SUEZ at the heart of resources management in India

Media trip from the 29th to the 31st of January 2018
India is facing the challenge of increasingly scarce resources. Rapid population and urbanisation growth linked to sustained economic and industrial development projects have resulted in significant increases in water demand and waste production, both on a domestic and industrial level.

As such, resource management represents high potential growth for India, where water has become a vital resource for the population and an asset to industrial and economic development.

Local authorities must also tackle a significant increase in waste production, notably amongst large cities, whilst even water treatment facilities work remain under-developed, bringing about sanitary and environmental risks.

In a bid to face these new issues, local authorities have launched investment programmes (eg. River Ganges Clean-Up and Smart Cities programmes). They are also calling upon the expertise of the private sector to ensure access to drinking water and sanitation services for a rapidly growing population, to manage water resources sustainably (notably within the industry sector), and in the long term, to manage waste in line with environmental standards.

International development is one of the 4 growth drivers of the SUEZ Group, a leader in the sustainable management of resources. India is both at the heart of the problem concerning resources (demographic growth, rate of urbanisation, lack of water, etc.) and at the heart of resources management (linked to demographic growth, urbanisation, etc.).

Present in India for more than 30 years, SUEZ has been supporting local authorities and industries in developing solutions to meet the challenge of resource management, notably thanks to providing contracts for infrastructure construction and operation, improving drinking water distribution services and developing alternative resources (such as wastewater reuse) and at the heart of the Group’s international development strategy.

SUEZ wishes to pursue its development in India by strengthening its position in water-related services (notably within the framework of contracts for infrastructure construction and water distribution services), sanitation-related services (such as treating wastewater and sludge, and water reuse), and by seizing opportunities for growth amongst industry actors and in new markets (sustainable cities, desalination, solid waste management, etc.).
# Table of contents

4  **Sustainable water and waste management: a long-term challenge and driving force for Indian development**

4  Ensuring access to water and sanitation to a rapidly growing population is a key issue

8  Water management for industry: a rapidly growing market and developmental asset for India

9  Waste management, India’s future challenge

10  The emergence of Smart Cities in response to the urban development challenge

11  **SUEZ, the partner of local authorities and industries in the sustainable management of resources**

11  Key Figures of SUEZ in India

11  An historical presence in water management for 30 years

12  SUEZ, a leader in water management for industry

13  Waste management presents significant development opportunities

14  **SUEZ key references in India**

14  SUEZ partners with New Delhi to respond to the need for access to water and sanitation in a rapidly growing city

16  SUEZ supports Bangalore in the sustainable management of its water resources

Night view of Bhandup drinking water production plant in Mumbai ©SUEZ
Sustainable water and waste management: a long-term challenge and driving force for Indian development

India’s rapidly growing population and urbanisation result in its engagement in major urban development projects and in the construction of essential infrastructure. This, in order to meet basic needs in terms of access to drinking water, sanitation, and in the long-term, waste treatment and recycling. Challenges reflect needs, and both are colossal.

In this context, India represents high growth potential for both SUEZ’s water and waste activities. Present in India for the past 30 years, the Group is committed to continually supporting Indian authorities in achieving their new ambitious targets to protect natural resources and the environment (eg. The River Ganges clean-up and the Smart Cities programmes). To do so, SUEZ will pursue its local partnership strategy that seeks to improve water and sanitation services in Indian metropoles, manage water resources sustainably within the industry sector.

Ensuring access to water and sanitation to a rapidly growing population is a key issue

Access to drinking water remains a key challenge:

➢ 163 million people lack access to safe water in India.
➢ 67% of India’s population live in rural areas, and 7% of them (63.4 million people) have no access to drinking water. Only 16% of households (almost 27 million households) are connected to a drinking water distribution system. Furthermore, over 13,000 of households have access to water polluted with contaminants such as iron and arsenic.

➢ The government plans to provide 90% of rural households with piped water and 80% of rural households with household taps by 2022, according to the strategic plan for rural drinking water, 2011-2022.
Rapid population and urbanisation growth imply the need for increasing volumes of water at a time when the resource is becoming scarce:

➢ The emergence of middle class citizens (300 million people) has resulted in expectations for better services (such as 24/7 water supply) accompanied by an increase in water consumption due to new ways of life.

➢ However, whilst water demand is increasing, water availability per capita is declining: the annual average per capita was 1,820 m³ in 2001, 1,545 m³ in 2011 and will reduce to 1,140 m³ in 2050. More than 25% of the population already lives in areas lacking water, and India has 4% of world’s drinking water resources.

➢ Groundwater is depleting at its highest rate. It is estimated that 30% of groundwater worldwide is extracted in India. More than 60% of irrigated agriculture and 85% of domestic water use now rely on groundwater. Forecasts predict that 86% of all groundwater will be extracted for use by 2050, leading to drastic decline in water levels. The Indus Basin is the second-most-overstressed aquifer in the world. If current trends continue, nearly 60% of Indian aquifers will be in a critical condition by 2030. Some 25% of agriculture production will be at risk.

➢ Intensive groundwater extractions and recurrent droughts have led to water rivalries between States, the most recent of which involves conflict between Karnataka and Tamil Nadu States as concerning access to the Kaveri River. Also, declining groundwater levels in the Indus Basin will most likely increase tensions over water between India and Pakistan.

➢ As a result, India risks slipping into the list of water-stressed countries by 2020 which may affect its GDP growth prospects.

➢ For the authorities, the challenge is a sizeable: supply the population with good quality drinking water and improve the water distribution service during a time where water is lacking and the population is growing.

➢ In response to this lack of water, alternative water resources such as desalination and wastewater reuse.

➢ Several tenders are ongoing for the construction of large-scale privately financed desalination plants. In Chennai, the capital of Tamil Nadu, almost a quarter of the 830,000 m³/day of water supplied is already sourced from desalination, and over the next five to ten years, 80% of its additional capacity will be sourced from desalination. The State also has further plans for sourcing water supply via desalination. The most advanced project concerns the extension of the Nemmeli desalination plant in Chennai, where German development bank KfW could fund part of the project under a 20-year build-operate-transfer (BOT) contract.

➢ Interest in wastewater reuse in India is growing too, in order to limit freshwater abstraction. Whilst no comprehensive national initiative for promoting water reuse in the municipal sector exists, the agenda is being firmly pushed as part of the Ganges Clean-Up programme (Namami Ganga) adopted in 2014. This plan includes the treatment of all wastewater in Class I Towns for reuse, as well as forcing all heavily polluting industrial units to adopt water reuse or Zero Liquid Discharge standards. In a bid to encourage this behaviour, it adds that freshwater withdrawals from the basin for non-agricultural purposes should be valued at least 50% higher than the cost of treating wastewater for reuse.

---

1 Towns located near to the Ganges or its tributaries of which treated or non-treated wastewater is discharged directly into the river.

2 The ZLD system represents the most effective treatment for reducing or eliminating wastewater discharge and enables a recycling rate over 90% to be achieved.
Aware of the challenge involved in guaranteeing water access to a population experiencing rapid growth, large metropoles are calling upon private operators such as SUEZ to improve their drinking water distribution services, reduce water loss within water networks and improve customer service. In certain areas, the share of leaks can be divided by 2 or 3 thanks to the use of technology such as helium gas, which enables leaks to be detected that were undetectable with traditional techniques.

Sanitation, a sanitary and environmental issue:

Protecting water sources (streams, rivers, groundwater tables, etc.) from pollution caused by untreated wastewater poses a key challenge both on a sanitary and environmental level in India. For example, pollution of the Ganges is 3,000 times higher than recommendations made by the OMS.

- 70% of 62,000 million litres/day of sewage generated in urban areas and more than 50% of industrial effluents go untreated, contributing to the contamination of rivers, lakes, seas and groundwater, therefore increasing the potential health risks to humans and ecosystems.
- 210 million people lack access to improved sanitation in India.
- 38 million people are affected by waterborne diseases each year, of which over 75% are children. The World Bank estimates that 21% of contagious diseases in India are linked to unsafe water and a lack of hygiene.

These challenges give rise to huge investment programmes, concerning both drinking water and wastewater, notably focusing on the rehabilitation of existing water networks and the development of sanitation systems. In order to ensure continuous transformation of cities, decisions need to be taken immediately, and decision-making process need to be accelerated at all levels (administrative, political decision-makers, etc.).

In response to these issues, India has recently strengthened existing environmental regulations and has called upon the expertise of private operators.

- Faced with a rapidly increasing urbanisation, many towns and cities have swelled to such a size that water infrastructure is becoming inadequate.
- Indian authorities became aware of the sanitary and environmental challenges linked to growing water scarcity and increasing volumes of wastewater and waste. Access to drinking water and the improvement of water quality are at the heart of local authorities’ priorities.

In 2015, the Indian government committed itself to improving urban water infrastructure through the AMRUT (Atal Mission for Rejuvenation and Urban Transformation) and Smart Cities programmes:

**AMRUT** is a 5-year programme totalling 6 billion euros and aims to help improve vital infrastructure (water, sanitation, waste, transport, etc) in 500 Indian cities with over 100,000 inhabitants. Of these cities, 100 will also be “smart cities”, and will benefit from both funding for AMRUT and the Smart Cities programme (just under $15 billion allocated over five years). For the latter, the application of smart technologies to existing water and wastewater networks and automated meter reading schemes are envisaged. Opportunities for water companies here lie in the enhanced management of networks, with plans for Zero Liquid Discharge (ZLD) also included.

The centre of gravity in the wastewater treatment market currently lies in the Ganges River Clean-Up (2015-2020), where the national government is committing 200 billion INR ($3.1 billion) in order to stop untreated wastewater discharge from 118 of the 222 towns and cities located along the River Ganges. The river stretches from the Himalayas to the Bay of Bengal and is a water source for 400 million people. But it is also polluted by the constant discharge of untreated wastewater as well as by the spillage of considerable amounts of solid and industrial wastewater continually produced by human and economic activity along the banks of the river. The main stem of the River Ganges passes through 50 Indian towns, with almost every one containing over 50,000 inhabitants. These towns generate some 3 million m³ of wastewater per day, of which only a fraction is treated before being released into the river. Whilst domestic wastewater represents...
70% to 80% of liquids released into the Ganges, industrial effluents represent more than 15% and their toxicity severely impacts human and aquatic health. What’s more, due to a lack of adequate management of solid waste in most towns, rubbish heaps pile up, adding to already high levels of pollution.

The Ganges Clean-up programme creates opportunities for private companies in terms of the construction of decentralised wastewater systems and installation of more advanced treatment technologies in order to meet more stringent discharge standards and enable more reuse.

Wastewater reuse is a key long-term goal to preserve water in the Ganges, and while creating a market for selling treated wastewater will be a challenge, central government is already taking steps to make this a reality. Significant volumes of private finance will be required in order to meet the enormity of the clean-up task. The Public-Private-Partnership model is thus promoted. In support of the Prime Minister’s initiative, in October 2016, the Indian Supreme Court entrusted the National Green Tribunal with enforcing water quality statutes on industries along the river and its tributaries. The Ganges initiative could prove to be a trial run for other treated wastewater schemes across the country.

➢ A number of vital infrastructure projects aimed at developing Indian megacities have been launched and benefit from international funding (World Bank, Asian Development Bank, etc.) which speeds up their implementation. For example, the Indian government and the World Bank signed a credit agreement in 2014 for 500 million dollars in order to improve water provision and sanitation services in the states of Assam, Bihar, Jharkhand et Uttar Pradesh.

➢ Inspired by efforts in the Ganges, tightening regulations on discharge from wastewater plants is also a major focus across the country. Lower levels of key parameters such as BOD, COD and TSS have been introduced in 2017. Furthermore, for the first time, faecal coliform and phosphorus standards are being introduced. This will drive the market for improved biological treatment systems, as well as opening it up to tertiary treatment, particularly disinfection systems. Newly constructed wastewater treatment plants (WWTPs) will need to meet these standards, while existing plants have five years to comply.

It is amid depleting water resources that industrial demand has experienced exponential growth, especially in the last decade. However, the impending water crisis could hold up the government’s “Make in India” initiative to boost manufacturing. With less than 30% share of the country’s GDP, manufacturing is a critical gap. According to an estimate, the total demand of industrial water in 2010 had stood in the range of 50-60 billion m³, which is slated to more than double (100-120 billion m³) by 2030. Annual industrial water consumption growth in the country in the 15-year period will be close to 4.5%.

The industry has experienced a significant shift in the approach to water management over the last few years, attributed to several factors such as changes in the regulatory landscape with more stringent standards such as Zero Liquid Discharge (ZLD) for specific industries and water consumption limits for industrial use being enforced. As a result, industries are now moving towards reducing their overall water footprint, adopting advanced technologies in order to limit deterioration of feed water quality and optimise wastewater treatment in order to facilitate water reuse.

New industrial parks and integrated business cities along India’s five planned industrial corridors planned by the “Make in India” programme are opening up an enticing market for international players. The Delhi-Mumbai industrial corridor (the most advanced corridor to date) is set to embrace long-term operations contracts and 100% wastewater reuse. Tendering for a number of water-related projects in the corridor is already underway. There is also a growing interest in integrated infrastructure operations contracts covering water and wastewater management alongside environmental services.

The development of these industrial corridors induces development of alternative water resources, such as desalination and reuse of wastewater, in order to respond to the growing demand for water and to guarantee development in these new economic areas:

- Aside from the longer-term goal for water reuse in the Ganges Clean-Up programme, measures will also be applied in various industrial sectors, namely power generation, refining and industrial parks. These water-intensive sectors are becoming increasingly subjected to limits on freshwater consumption, whilst wastewater reuse is practically obligatory in new refineries and petrochemical plants. This will drive the use of more reverse osmosis (RO) and other filtration technologies. Pushing for ZLD in specific industrial sectors can also help with a plant’s overall water management as steps are being taken to closely monitor water usage, reduce the quantity of effluent generated, avoid wastage and promote upstream recycling rather than looking at end-of-the-pipe solutions.

Desalination has also experienced an increase in popularity amongst Indian firms with plants in coastal regions like Chennai (such as Chennai Petroleum Corporation’s refinery) to mitigate water availability risks. Industrial clients have more readily embraced desalination plants than the municipal sector through necessity and the fact that their requirements can be met by smaller plants. Future developments of plants (such as power and steel production) located on the coast will automatically adopt seawater desalination as freshwater allocations will be reduced. Desalination plants are already being considered to serve nodes within the framework of industrial corridors. The Chennai-Bangalore corridor could be a key client, whilst brackish water desalination would help meet needs in the Dholera investment area in the Delhi-Mumbai industrial corridor.
India - 29th to the 31st of January

There is also development in water management models, with some industrial players preferring to completely outsource water management and leave it to expert service providers or water treatment companies. There is a growing trend towards Design-Build-Operate or Build-Own-Operate models and those that integrate financing are growing in popularity.

Waste management, India’s future challenge

India’s urban population of 429 million citizens produce 62 million tonnes of waste every year, including:

- 5.6 million tonnes of plastic waste
- 0.17 million tonnes of biomedical waste
- 7.90 million tonnes hazardous waste
- 1.5 million tonnes of electronic waste

A staggering 43 million tonnes of solid waste is collected annually, out of which only 11.9 million (28%), is treated, while about 31 million tonnes of waste is left untreated and dumped at landfill sites.

Major metropolitan cities such as Delhi, Mumbai, Chennai, Hyderabad, Bengaluru and Kolkata generate about 10 million tonnes of waste every day.

More than 70% of collected urban waste is dumped straight into landfills and most of them are brimming.

For example, in Delhi, 9,500 tonnes of waste is generated per day, of which the majority is disposed in several landfills, notably the ones of Ghazipur and Okhla.

Research shows that if India continues to dump untreated garbage at its current rate, then it will need a landfill of size 66,000 hectares which is 10 metres high and can hold 20 years’ worth of waste. That is almost 90% of the size of Bengaluru.

India faces major environmental challenges linked to this increase in waste and to inadequate waste collection, transport, treatment and disposal. Current systems in place are not adapted for the volumes of waste generated by a growing urban population and generate growing risks to the environment and public health.

A priority is to move from reliance on waste dumps that offer no environmental protection, to waste management systems that retain useful resources within the economy:

- Waste segregation at source and use of specialised waste processing facilities to separate recyclable materials play a key role.
- Disposal of residual waste after extraction of material resources requires engineered landfill sites and/or investment in waste-to-energy facilities.
- The potential for energy generation from landfill via methane extraction or thermal treatment is a major opportunity, but a key barrier is the shortage of qualified engineers and environmental professionals.

Faced with these challenges, the Ministry of Environment and Forests issued Municipal Solid Wastes (Management and Handling) Rules in 2000 to ensure proper waste management in India and new updated draft rules have recently been published. Municipal authorities are responsible for implementing these rules and developing infrastructure for collection, storage, segregation, transportation, processing and disposal of municipal solid waste. Chandigarh is the first city to develop solid waste management in a planned way and has improved waste management compared to other Indian cities. Waste-to-energy programs have been launched in Delhi and are under development.

---

4 Build Own Operate (BOO) contracts that foresee full private partner implication in management of the project, from design and construction to the financing and operating of the plant.
The emergence of Smart Cities in response to the urban development challenge

➢ By 2050, the population of India will reach 1.7 billion people, half of whom will be city dwellers. That’s 500 million more people than live there currently: challenges related to city management, pollution, waste treatment, and access to drinking water and sanitation services will grow more acute. Rather than transforming areas that have become denser – nine out of the 100 largest cities in the world are Indian – by modernising them, policymakers are looking for new solutions. They have therefore launched the “smart cities” programme for 108 cities that are required to adopt technologies associated with the city of the future, as well as for issues related to mobility, transport, renewable energy, and water and waste management. India is planning to create business corridors along high-speed roadways to link big cities.

➢ The government has therefore created ad hoc companies to launch calls for tender, and 108 managing directors attached to each project have been named for a term of three years. However, all these projects are running up against the key issue of cost; they ought to be structured in the form of public-private partnerships.

➢ A task force on sustainable cities was created within MEDEF International in 2013 to identify opportunities and present turnkey solutions. It brings together 450 companies, from SMEs to multinationals like SUEZ. In India, the French have translated this umbrella organisation into a “sustainable city club” that includes 71 companies already operating in the country. The Japanese, Koreans, Germans, Swedish, Australians and Indians are also mobilising around smart cities, but they lack the broad approach of French companies. Moreover, France is providing financial solutions; for example, the AFD is participating in around 15 Indian projects by supporting funding for expert assessments, but also, on a larger scale, via a loan of 100 million euros granted to the Indian government and aimed at smart cities like Chandigarh.

➢ At the heart of these “smart cities”, the renewable energy sector demonstrates high potential for French companies. India signed the Paris Climate Agreement adopted following the COP21 in December 2015. The Indian government is committed to reducing the carbon intensity of its GDP from 33% to 35% by 2030 compared to 2005. The aim is for 40% of the energy produced by 2030 to be non-carbon. Following the COP21, India and France launched the International Solar Alliance. Currently, nineteen of the 121 warmest countries on the planet have joined the Alliance. It aims to significantly improve solar energy production essentially in the area between the Tropics of Cancer and Capricorn.
SUEZ, the partner of local authorities and industries in the sustainable management of resources

- International development is one of SUEZ’s four growth drivers of development. In light of water and waste management challenges in India, the region is firmly included in the Group’s priority geographical areas.

- The historical presence of SUEZ in India makes it a privileged partner to support local authorities and industries in the development of innovative solutions to meet the climate challenge and the sustainable management of resources, particularly through construction and operation of facilities, improvement of drinking water services, and development of alternative resources (reuse of wastewater, desalination).

### Key figures of SUEZ in India

- **Operating in India for over 30 years** in water management.
- **Over 250 drinking water and sanitation plants** built with 25 currently in operation.
- SUEZ provides **drinking water services** for major municipalities like **New Delhi** (concession), **Bangalore**, and **Kolkata** (service contracts).
- **5.5 million m³** of **drinking water** distributed to over 44 million residents every day.
- **15 million residents** have benefited from SUEZ’s expertise in **improving the performance of water systems and drinking water distribution**.
- **4.8 million residents** benefit from **sanitation services** provided by the plants operated and built by the Group.
- **600,000 m³ of treated wastewater**, of which **300,000 m³** recycled by sanitation plants built by the Group.
- **11,000 km** of water networks managed by SUEZ, including **6,000 km mapped by GIS**.
- **8,000 invisible leaks** identified by the helium gas detection technique.
- **Over 1,200 employees** in the country.
- **10% turnover annual growth.**

### An historical presence in water management for 30 years

- **India is a dynamic market for the SUEZ Group**, showing strong demand in the Group’s traditional business line in India of treating and distributing water. This is linked to a growing and urbanising population, growing industrialisation, and the emergence of a middle class with high expectations for quality services, even as water resources grow scarcer. As this market grows, increasingly strict environmental standards are appearing in line with it.

- For 30 years, SUEZ has supported its municipal and industrial clients in conserving water resources with numerous references in the area of producing drinking water as well as treating and recycling wastewater. SUEZ has designed and built over 250 drinking water and sanitation plants in the country. Currently, SUEZ operates 25 of these. SUEZ helps major Indian cities access sanitation services as illustrated by the latest contracts won in Bangalore (improvement to infrastructure contract concerning 2 million residents of the
Vrishabhavathi Valley region in 2017); and is following major projects to come in Delhi and Mumbai in early 2018 for more than €1.3 billion.

> Since 2012, SUEZ has also provided its expertise in improving **drinking water services to major municipalities such as Delhi, Bangalore and Kolkata**. The Group helps these cities improve drinking water distribution, optimise their water systems, and improve customer service in the framework of a **concession or service contract model**. In this way, the Group’s activities help distribute **5.5 million m³ of drinking water to over 44 million inhabitants** every day.

> SUEZ has the right expertise and solutions to support local governments and industrial players in managing water resources and deploying **innovative solutions and alternative resources**:

- With a firm commitment to participate in modernising India’s water infrastructure, the Group has introduced **many innovations adapted to the region’s needs** – advanced filtration and clarification processes, sewage treatment technologies with generation of renewable energy, membrane bioreactor technology, Zero Liquid Discharge, network and distribution expertise, service level improvements, customer service, helium gas leak detection technology.

- **Supported by the most recent regulations, reuse and desalination are promising markets for the Group**. This is illustrated by contracts for treatment and recycling of wastewater in Bangalore (Cubbon Park and Raja Canal plants) and the call for tenders underway for a desalination plant in Chennai. The Group today recycles 300,000 m³ of treated wastewater, thus contributing to the preservation of water resources.

> **The Group’s ambition is to be a leader in the Indian water distribution business segment in the next 5 years thanks to winning large PPP projects.** This model enables net improvement of service quality and operational performance via structured knowledge transfer. Until now, water services contracts were segmented into city quarters but are now developing progressively towards water management contracts for the whole city, as illustrated by the contract won by SUEZ in Coimbatore. The Group is actively following similar water distribution improvement projects, notably in Pune and Kolkata.

> **SUEZ is also actively looking at how it can participate in government initiatives (Ganges Clean-Up and Smart Cities programmes)** as part of its overall aspiration to provide smart utilities in waste, water distribution and wastewater treatment. Actively involved in sewage treatment projects, mainly for the cities of Bangalore and Delhi, the Group is well positioned to take part in these initiatives and is looking at strategic partners. **The Group not only plans to set up treatment plants, but long-term, sustainable Ganges clean up with professional operation and maintenance services.** Its experience in long-term Operation & Maintenance contracts makes it uniquely placed to ensure reduction of pollution in the Ganges on a long-term basis. SUEZ will also follow the projects launched in the cities that will benefit from the **Smart Cities programme** such as Chandigarh, Pondicherry and Nagpur.

SUEZ, a leader in water management for industry

The reduction of water consumption, treatment and recycling of effluents are just as problematic for industrial actors in India, where rapid economic, industrial and urban population growth apply growing pressure on water resources. **The industrial water market in India offers substantial opportunities for development for private operators.**

SUEZ has supported industrial clients in water cycle management for several years:

> **48%** of installed thermal power capacity in India runs on water treatment plants designed by SUEZ,

---

5 The Helium Leak Detection technology, developed and patent by SUEZ, detects invisible leaks and is well adapted for cities of developing countries where intermittent supply, low pressure and noisy environment makes detection with traditional technique difficult and inefficient.
50% of existing oil refineries and 25% of major steel plants in India rely on water/wastewater treatment plants built by SUEZ.

In order to accelerate its market growth, SUEZ acquired the Indian company Driplex in 2016, a primary actor in India’s industrial market. Created in 1974, Driplex, headquartered in New Delhi, offers technological water treatment solutions to its industrial clients based both in India and internationally. The acquisition of Driplex provided the Group with an industrial base in India in order to serve industrial clients in the country as well as the region in the field of construction of water treatment units. The acquisition of GE Water on 30th September 2017 and the creation of the Business Unit Water Technologies & Solutions which regroups acquired activity as well as SUEZ’s industrial service activities further strengthens the presence and expertise of the Group in India.

The expertise of Driplex and GE Water enable SUEZ to benefit from an extensive portfolio of services, technologies and patents, both on a commercial and technological level. Furthermore, SUEZ is now supported by 4 production factories in India in order to consolidate its production capacities, in line with the ‘Make in India’ initiative.

SUEZ’s new Water Technologies & Solutions offer covers the entire water, wastewater and process value chain, including Design & Build projects, specialty chemical services, water treatment equipment and systems, and digital solutions for water management.

It is aimed at every sector of industry, from power, oil and gas (upstream & midstream, downstream & petrochemicals), to mining and metals, chemicals and pharmaceuticals, pulp and paper, food and beverage, utilities.

SUEZ is now the leader on the Indian market, in particular on the power sector (more than 100 water treatment projects executed), Oil & Gas (15 of the 21 refineries benefit from SUEZ equipment and services), metals, food & beverage and textile.

**Effluents recycling in a large steel plan**

In line with stricter regulatory discharge standards, a very large steel plant producing effluents containing cyanides, phenols and ammonia had to treat its coke oven.

SUEZ has offered a solution including a membrane bioreactor (MBR), the reverse osmosis technology and a Zero Liquid Discharge system to meet its environmental performance targets. As a result, 99% of the effluents are recycled and reused as process water. On a daily basis, 6,000 cubic meters of water are reused in the cooling tower of the facility.

This way, our Indian customer achieved to get the world’s 1st ZLD plant on coke oven effluent. Our customer recognized SUEZ’s efforts and granted us with Best Supplier Award.

**Key figures**

- 650+ strong team.
- 450 industrial water treatment projects.
- Local manufacturing capabilities – 4 factories comprising of membrane rolling, equipment fabrication and chemical blending.
- 1 Centre of Excellence for Engineering supporting global projects.
- Turnkey project and onsite service capabilities.

**Waste management presents significant development opportunities**

- Solid waste management remains a challenge for the local authorities. Globally, SUEZ supports municipalities, industries and healthcare professionals in the most complex waste management operations through a variety of services. In India, SUEZ would like to expand waste management operations by:
  - refuse derived fuel-based waste management solutions and
  - energy from waste options using both thermal and digestion techniques.

SUEZ is closely studying all opportunities in India relevant to its expertise in water, waste and smart urban development in the country. A number of opportunities have been identified, such as large sewage recycling projects and potential solid waste projects across India, provided we are offered a viable business model. Several projects are also underway within drinking water distribution services and network improvement projects via the reduction of leaks in every Indian megacity. The Group is also closely following development of the desalination market (Chennai tender) and of Smart Cities where SUEZ’s global expertise will certainly be of interest to cities grappling with the challenges of sustainable urban management.
SUEZ key references in India

SUEZ partners with New Delhi to respond to the need for access to water and sanitation in a rapidly growing city

The capital of India, New Delhi, has over 18 million inhabitants. As the fifth most populous city in the world and the largest in India, it is now being confronted with population growth and urbanisation. Authorities are launching investment programs to develop water and sanitation infrastructure and to implement an efficient powerful water distribution service. The goal is to guarantee access to drinking water for a quickly growing population and to reduce water leakage due to obsolete installations.

Since more than 20 years, SUEZ has been assisting the Delhi Jal Board, the authority in charge of water management in New Delhi, in the development of infrastructure aimed at improving access to drinking water and sanitation.

In doing so, SUEZ built and now operates two drinking water production facilities of a total capacity of nearly 700,000 m³/day. These include the Sonia Vihar facility, with its 635,000 m³/day capacity, and the Wazirabad plant (55,000 m³/day). Both plants provide water to more than 4 million inhabitants. Since March 2017, SUEZ has also been providing continuous (24/7) access to water to 400,000 inhabitants in the Malviya Nagar neighbourhood, as part of a contract the company won in 2012.

The Group also built and operates five wastewater treatment facilities, totalling a capacity of 400,000 m³/day.

SUEZ to assist Delhi with the development of its sanitation infrastructure

Confronted with a growing population in the Delhi area, India’s government is investing in infrastructure and services to improve the quality of wastewater discharges in the environment. From this initiative, the Yamuna Action Plan II (YAP-II) collaborative project was born between the Indian and Japanese governments, with the goal of restoring water quality for the Yamuna River, which provides over 70% of the city’s water.

Against this backdrop, the Delhi Jal Board assigned SUEZ a contract in 2013 in the area of Delhi Gate Nalla for the construction and operation of an urban wastewater treatment plant with a capacity of 70,000 m³/day. The contract was for an amount of 29 million euros and provided for a two-year construction phase, followed by an operation and maintenance phase of 11 years. The treated wastewater is reused as make-up water for the Delhi Gate Nalla power plant, enabling the preservation of water resources to be used as drinking water for inhabitants of the city.

The Delhi Jal Board selected SUEZ for its ability to deliver a compact, modular installation without any nuisance to surrounding populations. The Group equipped the plant with two of its signature technologies: Densadeg®, a condensed, polyvalent robust decanting process and Biofor®, a compact filtration system using set biological cultures to enable a tertiary treatment and 25,000 m² limit on the floor area of the plant, an essential criterion for India’s capital city. For the first time, the plant has been equipped with a deodorisation system for the wastewater treatment system, in order to limit olfactory nuisances. Anaerobic digestion and dehydration technologies developed by SUEZ have been deployed to significantly reduce the volume of the sludge produced by the plant, by drying and then recovering energy, with a production of electricity that covers 50% of the plant’s needs.

Since 2002, SUEZ has also been operating the Rithala wastewater plant, one of the first plants in India to be nearly self-sufficient in energy, thanks to energy recovery of sewage sludge by anaerobic digestion. This enables coverage of more than 60% of the plant’s electricity needs.
**Sonia Vihar, the capital city’s largest water plant**

As part of its goal to produce **3.5 million m³** of water per day, the Delhi Jal Board entrusted SUEZ with the construction and operation of a new drinking water production plant in 2006: Sonia Vihar. The operation contract was renewed in 2017 for a duration of 10 years.

The Sonia Vihar plant supplies nearly 4 million inhabitants of Delhi’s southern and western ends. Designed and operated by SUEZ, it is India’s largest water treatment plant.

It produces **635,000 m³/day** of drinking water from the Gange and Yamuna Rivers. The plant is entirely automated with the SCADA system and is equipped with SUEZ’s proven technologies which enable production of quality drinking water from high-turbidity natural water during monsoons.

To build this plant, SUEZ incorporated the Indian authorities’ growing requirements in water quality. Such a contract enables the Delhi Jal Board, owner of the facility, to ascertain that technologies are transferred to the plant and implemented, that investment and operating costs are managed and that the works and the quality of water delivered are sustainable. The Sonia Vihar plant is emblematic of the contractual framework in which a constructor-operator can fit into a master plan defined by a client and provide all its technical expertise in a willingness to serve local development.

**Key figures:**
- Production of **635,000 m³/day** of drinking water.
- **Nearly 4 million inhabitants** served.
- 3 pre-decanter stations for raw water with high turbidity during the monsoons.
- 2 pumping stations, each providing 100% of needs in raw water.

**The Malviya Nagar project: improve the water distribution service of a New Delhi area**

In 2012, the water situation was critical in India’s capital city. As was the case in its other neighbourhoods, the 400,000 inhabitants of Delhi’s southern Malviya Nagar district only had access to water intermittently, for 3 to 8 hours per day. Additionally, the performance of the water network was 33%, versus 75% on average in France, signalling the presence of a multitude of leaks.

Working from A to Z to improve the network’s performance

In 2012, the Delhi Jal Board entrusted SUEZ with a public-private partnership to improve water distribution service in the Malviya Nagar district.

The goal of the contract is to implement SUEZ’s expertise in order to ensure continual supply of water to the district’s 400,000 inhabitants.

SUEZ provides a global service to:
- **Ensure that inhabitants of the area continuously have access to drinking water, 24/7.**
- **Improve customer service** by implementing a call centre, perfecting billing, opening customer agencies in order to ensure better proximity and more efficiently handle requests and reclamations.
- **Increase the network’s performance** and improve return rate from 33% to 85%.
Replace all water connections and counters and connect 15,000 people to the network during the first two years of the contract to provide them with access to water.

Renew 100km of the 200km of existing piping and extend the system by 26km.

Improve network performance without threatening urbanism

A new helium-based technological solution is used to detect the network’s smallest cracks, without any invasive works in neighbourhoods where urbanisation is problematic.

Train locally to build adapted governance

In parallel, SUEZ has made international experts involved in training local teams, all while paying particular attention to customer relations. A dedicated service and a centre were opened, which take calls 24/7.

Since March 2017, inhabitants of Malviya Nagar have benefitted from 24/7 water access. SUEZ has improved the performance of the network (leak management, renewal and extension of piping, etc.), connected 40,000 people to the water network and improved customer service by creating a call centre, which is open 24/7 and answers on average 170 calls per day.

Key figures:

- First district in New Delhi to have 24/7 access to drinking water.
- 100km of modernised pipework
- 26km extension of the network
- 12,000 new beneficiaries connected to the drinking water network
- +20% connections to the network recorded in four years
- A recovery rate increase from 80 to 90%.

SUEZ supports Bangalore in the sustainable management of its water resources

Bangalore, considered as "India’s Silicon Valley", has experienced 45% growth of its urban population in the space of five years, exceeding the threshold of 12 million inhabitants in 2016. This urban growth linked to the development of commercial activities has caused an explosion in the demand for drinking water provision and wastewater treatment. In order to respond to these challenges, the Bangalore Water and Sanitation Board has called on the support of SUEZ’s expertise and technologies for several years.

The Group has constructed and operates water treatment facilities with a total capacity of 1.5 million m³ per day and wastewater treatment with a capacity of 175,000 m³ per day. Since 2013, SUEZ has improved the distribution of drinking water to 500,000 inhabitants thanks to using gas helium technology to significantly reduce leaks in the network.

Wastewater treatment

In September 2017, the Bangalore Water and Sanitation Board selected SUEZ to improve sanitation infrastructures for 2 million inhabitants in the Vrishabhavathi Valley area. The Group is responsible for:

- building a new sanitation plant (150,000 m³ per day);
- rehabilitating an existing plant (150,000 m³ per day);
- and the construction of a sewage sludge treatment and recovery plant resulting from both plants. This plant will be equipped with SUEZ degremont® technologies (Sedipac™ and Digelis™) that will recover into electricity the biogas produced in order to make the plant self-sufficient.

The construction contract will be followed up with 10-year operation, resulting in a total turnover of 82 million euros.

In January 2016, SUEZ won a contract for construction, design and operation of the Kengeri wastewater treatment plant, located to the south-west of Bangalore. Financed by the Japanese
Agency for Financial Cooperation (JICA), the plant will have a capacity of 60,000 m³ per day and will treat wastewater for over 400,000 inhabitants. Design and construction works will last for 30 months and will be followed by a 7-year operation and maintenance contract, for a total of 23 million euros.

In 2013, the Bangalore Water and Sanitation Board also awarded a contract worth 12 million euros to SUEZ for the construction and operation of a tertiary wastewater treatment plant with a capacity of 40,000 m³ per day at Raja Canal. Thanks to processes enabling the reuse of treated water, the Group meets the water needs for Raja Canal’s industrial area dedicated to IT and vehicle industries.

SUEZ also provides wastewater reuse solutions for municipal use as illustrated by the Cubbon Park plant. This plant ensures optimal treatment of municipal wastewater (4,000 m³ per day) in order to facilitate recycling for irrigation of Cubbon Park, a golf course, a race track, and green spaces in the legislative headquarters of Karnataka state (Vidhana Soudha), located in the heart of Bangalore.

Production and distribution of drinking water

In January 2016, SUEZ won the construction and operation contract for two units in the TK Halli water production plant, located approximately 90km away from Bangalore. The contract includes the construction and installation of a water production unit of 300,000 m³ per day, and the rehabilitation of an existing unit of 300,000 m³ per day. These projects will last for 30 months and will be followed by 7-year operation, and globally represent a turnover of 20 million euros for SUEZ. The Group has already constructed and operates two water treatment units in this plant since 2009, producing more than 1 million m³ of drinking water per day.

SUEZ has also won a contract for construction, design and operation of the Kengeri wastewater treatment plant, located to the south-west of Bangalore. Financed by the Japanese Agency for Financial Cooperation (JICA), the plant will have a capacity of 60,000 m³ per day and will treat wastewater for over 400,000 inhabitants.

Lastly, SUEZ has also assisted the city of Bangalore to improve its water distribution services. In 2013, the Group won an 8-year contract to optimise drinking water services in a district of 500,000 inhabitants. SUEZ is responsible for carrying out water distribution network diagnostics and rehabilitation in order to reduce water loss levels, from 42% in 2013 to 16% in a period of 5 to 8 years.

Additionally, the Group is responsible for detecting leaks in a distribution system 1,750km long in the North and East of the city, with the help of helium gas technology.
Wastewater treatment plant for a food processing factory © SUEZ Water Technologies & Solutions

Press contact:
SUEZ
Catherine des Arcis
Tel: +33 1 58 81 54 23
catherine.desarcis@suez.com