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SCIP SITA Incinerator, Shanghai

Environmental solutions for chemical park in China

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PART 1: SUEZ ENVIRONNEMENT SUBSIDIARIES



- **International** : Degrémont, SITA CZ, Water CZ & Hungary, SITA Polska, SITA El Beïda, SITA Australia, SITA China - Hong Kong, Lydec, Palyja, Bal-Ondeo, United Water, Sino French
- **Waste Europe** : SITA France, Terralys, SITA UK, SITA Sweden, SITA Finland, SITA News (Belgium, The Netherlands, Germany)
- **Water Europe** : Lyonnaise des Eaux, Agbar, Ondeo Italia, Ondeo Industrial Solutions, Safege

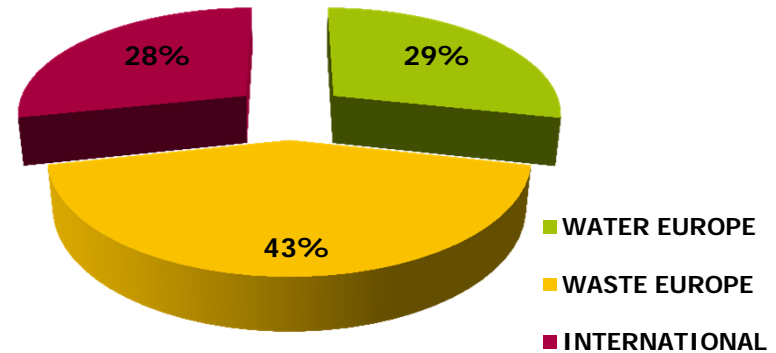


2011 KEY FIGURES

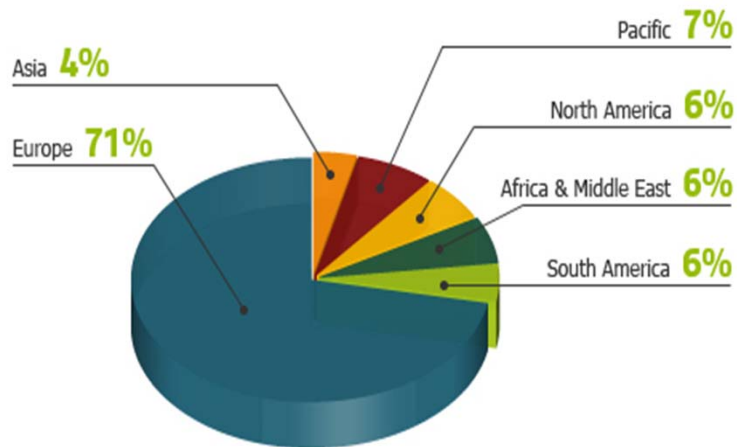
80,410 employees
70 nationalities

Sales Turnover: **€14.8 Bn**
 Gross Operating Profit: **€2,5 Bn**

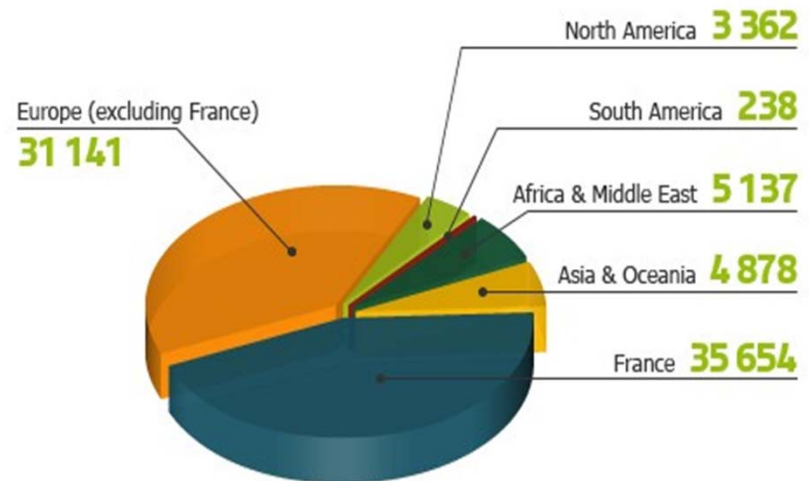
REVENUE BREAKDOWN BY BUSINESS SEGMENT



REVENUE BY GEOGRAPHIC AREA



GEOGRAPHIC BREAKDOWN OF WORKFORCE



SITA AREAS OF EXPERTISE

COVERING THE ENTIRE WASTE VALUE CHAIN:

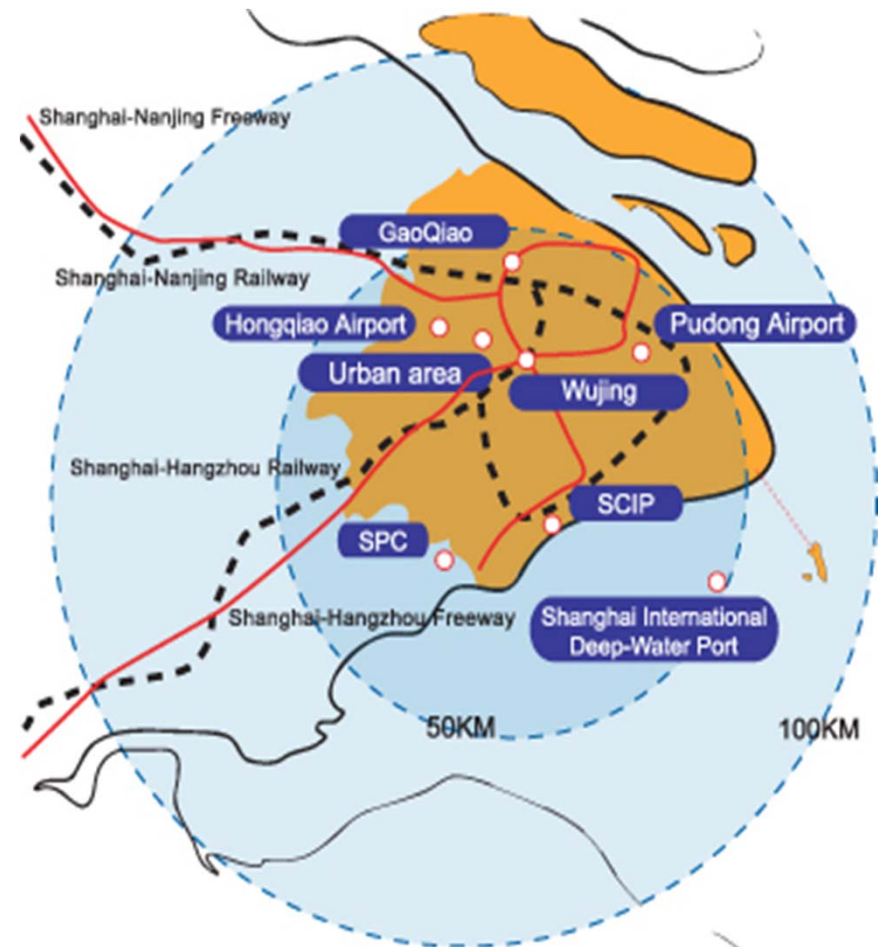
- Urban Sanitation and Waste Collection
- Sorting and Recycling
- Energy Recovery
- Organic waste recovery
- Waste Storage
- Treatment and recovery of technological waste (end of life vehicles, ships, planes and electronic equipment)
- Treatment of hazardous waste
- Decontamination and conversion of polluted industrial site



- **430,000** industrial and commercial clients
- **40 million** tons of waste treated every year
- **50 million** inhabitants benefit from our waste management services
- **9 million tons** of secondary raw material produced per year
- **1,087 waste treatment** and operating sites

PART 2: SHANGHAI CHEMICAL INDUSTRIAL PARK

- Covering 30 km², SCIP today hosts a large number of major Chinese and international chemical companies (SINOPEC, BP, Bayer, BASF, Evonik, Lucite, Air Liquide, Mitsubishi, etc).
- It is one of the largest chemical site in Asia, comparable to the parks of Antwerp or Singapore. SCIP now accounts for 9% of Shanghai GDP



SCIP: HISTORY

- 1992: plan worked out
- 1996-1998: reclamation
- Jan. 1999: granted as municipal industry park, incorporated in Shanghai Municipal overall planning
- 2000-now: infrastructure projects started; major chemical projects settling down in the Park successively; utilities and supporting projects started



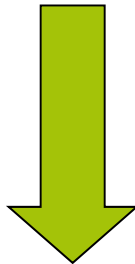
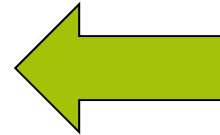
SCIP: LAYOUT



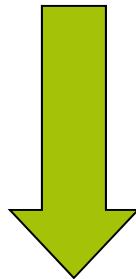
SCIP: INTEGRATED PRODUCTS

Fundamental products like ethylene, etc.

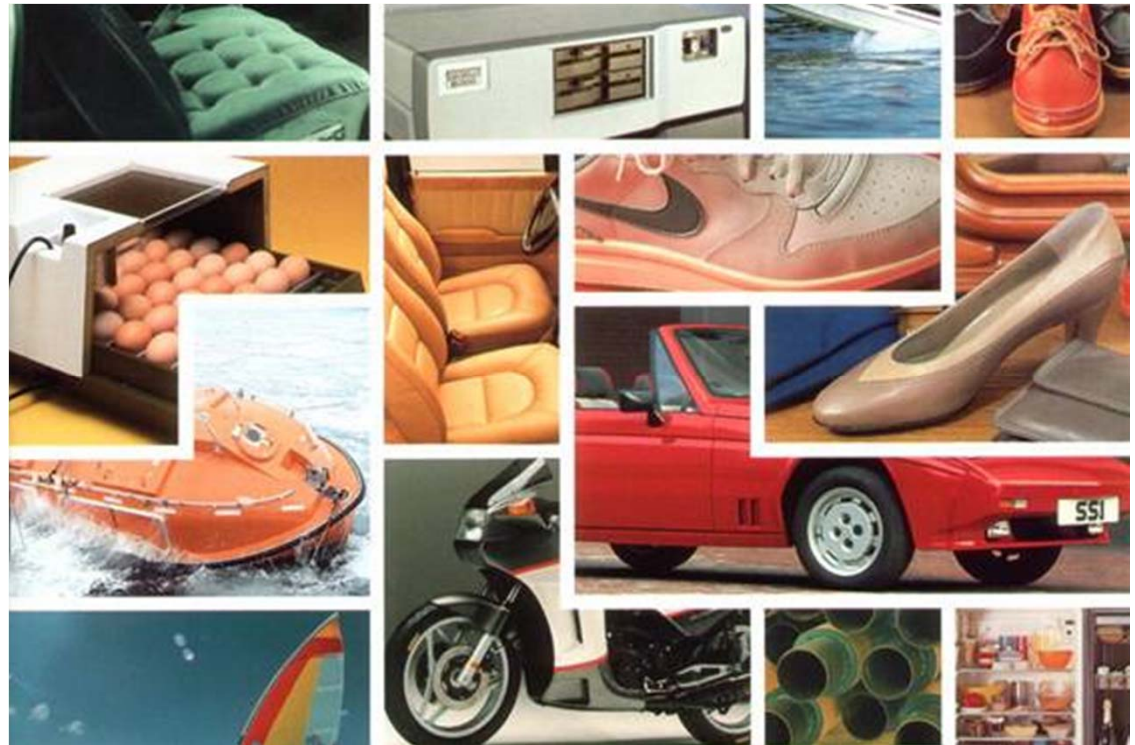
Raw material like naphtha, natural gas, etc.



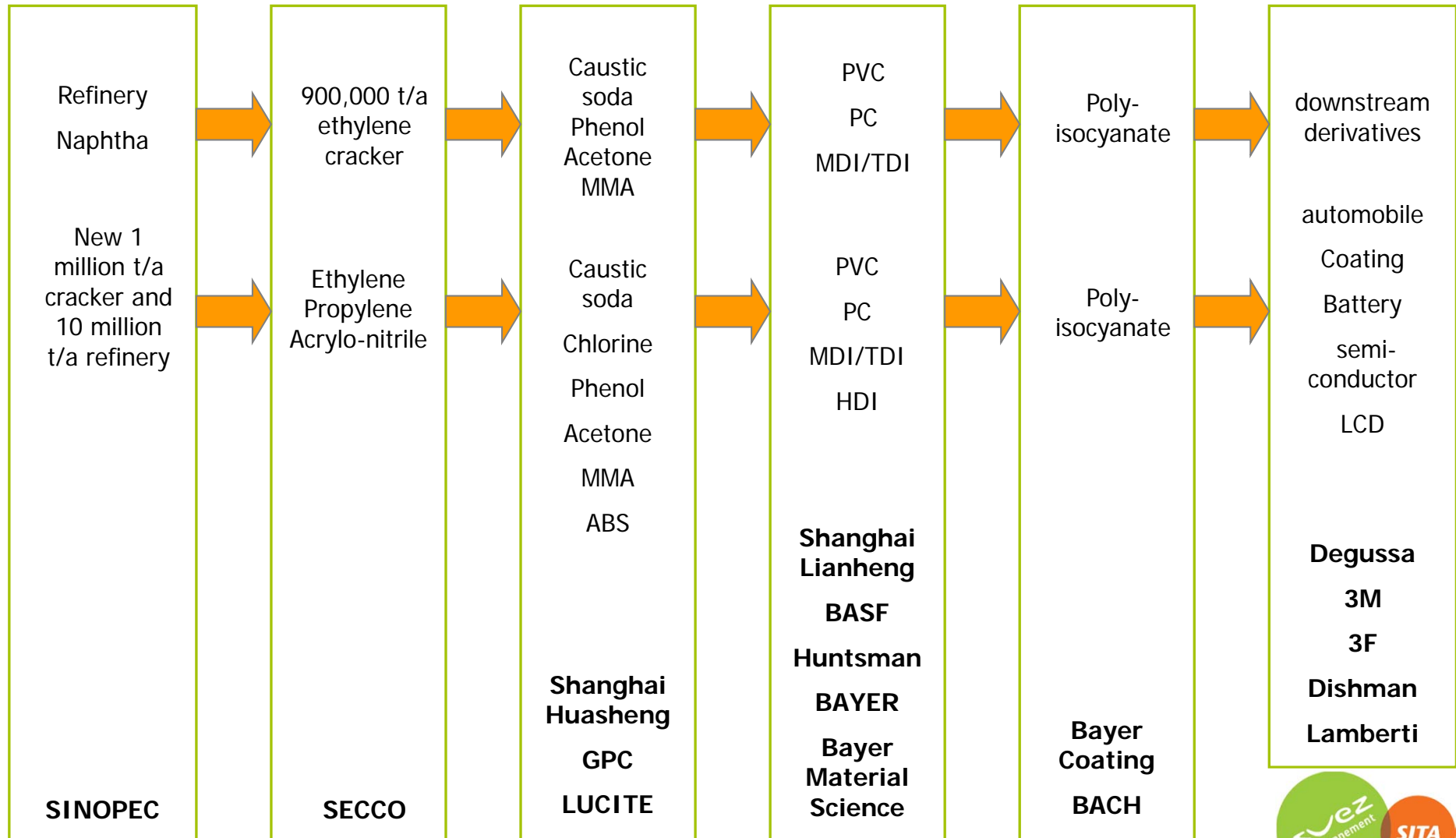
Mid products like MDI/TDI etc.



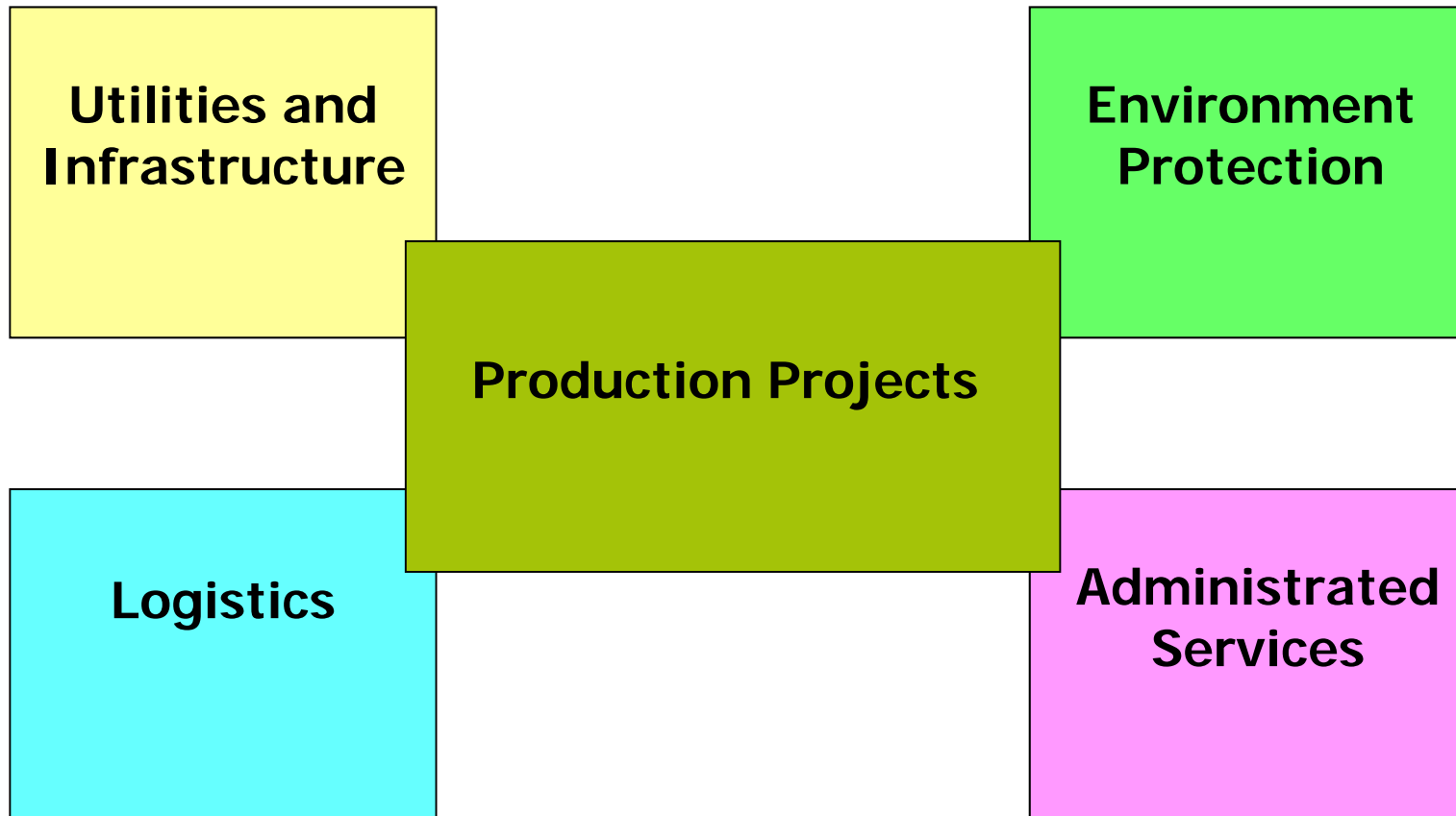
Synthetic new material & fine chemical products like PTHF, PC etc.



SCIP: INTEGRATED PRODUCTS

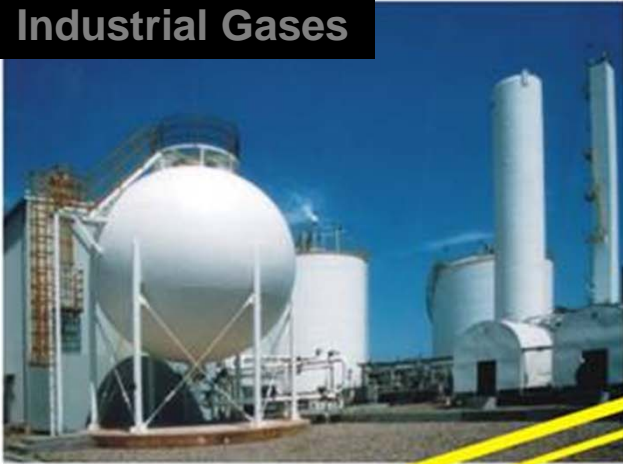


SCIP: INTEGRATION OF SERVICES



integrated specialty, concentrated investment, intensive resource and convergent benefit.

Industrial Gases



Waste Water Treatment



Jetty



Integration of Utilities

Piperack



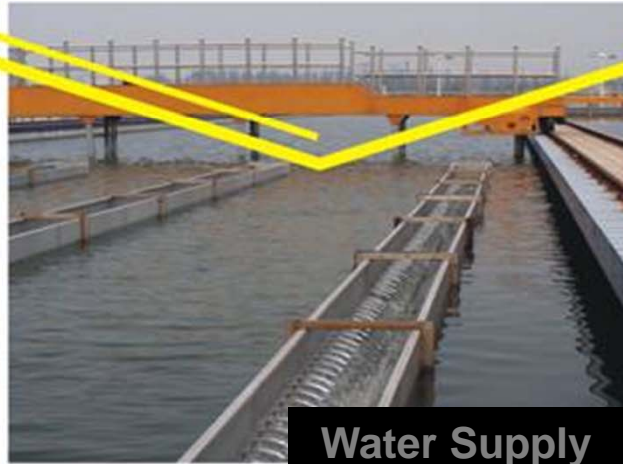
Tankfarm



Cogen



Water Supply



Incinerator



PART 3: LARGE SIZE INDUSTRIAL PARK NEEDS

- Waste generated from the chemical industry represent important qualitative challenges



- Challenges are also quantitative
 - Several companies generate important quantities of hazardous waste (in some cases, incompatible with any mix) and require a very high level of availability in terms of disposal capacity (downtime only every 12-18 months)
 - Associated logistics is also complex (transportation, storage, monitoring of waste characteristics)

SOLUTION BROUGHT BY SUEZ ENVIRONNEMENT

- Suez Environnement drew on similar experiences in Europe to design, build and operate a solution tailored to SCIP
- A high temperature incineration facility started operation in 2006 to provide a wide range of solutions:
 - Incineration of waste in all forms (liquid, solid and gaseous)
 - Reception & pretreatment of waste in all kinds of packaging (lab bottles to bulk 20m3 containers)
 - Direct injection for solid or liquid incompatible / reactive HW
- The incineration capacity (60,000T per year) is split in 2 independent lines to ensure maximum availability throughout the year. It is designed to meet the EU standard EC/76/2000
- **Energy is recovered in the form of steam, which is re-used on SCIP**, thus allowing savings of fossil fuel

CHALLENGES OF HW MANAGEMENT OF SCIP

Challenges of HW management of SCIP in Shanghai are different from those of SCIP

- Classical challenges of HW are naturally present



- In addition, challenges are also met in terms of waste characterization (or lack thereof), packaging, labeling (or lack thereof), transportation. While a good level regulation exists, its implementation remains uneven outside of well structured and monitored industrial parks

PART 4: SCIP SITA, A HAZARDOUS WASTE TREATMENT SOLUTION

- ❑ **Largest hazardous waste incineration plant in China (60,000T/year), with state of the technology & energy recovery**

- ❑ **SCIP SITA provides industrial waste management services from collection, transportation to final incineration.**

- ❑ **Certified by Chinese central authorities (permit delivered by the MEP)**

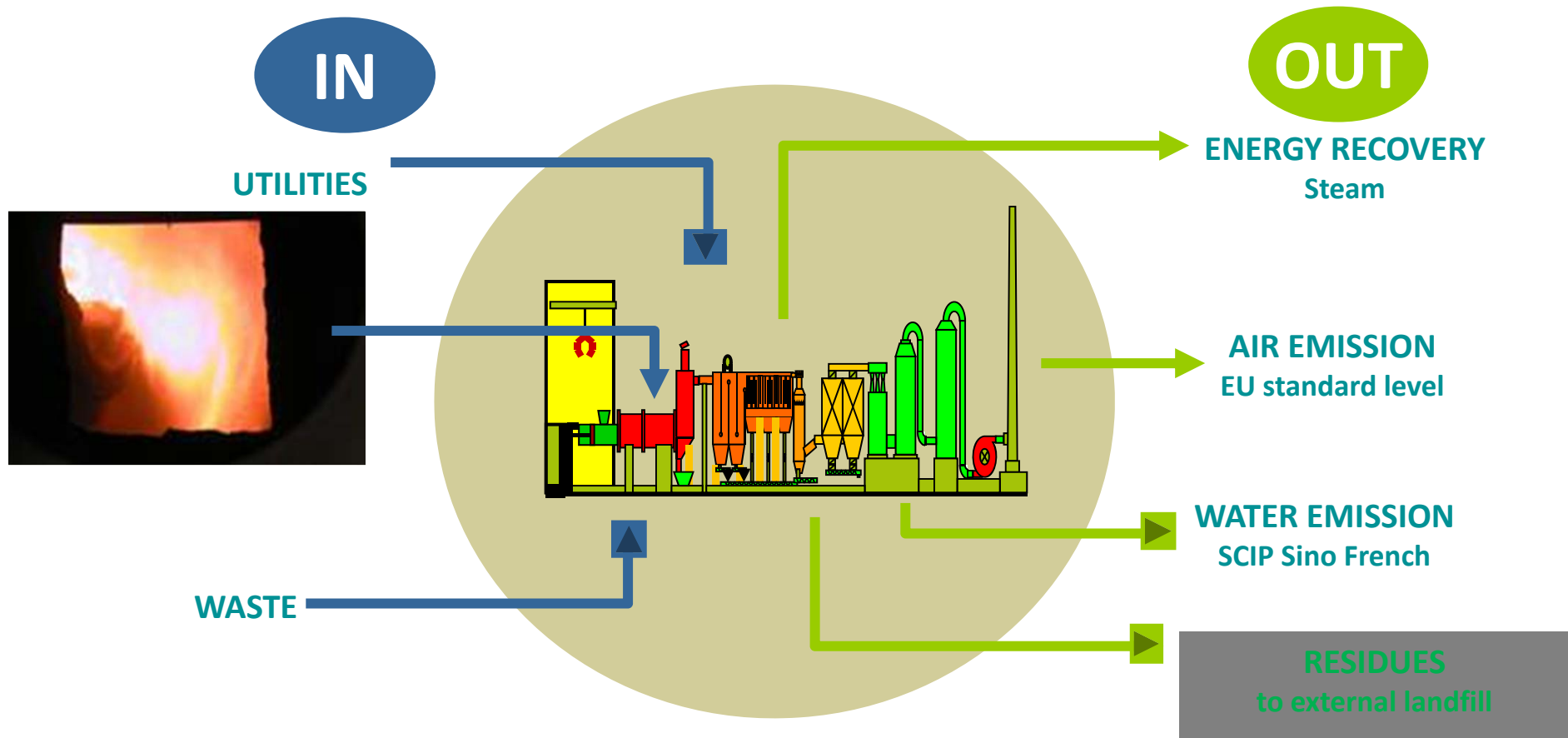
- ❑ **Designed to treat a wide range of waste:**
 - Liquid, solid and gaseous
 - From small packaging to bulk material
 - Storage tanks, drum store or direct burn

SCIP SITA: JOINT VENTURE

Investment of RMB 575 million



SCIP SITA: ENVIRONMENTAL FRIENDLY SOLUTION



SCIP SITA: HIGH AIR EMISSION PERFORMANCE

Pollutant	Unit	PRC regulation GB18484-2001	SCIP-SSWS Specifications
CO	mg/Nm ³	80	50
Particulate matter	mg/Nm ³	65	10
Total Organic Volatile Carbon (TOC)	mg/Nm ³	-	10
HCl	mg/Nm ³	60	10
HF	mg/Nm ³	5	1
SOx (as SO ₂)	mg/Nm ³	200	50
NH ₃	mg/Nm ³	-	-
Cd +Tl	mg/Nm ³	0,1	0,05
Hg	mg/Nm ³	0,1	0,05
Other Heavy Metals	mg/Nm ³	< 6	0,5
NOx (as NO ₂)	mg/Nm ³	500	500 (300 expected)
PCDD/PCDF	ngTEQ/Nm ³	0,5	0,1

SCIP SITA: PROCESS

❑ Incineration

- Total capacity of incineration: 2 X 30,000 T/a
- Rotary Kiln Technology
- Type of Waste: solid, liquid and gaseous

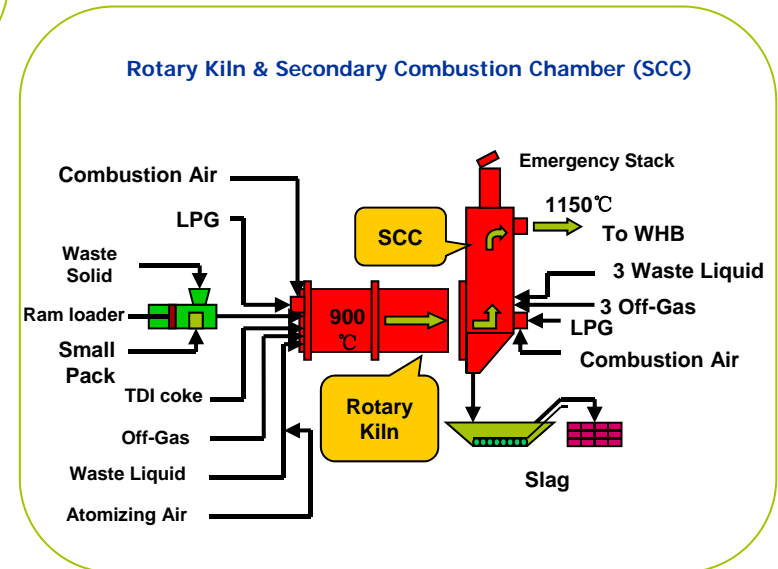
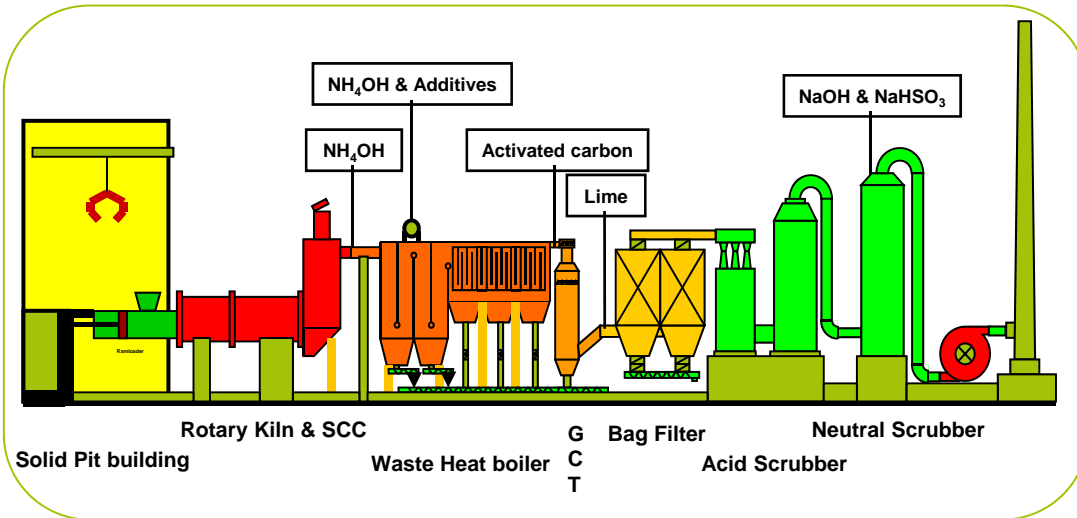
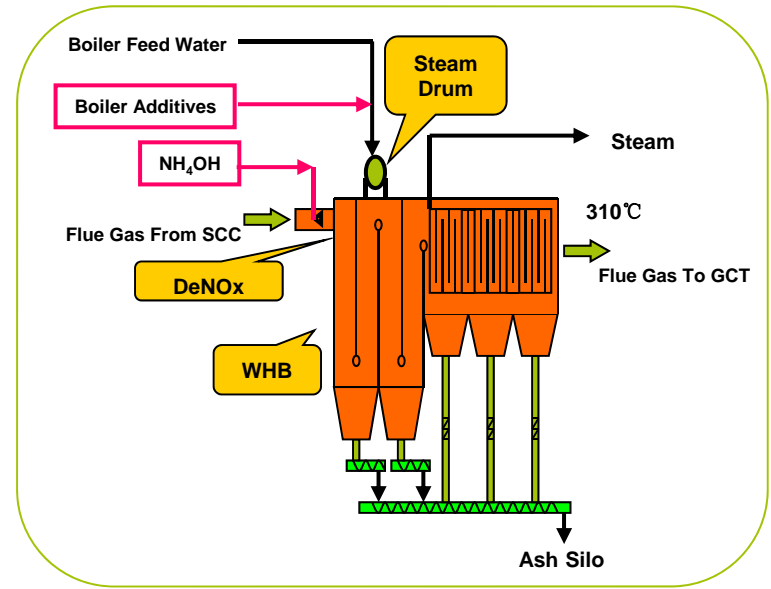
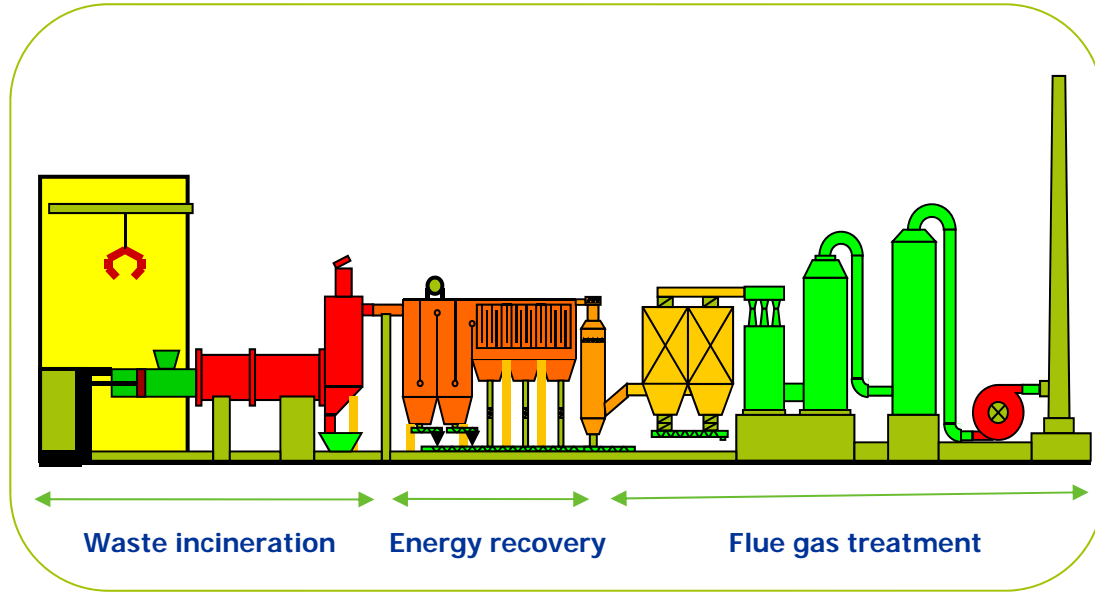
❑ Steam production (2 trains)

- Total capacity of steam production: 32t/hr
- 2 boilers, 16 t/hr for each, 28 bar g, 280°C

❑ Air Pollution Control

- Dust: bag filter,
- Nox : Selective Non Catalytic Reduction,
- HCl, SOx : Injection of lime
- Heavy metals and Dioxin: injection of activated carbon
- Halogen, sulfur and heavy metals: 2 levels of scrubbers
- Continuous Environmental Monitoring System

SCIP SITA: PROCESS



SCC: Secondary Combustion Chamber
GCT: Gas Cooling Tower
WHB: Waste Heat Boiler



SCIP SITA: SITE TOUR



CHALLENGES FOR HW PACKAGING AND LABELLING



CHALLENGES FOR WASTE TRANSPORTATION



... AND SOLUTION BROUGHT BY SUEZ ENVIRONNEMENT



Proper characterization of waste, identification of risks, handling and packaging methods have been developed with customers in SCIP and in Shanghai

... AND SOLUTION BROUGHT BY SUEZ ENVIRONNEMENT



Adequate transportation methods have been put in place to ensure safe transportation & handling of HW



SCIP SITA: SERVICE PROVIDED

- ❑ Waste identification: Laboratory analysis
- ❑ Waste treatment solution
- ❑ Logistic solution
- ❑ On Site services



PERSPECTIVE OF HW MANAGEMENT IN CHINA

- ❑ **Central and local authorities (Ministry of Environmental Protection, provincial Environment Protection Bureau) are actively working to improve HW management in China**

- ❑ **The waste management sector today is scattered and very uneven in terms of environmental performance. Authorities are striving to**
 - New capacities (with adequate technologies) are being fostered and consolidation of the industry is being encouraged
 - Several provinces are planning shutting down old waste disposal facilities

- ❑ **Regulation remains the main tool to improve waste management**
 - Authorities are clearly increasing the implementation of the existing regulation, with a focus broadening upstream, towards waste generators.
 - Regulation upgrades are being surveyed.

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the best job on earth

