Train local staff in China
- Employ local manpower as many as possible

No.	Business mode	Description
1	Investment mode	BOO (solely-invested by Everbright International as a foreign company)
2	Total investment	400t/d project with a total investment of about USD 50 million, including a capital fund (20%), and the remaining part borrowed from Asian Development Bank (ADB)
3	Franchise period	22 years (including two years for construction)
4	Waste collection and transportation	The transportation service supplier was selected by the government by means of public tendering. It is expected to transport municipal waste to the plant.
5	Waste processing cost	To be adjusted since the 6 th year according to the CPI. The money is granted by the national treasury of the Can Tho government, settled by the Department of Construction with our company and remitted into our account in the next month after that.
6	Feed-in tariff	According to the 2014-31# document issued by Ministry of Industry and Trade of Vietnam. It is paid by Power Purchase and Sales Co., Ltd. of Electricity of Vietnam and remitted into our account in the next month after that. The electric network for connection to the grid is constructed and maintained by the investor.
7	Land rent	It is free in the construction period (3 years at most) and the first 11 years of the operation



Can Tho WtE Project | Project milestones



Date	Project construction node
2016.12.20	Contract signing
2017.6.30	Commencement ceremony
2017.7.2	Foundation excavation of main workshop
2018.5.20	Hydraulic pressure test of boiler
2018.8.27	Turbine cylinder closing
2018.9.21	Inverse power transmission
2018.10.15	Approaching of waste into the plant
2018.10.31	First time of generator unit connection to grid
2018.11.9	72+24h operation
2018.11.26	Power generation operation permit was obtained
2018.12.8	Completion ceremony



Can Tho WtE Project | Construction history



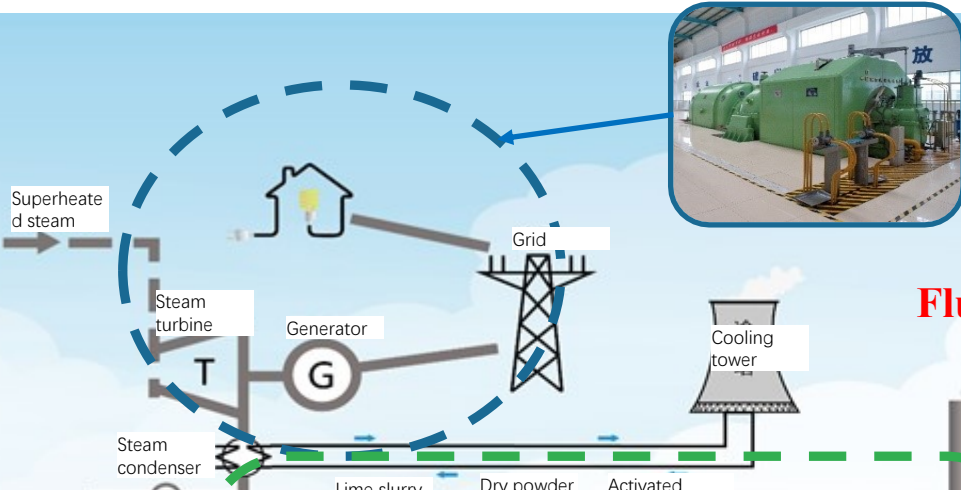
Can Tho WtE Project | WtE processes of Everbright Environment

Main process systems

Waste feed system



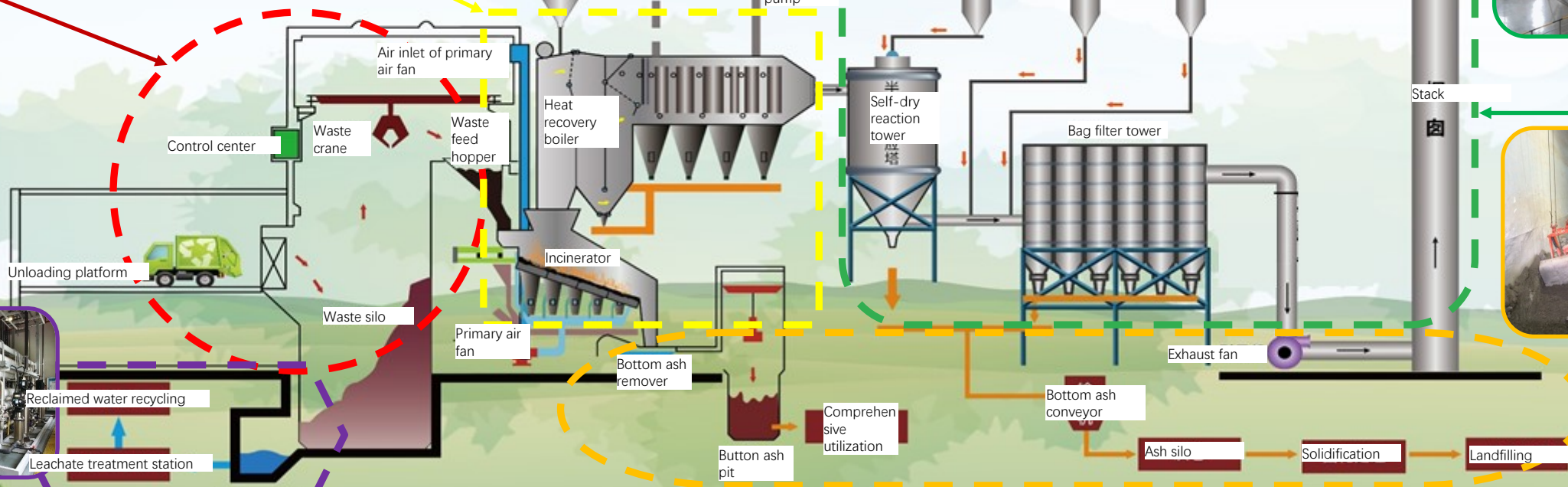
Incineration and heat recovery boiler system



power generation system



Flue gas treatment system



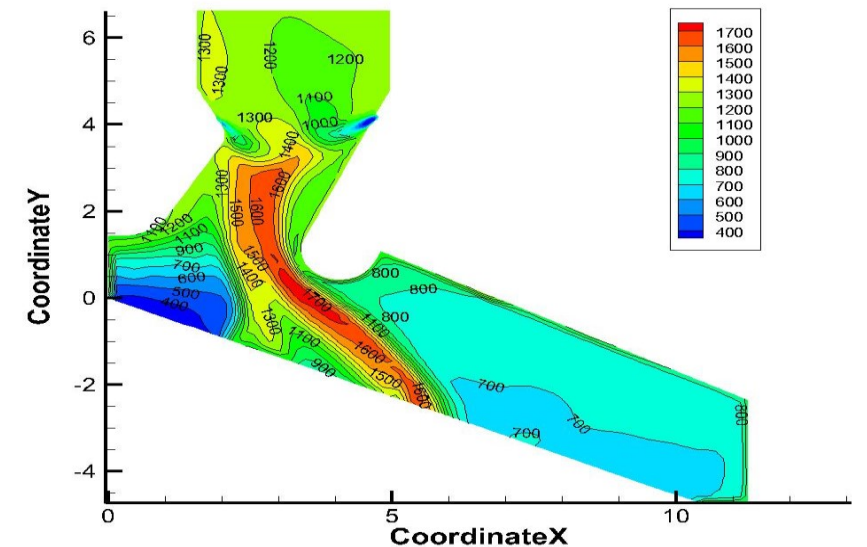
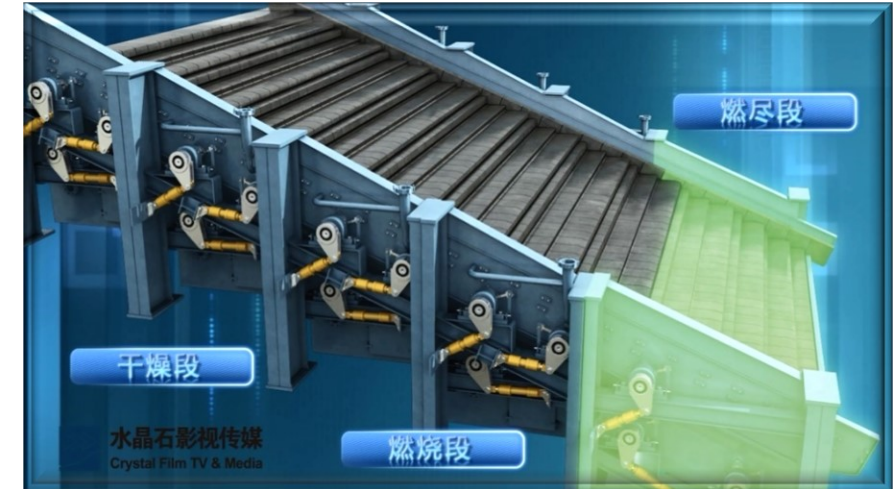
Leachate treatment system



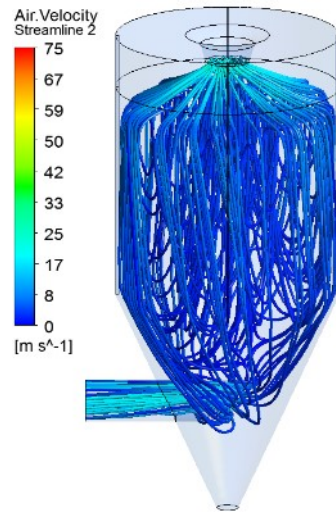
Ash collection and treatment system



Everbright Environment self-developed Grate Incinerator



Flue gas: Emitted in accordance with EU 2010

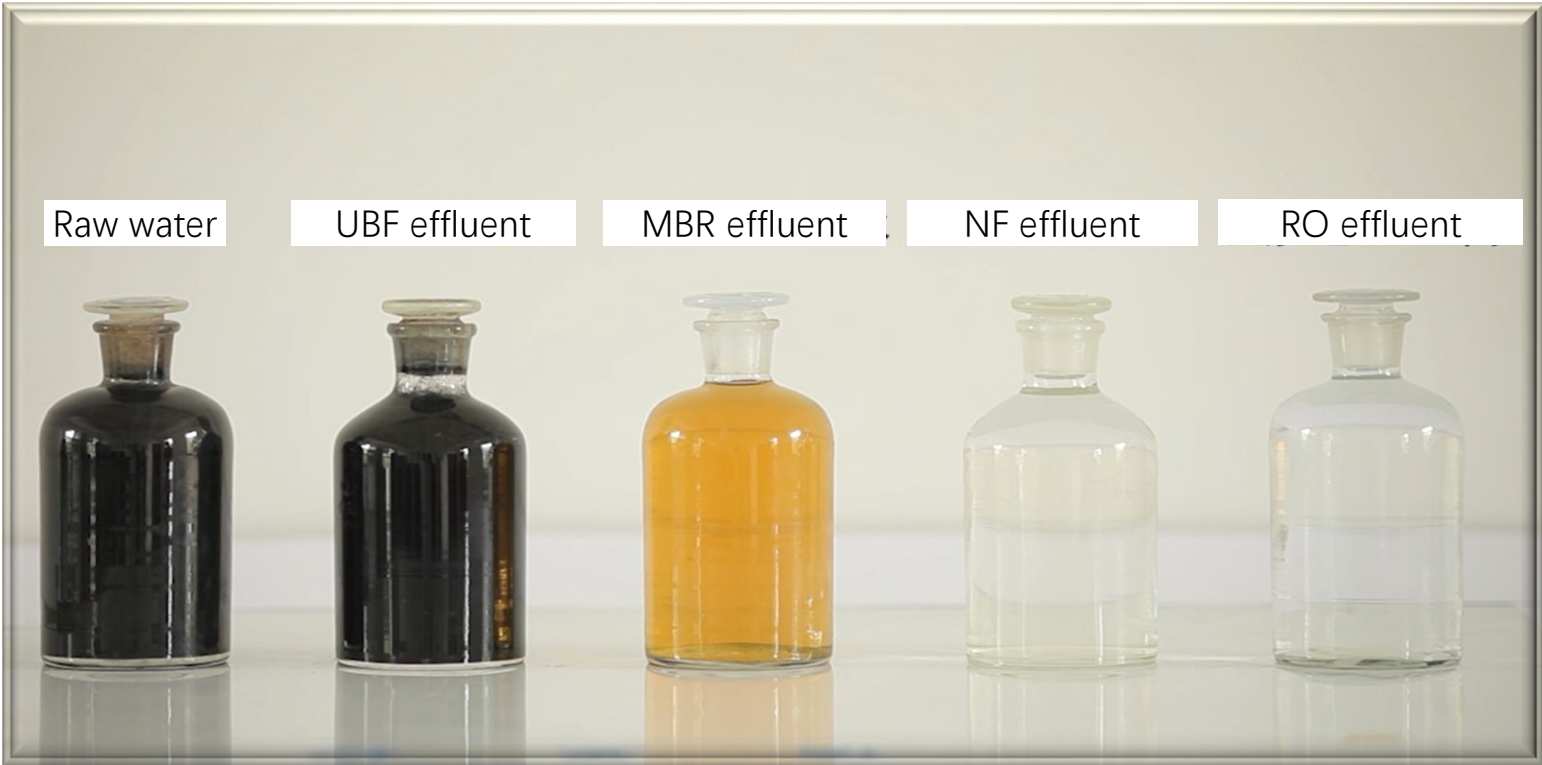


Indicator	QCVN61-MT: 2016/BTNMT	EU2010/75/EC	Can Tho Everbright's
Dust (mg/m ³)	100	10	2.41
NOx (mg/m ³)	500	200	149.72
SOx (mg/m ³)	250	50	11.19
CO (mg/m ³)	250	50	11.18
HCl (mg/m ³)	50	10	5.22
Hg (mg/m ³)	0.2	0.05	0 – 0.001
Cd (mg/m ³)	0.16	---	0 – 0.006
Pb (mg/m ³)	1.2	---	0 – 0.003
TEQ (ng/m ³)	0.6	0.1	< 0.1

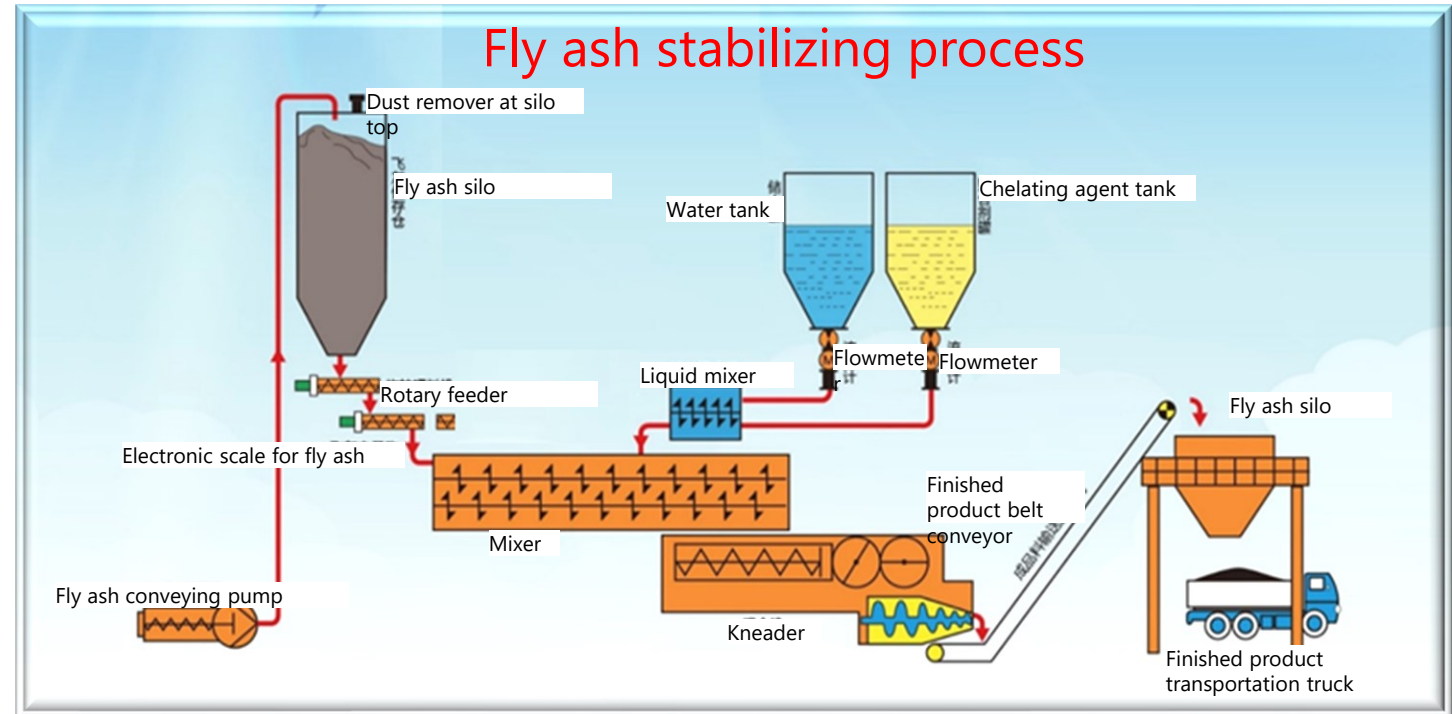
Leachate: Totally treated and recycled



	BOD ₅ (mg/L)	COD _{cr} (mg/L)	SS (mg/L)	NH ₃ -N (mg/L)	pH
Inflow indexes	30000	50000	10000	2000	3.0
Effluent indexes	≤10	≤60	≤10	≤1	6.5-8.5



Fly ash: Disposed safely



Bottom ash: Utilized totally and comprehensively



Bottom ash



Utilization workshop



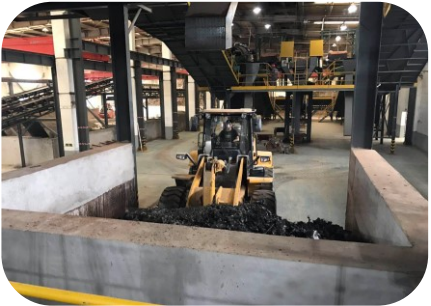
Bottom ash breaking equipment



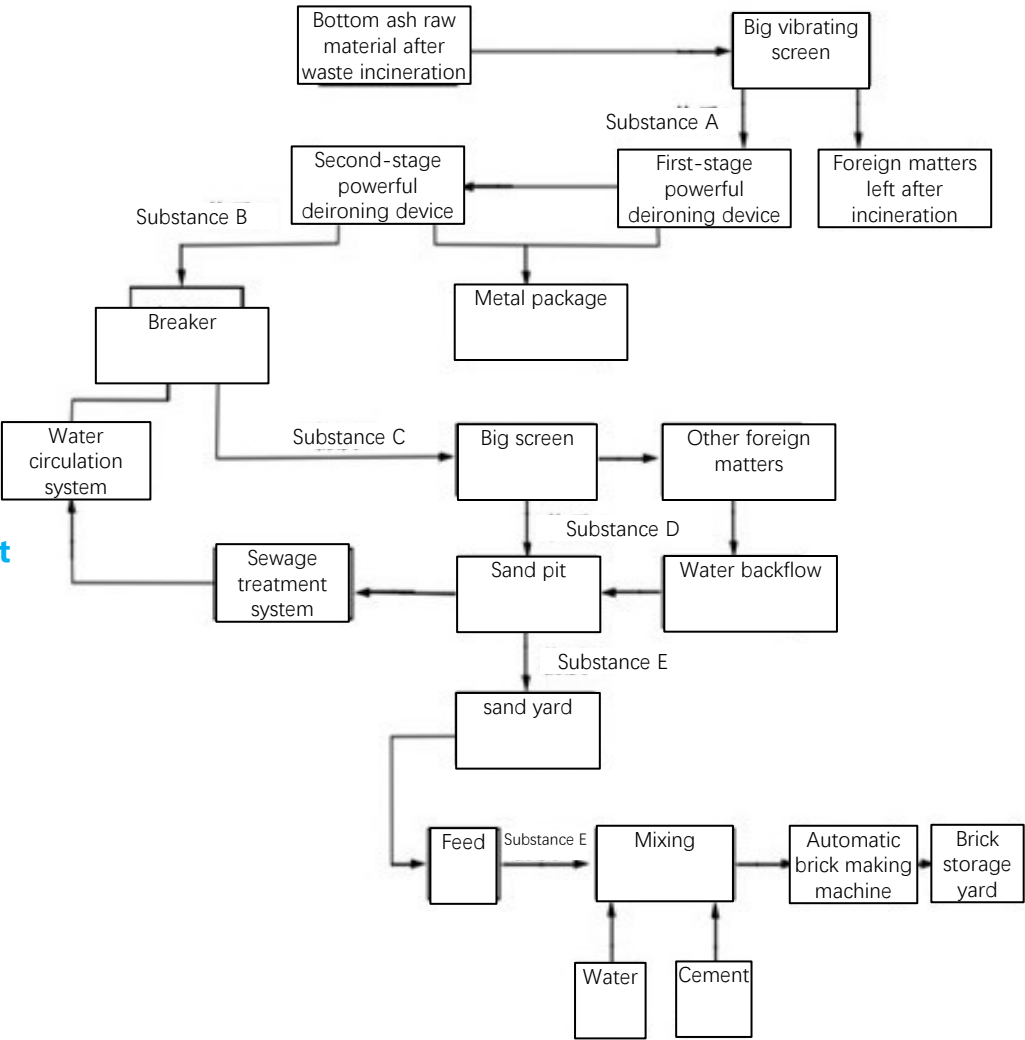
Bottom ash sorting equipment



Finished sand



Finished metals



Process Flow Chart of Comprehensive Utilization of Bottom Ash

Outstanding Enterprise Award of Can Tho City



Typical green project of The Belt and Road



By 31 March 2022

600,000 tonnes of municipal solid waste incinerated

168,700 tonnes of leachate treated

202,000,000 kWh of green electricity generated

223,700 tonnes of CO₂ emission reduction





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Contents

3. Summary



SUMMARY



- Benchmarking Green Project in Mekong River Delta Region .
- Social and economic benefits realized.
- The technical, equipment, construction, operation and management criteria of China have been fully verified and highly recognized by the governments, public and experts of Vietnam.
- It has been proved that good cooperation between enterprises and governments can fruit in reasonable returns on investments of small WtE projects

Thank you
Questions or Comments