

Achieving economic growth and environmental protection, together

SUEZ's Integrated Water and Waste Management Services
for Industrial Parks in Vietnam



Since the nation's first industrial park - Bien Hoa 1 Industrial Park - was established in An Binh Ward, Bien Hoa City, Dong Nai Province in 1963, Vietnam has developed over 400 industrial parks with a total natural land area of about 130,000 ha and an industrial land area of about 88,000 ha.

The increasing number of industrial parks are facing many water and wastewater challenges. These include **high variability in the quality of industrial wastewater, unstable effluents from wastewater treatment plants, lack of separation between rainwater and wastewater, damaged and leaky pipe networks, complex industrial effluent treatment requirements, and discharge of harmful pollutants.**

The Ministry of Planning and Investment issued a report stating that 40% to 50% of localities plan to convert existing industrial parks to eco-industrial parks, and 8% to 10% aim to build new ecological industrial parks by 2030.

Industrial parks are required to minimize their environmental impact, creating a demand for environmental service providers that can efficiently manage water and waste activities as partners.

 **+400**
industrial parks in Vietnam since 1963

 **218,000 ha**
land area in total,
including about 130,000ha of natural land area and 88,000ha of industrial land area

 **40%-50%**
of existing industrial parks
to be converted to eco-industrial parks

Ecological objectives in Vietnam



To achieve net-zero emissions by 2050



To achieve a target of reusing or treating 70% of wastewater before discharging it into the river



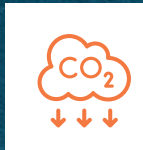
To accelerate renewable energy adoption, ensuring it comprises at least 47% of electricity generation by 2030, up from the current 36%



To ensure compliance with regulations governing industrial parks and economic zones for sustainable growth



To advance the projected peak date for all greenhouse gas emissions in Vietnam from 2035 to 2030



To cut greenhouse gas emissions by 9% using domestic resources and 27% with international support by 2030

Partnering with Industrial Customers to promote a circular economy and green, sustainable industrial development in Vietnam

With a 160-year track record in managing water and waste resources, SUEZ has partnered with 20 large-scale industrial parks across Asia for over 30 years, ensuring safe and continuous production while complying with environmental regulations, and delivering essential services that enhance quality of life in our operational areas.

Additionally, we tailor solutions for our industrial clients to enhance economic and environmental performance, empowering them to achieve their sustainability goals.



Satisfy regulations and
ensure safety compliance



Boost brand equity
through corporate social
responsibility



Develop 100% circular
solutions



Increase
competitiveness

In Vietnam for Vietnam

We recognize Vietnam's aim for a green and resilient future. With SUEZ's robust history of promoting sustainable development in Asia, we are committed to partnering with Vietnam's industrial sectors to mitigate climate change impacts on water, develop climate-responsible models, and advance material recycling and recovery, helping Vietnam achieve its ambitious environmental targets.

KEY REFERENCE

Our partner - Shanghai Chemical Industry Park

The Shanghai Chemical Industry Park (SCIP) is one of Asia's largest petrochemical industrial parks, home to leading global companies such as Sinopec, BASF, Covestro, Evonik, Huntsman, Mitsubishi Gas Chemical, and Mitsui Chemicals. Located south of Shanghai and north of Hangzhou Bay, SCIP spans an area of 29.4 km².

Customers in SCIP, spanning various industries, face numerous environmental challenges. **Large-scale chemical production companies in the park have significant water needs, generate highly concentrated effluents, and produce substantial amounts of waste, including a wide range of hazardous waste involved in complex reactions.**

SUEZ recognizes the critical role of integrated design and management, particularly for world-class facilities like SCIP. Even the best technologies can fail without proper integration and management. **We have partnered with SCIP from its early development stages, working closely for over two decades to provide sustainable, comprehensive solutions for water and waste management across the entire park.**



Partnership to establish the leading global model for ecological protection and the circular economy in a petroleum and chemical industrial park

#1

SCIP has topped the rankings of Top 30 Chemical Parks in China for years



Water & Wastewater Services

promoting the circular use of water resources

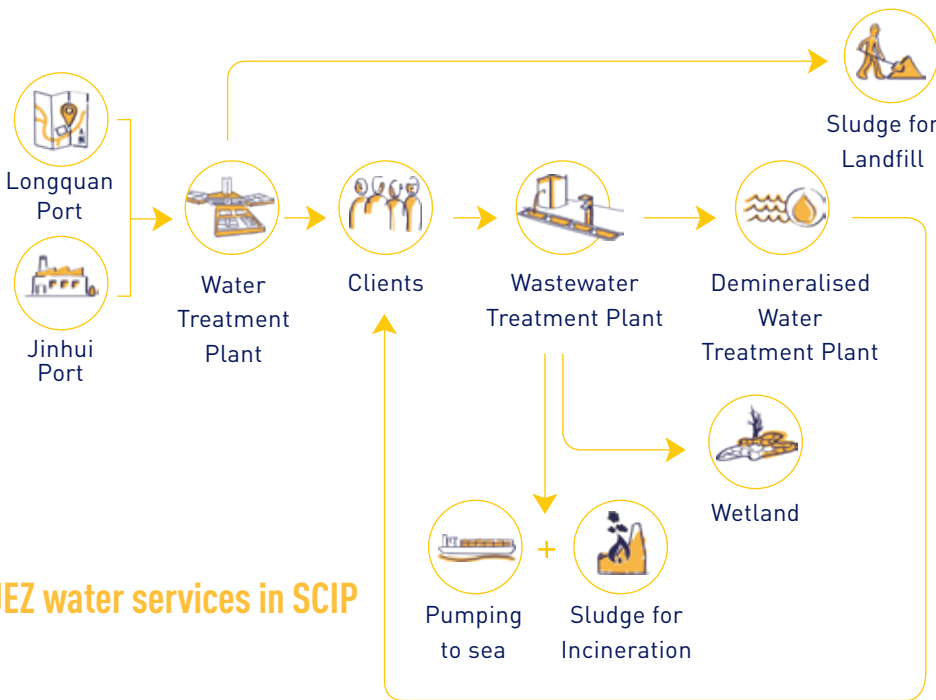
Major chemical companies demand significant water resources and produce highly concentrated wastewater, necessitating professional water services to balance production with ecological sustainability and the harmonious development of industry and environment. In 2002, SUEZ signed a cooperation agreement with SCIP to provide water supply and wastewater treatment services to meet the park’s expanding needs. SUEZ operates a water treatment plant and a wastewater treatment plant at SCIP, offering services that include industrial water, drinking water, demineralized water supply, as well as wastewater collection and treatment.

Our wastewater treatment plants (WWTP) are equipped to handle all types of effluents from the production process, including those with high organic concentration and salinity.

- ⇒ At the WWTP, wastewater is treated according to its specific characteristics before undergoing a biological treatment process and being discharged into Hangzhou Bay. Additionally, the WWTP features several emergency wastewater tanks to handle unforeseen incidents during production and operations effectively.
- ⇒ **To monitor wastewater quality throughout the process, wastewater from each customer is routed through dedicated lines—or through a common line at staggered hours**—allowing for precise control and regulation of water quality at the treatment plant. This system ensures stable operations for upstream customers and enhances preparedness for unexpected events. Moreover, we enhance environmental protection through dual monitoring. While supervising the discharge of wastewater from customers, we are monitored by the Ecological Environment Bureau.
- ⇒ **The treated effluents, through advanced treatment and membrane technology, can be converted into demineralized water, saving 2 million cubic meters of water annually.** This conservation supports resource reuse, reduces wastewater discharge, and optimizes the ecological environment of the Park.

Water research centre (SWRc)

SUEZ, SCIP, Tongji University, and East China University of Technology have jointly established China’s first research and development facility dedicated to industrial water supply and wastewater treatment. This facility focuses on the treatment feasibility of industrial wastewater, the recovery of treated industrial wastewater, and the development of sludge reduction treatments and technologies.



SUEZ water services in SCIP



44,500 m³
daily wastewater treatment capacity



2,000,000 m³
water saved per year

Hazardous Waste Services

achieving energy recovery and leading in the circular economy

The presence of numerous chemical companies often results in multiple streams of industrial waste, including a wide variety of hazardous waste susceptible to complex reactions. Therefore, professional treatment of hazardous waste is essential to ensure safety and environmental protection within and around the Park.

In 2003, SUEZ initiated a partnership with SCIP to operate three incineration lines, providing hazardous waste treatment and disposal services to petrochemical giants in the Park and over 1,000 other industrial enterprises in and around Shanghai. In 2020, this partnership was expanded to include SAIC and Sinopec for the construction and operation of a new hazardous waste project with an annual capacity of 40,000 tons. With this project commencing operations in 2023, **SUEZ's total hazardous waste incineration capacity in SCIP has risen to 160,000 tons per year.** This project underscores our strong partnership in hazardous waste treatment and resource recycling and signifies a significant milestone for SUEZ and its partners in promoting ecological transition.

Our disposal solutions manage a broad spectrum of hazardous waste, encompassing acceptance, packaging, collection, transportation, treatment, and analysis. We handle about 298 types of industrial waste across 24 categories, **ensuring full compliance with environmental standards, high transparency, and traceability.**



160,000 tons

Volume of hazardous waste that can be treated in a year, positioning the project as one of the largest of its kind in Asia



72,000 tons

Volume of standard coal saved per year due to steam generated

Our two systems effectively support economic circularity, energy conservation, and emissions reduction:

- ⇒ The smart management system enables automated inventory control and data analysis. Our incineration processes comply with European Union (EU) emission standards, among the strictest globally. For example, our incinerators control dioxin levels well below EU thresholds, ensuring cleaner air.
- ⇒ Additionally, the incinerators are equipped with **an advanced energy recovery system** that recycles heat generated during incineration to produce steam. This steam is then supplied to industrial companies within SCIP. By using steam as a substitute for traditional fossil fuels, industries in the Park significantly reduce their fossil fuel consumption, carbon footprint, and greenhouse gas emissions.



SUEZ waste services in SCIP

SCIP Waste R&D Centre

SUEZ has established a Waste R&D Center in SCIP to develop innovative solutions for hazardous waste recycling and disposal. The center focuses on enhancing waste-to-energy recovery, optimizing processes, and standardizing industrial practices. Additionally, this R&D platform will be used to strengthen our partnerships with Shanghai Jiaotong University and Tongji University, collaborating on innovative technologies for waste disposal and utilization.

Waste incineration

- Pre-treatment of Waste: Ensures readiness of waste before being fed into the incinerator.
- Incineration process: Occurs in a rotary kiln with a secondary combustion chamber, retaining waste for at least 2 seconds at temperatures >1,100°C

Exhaust treatment

- Four-Stage Off-Gas Treatment Process: Involves the removal of halogens, sulfur, heavy metals, and fly ash.
- Online Emissions Monitoring System: Continuously transmits data to the Shanghai Municipal Bureau of Ecology and Environment, ensuring compliance and transparency.

Energy recovery

- Waste heat boilers recover energy and generate steam



Smart water solutions enhancing SCIP's comprehensive competitiveness

By implementing smart water management solutions, SUEZ supports SCIP's ambitions to become a world-class industrial park and enhance its overall competitiveness. We are actively involved in developing the "1+6+X" model for the smart industrial park initiative, aiming to foster a favorable business climate and provide high-quality services to industrial customers.



To promote company
for smart management



To increase customers'
satisfaction



To support government with
environmental monitoring and
management

Smart environment centre

In 2019, SUEZ and SCIP jointly invested in the construction and operation of the Smart Environment Centre, with the aim of further advancing SCIP's digital transformation and smart management. The centre connects the Park, customers, industrial water plants, wastewater treatment plants, desalination plants, and water networks, and it integrates a full suite of SUEZ's advanced digital solutions – including the AQUADVANCED® system, NOSE PLATFORM®, GIS system, and BI reporting, among others. The centre enables centralised, comprehensive, and 24/7 management of key production, operation, and safety data. It also helps improve environmental governance and customer satisfaction with environmental services. It has become a centre of excellence for showcasing smart industrial park services.



AQUADVANCED® Smart Water Networks

To align with SCIP's advanced management goals, SUEZ has tailored an integrated smart water networks solution. This solution leverages data from its GIS system and incorporates the hydraulic model from the AQUADVANCED® system. It focuses on mobile monitoring of the water supply and drainage network, integrating water supply and drainage information, and offers network data as a service. By employing principles of "visualization, digitalization, modularization, integration, and automation," this smart water network management solution enhances performance management and boosts water network efficiency.

NOSE PLATFORM® Atmospheric Pollutants Monitoring System

To enhance air quality and safety in SCIP, optimize the performance of environmental treatment facilities, conserve energy, boost emissions reduction efforts, and fulfill public expectations for environmental quality, SUEZ has developed the NOSE PLATFORM®. This online monitoring platform is specifically designed for wastewater treatment plants to monitor air pollutants. The NOSE PLATFORM® enables uniform and intelligent monitoring of atmospheric pollutants, ensuring efficient and effective management of air quality.

Wetlands

First Chinese industrial park to integrate Zone Libellule® technology in wastewater treatment

In 2017, SUEZ introduced its patented Zone Libellule® technology to the artificial wetland project in SCIP. This marked the first instance of its use in a Chinese industrial park for treating industrial wastewater. The expanded artificial wetland covers over 50 hectares and features coastal, salt-tolerant plants that act as potent purifying agents, further treating the high-salinity tailwater produced by the WWTP. This process, known as a nature-based solution, harnesses the biological purification capabilities of plants to treat industrial wastewater while also providing an ecological habitat for local flora and fauna. It epitomizes the concept of "nature-based solutions" and emphasizes the importance of giving back to nature.



160 years

SUEZ, a top environmental services company, has been providing vital services for over 160 years to enhance our quality of life.

SUEZ offers innovative and resilient water and waste solutions to its customers. With 40,000 employees spanning 40 countries, the Group collaborates with customers to create value throughout the lifecycle of their assets and services, supporting their ecological transition.



57 million
people supplied by SUEZ with
drinking water



7.7 TWh
energy generated from
waste and wastewater



36 million
people with access to sanitation
services provided by SUEZ

We deploy the passion and dedication of our team to serve our customers worldwide, empowering them...

1

Providing access to water and waste services through resilient and innovative solutions.

2

Creating value throughout the lifecycle of assets and services.

3

Driving the ecological transition in collaboration with end-users.



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