

**威立雅环境服务：变废弃物为资源**

**Veolia Environmental Services : turning waste into a resource**



## 威立雅环境服务： 威立雅环境集团旗下的 废弃物管理分支

威立雅环境集团是全球环境服务领域的领先者，它通过提供因地制宜且能不断革新的解决方案，来满足客户的各种需求，以帮助解决他们在水、废弃物管理、能源合理利用和公共运输各个方面所遇到的难题。凭籍其遍布全球的业务网络、强大的人力资源、精湛的专业技术和无以匹敌的客户成功案例，威立雅环境集团在迎接本世纪最大的挑战，如自然资源保护、应对气候变化，以及寻求可持续的、平衡的发展模式等方面起着重要作用。

威立雅环境集团通过创造良好的公司业绩并致力于可持续性发展，充分地发挥了这一作用。

## Veolia Environmental Services: waste management subsidiary of Veolia Environnement

Veolia Environnement, the world leader in environmental solutions, responds to its clients' needs with appropriate and adaptable solutions to the problems they encounter in the fields of water, waste management, energy optimization and transportation. With its worldwide presence, human capital, technological expertise and unrivaled client references, Veolia Environnement is ideally positioned to meet the biggest challenges of this century: conserving natural resources, combating climate change and finding sustainable, equitable means of growth.

The company has succeeded in achieving this position through a harmonious combination of good business performance with a strong commitment to serving sustainable development.



### 威立雅环境 2008年关键数据

- 业务遍及72个国家，拥有员工336013名
- 2008年总营业额：362亿欧元
- 按业务划分：
  - 威立雅水务：35%
  - 威立雅环境服务：28%
  - 威立雅能源—达尔凯：20%
  - 威立雅交通：17%
- 按地区分布划分：
  - 法国：40%
  - 欧洲（法国之外）：36%
  - 北美洲：9%
  - 亚洲—大洋洲：8%
  - 其它地区：7%

### Veolia Environnement Key figures 2008

- Present in 72 countries, with 336,013 employees
- 36.2 billion euros of consolidated revenue for 2008
- Breakdown by division
  - Veolia Water: 35%
  - Veolia Environmental Services: 28%
  - Veolia Energy – Dalkia: 20%
  - Veolia Transport: 17%
- Breakdown by geographic area
  - France: 40%
  - Europe (Except France): 36%
  - North America: 9%
  - Asia-Oceania: 8%
  - Rest of the world: 7%



## 威立雅环境服务： 变废弃物为资源

威立雅环境服务公司是全球废弃物管理领域的领先者，是唯一一家能够对各类废弃物提供全方位管理的公司，所处理废弃物种类包括固体、液体废弃物，危险废弃物及一般废弃物，处理手段跨越从收集到处置和回收利用的各阶段，服务对象既有公共部门，又有私营企业。

在废弃物管理的上游，公司提供的服务包括废弃物收集，污水处理，公共场所、办公区域和工厂的清洁，生产设备的维修，土壤修复以及工业废弃物的管理。

在废弃物管理的下游，公司提供基本和综合并举的解决方案，如：

- 对废弃物中的原材料进行分拣和加工，使其重新在工业生产中得到利用，即回收利用/资源再生；
- 将有机物质转化成堆肥，再用于土壤中，即堆肥/农业资源再利用；
- 通过填埋和焚烧，使用对环境最为友好的方式来处理废弃物；
- 通过对废弃物填埋或焚烧来生产电能或热能，即能源回收。

## Veolia Environmental Services： Turning waste into a resource

Veolia Environmental Services is the worldwide leader in waste management, the only company that handles all forms of waste, at every step in the waste management process. We manage liquid and solid, non-hazardous and hazardous waste, from collection to disposal and recycling, for both the public and private sectors.

The company's upstream waste management and logistics services include waste collection, sewage management, cleaning of public areas, offices and factories, maintenance of production equipment, soil remediation and waste management at industrial facilities.

Downstream, it carries out both basic and complex waste treatments.

- It sorts and prepares the raw materials in waste so that they can be re-introduced into an industrial process: this is called recycling or material recovery;
- It converts organic matter into compost, for re-integration into the soil: this is called composting or agricultural recycling;
- It treats waste in the most environmentally-friendly way it can, through landfilling or incineration;
- It produces electric power or heat from landfilled or incinerated waste: this is called energy recovery.

## 威立雅环境服务 2008年关键数据

- 2008年营业额：101亿欧元
- 拥有105267名员工
- 业务遍及32个国家，63%的收入来自法国以外的地区
- 收集废弃物4589.4万吨
- 处理废弃物6659.2万吨，其中18.5%实现了物资回收
- 运营852个废弃物处理设施
- 减少排放相当于850万吨二氧化碳的温室气体
- 销售热能310万兆瓦时
- 销售电能520万兆瓦时

## Veolia Environmental Services Key figures 2008

- 2008 revenue: 10.1 billion euros
- 105,267 employees
- Operations in 32 countries, 63% of revenue from outside France
- 45.894 million metric tonnes of collected waste
- 66.592 million metric tonnes of treated waste, from which 18.5% is recovered/recycled
- 852 treatment units managed
- 8.5 million metric tonnes of CO<sub>2</sub> equivalent greenhouse gas emissions avoided
- 3.1 million MWh of thermal energy sold
- 5.2 million MWh of electricity sold

# 威立雅环境服务的专业特长

Veolia Environmental Services' Know - How



## 收集清运

- 1 市政垃圾和普通工业废弃物收集
- 2 市政清洁
- 3 植物废弃物收集
- 4 城市排污管网维护
- 5 危险废弃物收集
- 6 工业场所废弃物全面管理
- 7 工业和服务性行业清洁
- 8 工业场所拆除及土壤修复
- 9 废弃物整合及转运

## 海洋服务

- 10 海滩清洁
- 11 船舶废弃物管理
- 12 废弃石油钻井平台及船舶的拆除
- 13 海洋及水下维护

## 处理再利用

- 14 分拣及回收
- 15 物资回收

- 16 堆肥
- 17 农业废弃物回收
- 18 焚烧发电
- 19 填埋
- 20 能源再生



## Collection Cleaning

- 1 Collection of municipal and non-hazardous industrial waste
- 2 Urban cleaning services
- 3 Green waste collection
- 4 Pipe systems maintenance
- 5 Hazardous waste collection
- 6 Integrated waste management on industrial sites

## Marine Services

- 10 Cleaning of coast and beaches
- 11 Ship waste management
- 12 Dismantling of end-of-life oil rigs and ships
- 13 Marine and undersea maintenance

## Recovery Treatment

- 14 Sorting and recycling
- 15 Material recovery
- 16 Composting
- 17 Agricultural recycling
- 18 Incineration
- 19 Landfilling
- 20 Energy recovery

## 在亚洲的威立雅环境服务公司

Veolia Environmental Services' presence in Asia



### 活跃在亚洲的 威立雅环境服务公司

1992年，威立雅环境服务公司进入亚洲，目前业务遍及中国大陆，香港，台湾，南韩，新加坡等数个国家及地区，建有多个垃圾卫生填埋场，垃圾填埋气发电厂，垃圾焚烧发电厂，危险废弃物处理中心，并提供工业废弃物管理服务及市政清洁服务，拥有逾3500名职员。威立雅环境服务公司的亚洲总部位于北京，不仅是亚洲最大的私营废弃物管理公司，也是该地区唯一一家提供全方位解决方案的废弃物管理公司。

在中国大陆，威立雅环境服务公司为数十个城市的市政部门和工业企业提供废弃物管理服务，如北京、天津、上海、广州、西安、南京、杭州、九江、惠州及佛山。公司以各种灵活方式参与项目，如建设—运营—转让 (BOT) 和运营及维护 (O&M) 方式。

### Veolia Environmental Services, active in the Asian Market

Veolia Environmental Services commenced operations in Asia in 1992. Today the Company employs 3,500 persons and is present in Mainland China, Hong Kong, Taiwan, South Korea and Singapore, managing numerous projects of sanitary landfill, landfill gas-to-energy, hazardous waste treatment centre, waste-to-energy, as well as providing industrial waste management and municipal waste cleaning services. With Beijing as its regional headquarters, Veolia Environmental Services is the largest private waste management company in Asia and the only one providing an integrated approach to

waste management in the region.

In Mainland China, Veolia Environmental Services provides waste management solutions to the public authorities and industrial customers of more than 10 cities (Beijing, Tianjin, Shanghai, Guangzhou, Xi'an, Nanjing, Hangzhou, Jiujiang, Huizhou and Foshan). The Company has participated in the projects by flexible means, such as build-operate-transfer (BOT) and operation & maintenance (O&M) contracts.



## 联系我们 Contact us

中国 China

电话 Tel: + 86 (10) 59532000

传真 Fax: + 86 (10) 59532078

香港 Hong Kong

电话 Tel: + 852 28271383

传真 Fax: + 852 28271541

印度 India

电话 Tel: + 91 (44) 42237766

传真 Fax: + 91 (44) 42237767

新加坡 Singapore

电话 Tel: + 65 68635230

传真 Fax: + 65 68625488

南韩 South Korea

电话 Tel: + 82 (2) 22592829

传真 Fax: + 82 (2) 22592822

台湾 Taiwan

电话 Tel: + 886 (2) 25318866

传真 Fax: + 886 (2) 25311299

[www.veolia-esasia.com](http://www.veolia-esasia.com)

我们的  
使命：可持续发展

A vocation:  
Sustainable Development

我们的  
最高任务：研究和开发  
An absolute priority:  
Research & Development

我们的  
工作要点：提高技能

An imperative:  
Skill Development

# 香港综合危险废弃物处理中心

香港Hong Kong

## 项目概况

### 重要数据

#### 合同期限:

10年

#### 设计处理量:

10万吨/年

#### 再生能源 (2008年):

热能48800兆瓦时

(供设施内部使用)

衡力化学废料处理有限公司为威立雅环境服务集团旗下公司，为香港特别行政区政府环境保护署提供技术改造（以符合更严谨的排放标准并处理医疗废弃物）及营运该综合危险废弃物处理中心，为香港的危险废弃物提供一个由始至终的解决方案，也为越洋轮船所产生的海洋污染物（MARPOL）提供收集及处理服务。

综合危险废弃物处理中心是亚洲最全面和最复杂的危险废弃物处理设施之一，设计和运营均遵循国际最严格的环境及安全规格和标准。

## 主营业务

综合危险废弃物处理中心为香港所产生的危险废弃物提供收集、处理及处置服务。中心所提供的服务包括：

- 顾客服务；
- 废弃物分析及分类；
- 实验室废料收集；
- 海上及陆上废弃物收集；
- 处理及回收，如水银或氧化铜等废弃物；
- 应急反应服务。

处理工艺包括焚烧、物理/化学处理、油/水分隔、固化、铜氧化物及水银回收。

## 认证

自1995年以来，中心的实验室获得香港实验所认可计划的认证。



# The Chemical Waste Treatment Centre, Hong Kong

香港Hong Kong

## Project Background

### Key figures

#### Contractual period:

10 years

#### Designed Capacity:

100,000 metric tonnes/year

#### Energy recovered (2008):

Thermal energy 48,800 MWh  
(for internal consumption)

Ecospace Limited is a subsidiary of Veolia Environmental Services. It was awarded the 10-year contract to carry out upgrade works (to meet the more stringent emission standards and to also treat clinical waste) and operate the Chemical Waste Treatment Centre (CWTC) for the Environmental Protection Department of the Hong Kong SAR Government. The Centre provides a cradle-to-grave solution for all land-based chemical waste generated in Hong Kong, as well as collection and treatment services for marine pollutants (MARPOL waste) generated from ocean-going vessels.

The CWTC is the only chemical waste treatment centre in Hong Kong and one of the most comprehensive and sophisticated hazardous waste treatment facilities in Asia. It is designed and operated according to very stringent international environmental and safety standards.

## Main Activities

The Chemical Waste Treatment Centre (CWTC) provides collection, treatment and disposal services for almost all types of chemical waste generated in Hong Kong. The service package provided by the CWTC includes:

- Customer services;
- Waste analysis and classification;
- Lab pack services;
- Collection of both sea-based and land-based waste;
- Treatment and recovery of waste, such as mercury and copper oxide;
- Emergency response services.

Treatment processes include incineration, physical/chemical treatment, oil/water separation, stabilization, copper and mercury recovery.

## Certification

Laboratory listed in the Hong Kong Laboratory Accredited Scheme since 1995.



# 香港北大屿山废弃物转运站

香港Hong Kong

## 主营业务

### 重要数据

#### 合同期限:

北大屿山废弃物转运站: 15年  
香港迪士尼乐园及酒店有机废弃物的堆肥处理: 4年

#### 设计处理量:

北大屿山废弃物转运站: 首阶段的设计处理量为每日650吨, 将来可以在添加设备后提高至每日1200吨。

堆肥设备: 每日两吨

#### 服务人数:

13万, 及香港国际机场

为香港特别行政区政府环境保护署设计、建造及运营北大屿山废弃物转运站。该转运站接收香港国际机场及北大屿山的生活固体废弃物, 并把废弃物压缩及装入集装箱内, 再由船只把废弃物经水路运往填埋场处理。

另外设置了一部堆肥设备, 处理从香港迪士尼乐园及酒店收集的食物残渣及有机废弃物。

## 威立雅环境服务的先进技术和经验

设有活动底板输送系统及机械废弃物压缩机等先进科技, 优化接收及处理流程。一艘船只可负载80个6米长ISO国际标准集装箱, 帮助节省资源及减少废弃物收集车辆在路面行走时带来的交通和环境影响。垃圾在北大屿山废弃物转运站接收后, 随即在24小时内运送至指定的填埋场作最终弃置。



# North Lantau Refuse Transfer Station, Hong Kong

香港Hong Kong

## □ Main Activities

### Key figures

#### Contractual period:

NLRTS: 15 years

Composting for Disneyland  
Resort & Hotels: 4 years

#### Designed capacity:

NLRTS: 650 metric  
tonnes/day in its initial  
phase; can be upgraded to  
1,200 metric tonnes/day  
with additional equipment

Composting machine: 2  
metric tonnes/day

#### No. of people served:

130,000, plus the Hong  
Kong International Airport

Ecoserve Limited is contracted for the design, building and operation of the North Lantau Refuse Transfer Station (NLRTS) by the Environmental Protection Department of the Hong Kong SAR Government. NLRTS receives, compacts and containerizes municipal solid waste collected from the Hong Kong International Airport and North Lantau area and transfers the containers to landfill by marine vessel.

An automated composting machine is also installed for processing the food and green waste collected from Hong Kong Disneyland Resort & Hotels.

## □ Veolia-ES's Excellence

A moving floor conveyor system and mechanical waste compactors are put in place in the NLRTS to optimize the reception and handling processes. A marine vessel capable of transporting 80, six-meter long ISO containers help save resources and minimize the impact of truck transportation on the environment. All waste received by NLRTS is disposed of at the designated landfill within 24 hours.



北京 Beijing

# 北京阿苏卫垃圾填埋气体发电厂

## 项目概况

### 重要数据

#### 合同期限:

25年

#### 装机容量:

2700千瓦

#### 2008年发电量:

16120兆瓦时

威立雅环境服务是第一个在中国投资并运营垃圾填埋气发电项目的公司，目前在该领域的总装机容量占全国的75%，拥有一支高专业水平的本土化技术团队，有着丰富和先进的管理经验和技术，发电效率和沼气利用效率在全国名列前茅。

北京阿苏卫垃圾填埋气发电厂2007年4月正式投产，一期装机容量为2700千瓦。这是中国华北地区首个发电上网的填埋气发电项目。

## 推动环保 造福于民

年发电能力可满足10000个家庭全年的用电需要；每年可减少相当于10万吨二氧化碳气体的排放；相当于植树7800公顷；相当于每年节约14000吨标准煤。



北京 Beijing

# Beijing Asuwei Landfill Gas-to-Energy Plant

## General Introduction

### Key figures

**Contractual period:**

Contractual period: 25 years

**Capacity:**

2,700 KW

**Energy produced in 2008:**

16,120 MWh

Veolia-ES is the first company in China that has invested and operated LFGTE projects. The total installed capacity of the projects that Veolia ES has invested and operated up to now takes up 75% of the total installed capacity of all LFGTE projects in China. Veolia-ES has a highly professional localized technical team and has advanced technology and management expertise. Veolia-ES is the market leader in China in terms of landfill gas utilization efficiency and electricity generation efficiency.

Beijing Asuwei Landfill Gas-to-Energy Plant commenced commercial operation in April 2007. The installed capacity of Phase I of the project is 2,700 KW. The project is the first LFGTE project connected to the power grid in Northern China.

## Contribution to the Environment Protection

The annual power output of the project can meet the electrical demand of 10,000 households. The project brings environmental benefits that are equivalent to the reduction of CO<sub>2</sub> greenhouse gas by 100,000 metric tonnes per annum, to the planting of 7,800-hectare trees, and to the reduction of 14,000 metric tonnes of coal consumption.



# 广州大田山垃圾填埋气体发电厂

广州 Guangzhou

## 项目背景

### 重要数据

#### 合同期限:

25年

#### 装机容量:

1台奥地利颜巴赫1064千瓦填埋  
气体发电机组

#### 2008年发电量:

8069兆瓦时

威立雅环境服务公司与中方合作伙伴组建的中外合作广州广佳环保有限公司于1996年5月27日注册成立。公司以广州大田山垃圾填埋场为依托，由威立雅环境服务公司投入全部技术与资金，承担该场填埋气发电项目的设计，建设，运行和管理，从填埋场抽取填埋气体，净化处理后，发电上网，实现资源综合利用。该项目于1998年6月破土建设，并于1999年6月建成并投入试运行，1999年7月1日正式并网发电。

## 威立雅环境服务的先进管理经验与技术

广佳环保有限公司主要从事垃圾填埋场抽取填埋气体发电，属国家鼓励外商投资生产性项目。广佳公司从美国、奥地利等国家引进了填埋气体收集及预处理、发电机组等生产设备，采用垂直导气管气体收集技术及Leanox控制技术，具有发电效率高、运行稳定等特点，达到国际先进水平，公司垃圾填埋场抽取填埋气体发电的资源化利用水平处于国内领先地位。

经过八年的运营，公司在行业内享有一定的知名度，同时，培养了一批在气体收集、机组运行及维修、电网设备管理等领域的高素质人才。



# Guangzhou Datianshan Landfill Gas-to-Energy Plant

广州 Guangzhou

## Project Background

### Key figures

**Contractual period:**  
25 years

**Capacity:**  
1 unit 1,064 KWh gas engine

**Energy produced in 2008:**  
8,069 MWh

Veolia Environmental Services (VES) and its local partner jointly founded Guangzhou Guang Jia Co., Ltd. (Guang Jia) in May, 1996. Guang Jia was awarded the design, construction, as well as operation and maintenance contract of Guangzhou Datianshan Landfill Gas-to-Energy Plant, with technologies and capital invested by VES. The plant extracts gas from Guangzhou Datianshan Landfill, purifies it and generates power. Its construction started in June 1998 and was completed in June 1999. Guang Jia started to generate electricity on July 1st, 1999.

## Veolia-ES's Excellence

Engaging in the field of landfill gas-to-energy, Guang Jia Company is a foreign invested project with the support of the state. The company imported landfill gas collection & pre-treatment equipments and gas engines from the US and Austria, employing vertical gas collection system and Leanox Control technology and enjoys high efficiency as well as stability in operations and electricity generation. Achieving international level in its operation, the plant plays a leading role in the domestic market.

Having operated for 8 years, Guang Jia has acquired favorable reputations and at the same time, developed a group of professionals in the field of landfill gas collection system, gas engine operation and maintenance and power grid management.



# 佛山高明生活垃圾卫生填埋场

佛山 Foshan

## 重要数据

合同期限:

30年

处理能力:

1936吨/天

填埋容积:

2398万立方米

## 项目概况

- 2003年广东省和佛山市的重点工程，佛山市第一个跨区大型生活垃圾卫生填埋场，处理来自禅城、高明、南海、顺德四个区的生活垃圾。
- 威立雅环境服务公司通过建设-运营-转让模式（BOT）中标，获得30年的特许经营权；
- 建立了国际一流的垃圾卫生填埋场，并且成为佛山市环保教育基地；
- 利用填埋气发电并销售给当地电网。
- 最终将安装8台发电机（1369千瓦/台），总装机容量6511兆瓦。

## 主营业务

- 填埋作业：高维填埋设计，填埋深度平均为100米，场区采用高密度聚乙烯膜加上GCL膨润土防渗系统，确保地下水不会受到污染；
- 垃圾渗滤液处理：采用“MBR+纳滤”深度处理工艺处理垃圾渗滤液，出水水质为广东省地方标准I级排放标准；
- 填埋气体收集和发电：填埋区内铺设了水平和垂直的填埋气收集管道至发电站，充分回收垃圾中的能源最。

## 威立雅环境服务的先进技术

- 填埋实行分区、分单元作业，尽量缩小作业面；
- 高效的清污分流，控制渗滤液的产生量；
- 用土加上高密度聚乙烯膜覆盖垃圾面，保证臭气不外溢；
- 采用先进的填埋机械和填埋方式，保证垃圾压实度达到了1.20吨/立方米以上（国家标准为0.9吨/立方米），充分节约了空间。

## 荣誉

- 2008年 中国环保产业协会颁发“2008年国家重点环境保护实用技术示范工程”；
- 2008年 中国贸促会颁发“绿色行动特别贡献奖”；
- 2008年 广东省环保产业协会颁发“广东省环境保护优秀示范工程”；
- 2008年 广东省市政行业协会颁发“广东省市政优良样板工程”
- 2007年 建设部颁发“城市生活垃圾填埋场无害化处理等级1级”；
- 2007年 中国城市环卫协会颁发“城市生活垃圾填埋场无害化处理等级1级”。



# Foshan Gaoming Municipal Waste Sanitary Landfill

佛山 Foshan

## Key figures

Contractual period:

30 years

Daily in-take capacity:

1,936 metric tonnes

Landfill capacity:

23,980,000 cubic meters.

## Project Background

- Key project of the province of Guangdong and the city of Foshan in 2003; the first cross-district large scale municipal solid waste sanitary landfill in Foshan City, handling the waste generated in four districts including Chancheng, Gaoming, Nanhai and Shunde;
- Through a BOT module, Veolia Environmental Services signs a 30-year Concession Agreement with the municipal government for this project;
- The landfill is a world-class landfill and the education base of environmental protection in Foshan City;
- Operate the landfill gas-to-energy plant and supply electricity to the local users.
- Ultimately, 8 generators (1,369 KW per set) with a total capacity 6.511 megawatt will be installed.

## Main Activities

- Landfilling operation: high-volume design with an average landfill depth of 100 meters, a HDPE\* liner system and GCL\* for preventing underground water from contamination;
- Leachate Treatment: biochemical treatment by membrane bio reactor and nano-filtration tertiary treatment process; discharge of effluents at class I of Guangdong provincial standards;
- Gas extraction and gas-to-energy: to optimize the gas-to-energy plant, horizontal and vertical gas extraction pipes are installed within the waste mass and connected to the gas-to-energy plant.

## Veolia-ES's Advanced Technology

- Operating the landfill by cells and units to minimize the active tipping area;
- High efficiency in the separation of rain and leachate to control leachate generation;
- Covering waste with clay and HDPE membrane to avoid odor emission;
- Adopts modern landfill mechanical equipment and operation methods to guarantee a compaction ratio of 1.2 t/m<sup>3</sup> (national standard 0.9t/ m<sup>3</sup>), thus saving landfill space.

## Awards

- "National Key Environmental Protection Practical Technology Demonstration Project of 2008" awarded by China Environmental Protection Industry Association.
- "Special Contribution Award for Green Action" awarded in 2008 by China Council for the Promotion of International Trade (CCPIT).
- "Guangdong Province Environmental Protection Demonstration Project" awarded in 2008 by Guangdong Environmental Protection Industry Association.
- "Guangdong Municipal Excellent Sample Project" awarded in 2008 by Guangdong Municipal Industry Association
- "First Grade of Non-hazardous treatment for Municipal Waste Landfill" awarded in 2007 by Ministry of Construction, PRC.
- "First Grade of Non-hazardous treatment for Municipal Waste Landfill" awarded in 2007 by China Urban Environmental Sanitary Association.



\* HDPE: high density polyethylene

\* GCL: geosynthetic clay liner

# 佛山威立雅医疗废物处置有限公司

佛山 Foshan

## 重要数据

合同期限:

29年

处理能力:

运营初期处理量15吨/天

远期处理量25吨/天

## 项目概况

- 佛山市创模重点示范单位;
- 2007年4月与佛山市卫生局签订29年特许经营权合同, 2008年6月建成。

## 主营业务

- 负责收集、运输和焚烧处置佛山市五区的医疗废物;
- 采用国际先进设备焚烧处理医疗废物, 实现减量化和无害化。

## 威立雅环境服务的先进技术

- 先进的焚烧炉技术, 保证燃烧温度超过850度;
- 干法除酸加陶瓷过滤器, 烟气排放符合欧盟标准;
- 污水零排放;
- 自动上料, 自动清洗, 焚烧过程全自动控制, 国内最先进的医疗废物处理厂之一;
- 专用医疗废物运输车, 专用医疗废物收集桶, 保证沿途运输的安全。

# Foshan Veolia ES Medical Waste Treatment Co., Ltd

佛山 Foshan

## Key figures

### Contractual period:

29 years

### Capacity:

Initial: 15 metric tonnes/day

Future: 25 metric tonnes/day

## Project Background

- Key demonstration project in establishing Foshan as a model city for environmental protection;
- In April 2007, Foshan Veolia ES Medical Waste Treatment Co., Ltd signed a 29-year concession agreement with the Foshan Health Bureau. In June 2008, construction of the plant was completed.

## Main Activities

- Medical waste collection, transportation and treatment servicing five districts of Foshan;
- Medical waste incineration by international advanced technology and equipment.

## Veolia-ES's Excellence

- Advanced equipment to ensure a combustion temperature of over 850 °C;
- Dry lime and ceramic filters are applied; flue gas emission respects European standards;
- Zero discharge of sewage;
- Automatic feeding and washing; automatic control of the whole incineration process; one of the most advanced medical waste treatment plants in China;
- Dedicated transportation vehicles and collection buckets for medical waste to ensure transportation security.

# 广东省危险废物综合处理示范中心(惠州)

惠州 Huizhou

## 项目背景

### 重要数据

#### 合同期限:

30年

#### 处理能力:

一期50000吨/年

二期120000吨/年

#### 建设用地面积:

23万平方米

#### 服务区域:

9.3万平方公里

广东省危险废物综合处理示范中心一期工程（简称“示范中心”），是《全国危险废物和医疗废物处置设施建设规划》中的31个综合性危险废物处置中心之一，是《广东省环境保护“十五”计划》中规划兴建的5个危险废物处理处置中心的启动项目，是由广东省环境保护局筹建的广东省内第一个较大规模并具示范性质的重要环保项目。项目的功能和设计体现国内外处理处置工业危险废物的先进技术水平。

“示范中心”的服务范围为整个广东省，其中特许经营的服务范围包括珠三角和粤东地区，即佛山、中山、江门、东莞、肇庆、珠海、汕头、潮州、揭阳、汕尾、河源、梅州以及惠州（含医疗废物）等13个城市。

“示范中心”按国际标准运营，将对全省危险废物的处理处置起到示范和推动作用，同时还将发挥危险废物综合处理的作业示范、危险废物处理处置技术的研究开发、危险废物处理和生态保护相结合的实验基地和生态和环境保护的宣传教育等“四个基地”的作用。

“惠州东江威立雅环境服务有限公司”由法国威立雅环境服务公司与当地合作伙伴于2005年共同组建，是“示范中心”一期工程项目法人及运营商，负责“示范中心”一期工程的投资、设计、建设及营运。

## 主营业务

中心一期专营危险废物(含医疗废物)焚烧处理和安全填埋处置，可以处理的危险废物种类包括：废酸、废碱、废乳化液、重金属污泥、医疗废物、废油漆、废染料涂料、蒸馏残渣、有机树脂类废物、焚烧飞灰及残渣、石棉废物等40余类。

项目的二期还将包括重金属废物、废溶剂、废电子和电器用品的回收利用。

## 主要设施

|             |       |                                  |
|-------------|-------|----------------------------------|
| 焚烧处理车间      | 处理能力： | 10000吨/年                         |
| 物化处理/废水处理车间 | 处理能力： | 33000吨/年（物化处理）<br>72900吨/年（废水处理） |
| 稳定化/固化车间    | 处理能力： | 28000吨/年                         |
| 一期安全填埋场     | 处理能力： | 40000吨/年                         |



# Guangdong Hazardous Waste Comprehensive Treatment Demonstrative Center (Huizhou)

惠州 Huizhou

## Project Background

### Key figures

#### Contractual period:

30 years

#### Capacity:

50,000 metric tonnes/year, Phase I;  
120,000 metric tonnes/year, Phase II

#### Site surface:

230,000 sq.m.

#### Servicing area:

93,000 sq.km.

Guangdong Hazardous Waste Comprehensive Treatment Demonstration Centre (hereinafter referred to Demonstration Centre) is one of the 31 hazardous waste comprehensive treatment centers listed in the "Construction Program for Hazardous Waste and Medical Waste Treatment Establishment in China". Demonstration Centre is the first of the five establishments listed in "The Tenth Five-Year Environmental Protection Plan of Guangdong Province". This is the first largest treatment and Demonstration project of the Guangdong Environmental Protection Bureau. The design and functions of the Demonstration Centre utilizes a combination of advanced domestic and foreign waste treatment technologies.

According to "Concession Agreement for Guangdong Hazardous Waste Comprehensive Treatment Demonstration Centre, Phase I, (2005) 1186" from the Guangdong Environmental Protection Bureau, the Demonstration Centre has obtained a franchise to operate the hazardous waste collection and treatment services in 13 cities within the province. They are Foshan, Zhongshan, Jiangmen, Dongguan, Zhaoqing, Zhuhai, Huizhou, Shantou, Chaozhou, Jieyang, Shanwei, Heyuan, Meizhou. The Demonstration Centre is operated under international standards, playing a demonstrating role in the Province's hazardous waste management, serving as educational base in the field of research and development as well as environmental education.

Huizhou Dongjiang Veolia Environmental Services Co., Ltd, is jointly founded in 2005 by Veolia Environmental Services and Shenzhen Dongjiang Environmental Co., Ltd. The joint venture is responsible for the investment, design, construction and operation of the Demonstration Center (Phase I).

## Main Activities

The 40 plus types of hazardous waste (medical waste included) treated and disposed of at the Centre Phase I are waste acid, alkali waste, waste emulsion, heavy metal sludge, medical waste, waste oil, waste dye and paint, distillation residue, silicone waste, fly ash and residue, and asbestos waste.

The second Phase of the project will include recovery and recycling of heavy metals, solvents, and waste from electrical and electronic equipment.

## Main Equipments

|                                                            |                                                  |
|------------------------------------------------------------|--------------------------------------------------|
| Incineration plant capacity:                               | 10,000 tons/year                                 |
| Physical/Chemical and Wastewater treatment Plant capacity: | 33,000 tons/year (PCT)<br>72,900 tons/year (WWT) |
| Stabilization unit capacity:                               | 28,000 tons/year                                 |
| Safety landfill site Phase I capacity:                     | 40,000 tons/year                                 |



# 广州李坑生活垃圾焚烧发电厂

广州 Guangzhou

## 项目概况

### 重要数据

#### 合同期限:

10年

#### 处理能力:

1040吨/天

#### 服务人数:

100万

#### 生产能源 (2008年):

1.15528亿千瓦时

广州市政府一直重视环境保护工作，并希望在此领域加强与国际企业的合作。2005年，广州提出了“创建环保模范城市”的口号，旨在建设一个环境友好型的，和谐的生活、商业发展环境。

李坑生活垃圾焚烧发电厂是中国首个中温次高压（摄氏450度，6.4兆帕（Mpa））锅炉垃圾焚烧发电项目，是广州市第一座垃圾焚烧发电厂，广州市环境工程的示范项目。设计日处理能力为1040吨，发电量为每年1.3亿千瓦时。

在李坑生活垃圾焚烧发电厂的设计、招标及建设阶段，威立雅环境服务公司为业主提供技术支持。2005年，威立雅环境服务公司与广州市环卫局签署了为10年的广州市李坑生活垃圾焚烧发电厂的营运与维护合同。该厂2005年6月进入为期6个月的调试运行阶段，并于2006年1月正式投产。

## 主营业务

- 生活废弃物焚烧处理;
- 发电;
- 底灰处理;
- 飞灰固化处理.

## 威立雅环境服务的成绩

- 工厂的运营与管理采用国际先进的经验与技术，在提供优质服务的同时，降低了运营和维护成本；
- 烟气排放量为欧洲标准，严于中国的国家标准。

## 荣誉

2007年位列中国可再生能源产业蓝天排行榜垃圾焚烧十大发电厂第五位。

2007年获得ISO14000及OSHAS18000（职业健康安全管理体系）认证，并于2008年得到更新。



# Guangzhou Likeng Waste-to-Energy Plant

广州 Guangzhou

## Project Background

### Key figures

**Contractual period:**

10 years

**Capacity:**

1,040 metric tonnes/day

**No. of people served:**

1 million

**Energy produced (2008):**

115.528 million KWh

Guangzhou municipality is committed to environmental protection, encouraging the cooperation with multinational enterprises in this field. In 2005, the city advocated for the "Construction of an Environment-Friendly Model City", to create an environmental-friendly and harmonious environment for people and business.

Likeng Waste-to Energy Plant is the first waste-to-energy plant in China using sub-high temperature and sub-high pressure boiler (450°C , 6.4 Mpa). It is the first waste-to energy plant in Guangzhou, as well as a demonstration project for Guangzhou City's environmental infrastructure. The designed daily treatment capacity of the plant is 1,040 metric tonnes, with a power generation at 130 million KWh a year.

During the design, tendering and construction period of the Plant, Veolia-ES has provided technical support to the owner of the Plant. In 2005, Guangzhou Veolia ES Likeng Co. Ltd was awarded by the Guangzhou Appearance & Environmental Sanitation Bureau to operate & maintain the WTE plant for a period of 10 years. The commissioning of the plant started in June 2005 and lasted for 6 months before its commercial operation in January, 2006.

## Main Activities

- Municipal solid waste incineration;
- Electricity generation;
- Bottom ash transportation and disposal;
- Fly ash stabilization and transportation.

## Veolia-ES's Excellence

- The plant is operated with modern management skills and international advanced technology, providing quality solution, while optimizing operation and maintenance costs.
- Flue gas discharge of the plant meets European standards, which are far stricter than the national ones;

## Awards

In 2007, the plant was awarded No.5 of the "Top 10 Waste Incineration Power Plants" in Blue Sky Ranking on the Renewable Energy Industry in China.

In 2007 the plant got the ISO 14000 and OSHAS 18000 certification and got the renewal of the certificate in 2008.



# 广州市兴丰生活垃圾卫生填埋场

广州 Guangzhou

## 重要数字

合同期限:

8年

处理能力:

5700吨/天

总库容:

1970万立方米

服务人数:

逾994 万

发电量(2008年):

15.6 兆瓦时

## 项目背景

广州市兴丰生活垃圾填埋场是国家环境保护“十五”重点工程，是中国第一座通过国际招标，由跨国公司负责设计和运营，结合先进的技术和国际管理经验以实现最大程度保护环境的大型生活垃圾处理设施。

兴丰填埋场位于广州市东北部，距市区38公里，占地面积91.7公顷，其中填埋区面积47.5公顷，填埋容积为1970万立方米，可填埋处理垃圾2560万吨。广州市政府投资6.83亿元人民币完成项目建设。威立雅环境服务公司承担填埋场的设计，8年运营和1年的运营后维护服务。

## 主营业务

- **填埋作业：**高维填埋设计，填埋深度平均为75米，场区采用双层高密度聚乙烯膜防渗系统，确保地下水不会受到污染；
- **垃圾渗滤处理：**采用“SBR + 反渗透”深度处理工艺处理垃圾渗滤液，出水水质达到I级排放标准；
- **填埋气体收集和发电：**填埋区内铺设了水平和垂直的填埋气收集管道至发电站，充分回收垃圾中的能源。

## 威立雅环境服务的先进技术

- 开发应用独特的倾卸台和钢板路面以满足场区高交通负荷、大降雨量和处理高湿度垃圾的要求；
- 采用本地、进口设备和深度处理工艺处理渗滤液以达到回用水标准；
- 取代土层覆盖，改用土工膜覆盖垃圾面以实现空间利用率最大化和雨水渗透最小化；
- 填埋场的压实率达到了1.3吨/立方米（国际通常标准为0.9吨/立方米）。

## 获得的荣誉

### 设计奖三项

- 2006年9月获建设部优秀勘察设计一等奖；
- 2005年获广东省第十二次优秀工程设计一等奖；
- 2003年11月获部级第九届优秀工程勘察一等奖。

### 施工奖四项

- 2009年3月，获第八届中国土木工程詹天佑奖；
- 2007年12月获国家建设部颁发的2007年度国家优质工程金质奖；
- 2005年获广东省优秀样板工程奖；
- 2005年获国家市政金杯示范工程奖。

### 其它奖三项

- 2006年8月获广州市十大建设科技成就奖；
- 2005年1月获广东省环境保护优秀示范工程奖；
- 2004年11月获建设部科技示范工程奖。

### 兴丰填埋场以在国内同行中创下了三个第一

- 第一个根据国际标准和规范设计、建设的特大型填埋场；
- 第一个通过国际招标由境外公司承保设计、营运的垃圾填埋场；
- 第一个采用双衬层防渗系统的垃圾填埋场。



# Guangzhou Xingfeng Municipal Solid Waste Sanitary Landfill

广州 Guangzhou

## Key figures

**Contract Life:**

8 years

**Daily in-take:**

5,700 metric tonnes/day

**Landfill capacity:**

19.7 million cubic meters

**People served:**

Over 9.94 million

**Power Generation (2008):**

15.6 MWh

## Project Background

- Guangzhou City's Xingfeng Municipal Solid Waste Sanitary Landfill is a key project of the 10th National Environment Protection 5-year Plan. It is the first Chinese waste treatment facility internationally tendered for, designed and operated by a multinational company. It combines state-of-the-art technology and advanced foreign management to ensure the highest environmental protection possible.
- Located 38 km northeast of the city center of Guangzhou, Xingfeng Landfill occupies an area of 91.7 hectares with 47.5 hectares allocated for waste disposal. The capacity of the landfill is 19.7 million m<sup>3</sup>, capable of accommodating 25.6 million metric tonnes of waste. Guangzhou municipality has invested RMB 683 million yuan in its construction. The contract for the design, 8-year operation and one-year maintenance after operation was rewarded to Veolia Environmental Services.

## Main Activities

- **Landfill:** High-volume design with a depth of 75 meters and double layer HDPE liner system to protect the underground water from contamination;
- **Leachate Treatment:** Biochemical treatment and reverse osmosis tertiary treatment process to treat leachate to class I standard for discharge water;
- **Gas extraction and gas-to-energy:** Horizontal and vertical gas extraction pipes are installed and connected to the gas-to-energy plant. Up to 18 1-megawatt-generator sets will be installed to recover energy from waste decomposition and convert it into electricity for the South China Power Grid.

## State-of-the-art Technology

- Developing a unique operational tipping platform and steel plate road to meet the demand of heavy traffic, very high rainfall and soft wastes;
- Using imported and locally manufactured equipment, biological and tertiary technology to treat leachate to reuse water standards;
- Using geomembrane to cover the waste instead of soil in order to maximize the space utility and minimize rainfall penetration into the landfill;
- Maximizing space utility with a compaction ratio of 1.3 metric tonnes/m<sup>3</sup> (World Standards nominally 0.9 metric tonne/m<sup>3</sup>).

## Awards

### Design award

- The First Design Prize for Excellent Reconnaissance issued by Construction Ministry in September, 2006;
- The First Design Prize for the Twelfth Excellent Project of Guangdong Province in 2005;
- The first Prize for the Ninth Excellence Project Reconnaissance in November 2003.

### Construction award

- The eighth Session of Zhan Tianyou Award for Civil Work in China in March 2009;
- Golden Award for National Excellent Construction in December 2007;
- Excellent Model Project Award of Guangdong Province in Year 2005;
- Golden Cup Award for National Municipal Model Project in Year 2005.

### Other award

- Technology Model Award for Technology Construction issued by Construction Ministry in November, 2004;
- Excellent Model Project Award of Environment Protection in Guangdong Province in January 2005;
- Top Ten's Construction Technology Achievement Award in August 2006.

### Xingfeng landfill has achieved three first in the domestic waste management industry:

- The first extra big landfill of municipal solid waste which is designed and constructed in accordance with international standards and regulations;
- The first landfill awarded to a foreign company through international tendering;
- The first landfill that has adopted a two-layer HDPE liner system.



# 上海老港再生能源有限公司

■ 上海 Shanghai

## 项目概况

### 重要数据

#### 合同期限:

25年

#### 装机容量:

15兆瓦发电机装机容量, 12台1250千瓦填埋气体发电机组

#### 发电量 (2008年):

7151兆瓦时, 目前是2台1250千瓦的发电机组以孤网模式发电供老港生活垃圾填埋场使用。

该项目是亚洲地区最大的垃圾填埋气体发电厂之一, 于2007年1月破土建设, 并于同年7月建成并投入试运行, 目前采用孤网模式发电供老港生活垃圾填埋场使用。

威立雅环境服务有限公司与中信泰富的合资公司香港隆国有限公司与上海环境集团有限公司合资组建的沪港合资上海再生能源有限公司于2008年6月16日注册成立。上海再生能源有限公司由合资双方投资, 由威立雅环境服务有限公司负责项目的设计, 建设, 运行和管理。

2007年7月, 老港再生能源公司已经安装2台1250千瓦的发电机组, 公司按照国际先进水平管理的填埋气体发电厂, 以孤网模式运行稳定。有效地控制了有害易爆的填埋气体对填埋场可能造成的安全隐患。到2008年12月底, 已经减少了填埋场区约618余万立方米可燃易爆填埋气体的排放, 同时利用填埋气体发电约715.1万千瓦时, 成功地实现了垃圾填埋气体的无害化处理和资源综合利用, 取得了良好的社会效益和环境效益。

## 主营业务

从上海老港生活垃圾填埋场抽取填埋气体, 净化处理后, 发电上网, 实现资源综合利用。

## 威立雅环境服务的先进技术

- 国际先进技术, 工艺和设备是老港再生能源有限公司的主要特色之一; 整个填埋气体发电厂由气体收集系统, 气体压缩净化系统, 填埋气体发动机系统和发电机发电与升压上网四大系统组成, 这四大系统均由中央计算机集中控制。
- 完善的环境保护措施是老港再生能源有限公司的另一特色; 填埋气体发电厂项目本身就是一个消除填埋气体污染的环保项目, 基于现代的环境保护理念, 公司采用先进的清洁生产工艺以及封闭循环空气冷却系统, 实现了无污水, 无废渣排放, 尾气达标排放。
- 现代化的目标管理是老港再生能源有限公司的第三个特色; 严格的目标管理和人性化管理理念是公司的管理制度的出发点。严格的技术培训与考核, 明确的岗位责任, 奖罚分明的激励制度, 充分调动了每位员工的积极性。



# Shanghai Laogang Landfill Gas-to-Energy Co., Ltd.

## Project Background

### Key figures

#### Contractual period:

25 years

#### Capacity:

15MW gas engine capacity,  
12 units of 1.25MW gas  
engine

#### Energy produced (2008):

7,151MWh at isolate  
operation model with 2 units  
of 1.25MW gas engine

This is one of the largest landfill gas-to-energy projects in Asia, it was constructed in January 2007 and started to generate power on isolate model for site use in July 2007.

Shanghai Laogang Landfill Gas-to-Energy Co., Ltd. (EJV) is established by Shanghai Environment Group Co., Ltd. and Bloom Country Limited (BCL) in June 2008. BCL is a JV of Veolia Environmental Services with its partner. The project is designed, constructed and operated by VES.

Two 1,250 KWh gas engines were installed in July 2007. The landfill gas-to-energy plant is operating efficiently on isolate model presently generating power with VES advanced technology and management to reduce the risk of the landfill gas. By the end of 2008, the project has treated more than 6.18 million M<sup>3</sup> of landfill gas and generated 7,151 MWh power for site use. The project successfully turns the gas from waste into energy, contributing to the community and the environment.

## Main Activities

Extract gas from Shanghai Laogang Landfill, purify the gas and generate power.

## Veolia-ES's Excellence

- Advanced technology, processing and equipment are EJV's main characters. The whole facility comprises of four systems including gas collection, gas compression & purification, gas engine/generator and grid connection system. All four systems are controlled by the central computer.
- Perfect environmental protection measures are the EJV's another character. The plant itself is already an environmental protection project reducing the landfill gas pollution. Based on advanced environmental protection concept, the EJV has established clean processing and closed air cooling systems, realizing zero discharge of waste water and solid waste, and the emission of gas meets the national standard.
- Advanced objective management is the EJV's third character. The result focus and the humanized concept form the base of the company's management. Strict technical training and examination, explicit responsibility, distinct award and penalty system fully stimulated each staff's motivation.

# 上海老港生活垃圾卫生填埋场四期

■ 上海 Shanghai

## 项目概况

### 重要数据

#### 合同期限:

20年

#### 日接收量:

设计日处理量4900吨/天, 从2009年开始至少3年内日处理量将超过8000吨/天

#### 总库容:

8000万立方米

#### 服务人口:

80万

#### 总投资额:

10亿人民币

上海老港生活垃圾卫生填埋场四期工程位于上海市浦东新区东南部, 地处东海滩涂围垦区, 长4200m, 宽800m。占地361公顷。填埋场总库容8000万立方米, 可使用约45年, 以总库容和日处理量计, 是我国目前最大的生活垃圾卫生填埋场。填埋场处理原生垃圾及部分焚烧厂和综合处理厂的残渣, 服务范围覆盖上海市整个中心城区和近郊区。本工程是《上海市固体废弃物处置发展规划》中确定的重点建设项目, 被列入世界银行可调整计划贷款上海城市环境项目之一。工程总投资逾10亿人民币, 其中第一阶段投资5.5亿人民币。

通过国际投标, 威立雅环境服务赢得此项目, 并与合作伙伴组建了合资公司“上海老港生活垃圾处置有限公司”。根据与上海市市容环卫局签署的《特许权协议》, 合资公司在20年内负责该填埋场的投资、设计、建设、运营和维护。

## 挑战与目标

- 全量接受处置送往老港四期的生活垃圾;
- 处理产生的渗滤液达到行业三级标准;
- 将国际标准的填埋场设计、技术和管理引入上海;
- 利用垃圾降解产生的填埋气发电。

## 威立雅环境服务的先进技术

- 运用高维填埋技术提高地基承受力, 提升填埋高度, 扩大有效库容;
- 运用填埋场沼气发电, 供四期场内使用, 日后发电将并入市网;
- 采用地基沉降监测系统和双层HDPE膜水平防渗系统, 有效保护地下水;
- 注重员工安全培训、提高员工安全意识;
- 采用UASB+SBR生物处理工艺, 使处理的渗滤液达到行业三级排放标准后排入市政污水处理, 渗滤液处理扩建工程采用MBR工艺;
- 坚持长期环境保护和环境监测。

## 获得的荣誉

- 2008年获得改革开放30年上海城市建设优秀成果展示优秀奖;
- 2006年接受中国建设部“全国生活垃圾填埋场无害化处理检查”中被评为“一类卫生填埋场”, 评分位于全国前五名内;
- 2006年运营部被评为上海市重点工程实事立功竞赛“优秀集体”荣誉称号;
- 2005年获得由上海市重点工程实事立功竞赛领导小组颁发的“优秀公司”荣誉称号;
- 2004年获得上海市市容环卫局颁发的2004年度重点工程立功竞赛“先进集体”荣誉称号。



# Shanghai Laogang Engineered Sanitary Landfill Phase IV

## Key figures

### Contractual period:

20 years

### Daily intake:

Designed for 4,900 metric tonnes/day, intake from 2009 for a minimum of 3 years will be more than 8,000 tonnes/day.

### Landfill capacity:

80 million cubic meters

### No. of people served:

8,000,000

### Total investment:

RMB 1 Billion

## Project Background

Shanghai Laogang Engineered Sanitary Landfill Phase IV is located in the Pudong New Area of Shanghai on reclaimed land extending into the East China Sea. It is 4.2 km in length with a width of 800 meters offering a total area of 361 hectares. The overall capacity of the landfill is 80 million cubic meters with an expected life of 45 years. The Laogang Landfill Phase IV is the largest landfill in China in terms of capacity and daily intake. It accepts and treats municipal solid waste as well as residues from incineration plants and integrated waste treatment plants from downtown Shanghai and surrounding districts.

Laogang Landfill Phase IV is a key project of Shanghai's Municipal Solid Waste Disposal Program and one of Shanghai's urban environmental projects supported by the World Bank. The total investment for Laogang landfill Phase IV will be over RMB 1 billion, of which RMB 550 million has been initially invested.

Veolia Environmental Services was awarded the project through international tender and has created the joint-venture company "Shanghai Laogang Municipal Solid Waste Treatment Co., Ltd." with its partners. The Company is responsible for the investment, design, construction, operation and maintenance of the landfill for 20 years according to a Concession Agreement with the Shanghai City Appearance and Environmental Sanitation Administrative Bureau.

## Challenges & Objectives

- To accept and treat all waste sent to the Phase IV Landfill;
- To introduce international landfilling design, techniques and management to the city of Shanghai;
- To treat generated leachate to Class III standard;
- To produce electricity using landfill gas generated by the decomposition of the waste.

## Veolia-ES's Excellence

- Expanding usable landfill airspace by improving ground bearing capacity using high dimensional landfill technique;
- Protecting the groundwater using a double HDPE geomembrane system and a comprehensive subgrade settlement monitoring system;
- Treating leachate to Class III standard before discharging to the municipal wastewater network using UASB+SBR biological treatment processes and MBR process in the expanded leachate treatment plant;
- Supplying electrical power for the Phase IV site by utilizing the landfill gas. The electrical power will be exported to the municipal power grid in the future;
- Emphasizing staff safety training and enhancing safety awareness;
- Committing to environmental protection and monitoring for the long term.

## Awards

- In 2008, the Laogang Landfill Phase IV won the honor of "Excellent Work in the competition of Shanghai excellent construction works during 30 years' open-up and reform";
- In 2006, the landfill was evaluated as a "First-Class Sanitary Landfill" in the Assessment of Non-hazardous Treatment of National Municipal Waste Landfills organized by the Ministry of Construction. The assessment result is ranked among the top five;
- In 2006, Operation Department won the honor of "Excellent Group in the Competition of Shanghai Municipal Key Projects" organized by the Shanghai Urban Appearance and Environmental Sanitation Bureau;
- Honor of "Advanced Company" in 2005 awarded by the Shanghai Municipal Key Project Competition Management Team;
- Honor of "Advanced Group in the Key Project Competition in 2004" awarded by the Shanghai Urban Appearance and Environmental Sanitation Bureau.





# 南京净佳危险废物处理有限公司

## 项目概况

### 重要数据

#### 处理能力:

医疗废物2800吨/年

工业废物6000吨/年

南京净佳危险废物处理有限公司是在收购南京净之杰固体废物处理有限公司资产基础上设立的项目公司，坐落于江苏省南京市栖霞区尧化街道吴边工业园区。公司由威立雅环境服务有限公司投入全部技术进行技术改造和基础建设。技术改造于2009年3月底基本完成，现可以规范处理许可范围内的工业危险废物、医疗废物。

## 主营业务

工业危险废弃物及医疗废物的收集、运输、储存、处理。可处理的危险废物种类包括：农药废物、废矿化油、废树脂、废有机酸、废有机碱、废有机溶剂等19大类。

## 威立雅环境服务的先进经验与技术

- 技术、工艺和设备：原有设备的处理能力和处理标准大大得到提升。
- 完善的环保措施：对于焚烧设备产生的尾气进行严格处理，采用急冷、中和、吸附、除尘等净化系统，实现尾气达标排放。
- 先进的物流、仓储管理系统：对进入厂区的危险废物进行严格的分析、分类存储措施，确保厂区内工作有序，工作人员安全。
- 现代化的企业管理：有严格的废物收运、出入库管理制度，实现电脑网络全程管理；明确各员工的岗位职责，对员工进行定期培训与考核。



# Nanjing Jingjia Hazardous Waste Treatment Company Limited

## Project Background

### Key figures

#### Capacity:

2,800 metric tonnes/year of medical waste  
6,000 metric tonnes /year of industrial waste

Nanjing Jingjia Hazardous Waste Treatment Company Ltd is a project company established through purchase of assets from the former Nanjing Jingzhijie Solid Waste Treatment Company. It is located in the Wubian Industrial Zone of Yaohua Street Community in Qixia District, Nanjing city, Jiangsu province. The company underwent technical enhancements and infrastructural construction with all the technologies provided by VES. The technical transformation was basically finished at the end of March, 2009. The company can now treat industrial hazardous waste and medical waste within the permit scope according to relevant standards.

## Main Activities

Collection, transportation, storage, and treatment of industrial waste and medical waste, including waste pesticide, waste oil, waste resin, waste organic acid, waste organic alkali, and waste organic solvent.

## Veolia-ES's Excellence

- Technology, processing and equipment: treating capacity and standard of original equipments have been improved.
- Stringent environmental protection measures: the Company has established a modern decontamination system to control the release of vent gas, including quenching, neutralization, absorption and dust removing.
- Advanced logistics and storage system: the Company has a system for the detailed analysis and storage of hazardous waste to insure operations in order and the security of the staff.
- Modernized enterprise management: strict waste collection, transportation, ins and outs management is computerized. Explicit responsibility, regular training and examination system has been established to motivate staff.



# 南京水阁垃圾填埋气发电厂

## 项目概况

### 重要数据

#### 合同期限:

15年

#### 装机容量:

4050 千瓦

#### 2008年发电量:

21734兆瓦时

威立雅环境服务是第一个在中国投资并运营垃圾填埋气发电项目的公司，目前在该领域的总装机容量占全国的75%，拥有一支高专业水平的本土化技术团队，有着丰富和先进的管理经验和技术，发电效率和沼气利用效率在全国名列前茅。

南京水阁垃圾填埋气发电厂获得联合国（UNDP）以及国家环保总局（SEPA）颁发的国家环保工程示范项目称号，这也是国内垃圾填埋气发电项目中唯一获得该称号的电厂。

南京水阁垃圾填埋气发电厂2002年5月正式投产，目前装机容量为4050千瓦。

## 推动环保 造福于民

南京水阁垃圾填埋气发电厂年发电能力可满足15000户家庭全年的用电；每年减少相当于15万吨二氧化碳气体的排放；相当于植树11700公顷；相当于每年节约21000吨标准煤。

## 荣誉

2007年位列中国可再生能源产业蓝天排行榜十大沼气发电项目第二位。





# Nanjing Shui-Ge Landfill Gas-to-Energy Plant

## General Introduction

### Key figures

Contractual period:  
15 years

Capacity:  
4,050KW

Energy produced in 2008:  
21,734 MWh

Veolia-ES is the first company in China that has invested and operated LFGTE projects. The total installed capacity of the projects that Veolia-ES has invested and operated up to now takes up 75% of the total installed capacity of all LFGTE projects in China. Veolia-ES has a highly professional localized technical team and has advanced technology and management expertise. Veolia ES is the market leader in China in terms of landfill gas utilization efficiency and electricity generation efficiency.

Nanjing Shui-Ge Landfill Gas-to-Energy Plant project is designated by UNDP and SEPA as the National Environmental Protection Demonstration Project. It is the only LFGTE project in China that has received this award.

The commercial operation of Nanjing Shui-Ge Landfill Gas-to-Energy Plant commenced in May 2002. The current installed capacity is 4,050 KW.

## Contribution to the Environment Protection

The annual power output of the project can meet the electrical demand of 15,000 households. The project brings the environmental benefits that are equivalent to the reduction of CO<sub>2</sub> greenhouse gas by 150,000 metric tonnes per annum, to the planting of 11,700 hectare trees and to the reduction of 21,000 metric tonnes of coal consumption.

## Awards

In 2007, the plant ranked second in the "Top 10 Waste Landfill Gas Power Plants" in Bluesky Ranking on the Renewable Energy Industry in China.





# 南京威立雅环境服务有限公司

## 重要数据

处理能力:

51200吨/年

## 项目概况

南京威立雅环境服务有限公司是在收购南京澳利洗桶有限公司资产基础上设立的项目公司，该公司坐落于江苏省南京市国家级化学工业园区内，占地面积约8公顷。项目公司将按照国际化标准设计、建设并运营一座全新的大型危险废物综合处理处置装置。公司预计于2010年10月份部分装置投入运营。

## 主营业务

- 工业危险废弃物的收集、运输、储存、处理及回收。可处理的包括国家危险废物名录上除放射性废物、爆炸性废物、含铍废物、含硒废物、含锑废物、含碲废物、含汞废物、含铈废物及含多氯联苯废物以外的40类危险废物。
- 对外提供工业服务。包括高压射流清洗、化学清洗等各种清洗服务。承揽各企业被污染的储罐、储池、设备、建筑等设施的清理、清洗及无害化处理；同时承揽各企业及运输过程中危险废物发生泄漏事故的收集、清理及无害化处理业务。
- 资源化回收利用产品的销售。

## 主要设施及处理手段

- 焚烧处理车间 处理能力：28200吨/年；
- 物化处理车间 处理能力：20000吨/年；
- 综合利用及回收 处理能力：溶剂回收3000吨/年，洗桶20万只/年及再利用；
- 工业服务：一整套全自动进口设备；

## 威立雅环境服务的先进经验与技术

- 国际先进技术、工艺和设备：中央计算机自动控制整个焚烧、物化系统。
- 环保措施：更新监控系统，对于焚烧设备产生的尾气以及物化车间产生的废水进行严格处理，实现尾气与废水的达标排放。
- 先进的物流、仓储管理系统：对进入厂区的危险废物进行严格的分析、分类存储措施，确保厂区工作有序，工作人员安全。
- 现代化的企业管理：采用威立雅环境服务整套管理体系进行全过程管理



# Nanjing Veolia Environmental Services Company Limited

## Key figures

### Capacity:

51,200 metric tonnes/year

## Project Background

Nanjing Veolia Environmental Services Company Ltd. is a project company established through purchase of assets of the former Nanjing Aoli Industrial Barrel Washing Co., Ltd. The company is located in the Nanjing Chemical Industrial Park. It covers an area of 8 hectares. The company will design, construct, and operate a new hazardous waste treatment center according to international standards. Facilities are expected to commence partial operation in October 2010.

## Main Activities

- Collection, transportation, storage, treatment and recycling of industrial waste, including 40 types of waste in the national hazardous waste list except radioactive waste, explosive waste, waste containing Be, Se, Sb, Te, Hg, Ti and PCBs\*.
- Industrial services, including hydroblasting, chemical cleaning and other cleaning services. The Company will also offer services for: clear-up, cleaning and decontamination of contaminated tanks, pools, equipments, buildings and other facilities. Moreover, the Company can manage hazardous waste collection, cleaning and decontamination during transportation and production.
- Sale of recycled product(s).

## Main Equipment and Processes

- Incineration plant capacity: 28,200 metric tonnes/year;
- Physical/Chemical Treatment plant capacity: 20,000 metric tonnes/year;
- Integrated utilization & Recycling capacity: 3,000 metric tonnes of recycled solvent /year; 200,000 barrels cleaned per year and reutilized;
- Industrial Service: a set of imported automatic equipments.

## Veolia-ES's Excellence

- International advanced technology, processing and equipment: the systems for incineration and physical-chemical treatment will be controlled by the central computer.
- Environmental protection: the Company will upgrade systems for monitoring and control of all facility discharges which includes treated water and air.
- Advanced logistics and storage system: The Company is establishing a system for the detailed analysis and storage of hazardous waste, to insure compliant and safe operations.
- Modernized enterprise management: the Company is adopting Veolia Environmental Services' management system for overall administration.

\* PCBs: polychlorinated biphenyls

# 上海江桥生活垃圾焚烧厂

■ 上海 Shanghai

## 项目概况

### 重要数据

#### 合同期限:

20年

#### 处理总量:

日均处理量1500 吨

#### 处理能力:

上海地区10%的垃圾

#### 2008年发电量

发电上网1.36652亿千瓦时

- 位于上海市嘉定区，占地13.6公顷，总建筑面积约35000平方米，是中国最大的焚烧厂，处理总量约占上海市政垃圾的百分之十。
- 本厂的技术和主要设备都来自于欧洲，有3台日处理量500吨垃圾的焚烧炉，2台12.5 兆瓦的汽轮发电机组。
- 2003 - 2004年该厂试运行阶段和运行初期，上海奥绿思环保设施管理有限公司（OSEC，威立雅环境服务集团下属公司）提供了技术支持。
- 2005年1月，上海奥绿思环保设施管理有限公司开始履行20年运营合同的。
- 2008年，威立雅环境服务中国收购了上海环城再生能源有限公司40%的股份，成为上海江桥生活垃圾焚烧厂的业主之一，并通过特许经营权协议负责该厂的运营管理。

## 荣誉与认证

- 2007年位列中国可再生能源产业蓝天排行榜垃圾焚烧十大发电厂第一位。
- 2007年3月，上海江桥生活垃圾焚烧厂获得了ISO14001；2004和OHSAS18001；1999认证合格证书





# Shanghai Jiangqiao MSW Incineration Plant

## Project Background

### Key figures

#### Contractual period:

20 years

#### Capacity:

1,500 metric tonnes/day

#### Total waste treated:

Approx. 10% of waste  
generated in Shanghai

#### Energy produced in 2008:

136,652 MWh

- The plant is located in Jiading District of Shanghai. The facility sits on a 13.6-hectare piece of land with a total area built of 35,000 m<sup>2</sup>. This is the largest incineration plant in China treating approximately 10% of municipal waste generated in Shanghai.
- The technology and main equipment are from Europe. The facility includes three incinerators each with a capacity of 500 metric tonnes per day and two 12.5 MW turbine generators.
- In 2003 and 2004, ONYX Shanghai Environmental Co (OSEC), a Veolia Environmental Services' company, provided technical assistance during the start-up and testing period of the facility.
- In January 2005, OSEC officially started the 20-year O&M contract.
- In 2008, Veolia Environmental Services China acquired 40% of shares of Shanghai Huancheng WTE Co., Ltd., thus becoming one of the owners of the facility and meanwhile, taking charge of its operation and maintenance through a concession agreement.

## Awards and Certification

- In 2007, Jiangqiao Incineration Plant ranked first in the "Top 10 Waste Incineration Power Plants" in Blue Sky Ranking for the Renewable Energy Industry in China.
- In March 2007, Jiangqiao Incineration Plant was certified for ISO 14001:2004 and OHSAS 18001:1999.



# 天津危险废弃物综合处理中心

■ 天津 Tianjin

## 重要数据

合同期限:

30年

处理能力:

41900吨/年

客户数量:

800余家危废产生单位

## 项目背景

由天津合佳威立雅环境服务有限公司按照国际标准投资、设计建设并运营的天津危险废物处理处置中心是国内首座集焚烧、化学处理、安全填埋、资源化为一体的现代化危险废物处理处置中心。该中心可无害化处理处置工业危险废物、医疗废物、废弃危险化学品等；2003年9月1日投入试运行，2004年2月正式投产。

## 主营业务

- 工业有毒、有害固体废弃物及医疗废弃物的收集、运输、储存、处理，在目前国家确定的49大类危险废物范畴内，除了爆炸物不能处理外，其余的48大类我们均能处理。该中心的年处理能力为4.19万吨，其中焚烧：13500吨；物理化学处理：7000吨；资源回收：8000吨；固化填埋：6200；医疗非焚烧处理：7200吨；
- 固废处理处置设备的生产、销售、检修；
- 固废处理处置项目的开发、设计、建设及相关服务；
- 资源回收综合利用产品的销售。

## 荣誉与认证

- 合佳公司的危废处理处置设施和技术在国内同行业处于领先水平，被国家发改委和国家环保总局认定为全国示范基地。
- 2008年10月合佳威立雅环境服务公司的工业有毒有害固体废弃物焚烧技术与设备被国家发改委授予“国家高新技术产业化十年成就奖”。
- 2007年3月，通过ISO14001；2004和OHSAS18001；1999认证。
- 2006年底，天津市政府授予合佳公司“天津市清洁生产示范企业”的荣誉称号。
- 2006年国家环保总局授予合佳公司“国家环境友好企业”的荣誉称号。
- 2006年，国家环保总局为合佳公司颁发国家级危险废物经营许可证。
- 2004年2月，通过国际著名环境审计公司CHWMEG公司的环境专业审计。



# Tianjin Hazardous Waste Integrated Treatment Center

## Project Background

### Key figures

#### Contractual period:

30 years

#### Capacity:

41,900 metric tonnes/year.

#### No. of Clients:

more than 800 hazardous waste generators

Tianjin Hejia Veolia Environmental Services Co., Ltd. designed, constructed and now operates Tianjin Hazardous Waste Integrated Treatment Center according to international standards. This is the first treatment and disposal center in China integrating incineration, physical & chemical treatment, secure landfill and resource recycling. This center treats and disposes industrial hazardous waste, medical waste and hazardous chemical waste. It began trial operation on September 1st, 2003 and was formally put into operation in February 2004.

## Business Scope

- Collection, transportation, storage, and treatment of industrial toxic and hazardous solid waste & hospital waste. Of the 49 types of hazardous wastes defined by Chinese regulation, the center treats 48 types except the explosives. Its annual capacity is 41,900 metric tonnes including 13,500 metric tonnes by incineration, 7,000 metric tonnes by physical-chemical treatment, 8,000 metric tonnes by material recycling, 6,200 metric tonnes by landfilling, and 7,200 metric tonnes of medical waste through non-incineration treatment;
- Manufacture, sale, maintenance of solid waste treatment & disposal equipment;
- Development, design, construction and related services of solid waste treatment and disposal projects;
- Sales of recycled products.

## Awards & Certification

- Recognized as national piloting base by The National Development and Reform Commission and SEPA, Tianjin Hazardous Waste Integrated Treatment Center maintains its leading position nationwide;
- In 2008, Hejia was awarded "National High-Tech Industry 10 years of Achievement Award" by the National Development and Reform Commission;
- In March 2007, Hejia obtained the certification of ISO14001: 2004 and OHSAS18001: 1999;
- In 2006, SEPA awarded Hejia the state level business license of hazardous waste management;
- In 2006, SEPA awarded Hejia the honored title of the State Environmental Friendly Enterprise;
- By the end of 2006, Tianjin government awarded Hejia the title of Piloting Enterprise of Cleaner Production of Tianjin;
- In February 2004, Hejia passed environmental audit of the well-known international environmental audit company – CHWMEG company.



# 杭州天子岭垃圾填埋气体发电厂

杭州 Hangzhou

## 项目概况

### 重要数据

#### 合同期限:

18年

#### 装机容量:

2套970千瓦填埋气体发电机组

#### 2008年发电量:

15364兆瓦时

威立雅环境服务公司与中方合作伙伴组建的中外合作杭州中佳环境技术有限公司于1996年3月26日注册成立。公司以杭州天子岭垃圾填埋场为依托，由威立雅环境服务公司投入全部技术与资金，承担该场填埋气发电项目的设计、建设、运行和管理，从填埋场抽取气体，净化处理后，发电上网，实现资源综合利用。这是中国大陆第一家垃圾填埋气体发电厂，于1998年4月破土建设，并于同年8月建成并投入试运行，1998年10月，正式并网发电。

## 威立雅环境服务的先进经验与技术

国际先进技术，工艺和设备是中佳公司的主要特色之一；整个填埋气体发电厂由气体收集系统，气体压缩净化系统，填埋气体发动机系统和发电机发电与升压上网四大系统组成。

完善的环境保护措施是中佳公司的另一个特色；填埋气体发电厂项目本身就是一个消除填埋气体污染的环境项目，基于现代化的环境保护理念，中佳公司采用先进的清洁生产工艺以及封闭循环空气冷却系统，实现了无污水，无废渣排放，尾气达标排放。

现代化的企业管理是中佳公司的第三个特色；严格的目标管理和人性化管理理念是中佳公司的管理制度的出发点。严格的技术培训与考核，明确的岗位责任，奖罚分明的激励制度，充分调动了每位员工的积极性。

八年多来，公司运行稳定，满负荷发电至今。到2008年12月底，已经减少了填埋场区约10700余万立方米可燃易爆填埋气体的排放，同时利用填埋气体发电约1.5亿千瓦时，成功地实现了垃圾填埋气体的无害化处理和资源综合利用，取得了良好的社会效益和环境效益。





# Hangzhou Tianziling Landfill Gas-to-Energy Plant

## Project Background

### Key figures

#### Contractual period:

18 years

#### Capacity:

2 units 970 KW gas engine

#### Energy produced (2008):

15,364 MWh

Veolia Environmental Services (VES) and its local partner jointly founded Hangzhou Zhong Jia Environmental Technology Co., Ltd. (Zhong Jia) on 26th March, 1996. Zhong Jia was awarded the design, construction, as well as operation and maintenance contract of Hangzhou Tianziling Landfill Gas-to-Energy Plant, with all the technologies and capital invested by VES. The plant extracts gas from Hangzhou Tianziling Landfill, purifies it and generates power. This is the first landfill gas-to-energy project in Mainland China. Its construction started in April 1998, and finished in August 1998. Zhong Jia started to sell the power generated in October 1998.

## Veolia-ES's Excellence

Advanced technology, processing and equipment are Zhong Jia's main characters. The whole facility comprises of four systems including gas collection, gas compression & purification, gas engine/generator and grid connection system.

Perfect environmental protection measures are Zhong Jia's another character. The plant itself is already an environmental protection project reducing the landfill gas pollution. Based on advanced environmental protection concept, Zhong Jia has established clean processing and closed air cooling systems, realizing zero discharge of waste water and solid waste and the emission of gas meets the national standard.

Advanced objective management is Zhong Jia's third character. The result focus and the humanized concept form the base of the company's management. Strict technical training and examination, explicit responsibility, distinct award and penalty system fully stimulated each staff's motivation.

For the past years, the plant has been operating efficiently under full load. By the end of 2008, the plant has collected and treated 107 million M<sup>3</sup> of landfill gas and generated 150 million kWh of energy, realizing harmless treatment of landfill gas and integrated utilization of resources, making its share of contribution to the community and the environment.



# 威立雅环境服务固废清理 ( 香港 ) 有限公司

香港Hong Kong

## 业务概况

威立雅环境服务固废清理（香港）有限公司是现时香港最大的私人废弃物收集公司，拥有一支备有60多辆卡车的车队，当中包括有油罐车，运输卡车、夹斗车及生活垃圾收集车，服务整个社群。

为黄大仙、荃湾、港岛东区、元朗及湾仔等香港五个区域提供生活垃圾收集服务。

为香港迪士尼乐园及酒店提供废弃物收集及管理服务。

为餐厅，酒店、建筑及其他工业提供固体及液体废弃物收集服务。

## 重要数据

| 合同       | 合同期限 | 处理量      | 服务人数   |
|----------|------|----------|--------|
| 黄大仙*     | 5年   | 每天收集300吨 | 430000 |
| 荃湾*      | 5年   | 每天收集235吨 | 286000 |
| 港岛东区*    | 5年   | 每天收集240吨 | 634500 |
| 元朗*      | 5年   | 每天收集350吨 | 449000 |
| 湾仔*      | 5年   | 每天收集250吨 | 150000 |
| 迪士尼乐园及酒店 | 5年   | 每天收集17吨  | 每年五百万  |

\*获香港特别行政区政府食物环境卫生署授予生活垃圾收集服务合同。



# Veolia ES Waste Collection (Hong Kong) Ltd.

香港Hong Kong

## Main Activities

Veolia ES Waste Collection (Hong Kong) Ltd. is the largest private waste collection company in Hong Kong, with a fleet of over 60 vehicles including tankers, rear-end loaders, grab-mounted trucks and other collection vehicles.

Household waste collection services for 5 districts in Hong Kong, namely Wong Tai Sin, Tsuen Wan, Eastern District, Yuen Long and Wan Chai.

Waste management services for Hong Kong Disneyland Resort & Hotels.

Solid and liquid waste collection services for restaurants, hotels, construction and other industries.

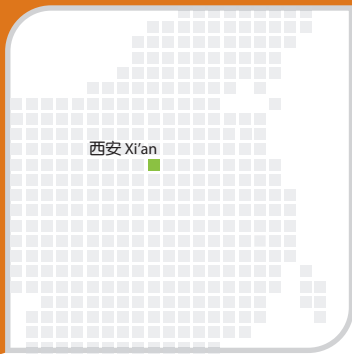
## Key Figures

| Contract                   | Period  | Tonnage             | Number of people served |
|----------------------------|---------|---------------------|-------------------------|
| Wong Tai Sin*              | 5 years | 300 tpd** collected | 430,000                 |
| Tsuen Wan*                 | 5 years | 235 tpd** collected | 286,000                 |
| Eastern District*          | 5 years | 240 tpd** collected | 634,500                 |
| Yuen Long*                 | 5 years | 350 tpd** collected | 449,000                 |
| Wan Chai*                  | 5 years | 250 tpd** collected | 150,000                 |
| Disneyland Resort & Hotels | 5 years | 17 tpd** collected  | 5 million per year      |

\* Household waste collection services contracts awarded by the Food and Environmental Hygiene Department of the Hong Kong SAR Government.

\*\* tpd: tonne per day





# 西安江村沟垃圾填埋气体发电厂

## 项目概况

### 重要数据

合同期限:

26年

装机容量:

6750千瓦

2008年发电量:

31218兆瓦时

威立雅环境服务是第一个在中国投资并运营垃圾填埋气发电项目的公司，目前在该领域的总装机容量占全国的75%，拥有一支高专业水平的本土化技术团队，有着丰富和先进的管理经验和技术，发电效率和沼气利用效率在全国名列前茅。

西安江村沟垃圾填埋气发电厂2003年12月正式投产，一期装机容量为2700千瓦，目前的装机容量为6750千瓦，是国内规模最大的垃圾填埋气发电项目。

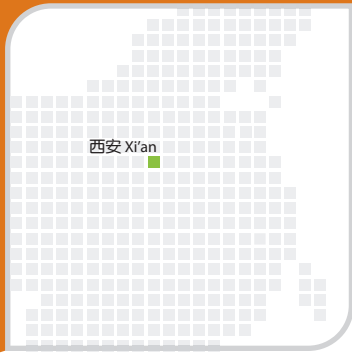
## 推动环保 造福于民

年发电能力可满足25000个家庭全年的用电；每年减相当于25万吨二氧化碳气体的排放；相当于植树19500公顷；相当于每年节约35000吨标准煤。

## 荣誉

2007年位列中国可再生能源产业蓝天排行榜十大沼气发电项目第一位。





# Xi'an Jiangcungou Landfill Gas-to-Energy Plant

## Key figures

Contractual period:  
26 years

Capacity:  
6,750 KW

Energy produced in 2008:  
31,218 MWh

## General Introduction

Veolia-ES is the first company in China that has invested and operated LFGTE projects. The total installed capacity of the projects that Veolia-ES has invested and operated up to now takes up 75% of the total installed capacity of all LFGTE projects in China. Veolia-ES has a highly professional localized technical team and has advanced technology and management expertise. Veolia ES is the market leader in China in terms of landfill gas utilization efficiency and electricity generation efficiency.

Xi'an Jiangcungou Landfill Gas-to-Energy Plant commenced commercial operation in December 2003. The current installed capacity is 6,750 KW. Thus far, this project has the largest installed capacity among all LFGTE plants in China.

## Contribution to the Environment Protection

The annual power output of the project can meet the electrical demand of 25,000 households. The project brings environmental benefits that are equivalent to the reduction of CO<sub>2</sub> greenhouse gas by 250,000 metric tonnes per annum, to the planting of 19,500-hectare trees and to the reduction of 35,000 metric tonnes of coal consumption.

## Awards

In 2007, the plant ranked first in the "Top 10 Waste Landfill Gas Power Plants" in Bluesky Ranking on the Renewable Energy Industry in China.



# 香港西九龙废弃物转运站

香港Hong Kong

## 主营业务

### 重要数据

#### 合同期限:

西九龙废弃物转运站: 15年,  
隔油池废弃物处理设施: 6年

#### 设计处理量:

西九龙废弃物转运站: 每日2875吨  
隔油池废弃物处理设施: 每日400吨

#### 服务人数:

285万

为香港特别行政区政府环境保护署设计、建造及运营西九龙废弃物转运站和隔油池废弃物处理设施。

西九龙废弃物转运站从西九龙、荃湾、葵青、黄大仙及油尖旺等区域接收生活固体废弃物，并把废弃物压缩及装入集装箱内，再由船只把废弃物经水路运往填埋场倾倒。

隔油池废弃物处理设施的设计处理量为每日400吨，已于2008年末开始运营。该设施可将隔油池废弃物加工成用途广泛的LIPOFIT®，以用作能源、生物柴油或其它制作工序的材料或添加剂。

## 威立雅环境服务的先进技术和经验

西九龙废弃物转运站设有活动底板系统、机械废弃物压缩机、电动滑轮传送系统及集装箱吊机等先进科技，优化接收，集装箱装箱及转运流程。整个废弃物处置过程，从废弃物收集车进入废弃物转运站至离开，一般不超过10分钟。两艘船只均可负载210个6米长ISO国际标准集装箱，帮助节省资源及减少废弃物收集车在路面行走时对交通和环境所带来的影响。垃圾在西九龙废弃物转运站接收后，随即在24小时内运送至指定的填埋场作最终弃置。



# West Kowloon Refuse Transfer Station, Hong Kong

香港Hong Kong

## □ Main Activities

### Key figures

#### Contractual periods:

WKRTS: 15 years

GTWTF: 6 years

#### Designed capacity:

WKRTS: 2,875 metric tonnes/day

GTWTF: 400 metric tonnes/day

#### No. of people served:

2.85 million

South China Transfer Limited is contracted for the design, building and operation of the West Kowloon Refuse Transfer Station (WKRTS) and the Grease Trap Waste Treatment Facility (GTWTF) by the Environmental Protection Department of the Hong Kong SAR Government.

The WKRTS receives, compacts and containerizes municipal solid waste collected from urban areas including West Kowloon, Tsuen Wan, Kwai Tsing, Wong Tai Sin, Tsimshatsui, Yaumatei and Mongkok and transfers the containers to landfill by marine vessels.

The GTWTF, with a designed capacity of 400 metric tonnes per day, has commenced operation in late 2008, treating grease trap waste into LIPOFIT® which is suitable for various uses such as an additive to fuel, biodiesel or in other manufacturing processes.

## □ Veolia-ES's Excellence

A moving floor conveyor system, mechanical waste compactors, electric dolly system and container gantry cranes are put in place at WKRTS to optimize the reception, containerization and container transfer process. The unloading process, from the time a truck enters the refuse transfer station to the time it leaves the station is completed within 10 minutes. Two marine vessels, each capable of transporting 210 six-meter long ISO containers help save resources and minimize the impact of truck transportation on the environment. All waste received by the WKRTS is disposed of at the designated landfill within 24 hours.



# 香港新界东南填埋场

香港Hong Kong

## 项目背景

### 重要数据

#### 合同期限:

自开始到封场的运营（预计为23年）；并负责封场后30年的修复护理。

#### 可填埋容量:

4900 万立方米

#### 日处理量:

5000吨

#### 生产能源（2008）:

热能：37388兆瓦时（供设施内部使用）

电力：11231兆瓦时（主要供设施内部使用；部分并网）

新界东南填埋场是香港三个策略性填埋场之一，主要处置香港所产生的生活固体废弃物。按面积计算，新界东南填埋场是三个填埋场之中的第二大，也是最接近市区的一个，接收香港所产生的生活固体废弃物、建筑废弃物及特殊废弃物，占总废弃物的37%。

威立雅环境服务公司旗下的翠谷工程有限公司为香港特别行政区政府环境保护署设计、建造及运营新界东南填埋场，并负责封场后30年的复修护理。

## 项目概况

新界东南填埋场平均每天接收1000多辆卡车运来的约5000吨生活固体废弃物。最高记录曾在一天内接收超过20000吨废弃物。填埋场的运营效率相当高，每部废弃物收集车由进入填埋场，完成倾倒废弃物至离开填埋场的整个过程，一般不超过12分钟。

填埋场设有完善的渗滤液和填埋气体收集及处理系统，以及一套严谨的环境监管计划，以确保填埋场的运作符合合同及政府法规要求。

为确保填埋场的运作符合最高的环保标准，翠谷工程有限公司采用了最先进的填埋场设计、建造和管理技术，涵盖：

- 填埋场防渗层系统
- 渗滤液管理系统
- 填埋气体管理系统
- 地表水/地下水管理系统
- 环境监测系统





# South East New Territories Landfill, Hong Kong

## Project Background

### Key figures

#### Contractual period:

Operations from its commencement to its closure (estimated life of 23 years), plus 30 years' aftercare

#### Landfill capacity:

49 million cubic meters

#### Daily in-take:

5,000 metric tonnes

#### Energy produced (2008):

Thermal energy - 37,388 MWh (for internal consumption)

Electrical power - 11,231 MWh (primarily for internal consumption with limited export to the grid)

The South East New Territories Landfill (SENT Landfill) is one of the three strategic landfills that serve as the major disposal method for municipal solid waste generated in Hong Kong. Among the three strategic landfills, the SENT Landfill is the second largest in terms of geographical area, and is the closest one to the urban area. It receives about 37% of the total waste generated in Hong Kong including MSW, construction and special waste.

A subsidiary of Veolia Environmental Services, Green Valley Landfill Limited is contracted for the design, building and operation of the landfill by the Environmental Protection Department of the Hong Kong SAR Government until its closure, plus 30 years' aftercare.

## General Introduction

The SENT Landfill receives an average of 5,000 metric tonnes of municipal solid waste per day from about 1,000 trucks, with a record high of over 20,000 metric tonnes of waste in one day.

It is operated with high efficiency and the average turnaround time for each truck from entering the landfill, disposal of waste to leaving the site is about 12 minutes.

Comprehensive leachate and landfill gas collection, treatment systems and a stringent environmental monitoring program are in place to ensure that the landfill is operated in compliance with the contractual and regulatory requirements.

State-of-the-art landfill design, construction and management techniques are deployed to ensure the landfill is operated with the highest environmental standards:

- Landfill liner system;
- Leachate management system;
- Landfill gas management system;
- Surface water/ground water management system;
- Environmental monitoring system.



# 广州兴丰垃圾填埋气体发电厂

广州 Guangzhou

## 项目概况

### 重要数据

#### 合同期限:

25年

#### 装机容量:

一期2x1064千瓦, 预计远期可安装同样类型的发电机组共12台

#### 2008年发电量:

15629.9兆瓦时

广州威立雅资源利用有限公司是威立雅环境服务(中国)全资的一间子公司,与当地合作伙伴共同合作经营填埋气的发电及CDM项目。公司承担该填埋场发电项目的设计、建设、营运及管理,并于2007年7月1日开始试运行。

一期工程采用两台节能环保新发电设备奥地利巴赫发电机组和两台进口封闭式燃烧器,每小时可处理填埋气3600立方米。

二期工程的4MW发电设备正在建设当中。

## 推动环保 造福于民

广州兴丰垃圾填埋气发电厂在2008年底实现每小时6兆瓦发电上网,成为国内最大的填埋气发电厂,每小时可处理填埋气4,000立方米,日发电可达140兆瓦时,既减少污染物的排放又产生了良好的经济效益,成功地实现了垃圾填埋气体的无害化处理和资源综合利用。



# Guangzhou Xingfeng Landfill Gas-to-Energy Plant

广州 Guangzhou

## Key figures

### Contractual period:

25 years

### Capacity:

initial capacity is  $2 \times 1.064\text{MW}$ ,  
future total capacity is 13MW

### Energy produced (2008):

15629.9MWh

## General Introduction

Veolia-ES Energy Recovery Guangzhou Limited, a member of Veolia Environmental Services China, cooperates with its local partner for landfill gas-to-energy project and CDM project. It undertook the design, construction, as well as the operation and management of Guangzhou Xingfeng Landfill Gas-to-Energy Plant and started the commissioning on July 1, 2007.

Initially, 2 Jenbacher gensets and 2 LFG flares were installed, treating 3,600m<sup>3</sup> of landfill gas per hour.

At the second phase, another 4MW capacity genset is under construction.

## Contribution to the Environment Protection

By the end of 2008, Guangzhou Xingfeng Landfill Gas-to-Energy Plant generates about 6MWh of green power, and has become the largest landfill gas-to-energy plant in China. About 4000m<sup>3</sup> per hour of landfill gas is treated and generates green power of up to 140MWh a day. Not only is greenhouse gas reduced, but the project has also brought about economic benefits. The project successfully realizes harmless treatment of landfill gas and well demonstrates an integrated utilization of resources.

