

# advanced solutions for integrated waste recovery

unlocking the potential of urban resources

ready for the resource revolution



suez

# waste management, a growing challenge for the world's cities

EMERGING COUNTRIES ARE FACING MULTIPLE ISSUES ASSOCIATED WITH THE GROWTH OF URBAN WASTE

x3

waste production in fast-growing urban areas is expected to nearly triple by 2025

80%

of collected waste is disposed of in unregulated landfill sites

12%

of global methane emissions are generated by landfill sites

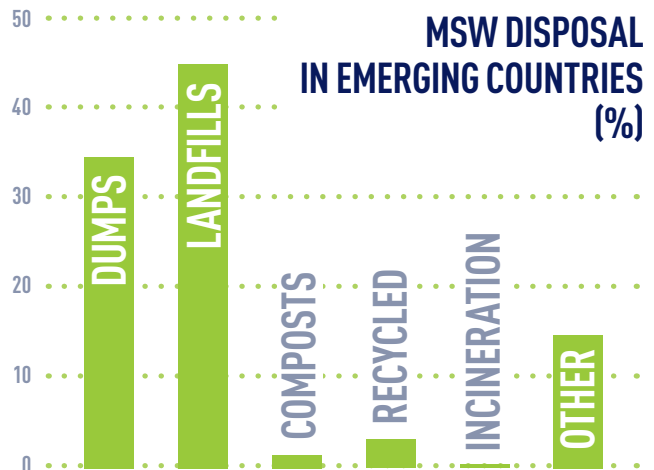
Sources:  
World Bank, 2012

As a result of **population growth, urbanization and economic development**, the world's waste production will nearly double by 2025. **Over 70% of waste will be generated in fast-growing areas.**

Today, **the vast majority of waste is disposed of in open dumps** and sub-standard landfill sites. If poorly treated, waste is hazardous for **public health** and the **environment**. It is responsible for air and soil pollution, including methane emissions, which are **21 times more powerful than CO2** in terms of greenhouse effects.

Yet despite these issues, the situation today is one of **opportunity** as innovative external financing solutions are becoming more readily available.

Improving waste management is crucial to addressing **social, economic, and environmental** challenges. That is why SUEZ has developed **ADVANCED SOLUTIONS FOR INTEGRATED WASTE RECOVERY.**





---

# advanced solutions to achieve your goals

---

## SATISFY LOCAL WASTE MANAGEMENT NEEDS AND REDUCE YOUR COMMUNITY'S ENVIRONMENTAL FOOTPRINT

- ▶ **Provide** an effective local waste treatment system and optimize the existing infrastructure
- ▶ **Protect** human health, clean the urban environment, and reduce atmospheric pollution
- ▶ **Improve** your community's well-being

## CREATE VALUE AND SUPPORT ECONOMIC DEVELOPMENT

- ▶ **Recover** the value of waste resources through reuse and recycling
- ▶ **Produce** secondary raw materials and provide new energy sources
- ▶ **Create** jobs and support the social integration of waste pickers
- ▶ **Promote** economic growth and improve quality of life

## BENEFIT FROM A FULLY-ADAPTED SOLUTION THAT IS SIMPLE TO MANAGE

- ▶ **Gain** access to high level experts in all fields
- ▶ **Acquire** know-how and expertise
- ▶ **Secure** financial resources

# UNLOCKING THE POTENTIAL OF URBAN RESOURCES



Keep this flap open to see  
our 5 solutions at a glance

# creating tailored solutions for local implementation

**ADVANCED SOLUTIONS FOR INTEGRATED WASTE RECOVERY:** efficient solutions to optimize your waste management from a world-class operator

Based on its **operational experience**, SUEZ has developed a suite of **five flexible and complementary solutions**. These services can be **customized** to meet your specific objectives.

1 2 3 4  
**5** flexible and  
complementary  
solutions



Keep this flap open to see  
our 5 solutions at a glance

ASSESSMENT & ORGANIZATION

## DIAGNOSIS & STRATEGY

Assessment, planning and monitoring of the project

## PROJECT STRUCTURING

Innovative and cost-effective financial solutions

## SECURED TREATMENT

Implementation and management of operations to reduce your environmental impact

## RESOURCE RECOVERY

Optimization of waste recovery to increase resources

## BUILDING LOCAL PARTNERSHIPS

Establishment of a professional recycling organization with waste pickers

IMPLEMENTATION & OPERATION



## know-how transfer

Our operational expertise is available to local staff



AN INTEGRATED WASTE RECOVERY SYSTEM TO CREATE NEW RESOURCES

# SMART CELLS™

Our SMART CELLS™ use simple technical solutions to convert waste into valuable materials and energy, capturing the full potential of community resources through:

- ▶ **Mechanical and manual sorting** to separate and recover valuable materials
- ▶ **Efficient pre-treatment solutions** before landfilling, transforming waste into new resources such as fuel with high calorific value, compost and fertilizers, biogas, etc.
- ▶ **Energy production** through biogas generation on the landfill site
- ▶ **Intelligent optimization systems** to increase the landfill site's energy performance
- ▶ **Tailored solutions** adapted to your local needs



# our operational expertise means you benefit from:

- ▶ An **integrated approach** coupled with our extensive experience in waste management and day-to-day operations
- ▶ A **wide range of customizable tools** that can be implemented in line with your specific requirements
- ▶ **Reliable technology**
- ▶ Our proven ability to **share knowledge** with your team
- ▶ **Global expertise** and access to international networks, offering more **visibility** to your project
- ▶ Our knowledge and leadership of the **circular economy**



## DIAGNOSIS & STRATEGY

# define a customized action plan through an in-depth analysis

SUEZ's solution is based on achieving an in-depth understanding of the local context, defining an appropriate solution, and building a customized action plan

### ASSESSMENT

- ▶ **Understand** local needs and **assess** the existing system
- ▶ **Characterize** the nature of the waste
- ▶ **Conduct** feasibility studies

### ACTION PLAN

- ▶ **Define** a customized solution by establishing the technical, social and economic benefits
- ▶ **Develop** a communication plan and engage with stakeholders to build common solutions

### MONITORING

- ▶ **Evaluate** the social, economic and environmental impact of the plan throughout the implementation phase
- ▶ **Monitor** the results and steer governance





## STAKEHOLDER TOOLKIT

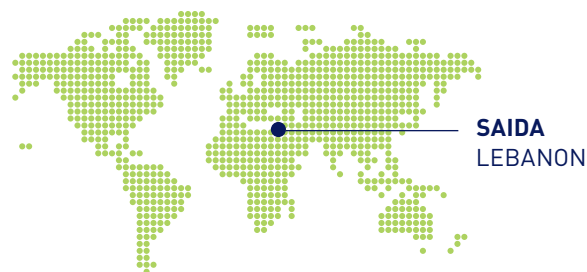
- ▶ Deploy local acceptance efforts through the mapping of stakeholders, the identification of target issues, the development of an action plan and a continued dialogue.



## BENEFITS

- ▶ **Define** a deliverable solution
- ▶ **Optimize** investments
- ▶ **Achieve** social acceptability
- ▶ **Develop** environmental awareness

## REFERENCES



# 700,000

tons of waste landfilled in safe conditions

- ▶ **40m<sup>3</sup>/day** of leachate collected and treated
- ▶ Rehabilitation of a dump site with a surface area of **3 ha**
- ▶ Mitigation of high environmental and sanitary risks
- ▶ **Assessment** and **waste characterization** studies
- ▶ Rehabilitated as a landscaped public park
- ▶ EP contract

## PROJECT STRUCTURING

# build a customized contractual model and secure financing

SUEZ's solution helps create environmental value to secure attractive financing

### STRUCTURING THE PUBLIC PRIVATE PARTNERSHIP

- ▶ **Identify** the contractual model that best suits your needs (EP, DB, DBO, BOT, etc.)
- ▶ **Get support in structuring** the financing of your project

### OPTIMIZE THE VALUE OF CARBON EMISSION REDUCTION

- ▶ **Calculate** the potential reduction in carbon emissions over the project lifecycle
- ▶ **Evaluate** benefits of carbon reduction based on existing national climate mechanisms

### IDENTIFY ATTRACTIVE FINANCING

- ▶ **Explore** potential financing options with International Financing Institutions and domestic lenders
- ▶ **Appraise** solutions focusing on climate change mitigation that offer improved conditions





## BENEFITS

- ▶ **Reduce** capital expenditure and **secure** funding
- ▶ **Increase** project profitability
- ▶ **Simplify** contractual and financing management
- ▶ **Contribute** to climate-resilient development

## REFERENCES



- ▶ **Structuring of comprehensive Public Private Partnerships (PPP)**, covering the design, financing, construction and operation of water and waste facilities
- ▶ **Innovative financial models**, associating public funding institutions and private investors
- ▶ **First BOT project in Jordan** for a wastewater treatment plant, involving **carbon credit development** and **stakeholder engagement**
- ▶ **Largest PPP tender in Poland** for the construction and operation of a municipal energy from waste plant





SECURED TREATMENT

# design, build, and operate sanitary landfills

SUEZ's solution addresses  
environmental, societal  
and economic challenges

## REHABILITATION OF DUMP SITES

- ▶ **Design** the rehabilitated site

## SITE CONSTRUCTION

- ▶ **Build** standard landfill sites with separated cells and active geomembranes
- ▶ **Comply** with health and environmental standards

## OPERATION OF THE SITE

- ▶ **Collect**, treat and monitor leachate and biogas
- ▶ **Manage** the site with support from our tools and advice from our experts
- ▶ **Benefit** from training and social engineering assistance

## LANDSCAPING & AFTERCARE

- ▶ **Treat** and monitor biogas and leachate
- ▶ **Ensure** maintenance of the site
- ▶ **Manage** aftercare provisions fund





## NOSE™

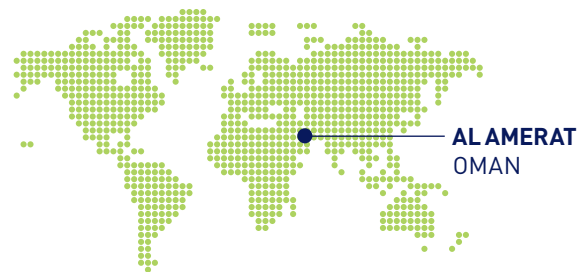
- Identify and control the olfactory impact of your activities to manage odors efficiently and sustainably.



## BENEFITS

- **Reduce** environmental pollution
- **Improve** public health and safety
- **Clean up** urban spaces
- **Gain access** to international expertise

## REFERENCES



2,4  
MT CAPACITY

- 5 year Operation & Management contract
- Collection and treatment of **biogas**
- **Odor** control system
- **100m<sup>3</sup>/day** of leachate collected and treated
- One year **aftercare service following closure**

## RESOURCE RECOVERY

# capture the value of waste and promote a circular economy

### PRE-TREATMENT AND WASTE RECOVERY

- ▶ **Increase** waste recovery through a multiple recovery system (Mechanical Biological Treatment)
- ▶ **Transform** waste into fuel with high calorific value (Solid Recovered Fuel)
- ▶ **Convert** organic waste into compost

### SORTING AND RECOVERING MATERIAL

- ▶ **Separate and recover** valuable waste through mechanical and manual sorting

### OPTIMIZATION OF SECONDARY RAW MATERIALS

- ▶ **Identify** appropriate trading channels for your recyclables

### ENERGY EFFICIENCY ON THE LANDFILL SITE

- ▶ **Produce** energy on site throughout the operating period by collecting and recovering biogas

SUEZ's solution optimizes your resources by transforming waste into secondary raw materials, compost, or energy





## EVALIX™

- ▶ The EVALIX™ system evaporates leachate using heat produced from biogas combustion, thus increasing the energy performance of a landfill site.



## BENEFITS

- ▶ **Generate** value from your waste
- ▶ **Reduce** greenhouse gases emissions and mitigate climate change
- ▶ **Provide** new power sources
- ▶ **Encourage** reuse and recycling

## REFERENCES



### EVERY DAY, ON THE WENT AND NENT LANDFILL SITES (DBO):

- ▶ **3,300 m<sup>3</sup>** of leachate treated
- ▶ **37 MWh** of electricity produced
- ▶ More than **25,000 m<sup>3</sup>** of biogas treated and transferred to a domestic gas production facility

### ORGANIC WASTE TREATMENT FACILITY (DBO):

- ▶ Daily capacity: **200 t/day of food waste**
- ▶ Production of **compost** and **biogas** (equivalent to **14 million KWh**)

A woman in a green jacket is sorting waste on a conveyor belt. The background is a blurred industrial setting with blue and yellow elements.

## BUILDING LOCAL PARTNERSHIPS

# build a professional organization with waste pickers to optimize recycling

SUEZ's solution creates a structured network for on-site sorting and recovery of recyclable materials

### DESIGN AND COORDINATION

- ▶ **Assess** the informal market for waste recycling
- ▶ **Design** a fully-adapted economic model and develop commercial partnerships
- ▶ **Provide** equipment and infrastructure

### STRUCTURING

- ▶ **Establish** a structured formal network, supported by a public authority's monitoring committee
- ▶ **Organize** training and capacity building to create a sustainable activity

### SOCIAL SUPPORT

- ▶ **Deploy** outreach and mediation efforts
- ▶ **Benefit** from social support processes
- ▶ **Establish** partnerships with specialized organizations in specific domains

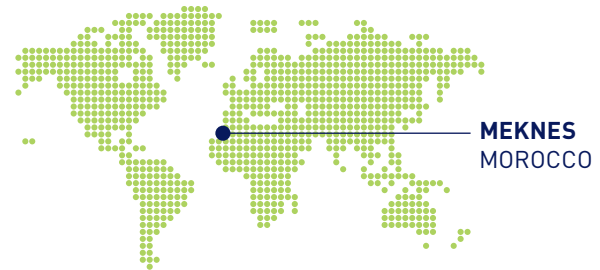




## BENEFITS

- ▶ **Increase** the operational performance of the site
- ▶ **Create** jobs and support social integration
- ▶ **Stimulate** the local economy
- ▶ **Improve** working conditions and create a healthy environment

## REFERENCES



1,000,000 POPULATION

- ▶ **Efficient** and **sustainable** household waste management:
  - **Rehabilitation** of existing landfill site (22ha)
  - **Construction** of a new landfill (30ha) and a compost plant (3,000m<sup>2</sup>)
- ▶ **Controlled** disposal ensuring no pollution
- ▶ Existing jobs **preserved** and new jobs created
- ▶ Establishment of a **cooperative** of 150 waste pickers
- ▶ **DBOF** contract



# tracking map

## SMART CELLS™ LAYOUT

define a customized  
action plan through  
an in-depth analysis

1

- ▶ ASSESSMENT
- ▶ ACTION PLAN
- ▶ MONITORING

build a customized  
contractual model  
and secure financing

2

- ▶ STRUCTURING THE PUBLIC PRIVATE PARTNERSHIP
- ▶ OPTIMIZE THE VALUE OF CARBON EMISSION REDUCTION
- ▶ IDENTIFY ATTRACTIVE FINANCING

design, build, and  
operate sanitary landfills

3

- ▶ REHABILITATION OF DUMP SITES
- ▶ SITE CONSTRUCTION
- ▶ OPERATION OF THE SITE
- ▶ LANDSCAPING & AFTERCARE

capture the value  
of waste and promote  
a circular economy

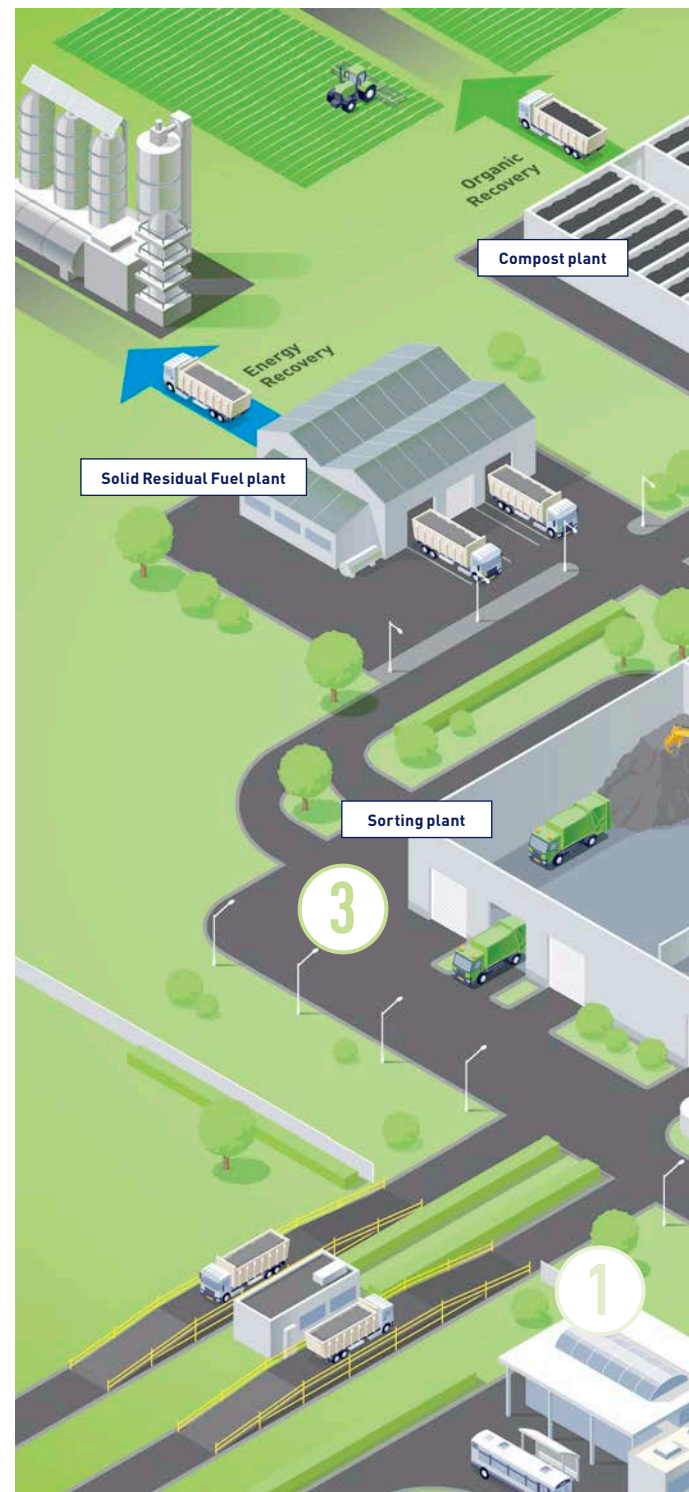
4

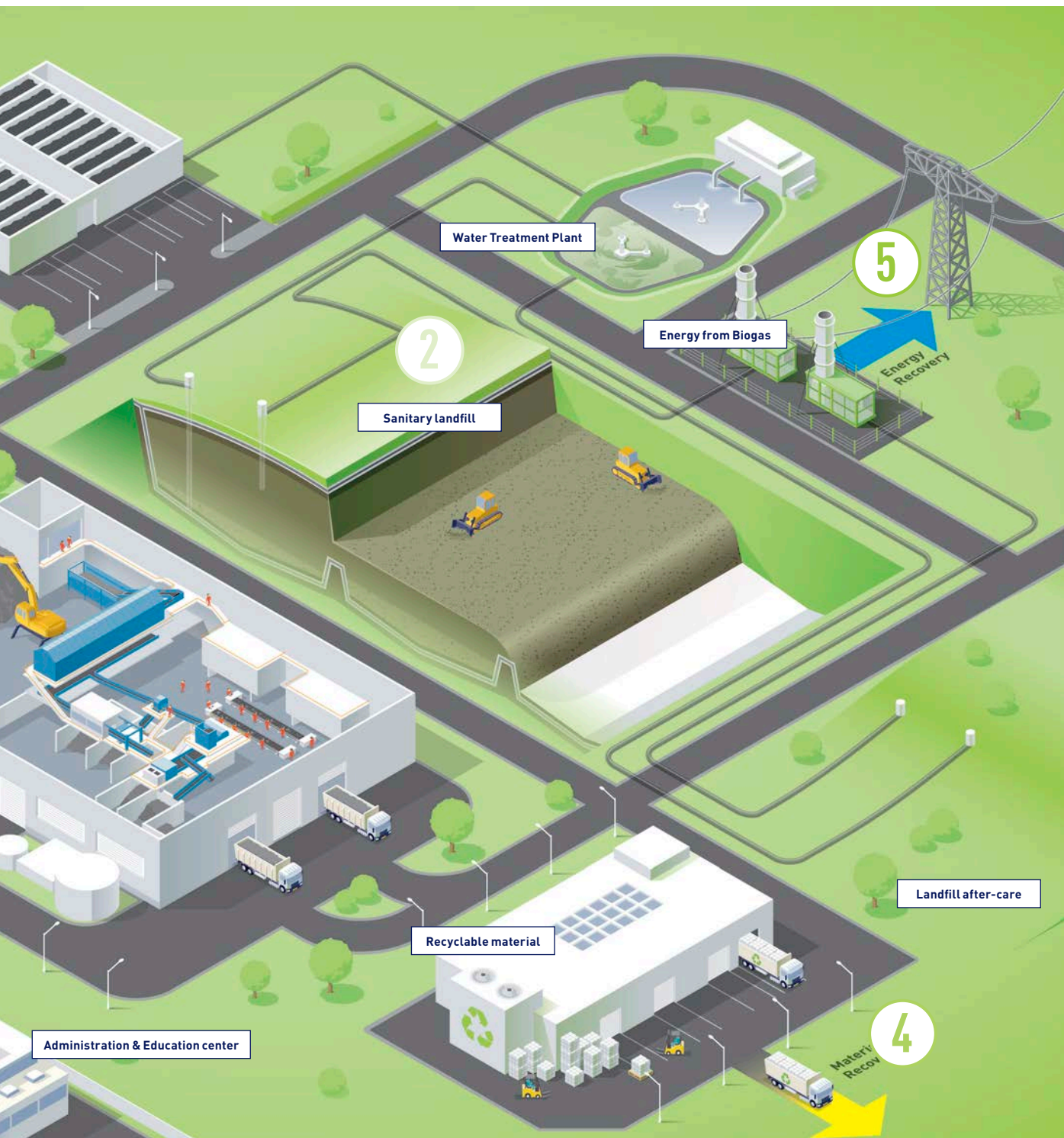
- ▶ PRE-TREATMENT AND WASTE RECOVERY
- ▶ SORTING AND RECOVERING MATERIAL
- ▶ OPTIMIZATION OF SECONDARY RAW MATERIALS
- ▶ ENERGY EFFICIENCY ON THE LANDFILL SITE

build a professional  
organization with waste  
pickers to optimize recycling

5

- ▶ DESIGN AND COORDINATION
- ▶ STRUCTURING
- ▶ SOCIAL SUPPORT







# know-how transfer sharing our expertise

**SUEZ makes its entire range of operational expertise and knowledge available to local staff.**

For years, SUEZ's global research and technical centers have been pooling their waste expertise. By leveraging the Group's extensive network and proven experience, we have developed an innovative and comprehensive approach for transferring knowledge to local operators.

**SUEZ helps you to achieve a high degree of institutional competence and full autonomy.**

Working to your specific needs, we focus on the elementary core business processes to help improve the efficiency of your waste operations. We assist you in defining, implementing, and monitoring tailored action plans for the effective transfer of knowledge to local staff.

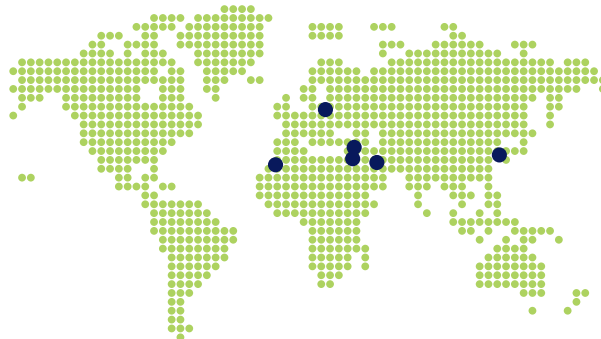


## BENEFITS

- ▶ **Achieve** a high degree of institutional competence and full autonomy
- ▶ **Transfer** relevant know-how and expertise to local staff
- ▶ **Improve** the operational efficiency of your waste management

## REFERENCES

- ▶ **400** researchers and experts around the world
- ▶ **17** research centers and over **70** research programs
- ▶ **120** research partners

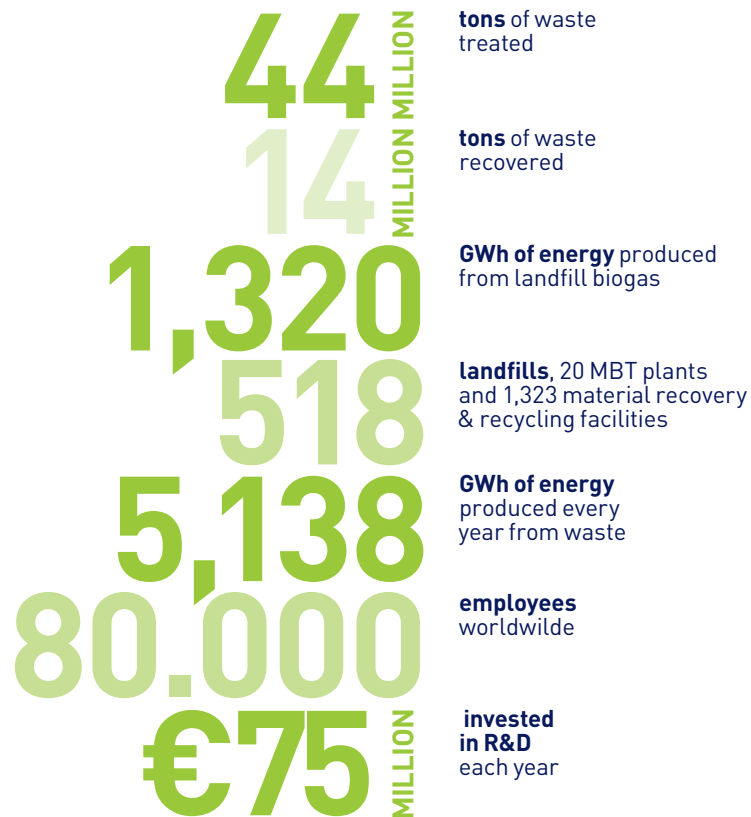




# SUEZ

## key figures

A GLOBAL LEADER IN WATER  
AND WASTE MANAGEMENT SERVICES  
OPERATING IN MORE THAN  
70 COUNTRIES ON 5 CONTINENTS  
SERVING MUNICIPAL AND INDUSTRIAL CLIENTS



## a unique profile

- ▶ Operator
- ▶ Customized & innovative solutions developer
- ▶ Solution integrator

## they trust us

Meknes (Morocco), Saïda (Lebanon), Al Amerat (Oman), Sydney (Australia), Perth (Australia), London (UK), Paris (France), Montpellier (France), Amsterdam (Netherlands), Brussels (Belgium), Hong Kong (China)...

---

[advanced.solutions@suez-env.com](mailto:advanced.solutions@suez-env.com)



ready for the resource revolution

