

# SUEZ Isle of Man Annual Public Report 2022

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# Foreword

Having overcome the challenges of the pandemic period, our team running the island's energy-from-waste facility made the most of more normal operating conditions in 2022.

It is with great pleasure that we introduce this annual report outlining those operations on Richmond Hill and the high standards of environmental protection, health and safety, and operational efficiency that SUEZ Isle of Man has sustained.

Clearing a large backlog of maintenance while maintaining excellent levels of availability and performance is a notable achievement. That effort necessitated an unprecedented four-week shutdown in the summer for a major overhaul of the operationally critical bunker crane. The temporary diversion of waste this required was handled smoothly, which is another testament to good planning and management.

It is impressive that both waste throughput and energy output were on a par with the facility's previous peak annual performance, as the facility nears the end of its second decade. More than 50,000 tonnes of waste were processed. Also, at a time of heightened concern about energy security, more than 25,000 megawatt hours of electricity were exported from Richmond Hill to the grid – enough to power more than 7,000 homes for a year<sup>1</sup>.

All this was achieved without compromising an exemplary record of environmental protection and worker safety.

We are pleased to note too how the team have been able to step up their engagement with the community. Once again, the site's visitor and education centre welcomed more than 300 local people. Our people are also active volunteers, supporting environmental conservation and the company's charitable fundraising and sponsorship. This community outreach is in keeping with our corporate ethos of balancing the interests of people, the planet and profit. Our commitment to this triple bottom line will continue now that the company's place in the SUEZ group is assured.

We thank the team, hope that you find this publication of interest and welcome your feedback.

## John Scanlon

Chief Executive Officer  
SUEZ recycling and recovery UK

## Jon Garrad

Plant Manager  
SUEZ Isle of Man

<sup>1</sup> Based on 3.509MWh average household consumption – [www.renewableuk.com/page/UKWEDEexplained](http://www.renewableuk.com/page/UKWEDEexplained)

# Introduction

This is our annual account of operations at the Isle of Man's energy-from-waste facility for the calendar year 2022.



The following chapters provide a comprehensive overview of the waste processed and energy produced on Richmond Hill, the facility's environmental performance and our company's approach to its wider corporate social responsibility.

SUEZ Isle of Man is required to report publicly on its operations by the Manx Government's Department of Infrastructure. It is also the policy of our parent company, SUEZ recycling and recovery UK, to be open and accountable to the communities we serve.

Business engagement with the community is a theme that runs through this annual report – from how we provide safe treatment solutions for problematical wastes arising on the island, to our involvement in good causes through volunteering and fundraising.

The contents of the report have been reviewed and verified independently by The Sustainable Growth Company Ltd.

## SUEZ recycling and recovery UK

SUEZ Isle of Man is a subsidiary of SUEZ recycling and recovery UK and now fully reintegrated within the global SUEZ group. This follows a long period of uncertainty over the ownership of our parent company, which ended in December 2022.

Back in May 2021, Veolia – another global environmental services corporation – agreed a large and complex deal to acquire various national waste and water operations of the SUEZ group around the world. In the UK, concerns were raised that the merger of the country's two leading providers of waste management services would lessen competition, harming the interests of local authorities and commercial and industrial customers.

In summer 2022, the UK's Competition and Markets Authority issued its final ruling that Veolia should dispose of its SUEZ waste interests in the UK to preserve competition. Although a global investment company had agreed to purchase the business from Veolia, the SUEZ group had the option under the original agreement to buy back its UK operations. This right of first refusal was invoked and the process of re-acquisition was completed at the end of the year.

Announcing the reintegration, SUEZ Group Chair and Chief Executive Officer Sabrina Soussan reaffirmed "its commitment to one of the most important waste markets in Europe". She also endorsed the strategic transformation of SUEZ recycling recovery UK in recent years, not least its development of recycling and energy recovery.

## The SUEZ group

One of the benefits of being part of the global SUEZ group is access to world-leading expertise.

For more than 160 years, SUEZ has been delivering essential services, developing innovative solutions to protect the environment and improve people's quality of life. With 44,000 employees across five continents, the group carries out research and development at nine technical and innovation centres in Europe and Asia.

In 2021, SUEZ generated 3.1 terawatt hours (TWh) of energy from waste and wastewater, and it avoided emissions equivalent to 4.2 million tonnes of carbon dioxide on behalf of its customers<sup>2</sup>.

The strategies of all group companies are guided by a sustainable development roadmap. Updated in January 2023, it sets out new ambitions with respect to climate change, social responsibility and natural resources for the period 2023-2027.

Among its 24 commitments, notable targets for these three pillars include:

- » **Climate:** A 26% reduction in greenhouse gas emissions from waste activities by 2030, and investment of €40 million in research and development dedicated to carbon capture and storage.
- » **Nature:** Double the area of land restored every year to combat soil artificialisation.
- » **Social:** By 2027, as part of the ongoing commitment to promoting social inclusion, 5,000 people each year will benefit from vocational integration through jobs and training.

<sup>2</sup> [www.suez.com/en/about-us/group](http://www.suez.com/en/about-us/group)

## Our values



### Respect

We care, we can be our authentic selves, we're compassionate, we're ethical and we're honest. We act to keep everyone safe and well.



### Team spirit

Together, we work, we collaborate, we problem solve, we support, we encourage and we celebrate.



### Commitment to the environment

We preserve, restore and protect our planet. We act to reduce, reuse, recycle and recover resources.



### Customer focus

We're dedicated, focused and creative. We innovate, we advocate and we collaborate with our customers for the environment.



## A sustainable model

The business of SUEZ today is very different from the waste management company that steadily grew, in the decades following its foundation in 1988, to become a UK market leader.

SUEZ in the UK was an early advocate of the need, in a world of depleting natural capital, to treat waste as a resource to be managed. The company reinvented its business to support this transition – from a linear model of ‘take, make and waste’ to a circular economy, that reuses, recycles and recovers maximum value from materials.

Putting the diverse waste streams of modern industry and society to good use has involved significant investment and innovation. What was a waste collection and disposal business, now generates energy from residual waste across Britain and on this island, while also manufacturing alternative fuels, composting green and food waste, and facilitating the re-use of materials, as well as recycling them.

In these and other ways, we help our customers make the best possible use of their waste, while also protecting the environment from pollution and reducing their carbon footprint.

The company’s business model is designed to balance the ‘triple bottom line’ of planet, people and profit. Its evolution continues with a new emphasis on maximising the social value of the company’s activities and collaboration with community enterprises (see section four).

## UK operations

SUEZ recycling and recovery UK serves millions of residents and over 25,000 business customers. More than 5,000 people are employed, handling and processing some 10 million tonnes of waste each year.

The value recovered from these waste streams is significant, and includes:

- » **More than six million tonnes diverted from landfill for re-use, recycling or recovery**
- » **418,000 items (mainly household goods) reclaimed for re-use**
- » **1.7 million megawatt hours (MWh) of electricity (enough to power 469,000 homes)**
- » **322,000 megawatt hours (MWh) of thermal energy**

## UK infrastructure

Richmond Hill is one of 10 energy-from-waste facilities managed by SUEZ in the British Isles. They are part of a diverse network including other advanced technologies, such as anaerobic digestion and gasification.

This infrastructure for processing and handling resources spans more than 300 locations.



## Other developments in 2022

As an industry leader, SUEZ recycling and recovery UK uses its position to promote policies and practices that support the circular economy and sustainability. The company commissions original research, publishes reports and hosts webinars on various topics for this purpose.

For example, a guide we launched in December 2022 shows how local authorities can promote the re-use of discarded household goods at their household waste recycling centres.

Many thousands of pre-loved items – from furniture to household appliances – could be refurbished and repaired for re-sale. By making re-use more accessible to local communities, local authorities can generate economic and social value as well as benefitting the environment.

The guide builds on the recommendations of a report SUEZ published earlier in the year, called *The stuff of life*<sup>3</sup>, which analysed the problem of overconsumption. Its practical advice is based on real experience. SUEZ manages 29 re-use shops around the UK, many of them at or near household waste recycling centres. In Greater Manchester, SUEZ has developed the country's largest re-use operation in partnership with the combined authority and local councils. Items collected at household waste recycling centres – from bikes to electrical goods – are refurbished at a central Renew Hub and re-sold at discounted prices through a network of Renew shops.

During the year, there was no pause either in plans to invest in the company's infrastructure and advanced technologies for decarbonisation – two notable examples:

- » Preparations for the UK's first carbon capture and storage (CCS) plant for energy-from-waste progressed. In November 2022, SUEZ launched a three-week local consultation ahead of a planning application to Stockton-on-Tees Council<sup>4</sup>. The carbon capture and storage plant would transport carbon from the SUEZ facility at Billingham via a pipeline to a geological site in the North Sea. It is part of the wider East Coast Cluster project to decarbonise local industry, which received the green light for government funding earlier in the year. Removing more than 90% of fossil and biogenic CO<sub>2</sub> emissions from the energy-from-waste facility, the process will be self-sufficient, running on power and steam from the SUEZ facility.
- » Another major planning application was announced for an anaerobic digestion facility, the company's second. The new facility at the SUEZ resource recovery park in Darwen, Lancashire, would turn food waste into green energy, drastically reducing the county's reliance on landfill. Compost-like soil improver is the other by-product of the anaerobic digestion process. Planning approval would allow the facility to be developed promptly following an expected UK government policy change to require segregated food waste collections.

<sup>3</sup> [www.suez.co.uk/en-gb/news/press-releases/220929-the-stuff-of-life-new-suez-report-sets-out-asks-of-government-to-reduce-consumption-and-help-households-reduce-expenditure](https://www.suez.co.uk/en-gb/news/press-releases/220929-the-stuff-of-life-new-suez-report-sets-out-asks-of-government-to-reduce-consumption-and-help-households-reduce-expenditure)

<sup>4</sup> <https://www.suez.co.uk/en-gb/news/press-releases/221123-suez-consults-on-plan-to-build-new-carbon-capture-plant-next-to-its-existing-facility-in-billingham>

## Purpose and principles

**The SUEZ triple bottom line strategy, our vision and purpose – building a sustainable future that doesn't cost the earth – are clear.**

To guide our progress, the company follows a series of principles and commitments.

These eight themes focus on the areas where business decisions can have the greatest impacts. They were agreed following wide engagement with employees, customers and communities.

## Lead by example

Embed the environment and social value at the core of how we do business, to make an increased difference year-on-year.

## Employees

Create a network of sustainability champions to empower and support employee action and develop our understanding of the key issues we face.

## Carbon

Reduce the carbon emission intensity for each tonne of waste we handle for our customers and our own activities per employee year-on-year.

## Re-use

Expand our network of re-use facilities to increase the volume of items reused, repaired or repurposed.

## Supply chain

Improve the environmental, social and economic impact of our supply chain year-on-year.

## Communities

Continue to be a good neighbour in the local community, taking part in local events and increasing what we spend with local suppliers.

## Biodiversity

Take action at every SUEZ location to improve its natural environment.

## Education

Share our knowledge and expertise to develop the resources sector, influence public behaviour and build a future workforce as part of the UK's creation of a sustainable future.

## Manx waste management

Energy-from-waste is central to the Isle of Man's waste strategy.

The vast majority of residual waste from households and businesses on the island is transported to Richmond Hill for processing. Other waste streams that cannot be recycled also form part of the feedstock used to generate electricity at the facility.

Approved by Tynwald in July 2018 and reviewed regularly, the strategy addresses the sustainability challenges for a small island economy.

Regulations in the UK or European Union that place obligations on packaging producers do not apply to our imported goods. Nor do manufacturers' take-back schemes. Access to markets for recyclable materials and waste electrical and electronic equipment (WEEE) is subject to regulatory and commercial uncertainties. Without economies of scale, specialist treatment facilities for hazardous waste or other challenging waste streams are not viable.

Manx strategy seeks to optimise sustainability and self-sufficiency within these constraints. As well as residual municipal and trade waste, our facility can safely process a range of other waste materials. These include clinical wastes from hospitals and other healthcare facilities, bio-pellets from the island's sewage treatment plant, and meat and bone meal from the animal waste processing plant. Energy is also recovered from used tyres, which have a high calorific value, and from waste oils.

As an additional power plant, the energy-from-waste facility contributes to the Isle of Man's energy security as well as its self-sufficiency in managing its own waste.


The current operating contract for the facility expires in August 2029. Richmond Hill will retain its essential role in the Manx strategy for waste management and sustainability, provided it continues to comply with emissions standards and operate to high standards of efficiency.



# Managing waste

There was a valuable increase in electricity exported to the island's grid in 2022 as the facility operated at high levels of efficiency.





Day-to-day operations are the focus of this chapter – from the waste received at Richmond Hill to the outputs and by-products of the facility. We also outline the major maintenance works undertaken over the year, report on our resource consumption and describe the process of generating energy from waste.

## The energy-from-waste process

Our facility uses a range of technologies designed to recover maximum energy from mixed wastes efficiently while safeguarding safety and the environment.

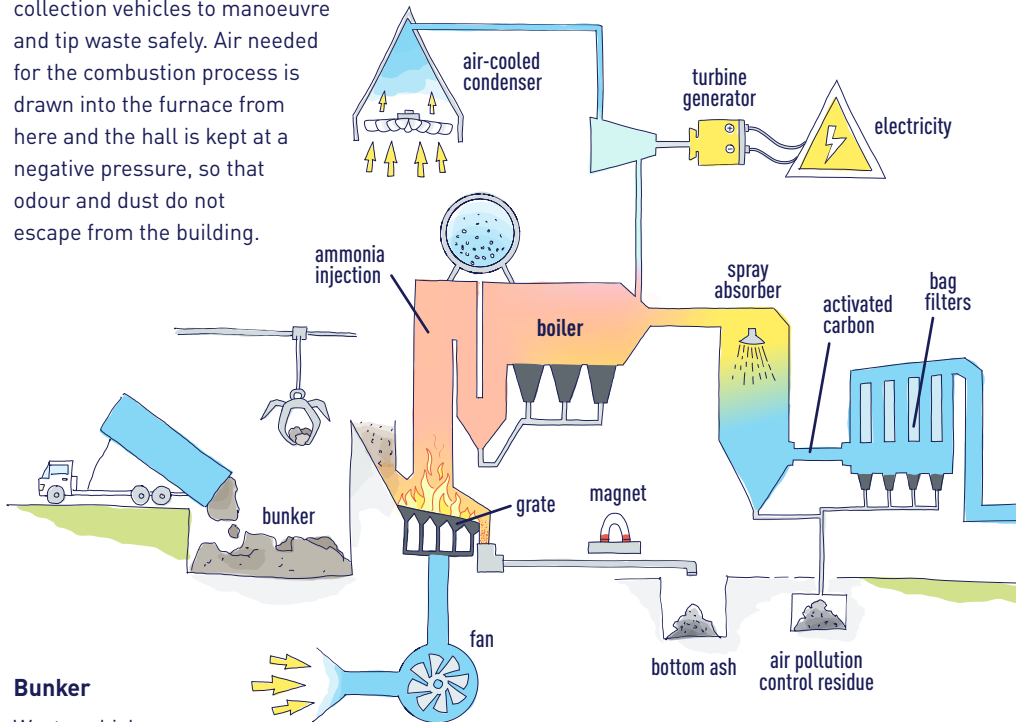
The primary processing line can treat up to 60,000 tonnes per year – mainly municipal and commercial waste, but also certain other materials. A secondary line was designed for animal, clinical and waste oils, with an annual capacity of 5,000 tonnes. Animal waste is now processed at the animal waste processing plant operated by the Department of Infrastructure, so the secondary line is only required to operate for short periods.

Waste is burned at temperatures of over 850°C in the furnace of the primary line, while on the secondary line, the minimum operating temperature rises to 1,000°C in its secondary chamber, where volatile gases are incinerated. These thresholds are set out in the EU Industrial Emissions Directive, which is designed to ensure the safe operation of processing facilities and destruction of waste.

On arrival at Richmond Hill, waste vehicles use an automatic weighbridge set back from the site entrance, so that vehicles do not have to queue on the public highway. Waste type and amount, as well as customer details, are recorded and the driver is directed to the appropriate delivery bay.

### Reception hall

A large reception hall allows refuse collection vehicles to manoeuvre and tip waste safely. Air needed for the combustion process is drawn into the furnace from here and the hall is kept at a negative pressure, so that odour and dust do not escape from the building.



### Bunker

Waste vehicles reverse to a wheel-stop and tip their loads into a large concrete bunker. At 60,000 tonnes of waste delivered per year, this is big enough to hold 16 days' waste, so that tipping can continue when the facility is shut down for maintenance. A shredder, for bulky items such as mattresses, also discharges material directly into the bunker.

### Control room

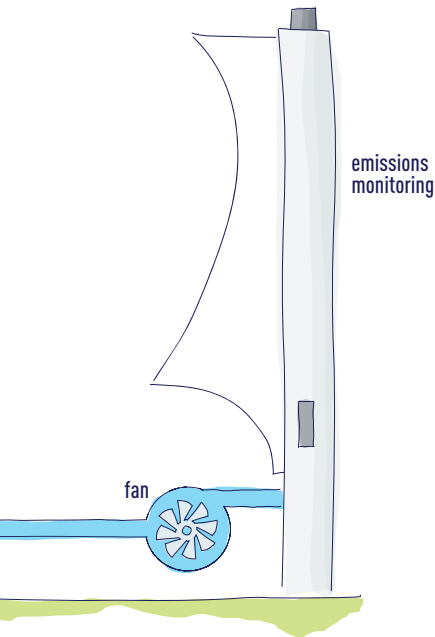
The facility's control room centralises the operation of all equipment, including the grab crane used to mix and load waste into a hopper that feeds the furnace. All on-site functions are monitored both automatically and manually. Control systems verify in real time that equipment is functioning properly, continuously monitor the combustion gas and maximise the efficiency of the entire energy-from-waste process.

### Grate and boiler

Combustion air is blown up into the bottom of the water-cooled grate through five computer-controlled zones. The thermal energy released from the burning is used to convert water into super-heated steam. At high pressure, this steam drives a turbine-alternator to generate electricity.

## Electricity generation

Electricity is generated at 11kV. At full capacity, around 1.5 megawatts is used to power the facility, leaving up to 5.5 megawatts for export to the Manx Utilities Authority, which distributes it around the island. The facility's switchgear is designed to protect the island's supplies from interruption.



## Bottom ash

Ash left on the grate after incineration is carried by conveyor, after quenching, to a storage bunker. A magnet above the conveyor extracts ferrous material for recycling. The remaining bottom ash is sampled for contaminants before being removed for disposal to landfill.

## Air-cooled condensers

After exiting the turbine, the steam is cooled and condensed back into water through air condensers. This recovered water is treated and reused in the boilers to produce more steam.

## Emission control

The gases from the furnace are subject to a rigorous cleaning process involving selective non-catalytic reduction, spray absorbers and active carbon injection. This removes oxides of nitrogen, acidic gases, dioxins and heavy metals from the gas stream.

## Air pollution control residue

The cleaned gas is passed through fine-fabric bag filters to remove solid particles before it is emitted through the stack. The resultant air pollution control residue, or fly-ash, contains particles from the incineration process, lime used in the spray absorbers, salts and carbon dust. It is analysed for contaminants and stored in a sealed silo or bags (approved under international rules for the carriage of dangerous goods) until it is collected for disposal in specialist, authorised facilities.

## Emissions monitoring

As they pass through the stack, the residual flue gases from the process are continuously monitored before release. This data is relayed automatically to the control room and to a secure recorder.

The facility's emissions management systems and performance are described in section three, while the summary emissions data for 2022 is set out in the tables at the end of section five.

## Our operations

After the disruption of the previous two years due to the pandemic, 2022 was an opportunity to carry out works that had to be postponed, while dealing with the day-to-day challenges of operating a complex energy-from-waste facility.

As normal, there were two scheduled shutdowns for essential maintenance. On seven other occasions, processing of waste had to be suspended due to a variety of causes. These included: a tube leak, two crane failures, a trip of the computer management system, two instances of high sulphur dioxide (requiring waste processing to be stopped to bring the levels of the gas down) and a blockage of the deslagger, which quenches ash from the grate and discharges it onto a moving conveyor.

Deslagger blockages caused by non-compliant waste, such as large sheets of metal or oversize wood, have been a persistent problem over the years. As described in our 2021 report, we took special measures with the support of the Department of Infrastructure and the Department of Environment, Food and Agriculture. Having renewed our efforts to educate customers and drivers about prohibited items, we increased the number of spot checks on incoming loads.

One of the main problematical substances in recent years has been plasterboard, which is made from gypsum. When processed at the facility, this emits high levels of sulphur dioxide (SO<sub>2</sub>), a toxic gas and significant air pollutant. The flue gas treatment system is designed to reduce these acid gases to acceptable limits set out in our licence. However, gypsum produces high levels that can overwhelm gas scrubbing systems. Early in the new year, there were several severe spikes in sulphur dioxide attributable to a high concentration of gypsum dust in some consignments. This also led to two deslagger blockages in the spring caused by concrete-like ash, which our operations team was able to clear without taking the facility offline. Laboratory analysis of dust samples confirmed high levels of gypsum present in the ash.

Following the introduction of 100% checks on skip loads from 11 January 2022, sulphur dioxide limits were not exceeded again for the rest of the year, and further enforced shutdowns were avoided. However, there were two more incidents – in November and December 2022 – when the team had to temporarily stop feeding waste and switch to burning virgin gas oil to avoid an exceedance of the emission limit.

The most likely underlying cause of these episodes is the shredding of plasterboard by some companies, underlining the need for continued close monitoring and sanctions to deter attempts to conceal this non-compliant waste.

## Scheduled maintenance

The first of our two planned shutdowns for maintenance lasted a week, beginning on 28 February 2022. Our main purpose was to upgrade the burner on our primary line to use waste oil as well as virgin gas oil. As the secondary line now only operates for limited periods when required to treat clinical waste, it is essential to maintain a safe disposal route for the island's waste oils. Modifications to the burner have removed the risk of storage capacity proving insufficient for the used oils arising from local manufacturing, the motor trade and other sources. It also means that the amount of virgin oil required to maintain operating temperature can be reduced at certain times when waste is not being processed.

An extended shutdown was planned for the summer to accommodate a major overhaul of the grab crane used to load waste onto the furnace grate. Lasting a month – from mid-June to 17 July 2022 – this was an unprecedented interruption to the round-the-clock operations of the facility. It required long-term planning, close consultation with stakeholders and the partial diversion of incoming waste.

Other essential but more routine maintenance tasks involved replacing the second and third-pass boiler tubes, and a broken screw mechanism that moves bottom ash from its hopper onto a conveyor. The long list of scheduled works included the replacement of the left and rear boiler wall, the facility's two compressors and new bag filter socks for trapping particulates. Repairs were made to the furnace refractory, feed chute and water-cooled grate. Various inspections were carried out involving pressure systems, the inside of the storage vessel for ammonia and a thickness survey of the boiler walls. A new system for purifying water for the boiler was also commissioned.

## Significant overhaul

Years of planning preceded the major overhaul of the waste grab crane, finally completed in summer 2022.

Daily operations depend on the crane, which is used to mix materials and continuously feed the furnace grate, so the feedstock burns efficiently. The crane's reliability had deteriorated in recent years and its electrical systems had become obsolete. Replacing these, while overhauling the mechanical elements (which were in acceptable condition), was not practicable during the pandemic.

As the manufacturer Kone Cranes required up to four weeks to carry out the work, the bunker could not accommodate continued tipping of waste deliveries over such an extended shutdown without the use of the waste crane to stack the waste.

Our solution – approved by the Department of Environment, Food and Agriculture – was to divert part of the waste to a temporary storage site. Putrescible waste would continue to be tipped into the pit, while other wastes could be stored at the Middle Park Recycling site adjacent to our facility.

The operation worked extremely well, thanks to careful planning, hauliers' cooperation and close supervision on both sites. Only inert, non-putrescible materials that posed no risk of offensive odours or attracting vermin were stored offsite. Any mixed loads potentially containing putrescible waste were directed to the pit.

As well as upgraded hardware, the crane now has a more sophisticated control system and more accurate weighing and position-sensing systems. These are maintained and supported remotely by Kone engineers from Germany as part of an ongoing service and support contract.

## Operational efficiency

The way we plan and manage maintenance has evolved since the facility was commissioned in 2004 – in line with best practice within the SUEZ energy division and the industry, and our lean continuous improvement programme.

Annual operational efficiency targets have also driven changes, while the onus on minimising equipment failures increases as the facility's plant and equipment age.

Our maintenance team uses portable devices to measure vibration in pumps, motors, fans and other plant with rotating components. These readings are analysed to assess the serviceability of the assets and identify deterioration. All maintenance works and repairs are tracked on our Mainsaver computer system. We also review maintenance intervals and records with a view to pre-empting equipment failures.

Two main targets are set each year to benchmark maintenance performance:

» Overall equipment effectiveness (OEE) is gauged by quantifying the availability and downtime for critical items of plant and equipment. The target for 2022 was ratcheted up once again – to 64.08% (from 62.43% the year before, and 61.88% in 2020). We surpassed this with an actual score of 70.89% – a highly creditable performance. It was achieved while clearing a backlog of overdue maintenance work caused by supply chain constraints due to COVID-19 over the two previous years.

» Our other indicator – first introduced for 2019 – measures preventative as opposed to reactive maintenance. The team was set a target of 90% and achieved 94.4%. Again, this marks a return to business as usual after 2021 when this benchmark for asset health monitoring and compliance was missed due to disrupted parts supplies and non-availability of specialist engineering contractors.

Our asset management is also accredited under the international standard ISO 55001. We were first audited against this benchmark in 2021, after SUEZ recycling and recovery UK gained registration. The next independent assessment is due in 2023.

An internal SUEZ audit of mobile plant was carried out in February 2022. This identified some upgrades to equipment, which were carried out immediately.

## Continuous improvement

Our continuous improvement strategy is based on the principles and processes of 'lean' thinking pioneered in the automotive manufacturing sector. Staff are trained to identify any wasteful element in our ways of working and encouraged to share ideas for improving efficiency and safety. Best practice is also shared across the company.

SUEZ audits lean performance to assess the continuous improvement programmes at its sites. Our facility achieved an overall score of 90.5% in 2022 – well over the 80% target.

SUEZ Isle of Man set a target of completing five improvement projects during the year (some already mentioned). They were:

### » **Installation of the new oil burner**

Enabling the primary line to burn waste oil ensures that stocks of used oils can be managed while also reducing consumption of virgin oil.

### » **Recovery of additional metals from incinerator bottom ash**

An overband magnet extracts larger pieces of ferrous metal within the facility. Other fragments, including non-ferrous metals, remain mixed through the incinerator bottom ash, which is transported to the Turkeylands landfill site for maturation and storage. To recover these metals would require the use of specialist equipment, including an eddy current separator as well as magnets.

In the UK, SUEZ processes more than a million tonnes of incinerator bottom ash each year. Drawing on this expertise, we commissioned a specialist contractor to process the ash. More than 1,200 tonnes of ferrous and 760 tonnes of non-ferrous metals were recovered and shipped to the UK for recycling. This project was a joint venture with the Department of Infrastructure and a good example of the high level of collaboration between SUEZ and Government departments. Our team has also identified opportunities to improve storage at Turkeylands to facilitate future operations when incinerator bottom ash stocks again reach levels viable for specialist recovery.



» **Re-use of reverse osmosis wastewater**

A new purification plant for boiler water was commissioned early in the year. Using reverse osmosis to demineralise water, it replaces an ion exchange system. Although far superior in terms of water purity and output, the reverse osmosis process produces wastewater, which is normally discharged to drains on industrial sites. To make good use of this by-product, we diverted the drain line to our site's process water pipe, so it can be used for slaking lime in gas scrubbing. Diverting this wastewater to our recycled water system will reduce mains water usage during dry periods of the year when the rainwater harvesting system is unable to supply the demand of the facility.

» **Touch-screen walkthroughs in the visitor centre**

Visitors with mobility issues and young children unable to access the plant area can now undertake a virtual walk through the facility, viewing plant and operations remotely on screens while learning from virtual tour guides about the process.

» **Waste grab crane upgrade**

To further improve the reliability of the refurbished waste crane, this project involved moving the cabinets housing its controls away from the waste pit area. This lessens the risk of electrical failures due to dust.

» **An electronic permit to work system**

Before any works are carried out by our maintenance team or external contractors, permission is required from the 'Senior Authorised Person'. Supporting documentation – including risk assessments and method statements – is checked before issuing a permit to work. During scheduled shutdowns, as many as 50 hand-written permits may need to be issued per day, some of them duplicates – such as permits for working in confined spaces, which are time-limited and often have to be re-issued. Implemented at the end of 2022, the electronic system not only streamlines a bureaucratic process, but also standardises the list of items required for specific tasks across all SUEZ energy-from-waste facilities.

## What we processed

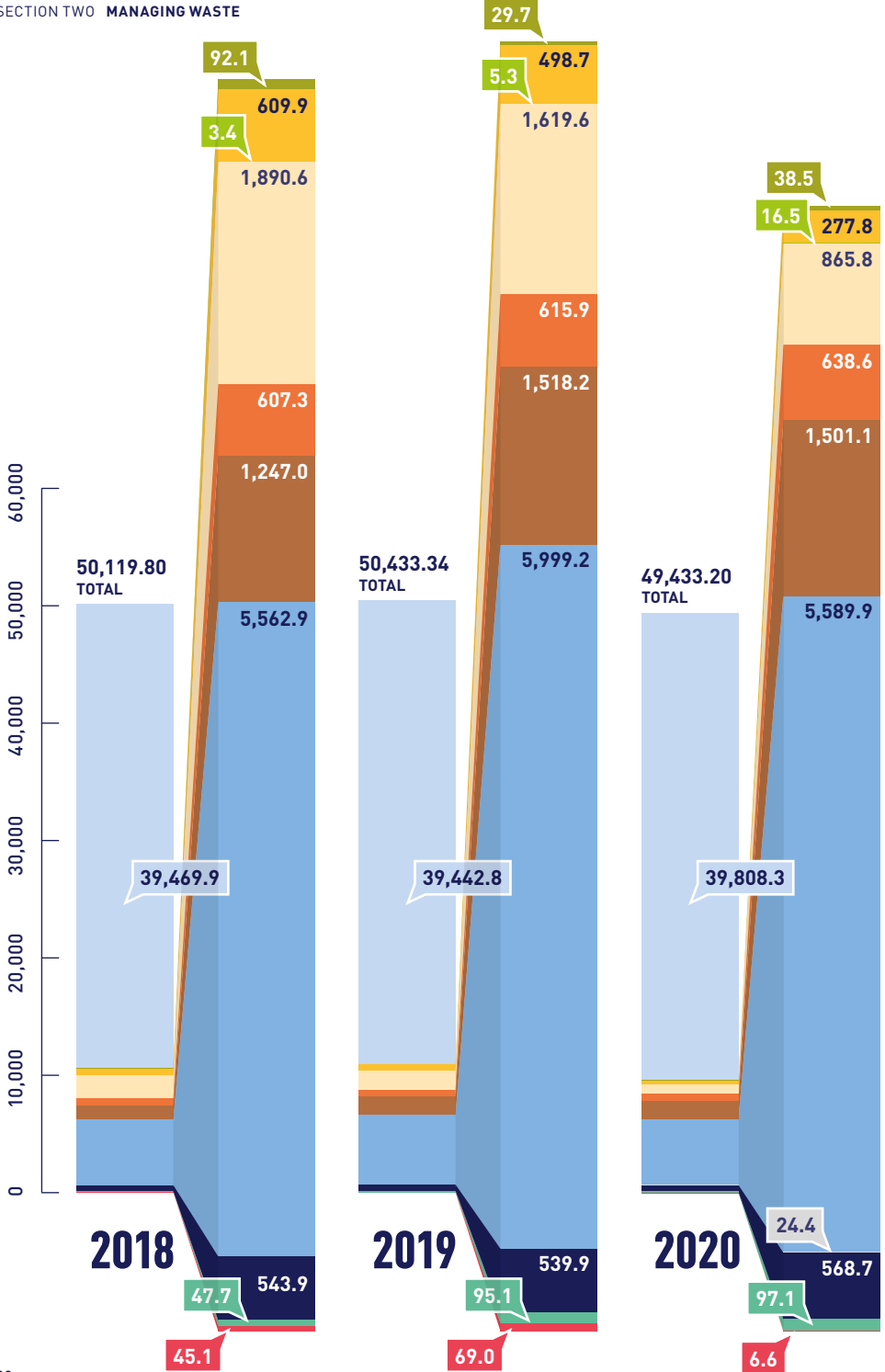
The throughput of waste declined slightly in 2022 as the facility recovered energy from 50,895 tonnes of materials.

More than 41,000 tonnes of municipal waste arrived at site, a slight decrease from 2021 but still higher than previous years. There was a sharp reduction in packaging materials – down around 40% by over 360 tonnes. Another notable change was in arisings from construction – this waste stream increased by more than 50% to almost 295 tonnes.

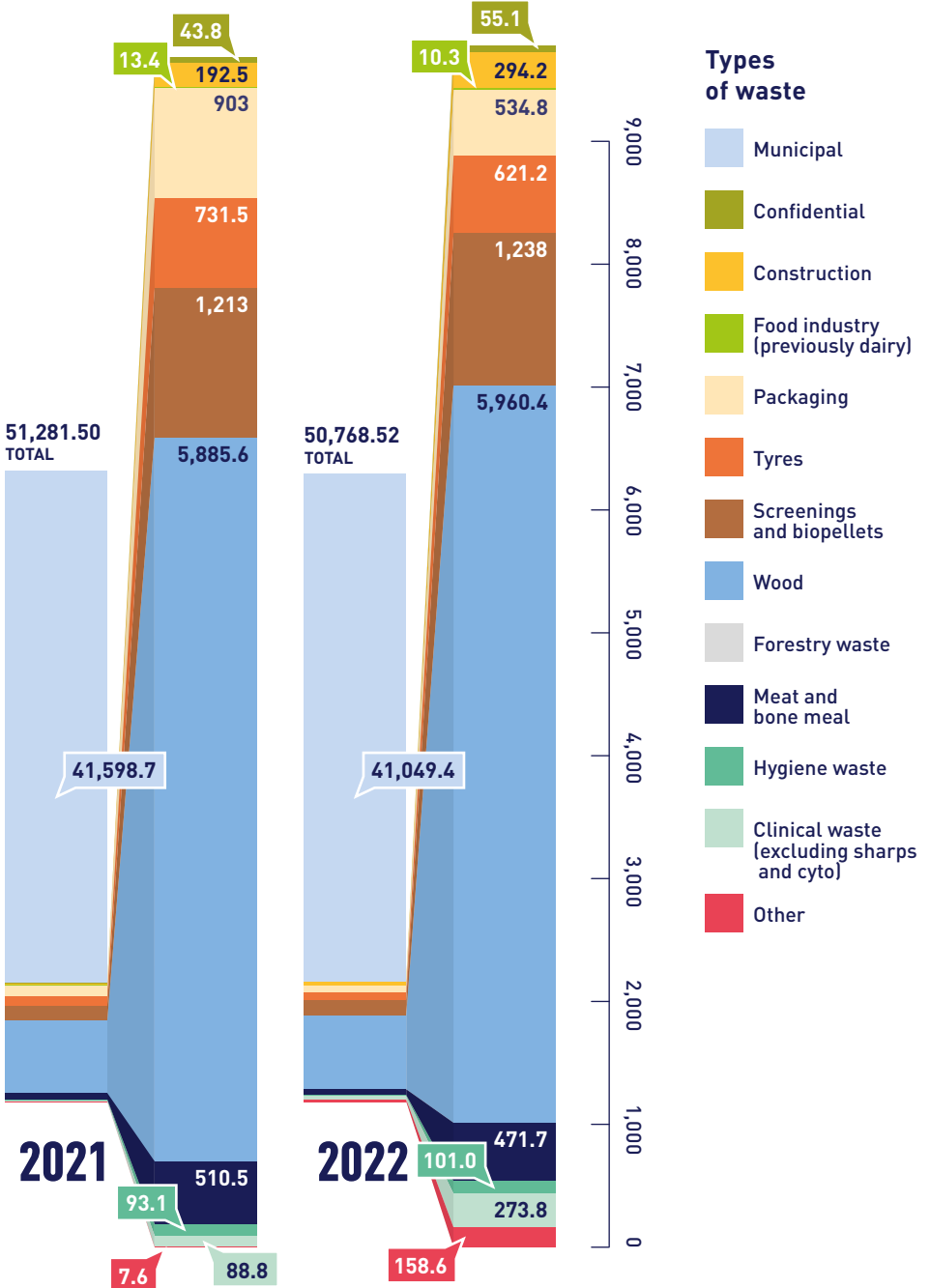
On the secondary line, the amount of clinical waste processed was just a fifth of the 2021 total, at around 57 tonnes. Clinical bagged waste was processed via the primary line to reduce the number of heating cycles required on the secondary line and therefore prolong its life. Only three short periods of operation were required to process the total throughput of 126 tonnes, including waste oils.





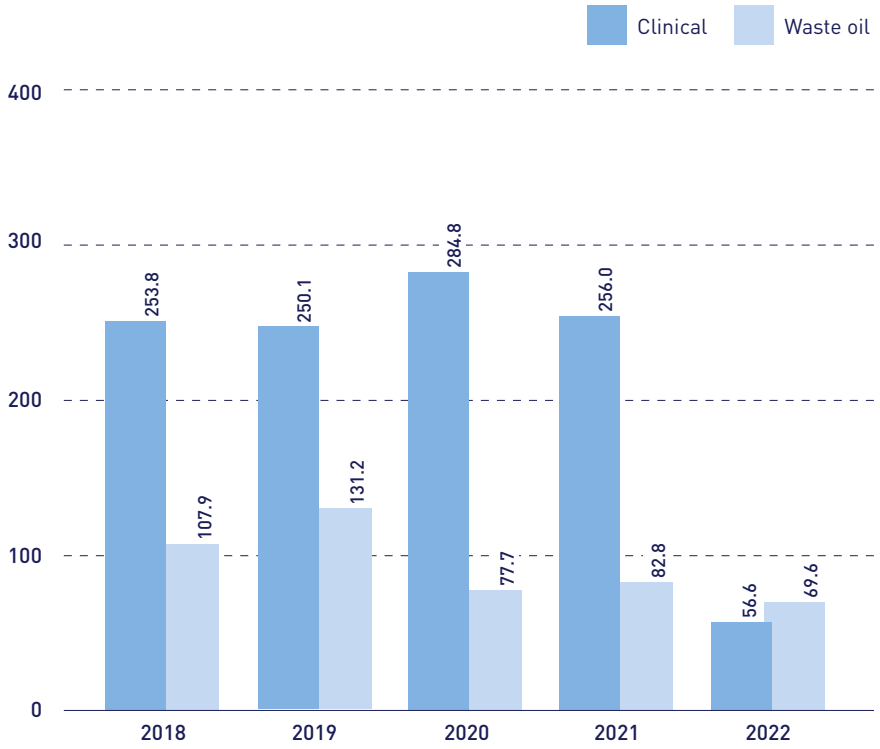


Waste delivered to the primary line (tonnes)





Waste incinerated in the secondary line (tonnes)



## Generating energy

More than 25,000 megawatt hours of electricity was generated over the year. This is in line with the pattern before 2021, when major maintenance on the turbine cut power output by around 20%.

Only 620 megawatt hours of electricity had to be imported – a reduction of some 1,460 megawatt hours compared to 2021. The 2021 electrical import was high as a result of the turbine major maintenance work which required the facility to be operated for a period of time without the steam turbine and generator in operation.

The rate at which energy is generated remains just below the long-term average of 0.5 megawatt hours per tonne of waste processed.



## Other outputs and inputs

By-products of the energy-from-waste process include fly-ash, as well as bottom ash and ferrous metals. Apart from gas oil and water, the most significant resources consumed are lime, powdered activated carbon and ammonia, which are essential for cleaning flue gases before they are emitted from the stack.

### Bottom ash

The largest output by volume and weight, incinerator bottom ash is essentially an aggregate with around 5% composed of naturally occurring compounds. It can be reused as a substitute aggregate in cement-bound materials, lightweight blocks, pavement concrete or for bulk fill. The ash is sampled for contaminants before being hauled to the Turkeylands New Quarry landfill site for maturation and storage.

Overall, the total was little changed at around 9,900 tonnes, but ash was produced at a lower rate. The reduction, by about 6% compared to previous years' average, is most likely due to a change in the mix of wastes processed. Universal skip inspection and higher levels of recycling on the island may be diverting more inert wastes and glass and metal.

### Air pollution control residue

As polluting gases from the furnace are cleaned, particles in the stream are encapsulated by chemicals, and air pollution control residue, or fly-ash, is formed. This is classed as hazardous waste as it contains heavy metals and dioxins as well as lime and salts. Carbon dust is also present from the activated carbon sprayed into the flue to capture lead, chromium, arsenic and other heavy metals. Concentrations vary with the mix of wastes and prevalence of batteries. Samples are analysed each quarter. Sealed in UN-approved bags, the residue is shipped off-island in sealed containers for recovery at a specialist facility in the north-east of England.

Air pollution control residue tonnage was down 6% by more than 90 tonnes compared to 2021. The lower rate at which the residue was generated – it decreased by almost 14% – reflected the lower usage of lime per tonne of waste processed. This drop in lime consumption was due to far fewer spikes in sulphur dioxide compared to 2021.

## **Ferrous metals**

The remains of steel and iron pieces mixed within waste are captured after incineration by an overband magnet as bottom ash passes along a conveyor. Higher tonnages are being recovered for recycling since the installation of a more powerful unit in 2019. The total was 528 tonnes in 2022, but more than double that amount was recovered from stored matured ash as part of the improvement project described earlier.

## **Gas oil**

Compliant and efficient operation of the energy-from-waste process requires close control of the temperature at which wastes are destroyed. To maintain minimum levels during start-up and shutdown it is essential to burn gas oil. Non-compliant waste or other interruptions to the continuous loading of the grate can also cause temperatures to drop, triggering oil burners.

For this reason, and reduced operation of the secondary line, there was a significant drop in oil usage in 2022, a year with fewer forced shutdowns due to crane failures and deslagger blockages. Total gas oil usage was down by almost two thirds. On the primary line, consumption per tonne of waste almost halved. The ability to use waste oils on the primary line will also have contributed to the saving by replacing virgin oil for short periods. Our target of reducing usage on the primary line to the 2019 level of 190.8 tonnes was achieved – by a margin of six tonnes.

## **Water**

The facility's new water treatment system provides ultra-pure water for the boiler more rapidly and in greater quantities than the old plant. Following a series of water tube leaks during the year, the boiler had to be emptied for repairs and re-filled for pressure-testing. These two factors largely account for our heavier use of mains water in 2022, which increased by almost 40%, more than 3,600 tonnes.

Water is also used for cooling the grate of the furnace and consumed in general cleaning, offices, toilets and the visitor centre.

Our facility is designed to conserve water and protect watercourses from contamination. We store and reuse rainfall and recycle water within the energy-from-waste process. The latest example is our improvement project to reuse wastewater from the new water purification plant in lime slaking.

## Chemicals

Lime, carbon and ammonia play essential roles in keeping air emissions within their strict licensed limits. We keep consumption under review to ensure that we are managing both resources and gas scrubbing efficiently.

The year saw annual reductions in chemical consumption per tonne of waste and/or total usage.

- » Ammonia is injected into the boiler to control oxides of nitrogen (NOx). Fewer than 26 tonnes were consumed – a saving of more than 8%. Better combustion control reduced the temperature of gases in the boiler's first pass, so that the gas scrubbing system worked more efficiently, requiring less ammonia to neutralise oxides of nitrogen.
- » Activated carbon is injected into the gases from the furnace to adsorb dioxins and trace metals. Dosing is more accurate following changes to program controls and the fitting of a new eductor pump. Consumption fell below 24 tonnes, giving another 8%-plus reduction. Further work scheduled in 2023 should boost efficiency further.
- » An alkaline lime solution is sprayed in the flue to neutralise gases such as sulphur dioxide (SO<sub>2</sub>) and hydrogen chloride (HCl). While there was a small increase (based on the amount of lime delivered to the facility) compared with the year before, usage per tonne of waste was down by more than 5%. In 2021, high levels of acidic gases caused by the burning of non-conforming waste such as plasterboard were a more frequent occurrence.
- » Chemicals are no longer required to demineralise water for the boiler. The new water plant, using reverse osmosis, replaced an ion exchange system that relied on caustic acid and hydrogen chloride.

## Other activities

Our people provide ancillary services on the island, reflecting some of the broader expertise of SUEZ. We manage hazardous waste collections, storage and shipment, and also offer a secure service for the disposal of confidential waste.

## Hazardous waste

We collect hazardous wastes from producers, for storage within a purpose-built building on our site pending their onward shipment to licensed facilities in the UK.

Our expert staff analyse and classify the substances, and determine the most appropriate facility for treatment or disposal. Having assembled an economic load, they raise the appropriate transfrontier shipment notices.

There were just two hazardous waste shipments off the island in 2022. Both comprised dimethylformamide solvents used in manufacturing, which went for recycling. Various other substances – from acids to mercury – were taken into storage for shipment in 2023.

## Confidential waste

This service caters to the need of organisations to destroy records that are no longer required in a secure manner, so potentially sensitive information is protected.

An extra 11 tonnes of confidential waste were processed compared with 2021, taking the total to just over 55 tonnes. The increase most likely reflects the return of local businesses to normality after the pandemic.






# Managing environmental performance

Our team at Richmond Hill upheld the facility's track record of high environmental performance in 2022.





Here we set out the environmental impacts of energy-from-waste, and policies and procedures for managing them. This section describes our environmental management systems, licence requirements and emissions incidents during the year.

Emissions data and other relevant information is summarised in the data tables at the end of this report.

## **SUEZ environmental policy**

SUEZ recycling and recovery UK sets the policy framework that governs operations at all its sites, including our management systems and procedures.

Our company's environmental policy requires total compliance with the terms of our site licence and all relevant legislation and regulations. It also challenges us to exceed those standards wherever practicable. Objectives and targets are also set to drive continuous improvement and our performance is monitored.

All procedures governing environmental protection are set out clearly in our integrated management system, which encompasses occupational health and safety, and quality of service as well as the environment in one, unified set of rules.

## **Our integrated policy statement for environment, health, safety and quality**

SUEZ Recycling and Recovery UK Ltd recognises that how we manage our customers' and our own waste has an impact on the environment, the health and safety of our employees, persons working on our behalf, and the public. From a position of leadership in the UK's recycling and waste management industry, SUEZ is fully committed to the effective management of all such issues associated with our activities.

### **Management responsibility**

The Management Board will ensure that responsibility for environmental, health and safety, and quality issues is clearly defined and understood throughout the company. All activities will be conducted in a manner designed to: protect the health and safety of our employees, persons working on our behalf and the public; ensure the sustainable consumption of resources, mitigate the causes of climate change and biodiversity loss, and protect the environment from risk of pollution; and ensure a high quality of service for our customers.

Managers should be aware that a European Health and Safety agreement exists. This sets out the standards that the Company expects in respect of securing the health, safety and welfare of our employees and all other persons that could be affected by our business activities. A copy of the agreement can be found in the policy statement section of the SUEZ policies and procedures database.

### **Legislation**

SUEZ will comply with and wherever possible exceed existing environmental, health and safety, fleet and other pertinent legislative requirements at all stages of our business activities and operations.

### **Stakeholder relations**

SUEZ recognises the importance of our relationship with stakeholders: employees, the public, contractors, customers and shareholders. We will communicate this Policy to them, report annually on performance and engage with stakeholders so as to understand and consider their expectations in the way we manage our business.



## Continual improvement

SUEZ will monitor and measure progress by setting improvement objectives and targets to ensure continuous improvement in performance.

In order to mitigate the impact on the environment, enhance health and safety management and performance, and ensure delivery of service to all our customers, SUEZ will:

- › Commit to eliminate hazards and reduce occupational health and safety risks in order to prevent injury and ill health and promote a positive health and safety culture.
- › Ensure all of our facilities are managed in such a way as to prevent and minimise pollution and commit to providing safe and healthy working conditions for the prevention of work-related injury and ill health.
- › Seek to enhance the biodiversity on our sites.
- › Seek to minimise the environmental impact of transport use.
- › Seek to reduce the amount of energy obtained through non-renewable resources, use energy efficiently and reduce greenhouse gas emissions.
- › Seek to minimise the volume of waste generated and to maximise re-use, recycling and energy recovery from waste.
- › Implement a sustainability network to drive forwards sustainability improvements across our sites.
- › Use suppliers or contractors that have environmental and health and safety standards compatible with our own wherever possible, and maintain good customer and supplier relationships.
- › Continually reassess all the above in light of changing technology, legislation, the precautionary principle, business requirements and best practice.
- › Ensure adequate resources are provided to meet specified customer and company requirements.
- › Ensure personnel working for and on behalf of SUEZ are aware of their responsibilities and comply with our policies and procedures.
- › Regularly evaluate and review company performance and service provision.
- › Commit to consultation and participation of workers and where they exist, workers' representatives.
- › Evaluate the incident and crisis preparedness, response and recovery protocols to mitigate risk.
- › Drive forward the promotion of health and wellbeing programmes, providing resources to support our employees.

The Management Board will periodically review this policy to ensure that it continues to meet the needs and aims of the business.

## Management systems

At every stage of our activities – from waste deliveries to disposal of bottom ash – the compliant course of action is clear to staff. Our integrated quality and environmental system addresses all aspects of operating the energy-from-waste facility. It also sets out the procedures for reporting our performance to the island’s regulator.

Our management system is registered to the relevant international standards. Continued certification depends on regular independent assessments of our procedures and operations. Since we began operating, our system has continuously met the environmental requirements of ISO 14001. We also satisfy the equivalent certification for quality management – ISO 9001:2008.

In addition to this external verification, our operations are subject to auditing by the Government’s Environmental Protection Unit and by our parent company. We also perform our own internal auditing.

## Environmental compliance

SUEZ Isle of Man is committed to meeting and surpassing the standards set in all relevant UK and European legislation, as well as Manx laws and regulations.

This local legislation includes:

- » **The Public Health Act 1990**
- » **The Collection and Disposal of Waste Regulations 2000**
- » **The Import and Export of Waste Regulations 2001**
- » **The Town and Country Planning Act 1934-1991 (as amended 1999)**

Local regulation is the responsibility of the Environmental Protection Unit, which reports to the Department of Environment, Food and Agriculture.

## Compliance audits

No external compliance audits were due in 2022. The island’s Environmental Protection Unit will audit the compliance of the facility and our hazardous waste management service with the site’s waste disposal licence in 2023.

An internal SUEZ business control audit was overdue, as a result of the COVID-related restrictions. Performed in March, this integrated audit tested compliance with safety, health, environmental and quality procedures. A high score of 93.8% was achieved.

Various other audits are carried out periodically, addressing preventative maintenance, continuous improvement and the status of critical pieces of plant, such as the turbine.

## Environmental impacts

As with every industrial process, waste treatment has impacts on the environment and the potential to cause harm. The Richmond Hill facility and its management and control systems are designed to minimise those impacts. Likewise, the competency and specialist training of our personnel help ensure safe operation of the energy-from-waste process at all times.

All potentially significant impacts, both negative and positive, are assessed, reviewed and recorded in our site's Significant Environmental Impacts Register. Listed impacts include: noise, odour, delivery and storage of fuel and chemicals, and potential impacts on biodiversity, as well as emissions to air, water and land, hazardous waste, and ash residues.

Maintaining the register helps us mitigate these risks and identify possible improvements.

## Emergency planning

As part of our risk management, we test our people's response through emergency drills. The minimum number included in our targets for 2022 was four, but ten were completed over the year.

In each case, the team on duty – who receive no advance warning – had to respond to various scenarios. The emergencies simulated involved first aid, critical steam turbine alarms, a building fire, chemical spillage, tube leak, power blackout, incinerator bottom ash blockage, missing person, waste pit fire and hopper blockage.

Lessons learned from drills are noted and acted on.

## Biodiversity

Many of the procedures we follow daily – as well as the design of the energy-from-waste facility and enhancements made over the years – are geared to protecting local wildlife habitats and biodiversity.

All discharges to watercourses, as well as emissions to air, are controlled. Special measures are in place to manage the risks associated with storing oil, chemicals and hazardous wastes on site. Their handling and transportation are also subject to strict procedures and tested in emergency drills.

The latest SUEZ sustainability roadmap for 2023-2027 adds new commitments to preserve biodiversity and natural resources. These include a target to double the amount of land restored each year to combat soil artificialisation. From 2025, planning for both land restoration and development projects will systematically integrate local species.

As at other major facilities operated by SUEZ, the biodiversity action plan for Richmond Hill recognises the sensitivities of the local ecosystem and how biodiversity can be conserved and promoted in the area that we influence.

SUEZ Isle of Man's Sustainability Action Plan for Richmond Hill goes beyond environmental protection by identifying ways we can promote flora and fauna, and enhance wildlife habitats. Implementation is overseen by our designated Sustainability Champion, Mike Valerga.

Measures taken so far to enhance biodiversity include:

- » Planting of bee-friendly apple and plum trees.
- » Installation of a second beehive in 2022. The hives are maintained by three colleagues who volunteered to train in beekeeping. The first hive began producing honey in 2021.
- » Mounting bird boxes on trees around the site. During 2022, we added a nesting box for a peregrine falcon.
- » Sponsoring the local woodland trust.
- » Volunteering during the year, for the local woodland trust and a birdlife conservation charity.



## Our environmental performance

Energy-from-waste is one of the most tightly regulated industrial processes in Europe. The EU Industrial Emissions Directive governs how emissions from the facility are monitored.

Under the terms of our site licence, we monitor all emissions to air, land and water – including solid residues – and report the results to the Environmental Protection Unit.

### Emissions

Our operating licence sets air emission limits for a range of parameters.

The facility's continuous emissions monitoring system analyses gases in the flue after the scrubbing process. It measures:

- » **Particles**
- » **Carbon monoxide**
- » **Sulphur dioxide**
- » **Hydrogen chloride**
- » **Oxides of nitrogen**
- » **Volatile organic compounds**
- » **Ammonia**

Some compounds cannot be measured continuously. They are still subject to emission limits and must be tested periodically. Dioxins, furans and dioxin-like polychlorinated biphenyls are monitored each quarter, while testing for heavy metals and polycyclic aromatic hydrocarbons is biannual<sup>5</sup>.

Certain compounds are subject to half-hourly limits, while a 10-minute interval applies to carbon monoxide. When these limits are exceeded, the facility may continue to operate in full compliance with its licence conditions, but if the emission is not brought back under control within a specified time, operations must be shut down as soon as practicable.

We are required to report all exceedances to the Environmental Protection Unit and investigate the causes. Our staff inform the Environmental Protection Unit of the outcome of each investigation and the corrective action, where appropriate, before closing the event.

Daily emission data for the continuously monitored parameters are published on our website ([www.suez.co.im](http://www.suez.co.im)) along with other updates, including electricity exports. Graphs show the daily readings for each parameter and emission limit, and the emissions profile for the previous 90 days for both lines.

<sup>5</sup> Polychlorinated biphenyls (PCBs) are banned carcinogenic compounds formerly used to insulate electrical equipment such as transformers. Polycyclic aromatic hydrocarbons (PAHs) occur naturally in crude oil and coal, and also result from incomplete combustion of refuse or wood.

## Licence emissions limits

### Emissions to air

	Half-hour average	Daily average	Other limit
Particulate matter	30 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	
VOCs as Total Organic Carbon	20 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	
Hydrogen chloride	60 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	
Hydrogen fluoride			2 mg/m <sup>3</sup>
Carbon monoxide		50 mg/m <sup>3</sup>	150 mg/m <sup>3</sup> 95 per cent of all 10-minute averages in any 24-hour period
Sulphur dioxide	200 mg/m <sup>3</sup>	50 mg/m <sup>3</sup>	
Oxides of nitrogen	400 mg/m <sup>3</sup>	200 mg/m <sup>3</sup>	
Cadmium and thallium (and their compounds)			0.05 mg/m <sup>3</sup>
Mercury (and its compounds)			0.05 mg/m <sup>3</sup>
Sb, As, Cr, Co, Cu, Pb, Mn, Ni and V (and their compounds)			0.5 mg/m <sup>3</sup>
Dioxins and furans			0.1 ng/m <sup>3</sup>
Ammonia			*
Polyaromatic hydrocarbons			*
Dioxin-like PCBs			*

## Discharges to water

New procedures for operating and maintaining the on-site sewage bio-treatment system were introduced during the year. These anticipate a river discharge licence to be issued in 2023, replacing the conditions originally imposed in our waste disposal licence.

During the year, we were able to demonstrate that this maintenance regime would ensure compliance with the new, lower limits for biochemical oxygen demand and suspended solids.

The changes included increasing the frequency of de-sludging and replacing bleach-based toilet cleaning products with biological alternatives, while also adding bacteria that promote the natural process for treating sewage.

## Emissions to water

Surface water	Limit
pH minimum	6
pH maximum	10
Conductivity	*
Temperature	30°C
Flow duration	*
Suspended solids	*
Chemical oxygen demand	*
Sulphides	*
Sb, As, Cd, Cr, Co, Cu, Pb, Mn, Hg, Ni, Ti and V	*
Visible oil	Nil
Ammonia (N)	0.6 mg/l

\* Parameter does not have a limit stated in the waste disposal licence, but is required to be measured and reported to the Environmental Protection Unit.

Sewage treatment facility	Limit
pH minimum	6
pH maximum	9
Visible oil	Nil
Suspended solids	60 mg/l
Biochemical oxygen demand	50 mg/l



## Licence variations

Over the last two decades, the site operating licence has evolved, mainly to permit treatment of additional waste streams. The process involves consultation with the Department of Environment, Food and Agriculture on the proposed adjustments and compilation of supporting evidence for any application. Variations are only granted if it is proven that the change would not compromise the safe operation, compliance and efficiency of the facility.

The Richmond Hill facility has demonstrated its capacity to treat challenging wastes, such as vehicle tyres and bio-waste, recovering energy safely and in an environmentally responsible way.

During 2022, there were two variations:

- » Waste oil can now be used in the primary line's burner. This change ensures that stocks of used oils can be treated during the increasingly long periods when the secondary line is not operating. There is also potential to replace some virgin oil in certain scenarios. In the event of a crane failure, for example, the facility may need to run on burners to maintain the minimum temperature while waste cannot be fed into the feed hopper and repairs are carried out. Used oils may make up to 75% of the oil mix during these periods, so long as the furnace temperature does not fall below 850°C. Only virgin oil is used in the start-up and shutdown phases when the temperature is below 850°C.
- » SUEZ Isle of Man manages the shipment of air pollution control residue (APCR) from the island's crematorium to the UK as part of our hazardous waste management service. We sought a solution when the UK's Environment Agency denied permits for reprocessing this air pollution control residue at a specially licensed facility because of excessive levels of mercury. Present in dental fillings, the metal exceeded the UK's strict limit for imported waste and would have required a costly treatment process to recover the mercury. Following consultations with the island's Environmental Protection Unit, it was agreed that the crematorium air pollution control residue could be mixed with the facility's air pollution control residue to dilute the mercury content to the low levels normally seen in energy-from-waste fly-ash. A licence amendment was necessary to allow blending of the two streams. This is carried out in the bag filter house using an automated valve, which meters the ash to ensure adequate dilution.

## Measuring our performance

SUEZ Isle of Man has once again maintained its exemplary record on emissions. Over the year, cumulative emissions remained well below the maximum levels set out in the operating licence. This has been the case every year since operations began in 1994.

During 2022, there were six incidents in which half-hourly limits for airborne emissions were exceeded. These involved sulphur dioxide (SO<sub>2</sub>), hydrogen chloride (HCl), and particulates. There was also one exceedance by the site's sewage bio-treatment plant.

- » Early in January, the sulphur dioxide limit was exceeded on two occasions due to waste with a high sulphur content. After the first incident, material found in the deslagger was sent for analysis. Laboratory tests confirmed the presence of hydrated gypsum, indicating that plasterboard – a non-compliant waste – was responsible. The same cause explained the second incident, four days later. Mixing of waste in the pit had already been stepped up. Following consultation with the Department of Infrastructure, spot checks were extended to all skip deliveries.
- » There were three exceedances involving hydrogen chloride during 2022. Two – in February and October 2022 – were triggered by waste items with a high chloride content. Investigation following the second incident, when both half-hour and daily limits were exceeded, confirmed that the source was uPVC. This had not been identified as a problem previously, as most building contractors diverted old uPVC window frames and doors via one of the recycling routes available on the island. Checks on the lime slaking temperature and flow confirmed that the gas scrubbing system had functioned properly. This material has now been added to the list of prohibited wastes, so all loads containing uPVC windows and doors will be rejected.

- » The third hydrogen chloride exceedance, which coincided with a spike in particulates, was caused by a fault in the distributed control system, the main computer of the facility. Two servers operate in parallel, so the management function shifts seamlessly to the back-up when the system's software is being updated. This feature failed in mid-March 2022 when a fault occurred during a routine download, leading the flue gas treatment system to trip. It took two and a half hours to recover control manually, restoring normal operation of the absorber and bag filters, and emission levels. As manufacturer Siemens investigated the cause of the fault, further downloads by SUEZ staff were postponed until after an upgrade of the control software due in May 2023.
- » The half-hourly limit for particulates was exceeded in October 2022 on resuming operations after an outage. A failed bag filter pocket blanking plate was traced by taking each of the filter cells out of service in succession. Dust levels returned to normal once the faulty unit was taken offline and repairs were made. The bag's blanking plate was re-attached and spot-welded to prevent a recurrence.
- » Wastewater from the site's sewage treatment plant fell outside the permitted range for biochemical oxygen demand and suspended solids. On inspection, we deduced that refilling of the final settlement tank had disturbed matter that washed through into the sample chamber. Site procedures were amended to clarify the process of refilling after de-sludging. The final settlement tank now fills naturally with the flow from the bio-zone. Also, the sample hose is removed when the system is being de-slugged and the sample chamber inspected.

## Climate change

SUEZ Group is a recognised corporate leader in the global response to the climate emergency. It has set science-based targets for cutting carbon emissions in line with the Paris Agreement's 1.5°C global heating limit and revised them in line with the latest guidance from the Intergovernmental Panel on Climate Change (IPCC).

The 2023-2027 sustainability roadmap again raises the bar for group companies with a series of new commitments. These targets include:

- » By 2030, 70% of energy used at SUEZ facilities worldwide will be renewable, rising to 100% in Europe.
- » From 2023 onward, the group will be self-sufficient in terms of electric power across Europe, producing more than it consumes.
- » By 2030, greenhouse gas emissions from water activities will be reduced by 39%.
- » For waste activities, the emissions reduction will be 26% by 2030, and €40 million will be invested in carbon capture and storage research and development.
- » By 2027, all priority sites and those vulnerable to climate change will have a specific adaptation plan.

Like all SUEZ companies, we calculate and report the facility's carbon emissions. These figures are consolidated in group-level reporting.

### Local action

Our site Sustainability Action Plan seeks to identify all ways in which we can reduce our carbon footprint.

In 2022, we replaced a diesel van with an electric model. This will be charged from the electricity generated on site over the next seven-plus years of its life.

Employees are following suit, encouraged by our revamped company car policy. Three more members of staff switched to electric cars (battery and plug-in hybrid). As well as availing of the charging point at the facility, employees benefit from an allowance towards installing a charger at home.

Company travel policy favours the continued use of remote conferencing via Microsoft Teams in preference to flying to business meetings.

We also cut down on paper usage by adopting the iAuditor software program to map preventative maintenance routes. These can now be followed on a handheld tablet with no need for printing.



## Calculating emissions

The carbon emitted when conducting a business or industrial activity is bracketed in three categories:

- » Scope 1 – direct emissions, for example, from operating mobile plant and vehicles, and in the case of an energy-from-waste facility, the furnace and boiler.
- » Scope 2 – indirect emissions by the electricity or other energy supplier, providing power for lighting, heating and cooling in buildings.
- » Scope 3 – emissions in the supply chain, for example, embedded in the products and materials consumed on site, and those associated with disposing of bottom ash.

In 2021, SUEZ Isle of Man extended its reporting to include Scope 3 emissions and we also improved the accuracy of our Scope 1 estimate in two ways. First, rather than rely on conversion factors, the calculation is based on readings from the facility's continuous monitoring of actual emissions. The second change followed an analysis of the waste feedstock processed on Richmond Hill, providing a measurement of biogenic and carbon content rather than using a UK average figure.

Biogenic content (wood and other organic material) is slightly lower on the Isle of Man, while carbon is higher due to tyres and plastic in the waste stream. Otherwise, the methodology is still based on that developed by the UK waste industry, which in turn accords with the GHG Protocol global accounting standard for greenhouse gases<sup>6</sup>.

These changes had the effect of increasing our combined Scope 1 and 2 emissions compared with previous years. Carbon emissions are quantified as tonnes of carbon dioxide equivalent (TeqCO<sub>2</sub>). In 2022, there was a slight increase of just over 42 TeqCO<sub>2</sub>, or 0.18%.

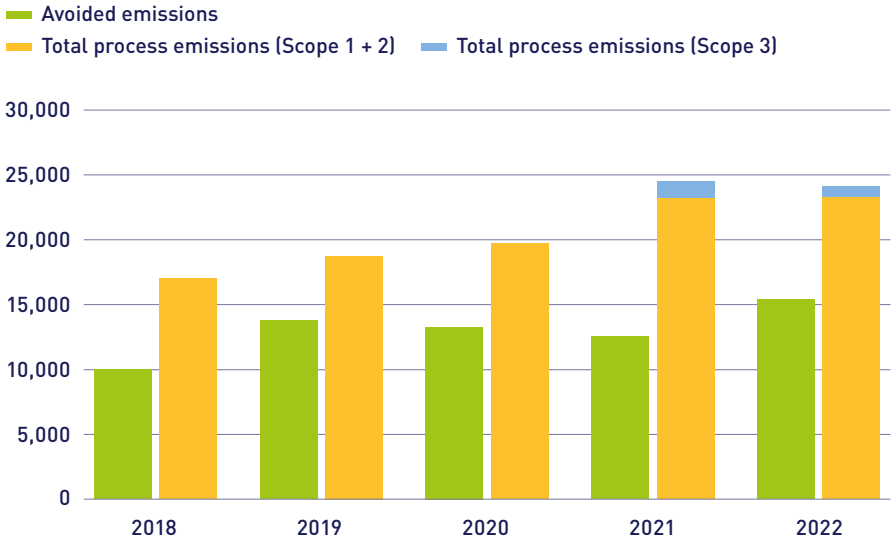
Scope 3 emissions were down by more than 500 TeqCO<sub>2</sub> – almost 40% – mainly due to reductions in electricity imports and fuel use. Electrical consumption was high in 2021 when the turbine was offline for a major overhaul. The significant increase in the facility's operational reliability during 2022 reduced the need to burn gas oil.

The final element of our calculations is the amount of carbon we avoid by generating power that displaces fossil fuel consumption and by recovering materials such as metals for recycling, thus reducing the demand for virgin materials.

Our 2022 calculation shows that an additional 2,865 TeqCO<sub>2</sub> were saved, compared with the year before. This increase of almost 23% was due to the rise in electricity exports over the 12 months when the turbine was fully operational.

<sup>6</sup> ghgprotocol.org

**Total process emissions and avoided emissions (TeqCO<sub>2</sub>)**

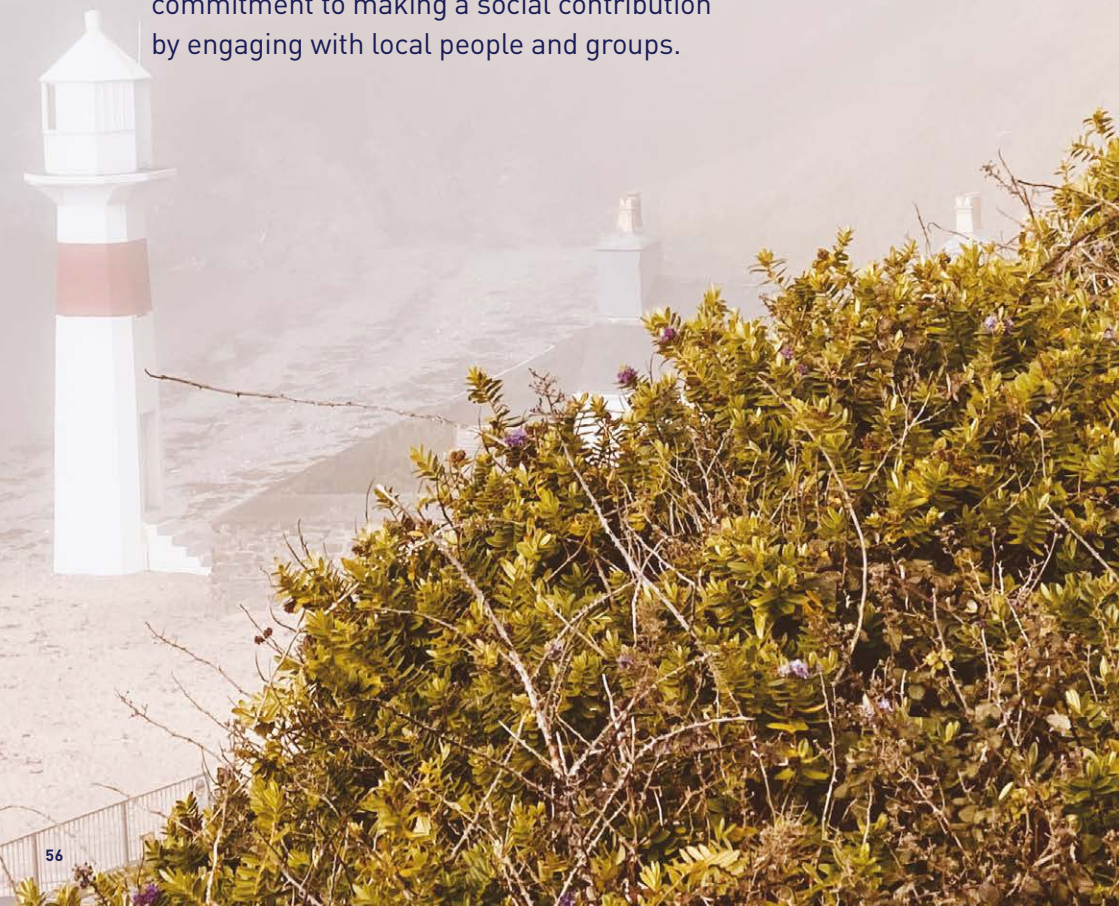


	2018	2019	2020	2021	2022
Avoided emissions	10,014	13,820	13,318	12,591	15,456
Total process emissions (Scope 1 + 2)	17,106	18,818	19,803	23,359	23,401
Total process emissions (Scope 3)				1,287	785

# Corporate social responsibility

Our wider responsibilities as a company and employer extend beyond environmental protection to how we safeguard our people and promote their wellbeing and that of the communities we serve.

Aspects we report on here include health and safety, training, accountability to our neighbours, and our commitment to making a social contribution by engaging with local people and groups.



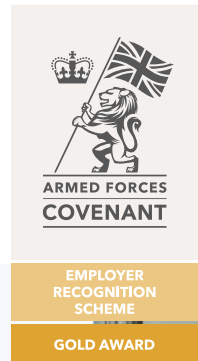


## Our people

The sustained high performance of SUEZ Isle of Man and the standing of the company within our group and industry stem from the strength of our team – backed up by our corporate policies and procedures, and investment in equipment and training.

Our first priority is to provide a working environment that is safe and healthy, reflecting the wider SUEZ commitment to employee welfare. This inspires our mental health awareness training and wellbeing webinars, with downloadable guides on topics ranging from stress and anxiety management to healthy eating.

The inclusion and diversity networks of SUEZ recycling and recovery UK are another example of this holistic approach to wellbeing. These include a network dedicated to veterans, and the company is proud to have received the gold award of the UK Ministry of Defence's Employer Recognition Scheme in 2022 for the support provided to the armed forces community.



## Health and safety

As described in section three, our integrated management system sets out all procedures for safe working. By joining up this guidance with environmental protection and quality management, we strive to embed safety in every activity and task we undertake.

Risk assessment, training and auditing underpin our approach to safety management. We report and review near misses, investigate all incidents, and take any necessary action and amend procedures where appropriate before reports are closed.

Essential though they are, systems alone cannot secure safety. Safety awareness is also an individual mindset and a team culture. Safety in Mind, our industry-leading behavioural programme, was developed by employees across SUEZ recycling and recovery UK.

All our people benefit from Safety in Mind refresher training, as well as courses tailored to specific tasks and situations, such as working in confined spaces, and new campaigns. A SUEZ campaign launched at the start of the year highlighted the importance of situational awareness. A series of videos demonstrate various scenarios – for example, someone working overhead – where risk alertness can be crucial.

Other themes, often covered in ‘toolbox talks’, range from the use of defibrillators to driving to work. In routine health and safety meetings, members of the management team and our safety advisors watch training videos on first aid and related topics.

Safety representatives and team members are encouraged to share any safety concerns and ideas for improvement. We had 4,916 of these Safety in Mind conversations over the year. They are logged in a new app, which also makes it easier to capture managerial safety visits and ‘vigiminutes’ – when we take time out to assess tasks and ensure everything is in place to avoid risk to those performing the work or anyone nearby. Over the year, 135 vigiminutes were recorded and there were 21 managerial safety visits by local and UK-based managers, when they look for hazards and discuss these as well as positive points with colleagues.

### Incidents in 2022

Once again there were no incidents reportable to the authorities under RIDDOR (the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations) during the year.

A total of seven personal injuries occurred on site. Two involved manual handling, resulting in a sprain/strain. Contractors clearing boiler ash during a scheduled shutdown sustained two minor impact injuries when they were struck by boiler ash as it was being cleaned from the walls of the furnace. The other incidents were a slip/trip, an eye irritation, and a contractor needle prick which required hospital treatment. None of the injuries were recordable as ‘lost time’ incidents.

While SUEZ Isle of Man has a proud track record of safe working without serious injury to employees or contractors, we recognise the danger of complacency. The number of near misses reported was, at 29, in line with the previous year, despite a higher level of maintenance activity. We will continue to stress the importance of capturing and learning from these events.

## Training and development

We have a comprehensive training and development programme. Our new skills and mandatory training matrix helps ensure we identify individual needs and track progress.

Training investment underpins competency – all operations and maintenance staff complete our in-house competence training and are formally assessed. It also promotes continuous learning and people’s career progression through complementary skills. The aim is to provide fulfilling careers within our company and the wider group and, where possible, promote from within.

During the year, we provided or sponsored 1,071 hours of training in total. Our investment in staff development ranged from preparations for a bachelor's degree and an accountancy qualification to industry-accredited courses on Managing Safety (Institute of Occupational Safety) and Boiler Operation Accreditation Scheme (BOAS). The programme also involved coaching in first aid, situational awareness and manual handling.

SUEZ also invests time and effort in consulting and listening to its people, reinforcing our sense of shared purpose.

This was borne out in November 2022 as SUEZ recycling and recovery UK was ranked – for the third time – among the Top 25 Best Big Companies to Work For. Employee engagement specialist Best Companies surveyed employees and highlighted:

- » The open and honest relationships employees have with their line managers.
- » Employees feel they make a valuable contribution to the success of the organisation.
- » The positive job experience at SUEZ supports career development.



## Our team

SUEZ Isle of Man has a capable team committed to providing an essential service to the island to the highest standards of safety and efficiency.

We employed a total of 32 people at the end of 2022, following a series of job moves and promotions.

Our company values apprenticeships. In 2022, we were able to recruit a new Operations Apprentice, Steph Christian.

Three new technicians were also appointed:

- » Joe Douglas, a Senior Electrical Technician, was recruited in 2022.
- » Martin Tvaroh arrived to fill the vacancy left by Senior Operations Technician Stuart Storie.
- » Nick White took on the role of Operations Technician, taking the place of John Hyland, who comes off shift to join the day operations team.

There were also changes within the management team. Mike Spiers was promoted to Maintenance Manager, succeeding Jonson Brennan. Senior Maintenance Technician Mike Valerga stepped up to assume the vacated position of Technical Plant Engineer.

Meanwhile, Mark Ellison passed a milestone in 2022, receiving his 10 years' service award. A Shift Manager, Mark started his SUEZ career as a Shift Operations Technician, exemplifying the progression possible within our company.

## Generating careers

Over the years, SUEZ Isle of Man has trained several apprentices and we would like to continue providing opportunities for local youth.

Our parent company has a strong apprenticeship programme. It pays into the UK's national levy which, in turn, funds the wages of apprentices, but this does not extend to the island. As well as self-funding apprenticeships, there is another challenge. It is difficult to recruit young people into these technical training roles. This may be partly due to misperceptions – some may see the facility as little more than a large shed where rubbish is dumped and burned.

The reality is that Richmond Hill is home to a range of modern technologies – from sophisticated control systems to the boiler and steam turbine. People operating them draw on a varied set of advanced skills in subjects such as maths, chemistry and physics, as well as electrical and mechanical engineering<sup>7</sup>. Mastering these disciplines opens the door to purposeful and rewarding careers here on the island, in the UK and across the global SUEZ group.

We will continue to engage with school and college students, and plan to host an open day in the coming year.

<sup>7</sup> Educational resources on STEM subjects (science, technology, education and maths) for teachers and students can be downloaded from the SUEZ website: [www.suez.co.uk/education](http://www.suez.co.uk/education)

## Our community

Our parent company was the first in the UK resources and waste management sector to measure social value with a view to maximising the benefits that business activities can generate for communities.

Based on 88 performance indicators that capture environmental, economic and social impacts, SUEZ gauges the overall value it generates for society. In 2021 (the latest year for which figures are available), this amounted to £2.18 billion, some £200 million higher than the year before.

To generate further social value, SUEZ is adapting its business model to promote the re-use of household goods – to benefit social enterprise, the circular economy and the environment. This is the triple bottom line of people, planet and profit in action.

On the island, as well as fulfilling our service obligations, SUEZ Isle of Man also aims to give back in various ways – from volunteering for good causes and charitable fundraising to regular roadside litter picking on Richmond Hill.

In 2022, SUEZ launched a volunteering initiative. Every employee is encouraged to volunteer for a workday in support of community ventures and is paid as normal. Each day triggered a £5 contribution to our national charity partner, Macmillan Cancer Support. Of our 5,600 colleagues, 20% volunteered, which is a good result for year one (and equivalent to £1 million of social value). Participation was even higher on the island, where our volunteers turned their hands to helping fauna and flora.

Two notable landmarks for corporate giving were reached in 2022. This was the year that SUEZ hit a total of funds raised for our corporate charity partner, Macmillan Cancer Support, of £500,000.

Local employees have taken part in special annual fundraising events for the charity over the years on and off the island – from cycle relays around Britain to climbing Helvellyn in the Lake District or, as in 2021, Snaefell Summit. Colleagues also organise a whole series of other activities each year. Examples in 2022 ranged from a hog roast and Grand National sweepstake to an on-site tuck shop and our annual charity golf day. As a result, we were able to contribute £1,500 to this worthy cause. Over the 12 months, Macmillan Cancer Support awarded approximately £9,560 in grants to people on the Isle of Man living with cancer.

## Tending to terns and trees

Five colleagues spent a day volunteering at the Point of Ayre National Reserve, which hosts heathland habitats and freshwater lakes in former quarries. The area has become very attractive both to migrant and non-migrant birds and other wildlife.

Arctic terns nesting on a nearby beach earlier in the year lost all 60 of their chicks to predators. The SUEZ volunteers spent the day building a raft for the terns to nest on safely.

Twenty years after writing a report on the restoration of the area for the quarry operator in 2003, one of our colleagues was delighted to see nature's transformation (aided by the conservation charity). Manx Bird Life hopes to open the reserve to the public in 2024.

SUEZ Isle of Man was a sponsor of the Manx Woodland Trust for 2022. When we were given the opportunity to plant more than 120 saplings, 10 colleagues were happy to make it their annual volunteering day. Early in October 2022, they planted alder, three species of pine (Austrian, Scots and Lodge Pole), sessile oak, rowan, downy birch, grey willow, wych elm, beech, whitebeam and wild cherry.



## Our neighbours

Forums for local residents are encouraged at major SUEZ sites to promote openness and accountability. Members of the Richmond Consultative Committee, a statutory body, can convene a meeting at any time to raise issues and access any relevant information on the operations of the energy-from-waste facility.

Local authorities, neighbours and other members of the public can also make complaints directly to SUEZ Isle of Man. Every complaint is logged and investigated, and the outcome is reported back to the complainant.

During the year, a number of complaints, all relating to noise, were made by a local resident to the Environmental Protection Unit.

- » Two complaints were due to the ammonia alarm sounding through the night. This was triggered by a small spill contained within the bund that could not be pumped out as the fire and rescue service had borrowed the facility's chemical pump the day before to deal with a hazardous waste road traffic incident. The service has since acquired its own pump. The ammonia alarm sounders were repositioned to face away from the complainant's property.
- » The processing of clinical waste overnight prompted two other complaints over the reversing alarms sounded by mobile plant. In response, the practice was suspended immediately and clinical waste operations on the primary line have been switched to mornings instead.
- » Several other noise complaints were logged, but investigations confirmed that our facility was not responsible. Alarms from reversing wagons were blamed for disturbance on two occasions when the site's CCTV showed that no mobile plant was operating in the area at the time. In a third case, an alarm sounding through the night had been due to a sprinkler fault on the neighbouring Middle Park Recycling site.



## Our visitors

We were pleased to be able to host tours of the facility throughout the year once more.

Richmond Hill's visitor and education centre is a resource for schools and community groups. There were 20 tours in total, a dozen of them from schools. Other delegations included Members of the House of Keys, the Clerk of Tynwald, Douglas Councillors and the Interim Deputy Chief Executive of the Department of Infrastructure. In all, some 300 people visited the facility.

The option of a virtual tour is a welcome new feature we can offer to people with mobility issues, young children who are not permitted within the facility, and when areas may be off limits for safety or other reasons. Touch screens installed in the centre allow visitors to 'walk through' the facility and view close-up the various operations undertaken as well as learning about the process from virtual tour guides.

Another improvement for visitors is the new storage area for personal protective equipment. The wooden frame from our old isolation lock box storage system was cleaned and re-painted to store vests, gloves and glasses for children, as well as hard hats and personal protective equipment for adults.

## Our communications

Apart from this annual report and our direct engagement with local groups, authorities and residents, the company website is our main channel of communication. The site ([www.suez.co.im](http://www.suez.co.im)) is dedicated to keeping people informed about our operations.

Visitors can view daily emissions, three-month trends and details on electricity generation.

Further information about our parent company's activities, energy recovery, the circular economy and research reports can be found on the SUEZ recycling and recovery UK website ([www.suez.co.uk](http://www.suez.co.uk)).

# Our objectives

Annual objectives and targets benchmark our performance in various areas such as compliance, efficiency and continuous improvement.

The table here shows how we performed against our objectives in 2022, while we set out our targets for 2023 in the following pages. The remainder of this final section is devoted to the data underlying this annual report.

## How we did in 2022

### Our strategic objectives

### Targets set for end of 2022

<b>Emergency preparedness</b>	Carry out four emergency preparedness procedures.
<b>Biodiversity</b>	Implement biodiversity action plan, as required.
<b>Hazardous waste management</b>	Complete hazardous waste shipments, as required.
<b>Compliance and communication</b>	Conduct safety, health, environment and quality meetings.
<b>Environmental protection and compliance</b>	No daily emission breaches during normal operating conditions.
<b>Oil usage</b>	Reduce oil usage to 2019 level.
<b>Staff competency</b>	Maintain competency matrix.
<b>Management systems</b>	Maintain certification to ISO 14001, ISO 9001, ISO 45001 and ISO 55001.
<b>Reporting</b>	Meet SUEZ internal reporting and carbon monitoring requirements.
<b>Operational efficiency</b>	Meet operational equipment efficiency and preventative maintenance targets.
<b>Continuous improvement</b>	Conduct five continuous improvement projects.

Achieved?	How we performed
✓	10 drills completed, including first aid, critical steam turbine alarms, a building fire, chemical spillage, tube leak, power blackout, incinerator bottom ash blockage, missing person, waste pit fire and hopper blockage.
✓	Biodiversity action plan in place and actions implemented.
✓	Two dimethylformamide loads shipped off island for recovery.
✓	12 meetings held throughout the year.
✗	One daily emissions breach for hydrogen chloride on the primary line.
✓	Oil usage reduced in 2022 compared to 2019 usage by 7,000 litres.
✓	Matrix maintained.
✓	ISO certifications maintained.
✓	All reports completed.
✓	Operational equipment efficiency target of 64.08% met with 70.89% outcome.
✓	Asset health monitoring (the number of items with no actions identified) target of >90% met with 94.4% outcome.
✗	Asset health compliance target of >90% not met with 88.8% outcome
✓	Five projects completed.

## Objectives and targets for 2023

<b>Our strategic objectives</b>	<b>Targets set for end of 2023</b>
<b>Emergency preparedness</b>	Carry out four emergency preparedness procedures.
<b>Biodiversity</b>	Implement biodiversity action plan, as required.
<b>Hazardous waste management</b>	Complete hazardous waste shipments, as required.
<b>Compliance and communication</b>	Conduct safety, health, environment and quality meetings.
<b>Environmental protection and compliance</b>	No daily emission breaches during normal operating conditions.
<b>Oil usage</b>	Maintain oil usage at 2022 level.
<b>Staff competency</b>	Maintain competency matrix.
<b>Management systems</b>	Maintain ISO certification.
<b>Reporting</b>	Meet SUEZ internal reporting and carbon monitoring requirements.
<b>Operational efficiency</b>	Meet operational equipment efficiency and preventative maintenance targets.
<b>Continuous improvement</b>	Conduct five continuous improvement projects.



# Performance data

All the performance data supporting the previous chapters are collated in the following tables. Figures for past years have been corrected or amended for consistency, where appropriate.

## Waste delivered

### Wastes delivered to the primary incinerator (tonnes)

	2018	2019
Confidential	92.1	29.7
Construction	609.9	498.7
Food industry (previously dairy)	3.4	5.3
Municipal	39,469.9	39,442.8
Packaging	1,890.6	1,619.6
Tyres	607.3	615.9
Waste screenings and biopellets	1,247.0	1,518.2
Wood	5,562.9	5,999.3
Forestry	0	0
Meat and bone meal	543.9	539.9
Hygiene waste	47.7	95.1
Clinical waste (excluding sharps and cyto)	-	-
Other	45.1	69.0
<b>Total</b>	<b>50,199.8</b>	<b>50,433.3</b>

### Wastes incinerated in the secondary incinerator (tonnes)

	2018	2019
Clinical	253.8	250.1
Waste oil	107.9	131.2
<b>Total</b>	<b>361.7</b>	<b>381.3</b>

### Exceedances

	2018	2019
Number of exceedances of licence emission limits	3	7

	2020	2021	2022
	38.5	43.8	55.1
	277.8	192.5	294.2
	16.5	13.4	10.3
	39,808.3	41,598.7	41,049.4
	865.8	903.0	534.8
	638.6	731.5	621.2
	1,501.1	1,213.0	1,238
	5,589.9	5,885.6	5,960.4
	24.4	0	0
	568.7	510.5	471.7
	97.1	93.1	101.0
	-	88.8	273.8
	6.6	7.6	158.6
	<b>49,433.2</b>	<b>51,281.5</b>	<b>50,768.5</b>

	2020	2021	2022
	284.8	256.0	56.6
	77.7	82.8	69.6
	<b>362.5</b>	<b>338.8</b>	<b>126.2</b>

	2020	2021	2022
	6	7	7

## Consumption of raw materials

	2018		2019	
	Kg per tonne of waste	Total tonnage	Kg per tonne of waste	Total tonnage
Gas oil (primary)	4.5	213.6	3.9	190.8
Gas oil (secondary)	647.1	185.3	565.1	141.3
Water	181	9,063	216	10,775
Lime	8.9	444.6	8.4	416.9
Activated carbon	0.4	21.1	0.4	19.8
Ammonia	0.6	27.5	0.5	25.3

## Energy consumption and generation

	2018		2019	
	MWh per tonne of waste	Total MWh	MWh per tonne of waste	Total MWh
Electricity consumed	0.016	816.7	0.012	598.4
Electricity exported	0.501	24,966.3	0.505	25,151.0

## Waste recovery and disposal

	2018		2019	
	Kg per tonne of waste	Total tonnage	Kg per tonne of waste	Total tonnage
Bottom ash (landfill)	209.7	10,462.0	205.7	10,237.1
Air pollution control residue (landfill)	32.1	1,599.0	34.5	1,717.3
Ferrous metal (recycled)	10.3	514.6	3.2	160.4



2020		2021		2022	
Kg per tonne of waste	Total tonnage	Kg per tonne of waste	Total tonnage	Kg per tonne of waste	Total tonnage
7.0	343.8	8.4	398.9	3.6	184.8
1,260.1	319.1	1,153.2	308.9	898.0	50.9
271.2	10,479	194.4	9,211	250.0	12,879.0
8	382.8	9.6	453.3	9.1	469.1
0.5	22.9	0.5	25.7	0.5	23.5
0.7	32.9	0.6	28.0	0.5	25.6

2020		2021		2022	
MWh per tonne of waste	Total MWh	MWh per tonne of waste	Total MWh	MWh per tonne of waste	Total MWh
0.018	861.5	0.044	2,078.4	0.012	620.7
0.530	25,556.0	0.426	20,228.0	0.492	25,340.0

2020		2021		2022	
Kg per tonne of waste	Total tonnage	Kg per tonne of waste	Total tonnage	Kg per tonne of waste	Total tonnage
205.7	9,926.6	206.3	9,799.4	193.9	9,937.0
32.1	1,538.7	33.6	1,587.3	29.0	1,494.3
5.9	286.7	9.8	466.8	10.3	528.0

## Air emissions

	2018		2019	
	Kg per tonne of waste	Total tonnage	Kg per tonne of waste	Total tonnage
Particulate matter	0.004	0.19	0.003	0.17
Volatile organic compounds	0.005	0.25	0.005	0.25
Hydrogen chloride	0.048	2.40	0.044	2.19
Hydrogen fluoride	0.001	0.055	0.001	0.034
Carbon monoxide	0.054	2.66	0.047	2.3
Sulphur dioxide	0.121	6.01	0.125	6.2
Oxides of nitrogen	1.070	53.0	1.059	52.3
Ammonia	0.01	0.42	0.00	0.03
Cadmium and thallium	$5.1 \times 10^{-06}$	0.0002	$5.1 \times 10^{-06}$	0.00025
Mercury	$9.5 \times 10^{-05}$	0.0047	$1.8 \times 10^{-06}$	0.000087
Sb, As, Cr, Co, Cu, Pb, Mn, Ni and V	$1.4 \times 10^{-04}$	0.007	$1.3 \times 10^{-04}$	0.0064
PAH	$2.3 \times 10^{-05}$	0.0012	$2 \times 10^{-05}$	0.00097
Dioxins and furans	$1.2 \times 10^{-11}$	$6 \times 10^{-09}$	$9.1 \times 10^{-11}$	$4.5 \times 10^{-09}$
Dioxin-like PCBs	$2.5 \times 10^{-12}$	$1 \times 10^{-10}$	$7.2 \times 10^{-12}$	$4 \times 10^{-10}$

\* Tonnes allowed under licence conditions calculated using the waste disposal licence limit, flue flow rate based on actual waste to flue gas ratio and hours the facility can operate in the year (excluding two-week maintenance outage).

## Water emissions

	2018		2019	
	Kg per tonne of waste	Total tonnage	Kg per tonne of waste	Total tonnage
Suspended solids*	0.009	0.48	0.006	0.30
Biochemical oxygen demand*	0.0008	0.04	0.0012	0.06
Chemical oxygen demand*	0.035	1.78	0.005	0.24

\* Calculated from estimated flow rate.

	2020		2021		2022		Tonnes allowed under waste licence*
	Kg per tonne of waste	Total tonnage	Kg per tonne of waste	Total tonnage	Kg per tonne of waste	Total tonnage	
	0.004	0.18	0.002	0.09	0.005	0.26	4.567
	0.004	0.18	0.005	0.22	0.004	0.20	4.567
	0.044	2.12	0.044	2.09	0.045	2.34	4.567
	0.000	0.0072	0.005	0.23	0.001	0.07	0.913
	0.069	3.31	0.054	2.56	0.056	2.91	22.835
	0.120	5.77	0.119	5.61	0.115	5.92	22.835
	1.077	51.7	1.133	53.58	1.441	74.21	91.342
	0.00	0.03	0.001	0.030	0.001	0.050	-
	$4.8 \times 10^{-06}$	0.00023	$4.9 \times 10^{-06}$	0.00023	$4.8 \times 10^{-06}$	0.00025	0.023
	$4 \times 10^{-06}$	0.00019	$3.8 \times 10^{-06}$	0.00018	$5.1 \times 10^{-06}$	0.00027	0.023
	$6.8 \times 10^{-04}$	0.033	$2.8 \times 10^{-04}$	0.0132	$5.3 \times 10^{-04}$	0.028	0.023
	$2.5 \times 10^{-05}$	0.0012	$7.5 \times 10^{-05}$	0.00036	$7.3 \times 10^{-6}$	0.00038	-
	$2.6 \times 10^{-11}$	$1.3 \times 10^{-09}$	$7.8 \times 10^{-11}$	$3.7 \times 10^{-09}$	$2.5 \times 10^{-10}$	$1.2 \times 10^{-08}$	$4.6 \times 10^{-08}$
	$2.3 \times 10^{-12}$	$1 \times 10^{-10}$	$5.9 \times 10^{-12}$	$3 \times 10^{-10}$	$4.8 \times 10^{-11}$	$2.5 \times 10^{-09}$	-

	2020		2021		2022	
	Kg per tonne of waste	Total tonnage	Kg per tonne of waste	Total tonnage	Kg per tonne of waste	Total tonnage
	0.006	0.32	0.008	0.41	0.004	0.20
	0.0015	0.07	0.0010	0.06	0.0010	0.05
	0.005	0.26	0.003	0.16	0.004	0.19

# Glossary

## **Anaerobic digestion**

The process by which organic matter is broken down by bacteria in the absence of oxygen.

## **Air Pollution Control Residue (APCR)**

Particles from combustion gases, heavy metals and dioxins, carbon dust, salt and lime used in the gas-cleaning process, also known as fly-ash.

## **Biodegradable**

Capable of being decomposed by bacteria or other biological means.

## **Bottom ash**

The residue formed on the furnace grate when waste materials are incinerated.

## **Circular economy**

Within a circular economy, the role of resource and waste management is to help prevent waste throughout the whole system, to target materials for harvesting, to manage their logistics in efficient ways, and to treat and return the recovered secondary resources back into the cycle of production and consumption in a compliant and economic manner.

## **Climate change**

The process in which man-made gases are building up in the atmosphere, trapping the sun's heat, causing changes in weather patterns on a global scale.

## **Deslagger**

The system that removes the bottom ash from the incinerator. It comprises a drop-off chute from the final grate, a water filled chamber, a hydraulic pusher and an inclined discharge chute. Also called an ash-extractor.

## **Dioxins and furans**

A large family of compounds – including some of high toxicity – that are by-products of uncontrolled burning, incineration and certain industrial processes, as well as volcanoes and forest fires.

## **Energy-from-waste (EfW)**

The incineration (burning) of waste at high temperatures to reduce its weight, volume and toxicity. The energy from the incineration process is used to generate electricity.

## **Environment Agency**

The UK's waste industry regulator. A non-departmental government public body, set up under the Environment Act 1995 to take an integrated approach to environmental protection and enhancement in England and Wales.

**EU Industrial Emissions Directive**

Issued by the European Union, the directive commits European Union member states to control and reduce the impact of industrial emissions on the environment. It takes an integrated approach to controlling pollution to air, water and land, and sets challenging industry standards for the most polluting industries. The directive aims to prevent and reduce harmful industrial emissions, while promoting the use of techniques that reduce pollutant emissions and that are energy and resource efficient.

**Fly-ash**

See Air Pollution Control Residue.

**Furans**

See dioxins.

**Gasification**

Gasification is a method for extracting energy from different types of organic material through thermal treatment.

**Greenhouse gas**

Natural and man-made gases that contribute to the 'greenhouse effect' and climate change, including carbon dioxide, methane, ozone and chlorofluorocarbons (CFCs).

**Hazardous waste**

Defined by EU legislation as the wastes most harmful to people and the environment.

**ISO 14001**

The international standard for environmental management.

**ISO 9001**

The international standard for quality management.

**ISO 45001**

The international standard for occupational health and safety management.

**ISO 55001**

The international standard for asset management.

**Landfill**

The deposit of waste into or onto land in such a way that pollution or harm to the environment is minimised or prevented and, through restoration, reclaims land which may then be used for another purpose.

**Landfill Directive**

The Landfill Directive (Council Directive 1999/31/EC) aims to prevent, or to reduce as far as possible, the negative environmental effects of landfilling.

**Mainsaver**

A Computerised Operation and Maintenance Management System (COMMS). Used for the management of maintenance and operational tasks, including scheduling of preventative and planned maintenance activities, asset health recording, electronic shift log, raising and recording work requests and detailed maintenance costs.

**Methane**

An odourless gas and principal component of natural gas and landfill gas, produced as biodegradable waste breaks down in a landfill site. Over 20 times more potent as a greenhouse gas than carbon dioxide.

**Municipal waste**

Household waste, as well as other industrial and commercial waste similar in nature or composition, such as wastes collected by a waste collection authority or its agents (i.e. wastes from municipal parks and gardens, beach cleansing, and fly-tipped materials).

**MWh**

Megawatt-hour, equivalent to one million Watt-hours, and a unit of energy (one Watt is equivalent to one Joule of energy per second).

**OHSAS 18001**

The international standard for health and safety management.

**Recycling**

The direct reintroduction of a waste type into the production cycle from which it originates as a total or partial replacement for new material.

**RIDDOR**

The UK's Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995, which require the reporting of work-related accidents, diseases and dangerous occurrences.

**Science-based targets**

Science-based targets show companies how much they need to reduce their greenhouse gas emissions by, and how quickly, to keep these in line with worldwide reductions required to keep global temperature increase below those outlined in the 2015 Paris Agreement.

**VOCs**

Volatile organic compounds: carbon-based compounds that easily evaporate into the atmosphere, commonly used in industry for de-greasing, thinning and dissolving, and found in paint, inks and adhesives.

**WEEE**

Waste electrical and electronic equipment. The WEEE Directive was introduced in the UK in January 2007 and aims to reduce the amount of electrical and electronic equipment being produced, and to encourage re-use, recycling and recovery.



## The external verifiers' verdict

"Further to consideration of the documentation, data and information resulting from the organisation's internal procedures examined on a sampling basis during the verification process, it is evident that the environmental policy, programme, management system, review (or audit procedure) and environmental statement meet the requirements of the Isle of Man Government in providing an annual report and reflects the commitment of SUEZ Isle of Man to satisfy and surpass the standards set in the relevant UK and European legislation as well as local laws and regulations."

Signed: 

Date: 31 May 2023

The Sustainable Growth Company Ltd  
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