Practical application of VALMET technology on waste incineration in China

维美德垃圾焚烧技术在中国的实践应用

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INTRODUCE TO HANGZHOU JINJIANG

杭州锦江简介
Hangzhou Jinjiang Group Co. Ltd (Jinjiang Group) was founded in 1983, headquartered in Zhejiang, China.

Now we mainly engage in eco-friendly energy, non-ferrous metals, chemical industry and new materials. Our business has expanded to trading, logistics, investment and finance in recent years. In 2017, both of total assets and revenue are about RMB 80 billion (USD 11.67 billion).

Today, Jinjiang Group has more than 500 subsidiaries which are distributed in more than 30 domestic provinces, and speeds up its global development strategy, with holding international business in Singapore, Cayman Islands, India, Indonesia and Vietnam.
HONORS

企业荣誉

193 TH
Top 500 enterprises of China

82 TH
Top 500 Manufacturing Companies

51 TH
TOP 500 private enterprises of China

25 TH
Top 500 private manufacturing enterprises

9 TH
Top 20 enterprises of Zhejiang Province
China Jinjiang Environmental Holdings Co., Ltd. is a subsidiary of China’s top 500 enterprises, Hangzhou Jinjiang Group. Since the development of the environmental energy industry in the early 1990s, it has been committed to researching fluidized bed waste incineration power generation technology for more than 20 years.
One of China’s earliest private enterprise investing in the field of clean energy
One of enterprises in China with most volume of garbage incineration power plants and the largest capacity of garbage treatment.
China’s spreader and leader of domestic technologies on incineration of municipal solid waste
One of China’s top 10 most influential solid waste industry enterprises
China’s excellent investor of urban venous industry parks
Listed in Singapore Exchange in 2016, S/N: BWM
INDUSTRIAL DISTRIBUTION OF SOLID WASTE TREATMENT IN CHINA

环保产业在中国的布局

1998
- The Earliest Enterprise Engaged On Environment Industry: From 1998

22
- Most Projects: More Than 22 Project Under Operation

29,440
- Most treatment capacity: 29,440 tons per day

4
- 4 waste-to-energy projects are built or expended

20
- 20 projects have been approved

5
- 5 recycling projects

Treatment capacity of solid waste will increase to 66,786 tons per day after all above projects are constructed

Note: including the oversea projects
April, 2018
Entering the Latin American market for the first time, winning the first Brazilian waste-to-energy plant, also the first waste incineration power plant in Latin America.

April, 2017
Winning 3 WTE plants in India

May, 2017
Winning the MBT project in Singapore
THE EXPLORATION OF VALMET TECHNOLOGY IN CHINA
WASTE-TO-ENERGY PLANT WITH HIGH EFFICIENCY

高效的垃圾绿色发电工厂

ZIBO GREEN ENERGY NEW ENERGY CO. LTD.

PROJECT NAME | Linzi waste-to-energy project
LOCATION | Zibo, Shandong, China
LAND SCALE | 140,000 m²
TREATMENT CAPACITY | 3,000 T/D
CAPITAL | RMB 1.18 billion
OBJECT | Municipal solid waste

The first CFB with high steam parameters in China (520℃/79bar)
GREEN ENERGY GENERATED BY NEW WASTE-TO-ENERGY

垃圾绿色发电
WASTE-TO-ENERGY PLANT WITH HIGH EFFICIENCY
高效的垃圾绿色发电工厂

CIRCULATING FLUIDIZED BED (CFB) TECHNOLOGY
Zibo Green Energy New Energy Co., Ltd

STEAM
- 37 kg/s
- 80 bar
- 520 °C
- 108 MW

FUEL
- RDF

START-UP
- 2017

MBT

CYMIC BOILER
<table>
<thead>
<tr>
<th></th>
<th>Months from contract</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Contract</strong></td>
<td></td>
<td>5/2016</td>
</tr>
<tr>
<td><strong>Start of erection</strong></td>
<td>10</td>
<td>3/2017</td>
</tr>
<tr>
<td><strong>Hydro test</strong></td>
<td>17</td>
<td>10/2017</td>
</tr>
<tr>
<td><strong>Hot commissioning</strong></td>
<td>24</td>
<td>5/2018</td>
</tr>
<tr>
<td><strong>Take over</strong></td>
<td>29</td>
<td>10/2018 (Expected)</td>
</tr>
</tbody>
</table>
## Fuel properties

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
<th>Guarantee value</th>
<th>Design range</th>
<th>Range for All Mixtures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range</td>
<td>% of energy</td>
<td>100</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Lower heating value (LHV)</td>
<td>MJ/kg as received</td>
<td>10.5</td>
<td></td>
<td>9.5 – 14</td>
</tr>
<tr>
<td>Moisture</td>
<td>%</td>
<td>30</td>
<td></td>
<td>≤ 45</td>
</tr>
<tr>
<td>Ash content</td>
<td>% of DS</td>
<td>30.9</td>
<td></td>
<td>≤ 31</td>
</tr>
</tbody>
</table>

## 燃料特性

<table>
<thead>
<tr>
<th>参数</th>
<th>单位</th>
<th>保证值</th>
<th>设计范围</th>
<th>全混合物范围</th>
</tr>
</thead>
<tbody>
<tr>
<td>范围</td>
<td>百分比能量</td>
<td>100</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>低热值（LHV）</td>
<td>MJ/kg as received</td>
<td>10.5</td>
<td></td>
<td>9.5 – 14</td>
</tr>
<tr>
<td>湿度</td>
<td>%</td>
<td>30</td>
<td></td>
<td>≤ 45</td>
</tr>
<tr>
<td>灰分含量</td>
<td>% of DS</td>
<td>30.9</td>
<td></td>
<td>≤ 31</td>
</tr>
</tbody>
</table>
## Fuel properties

<table>
<thead>
<tr>
<th>Material</th>
<th>w-% DS</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Al in metallic form</td>
<td></td>
<td>&lt; 1</td>
</tr>
<tr>
<td>Fe and other metals excluding Al</td>
<td></td>
<td>&lt; 1</td>
</tr>
<tr>
<td>Glass</td>
<td></td>
<td>&lt; 2</td>
</tr>
<tr>
<td>Other non-fluidizeable material</td>
<td></td>
<td>&lt; 5</td>
</tr>
</tbody>
</table>
TECHNOLOGY ADVANTAGE

**HIGH THERMAL EFFICIENCY**
Steam parameter is 79 bar/520℃, thermal efficiency of the boiler can be 89%, 13% higher than that with medium temp and pressure.

**EXCELLENT ENV. PERFORMANCE**
CO < 50mg/Nm³, NOx < 100mg/Nm³, far lower than current standard.

**HIGH TREATMENT CAPACITY**
Capacity can be 1000 tons/day, biggest can be 1400 tons/day.

**LONG RUNNING TIME**
Annual operation time over 8000h.

**FULLY AUTOMATIC**

**LOW FLY ASH**
Fly ash can reduced to 5% of the feeding fuel.
EXEMPLARY TEAM AND GOOD CHINESE-WESTERN COLLABORATION

Excellent Communication And Collaboration

Fast Construction Speed

Stable operation and good performance
PROSPECTIVE TO THE FUTURE

未来展望
TREATMENT SITUATION FOR MSW IN CHINA

中国垃圾处置现状

TREATMENT METHOD FOR MSW IN CHINA

MSW COLLECTED IN TOTAL AND HARMLESS TREATMENT RATE

** Source: National Bureau of Statistics
MUNICIPAL WASTE TREATMENT IN 2015, EU 28+

欧盟28+垃圾处理现状

图示显示了欧盟28+各国的垃圾处理方式，包括填埋、废物能源化、回收和生物处理。每个国家的柱状图根据垃圾处理方式的百分比进行划分，具体数据和百分比需要具体分析图表。
Examples of waste-to-energy process

- Anaerobic digestion of organic waste, which is recycled as a fertilizer
- Waste incineration and co-incineration operation with a high level of energy recovery reprocessing of waste into materials that are to be used as solid, liquid or gaseous fuels
- Waste incineration and co-incineration operation with limited energy recovery reprocessing of waste into materials that are to be used as solid, liquid or gaseous fuels
- Utilization of captured landfill gas

**Source:** Presentation from Mr. Jakob Sahlén, M.Sc., 7th conference on WTE, CAUES, 29th June 2017
The four ministries (NDRC, Ministry of Housing and Urban-Rural Development, Ministry of Environmental Protection, Ministry of Land and Resources) jointly issued:

《Opinions on further strengthening the work of municipal solid waste incineration》

THE “13TH FIVE-YEAR PLAN” TARGET IS CLARIFIED:

- By the end of 2017, establish a standard and evaluation system for clean incineration of domestic waste in line with China's national conditions.

- By the end of 2020, the city's urban waste incineration capacity will account for more than 50% of the total processing capacity (38% in 2015), all of which meet the clean incineration standards.

THERE IS STILL A LONG WAY TO GO FOR CHINA’S WASTE-TO-ENERGY INDUSTRY!
IN THE FUTURE WE WILL…
未来工作方向

KEEP AHEAD OF THE INDUSTRY
- Improve the waste disposal capacity of existing facilities
- Growth through self-growth and looking for M&A opportunities

EXPANDING THE INTERNATIONAL MARKET
- Focus on Southeast Asia and other developing countries
- Improve brand image and international visibility

CONTINUOUS TECHNOLOGY UPGRADE
- Introduce advanced technologies from developed countries, combined with independent R&D
- Improve WTE facility efficiency and reduce emissions

DIVERSIFY THE WTE VALUE CHAIN
- Expand the scope of WTE business to related fields such as sludge treatment
- Further develop EMC and third-party project management services
OUR TARGET IS...

我们的目标

TARGET OF WASTE DISPOSAL CAPACITY IN THE NEXT FEW YEARS

DAILY MSW TREATMENT CAPACITY IN THE END OF THE YEAR (TONS)
BUILDING A MULTI-FUNCTIONAL ECOLOGICAL ENVIRONMENT COMMUNITY

建设多功能生态环境社区

- WASTE TO ENERGY
- FOOD WASTE TREATMENT
- BIO. POWER PLANT
- DISEASED ANIMAL
- SLUDGE TREATMENT
- WASTE LEACHATE
- FECAL TREATMENT
- WASTE HEAT UTILIZATION AND ENERGY STORAGE
- MEDICAL WASTE TREATMENT
THANKS FOR YOUR ATTENTION

RUPEI WANG / CHINA JINJIANG ENVIRONMENT CO., LTD.