The path to sustainable urban environments

Sustainability Report

envacgroup.com

Year | 2024

Highlights of the year 2024

Residents give high marks to pneumatic waste collection

94.7%

In a survey carried out by the third-party market researcher firm Sigma Dos, an impressive 94.7% of users expressed their satisfaction, rating the system an average of 7.88 out of 10.

25 years of Envac

The City of Majadahonda, outside Madrid in Spain, was an early pioneer in providing sustainable public services to both residents and businesses.

Users reported increased motivation to sort waste correctly

>50%

At Stockholm Royal Seaport, Sweden success is driven by the Envac ReFlow app, which digitalises the pneumatic waste collection system. The tool helps residents reduce residual waste and improve recycling.

Increased ROI & energy savings, 28 kWh per tonne

In Qingdao, China, the new project blends innovation with sustainability aiming to achieve overall lower carbon emission. It aligns with Envac's target of less than 50kWh per tonne of energy use making the system highly efficient.

Reduced power consumption by

70%

In Sweden, Envac's Automation Platform is drastically reducing power consumption and lowering operational costs, and overall carbon footprint for facility owners.

Fewer infections in hospital by

49.3%

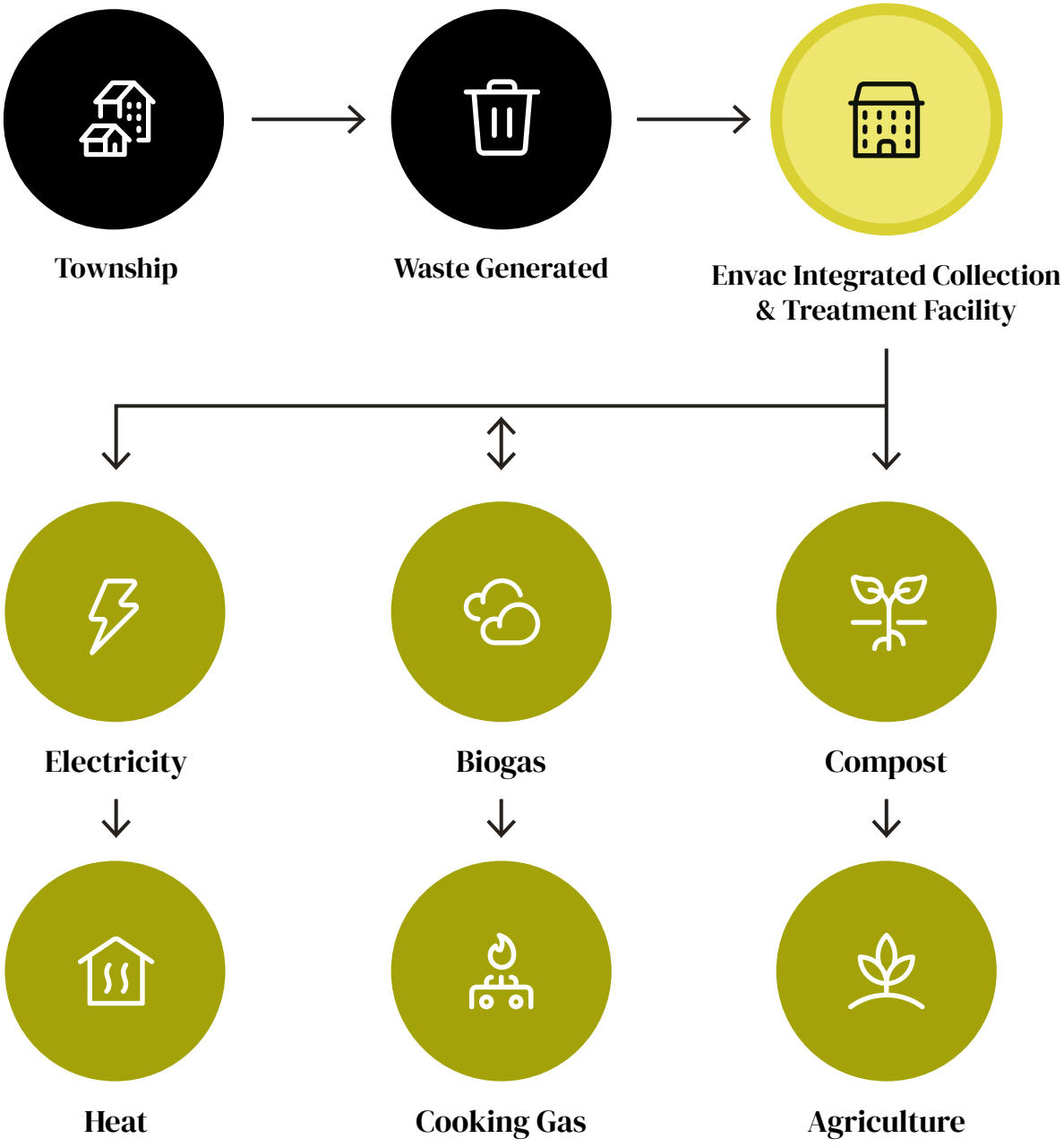
Envac's automated system significantly reduces bacterial contamination in hospitals compared to traditional waste management, according to a recent study in Sweden.

Contents

Envac's sustainability strategy – contributing towards sustainable urban development

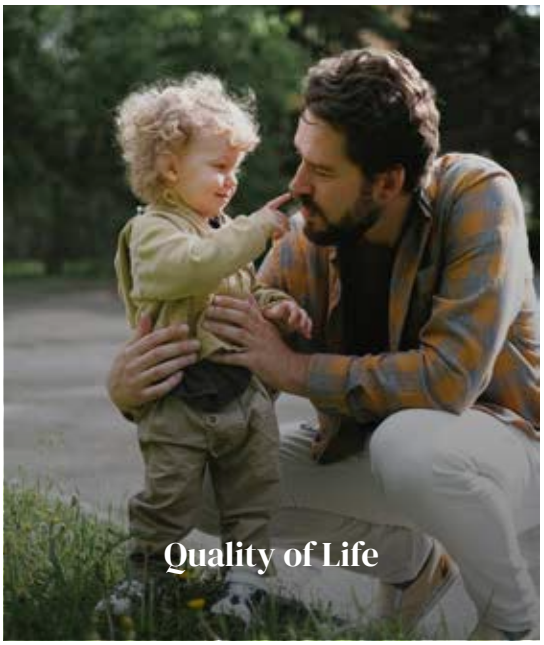
As urban populations are projected to increase by 2.5 billion by 2050, the amount of waste generated will double, necessitating smarter and more sustainable waste management solutions in cities. Proper waste management is crucial for promoting resource circularity, as it enables materials to be reused, recycled, and repurposed rather than ending up in landfills. By implementing effective waste management systems and promoting behavioural change, cities can pave the way toward a circular economy, where resources are kept in use for as long as possible, minimising waste and reducing environmental impact.

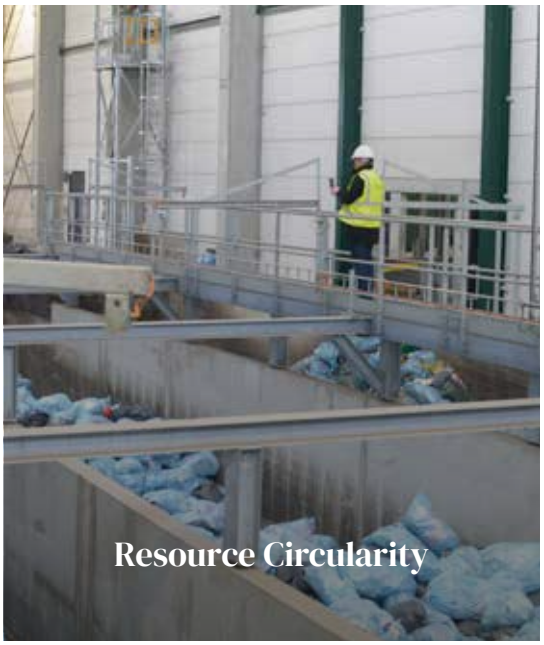
How Envac adds value to the urban environment

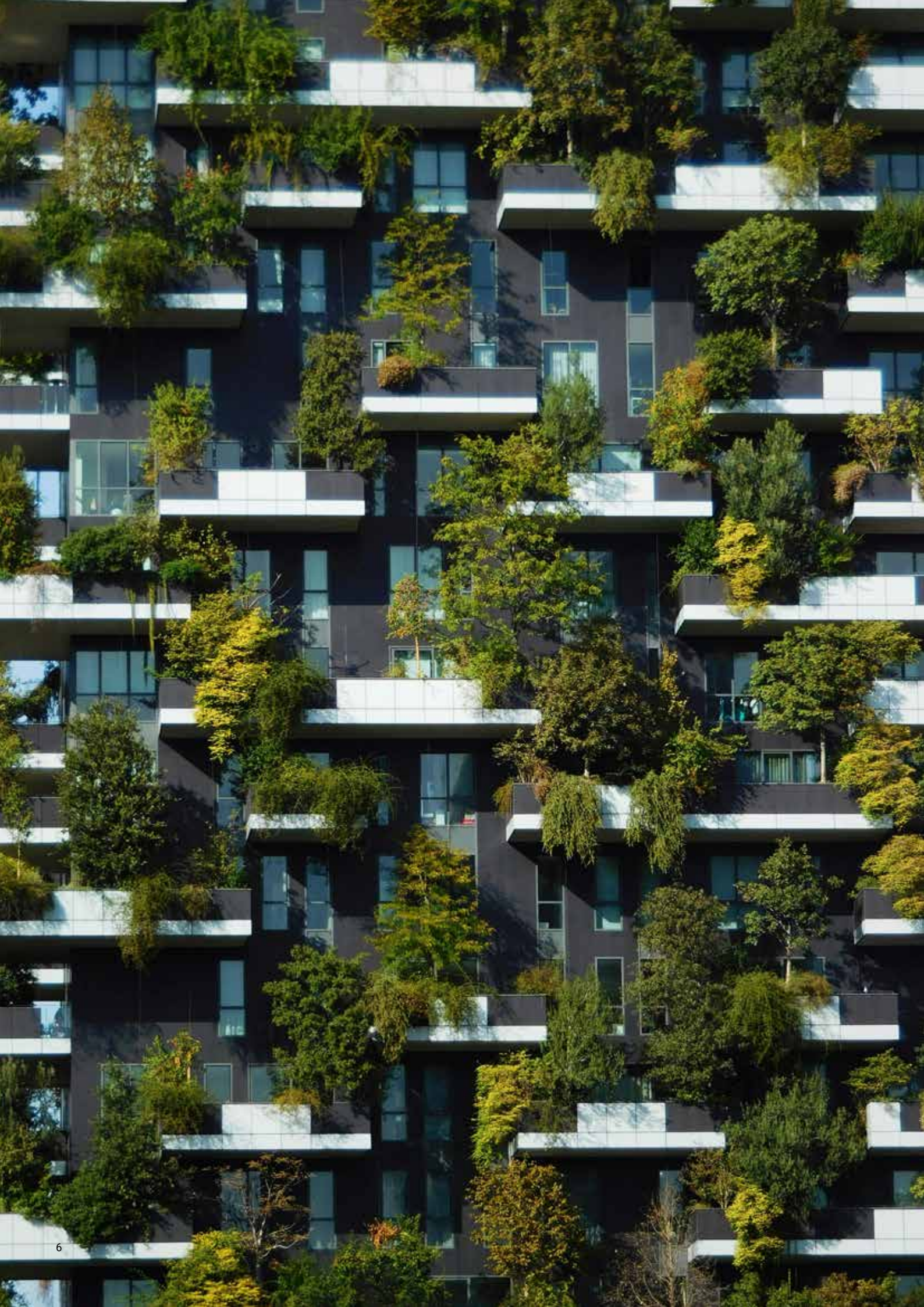


Our core areas

Sustainability has always been at the core of what we do and is an essential driver of our business. We enable smart, sustainable communities and drive the circular economy by redefining how society thinks of waste – today and for future generations.
Envac is part of the broader solution by promoting circular resource use and clean energy sources. Thus, it improves quality of life and creates added value for property developers. Our strategy revolves around enabling our customers, including end-users, to make smart, green, and responsible choices in sustainable urban developments. Based on our strategy development, using the learning from previous Life Cycle Assessment (LCA), the Double Materiality Assessment (DMA) results and this year's scope 3 emissions assessment; the company focused on four prioritised core areas to reach this strategy. The current report is built around these core areas and how we must act ourselves and empower our customers to add value.







Foundation of sustainability at Envac

Envac, as part of the Stena AB group, is working to meet the Corporate Sustainability Reporting Directive (CSRD) requirements starting in 2026. To understand our major impact areas, we have conducted a Double Materiality Assessment (DMA) and are collaborating with Stena AB to identify areas for improvement. This year, we focused on Scope 3 emissions, which provided insights into our broader environmental impact. The findings from our Scope 3 emissions and Life Cycle Assessment (LCA) conducted in 2023 have reinforced our commitment to prioritising resource circularity and energy efficiency as a key focus in our environmental impact. With EU regulations on the horizon, we are actively pursuing initiatives to improve our understanding and reporting under the proposed Corporate Sustainability Due Diligence Directive (CSDDD).

Status of our work to meet CSRD requirements in 2026:

2023

Completed

Prestudy ESRS topics
DMA Version 1.0

2024

Completed

ESRS test reporting
Assessed the socpe of EU-taxonomy
Updating reporting topics and DMA Updating

2025

In progress

ESRS - Full scale test reporting
Complete the assessment of the socpe of EU-taxonomy
DMA Updating

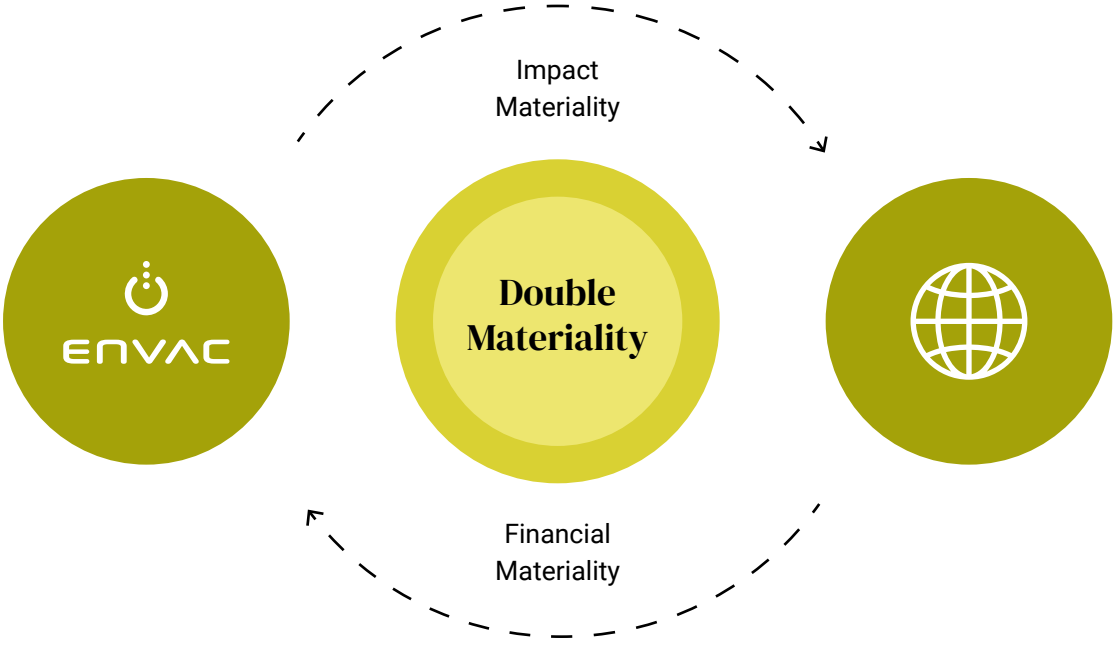
2026

First year of ESRS reporting

Note: The current status of CSRD is discussed in the EU parliament. We will act based on that decision when it comes.

Envac did an update of our DMA in 2024 and there were no significant changes to our identified materiality topics. In the DMA, we are working with an inside-out outside-in perspective. To understand our positive and negative impact towards sustainability, we must align ourselves and always be aware of how the socio-economic and political landscape, along with climate, can play a leading role in affecting how we run the business.

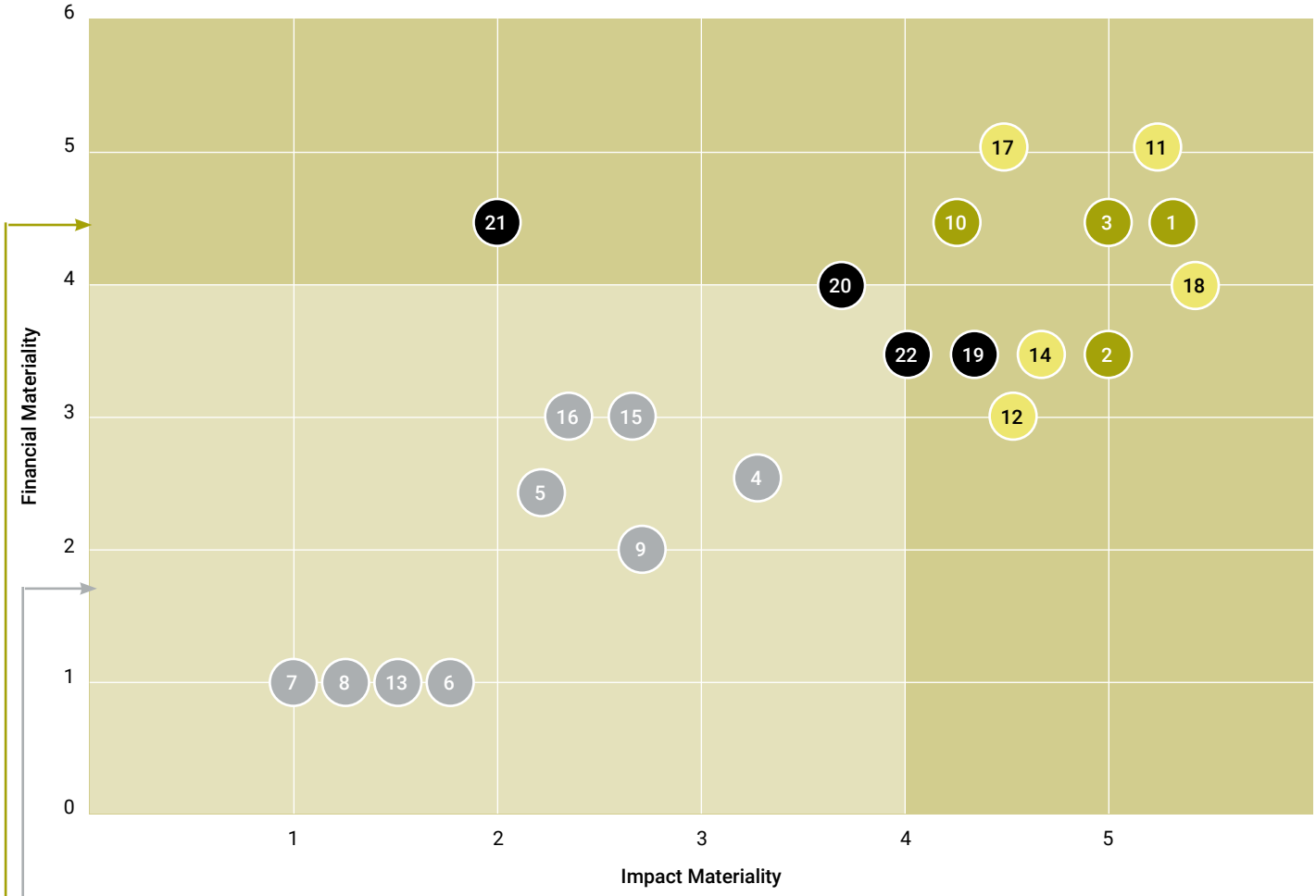
Inside-out perspective



Outside-in perspective

Topic	Envac approach to Inside -> Out perspective	Impact on Envac Outside -> Inside perspective
Quality of Life	Envac's products have a positive impact on increasing the quality of life for residents. For example: • Increased aesthetics and hygiene, clean and vermin-free waste handling solutions • Reduced noise in living areas from waste handling • Reduced heavy traffic in residential areas leads to increased safety for residents • Saved space in residential areas to be used for added-value solutions for residents	Global urban cities have a rapidly increasing population. According to United Nations, today, 55% of the world's population lives in urban areas, a proportion that is expected to increase to 68% by 2050. This will lead to twice as much waste generation as today, clarifying the critical challenge for urban resource management.
Minimise Emissions	Envac products positively impact carbon emissions by reducing the need for heavy traffic and waste-handling transports. As we operate the system for our customers, energy is used, which impacts our environment. Therefore, Envac needs to work on having an energy-efficient product in combination with smart automation solutions and O&M practices during the operation of the customer sites.	The need to decrease the use of fossil-free sources is increasing, and to succeed in this, energy efficiency in products running on, i.e. electricity, is crucial. Requirements for energy efficiency from customers and authorities and new legal regulations are developed and implemented regularly. If we do not have the proper energy efficiency focus on our products, there is a high probability we or our customers will need to pay more for the energy used in the future.
Resource Circularity	Envac offers products that support the behavioural change for end users that enables increase recycling rates. We deliver easy-to-use optical waste solutions that handle multiple fractions. Our digital solutions communicate, educate, and guide end users to sort waste correctly. Envac empowers the necessary change.	As the world develops, the need to manage waste as a resource increases. According to United Nations Environment Programme, 91% of plastic is not recycled, and each day, we throw away 1 billion edible food meals. Society and authorities are requiring more recycling. One key to success is raising awareness at the end-user level, making it easy to do right and guiding the behavioural change of the end user.
Business Responsibility	Envac wants to be considered a serious business partner; crucial in achieving this is taking care of our workforce, value chain workers and people affected by our products.	Customers, municipalities, etc, demand high business ethics; for Envac to meet these requirements, we must set high internal standards and require this from our suppliers. We use our code of conduct and supplier code of conduct to communicate our expectations towards our employees and suppliers.

The Double Materiality Assessment model



Material Subjects		Positive		Negative
Environment ●	3. 10.	Climate change adaption Circular economy- resource inflow	1. 2.	Climate change mitigation Energy consumption and mix within the organisation
Social ●	12. 18. 17.	Own workforce equal treatment and opportunities - diversity Consumers and end-users - Health and safety Affected communities - Land related impacts	11. 14.	Own workforce working conditions - Health and safety Value chain workers working conditions - Health and safety
Governance ●	19. 21. 22.	Business conduct - Corporate culture Political engagement Relationship with suppliers	20.	Corruption and bribery

Non Material Subjects ●

4.	Pollution of air, water, and soil	7.	Water
5.	Hazardous substances	8.	Marine resources
6.	Microplastics	9.	Biodiversity and ecosystems
13.	Own workforce – Other work-related rights	15.	Value chain workers – Equal treatment and opportunities
16.	Value chain workers – Other work-related rights		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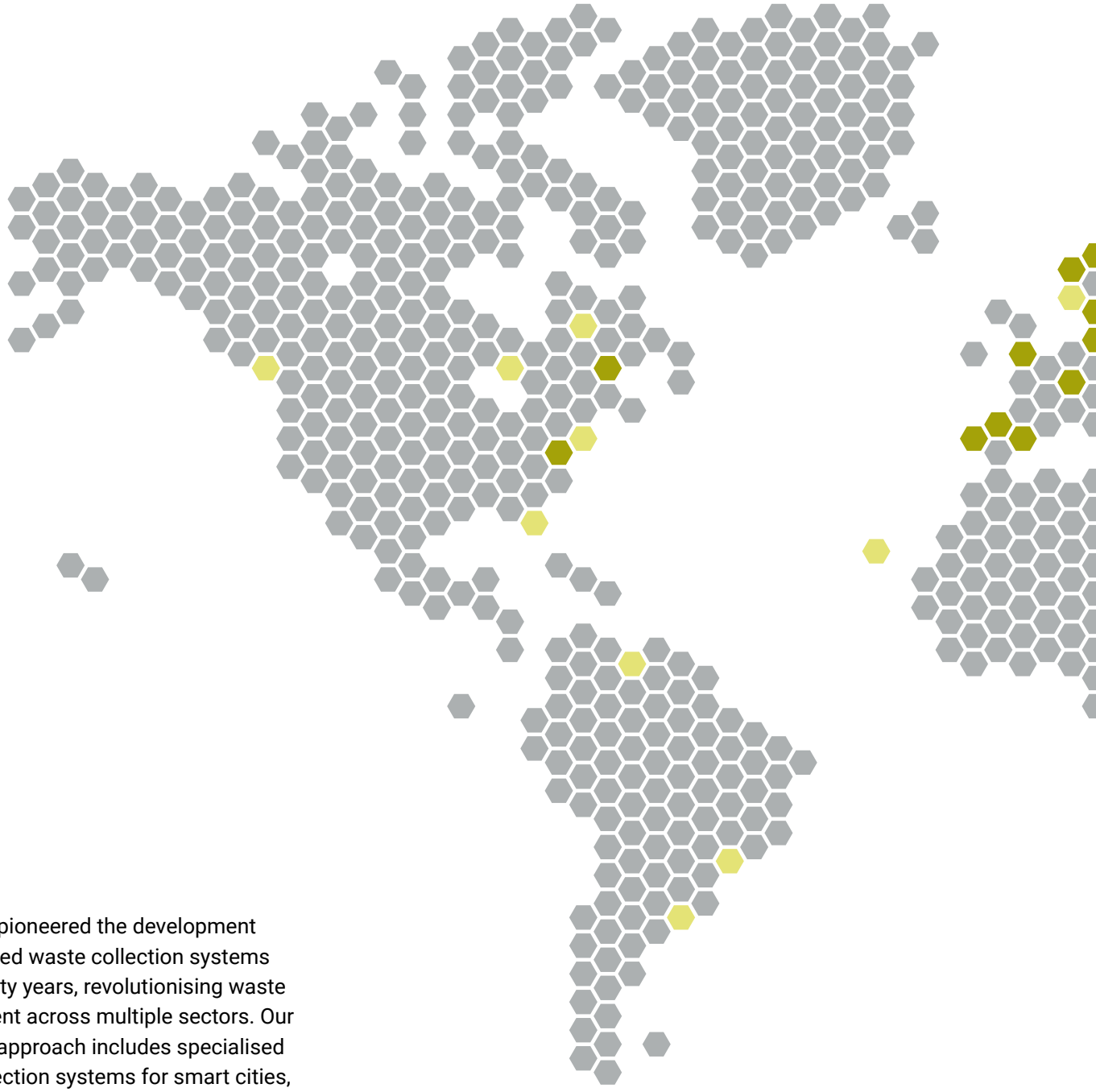
This is Envac



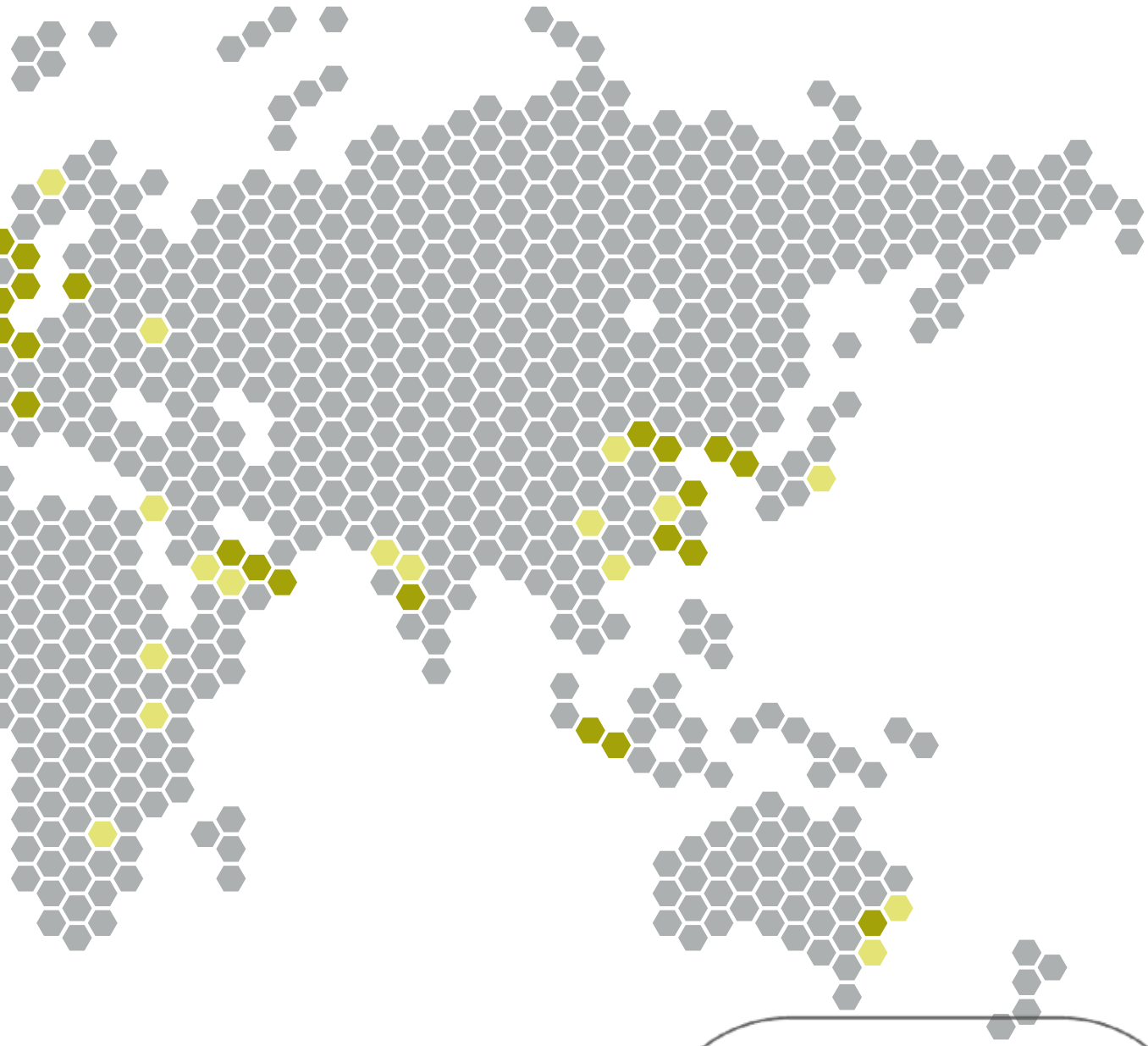
Envac has pioneered the development of automated waste collection systems for over sixty years, revolutionising waste management across multiple sectors. Our integrated approach includes specialised waste collection systems for smart cities, enhancing urban living with cleaner and quieter environments through efficient underground waste transport. We also deliver targeted solutions for airports and provide waste management services tailored for healthcare facilities, including the safe disposal of soiled linen, general, and infectious waste.

Our commitment to innovation extends to optical sorting technologies that significantly improve material recovery and recycling rates. Additionally, Envac's ReFlow platform offers a digital solution for resource circularity, optimising waste logistics with smart, data-driven insights. (read more on pg. 37)

Envac is a group of five business regions that operates across 20 countries with 35 local offices to deliver solutions globally. The business regions are:

- Envac China, South East Asia & India
- Envac Europe, Middle East & Africa
- Envac North Europe
- Envac North America
- Envac South Korea & Australia

Envac is part of the Stena AB Group.



MISSION

Combining innovation and experience, we create and implement clean, clever and resource-efficient waste handling technologies, providing our customers with game-changing solutions for sustainability and quality of life.

VISION

To create smarter cities, improve quality of life today and help secure a greener planet for future generations.

Envac's solutions

The Envac Automatic Waste Collection System (AWCS) offers an effective solution for managing urban waste. As cities continue to grow rapidly, they face increasing challenges in handling the rising volume of waste. The Envac solutions simplifies urban waste management, helping to meet regulatory compliance while promoting better waste management practices. This innovative solutions streamlines waste collection processes and brings numerous benefits to urban environments, making cities cleaner, safer, and more sustainable.

"Every year across the globe more than two billion tonnes of municipal solid waste (MSW) is generated. If packed into standard shipping containers and placed end-to-end, this waste would wrap around the Earth's equator 25 times, or further than traveling to the moon and back."
- Based on the Global Waste Management Outlook 2024 (report) from United Nations Environment Programme

Enabling sustainable urban environments

Automated waste collection solution for smart cities

- Higher quality of life for residents
- Greater operational efficiencies, 24/7 availability
- Lower risk of work injuries and illness
- Real-time, data-driven decision-making
- Save space up to 70%

Waste handling solution for healthcare

- Improving logistics and safety with soiled hospital linen collection
- Strengthening hospital reputation and ensuring regulatory compliance
- Reducing costs and maximising ROI with automated waste management
- Reducing the spread of infection with infectious waste collection (IWC)

ReFlow

- Effective and improved recycling
- An interactive and cost-effective digital solution
- The world's first smart meter for waste collection
- Seamless management

Optical sorting

- Multiple recyclables and collection methods - one sorting plant
- Encouraging user engagement for successful recycling
- Data-driven waste sorting for a smarter circular economy
- Cost-effective recycling solutions for a circular economy

Waste handling solution for airports

- Ensure security and regulatory compliance
- Eliminate overflowing bins, airside or landside
- Improve cleanliness and the guest experience
- Achieve labour cost efficiencies

Kitchen waste collection solution

- Save space, improve logistics
- Eliminate contamination risks, improve kitchen safety
- Minimise manual handling, gain operational efficiencies
- Better food waste sorting at the source

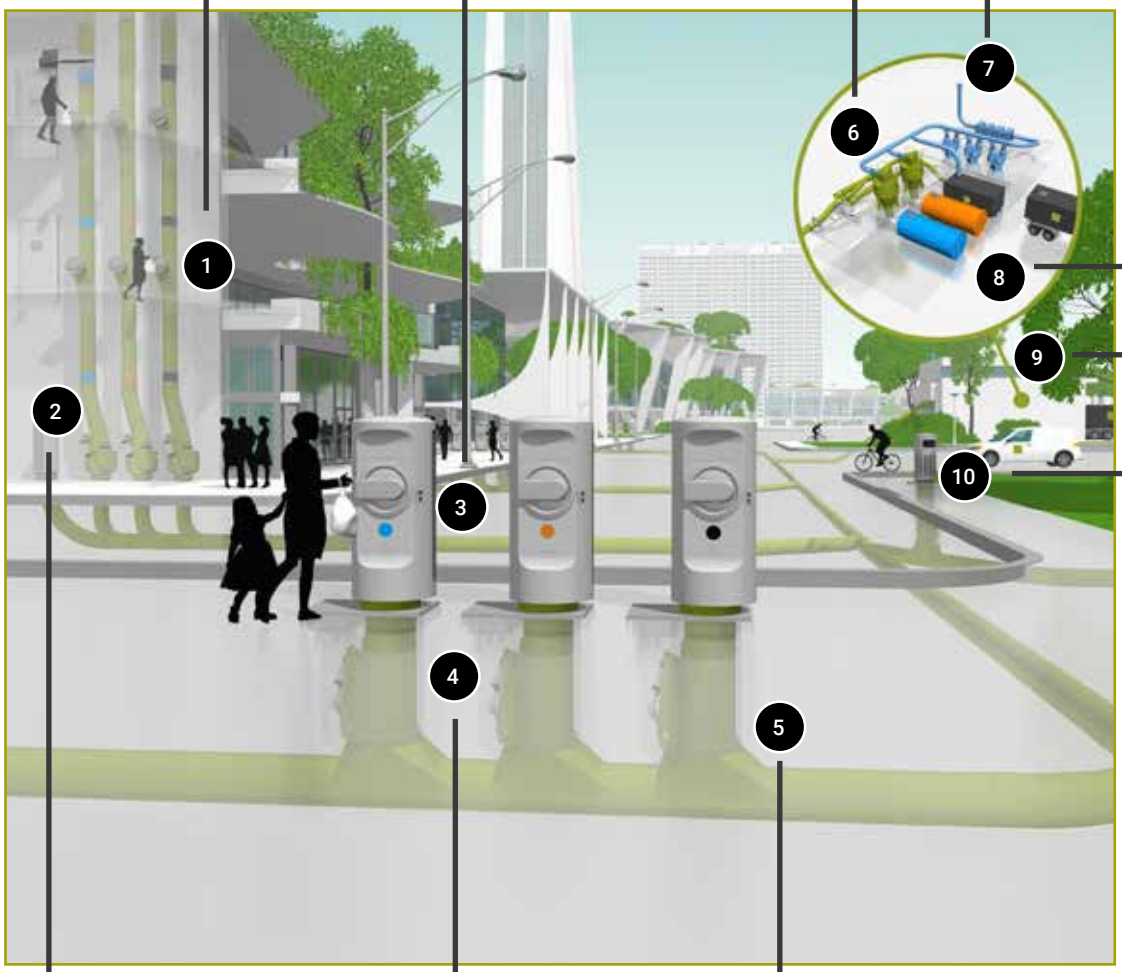
This is how Envac solutions work

1. Indoor waste disposal points placed on each floor or in the entrance hall.

3. The inlets for each type of waste and recyclables are placed close to the building. The easier it is to dispose of sorted waste, the more waste will be sorted.

6. A diverter valve directs bags to the correct cyclone and container, where a cyclone separates the transport air from the bags.

7. The transport air is filtered before being released, powerful fans create airflow in the pipes.



City & Residential

2. Air inlet valves transport air into the system upon signal from the control system. The valves placed outside can be easily hidden in green spaces.

4. Bags are stored in vertical storage chutes until they are full. Sensors in the chute send a signal to the collection station, triggering an emptying cycle. Valves open when the system is pressurised.

5. Waste inlets are connected to an underground pipe network that transports waste bags to the collection station at a speed of approx. 70 kph.

8. Full containers are transported to the recycling center and returned empty.
9. The waste collection station can be located up to 2 km from the central urban area, reducing the impact of heavy traffic, noise, air pollution, and congestion. By collecting all waste at a single point, the system is easier to maintain and more cost-efficient than traditional handling.
10. Public self-emptying litter bins can be connected to the system for improved waste management.

Hospital & Airport

11. At airports, it helps address logistical challenges by efficiently managing both regular and food waste.

12. Being underground makes the system resilient against extreme weather events or societal pressure. This resilient system is part of the smart city's infrastructure and is available 24/7/365.

13. The Envac System works efficiently in healthcare. For hospitals, it can handle all waste fractions, including general, soiled linen and infectious waste.

14. The system removes overflowing waste containers and litter bins by replacing them with a sealed underground system. Waste inlets are emptied immediately, eliminating foul odours and preventing littering in residential areas.

Optical Sorting

15. This sorting solution is ideal for both high-density urban areas and sparsely populated municipalities. All waste fractions are disposed of in the same bin but separated into different coloured bags, which are then optically sorted at a recycling facility. This solution can be used alongside any waste collection method.

Our value chain

The value chain illustrates the main areas where our activities impact society and the environment in different ways. To maximise our positive impact and minimise our negative impact, we continuously analyse the various parts of the value chain.

Waste collection station/ terminal at Lezkairu, Pamplona, Spain

Envac Value Chain

Research & development
We develop and improve products with end-users in mind while ensuring quality, cost-efficiency, and regulatory compliance.

Supply
We must partner with top suppliers that have robust manufacturing processes to ensure high-quality standards of ethical and environmental practices.

Sales & marketing
To effectively sell Envac systems, it is important to understand the sustainability benefits of our systems, using verified facts from trusted sources.

Project installation
We prioritise environmental, occupational health, and social standards in our installation work, which is often physically demanding and carries safety risks.

Operation & maintenance
Our technicians maintain the system for optimal operation and a long-life cycle.

Modernisation
Envac works with its customers to offer necessary system upgrades to improve efficiency and prolong the lifespan.

End of life
At the end of life, the customer considers various solutions such as demounting hazards and recycling materials.

Envac's sustainability risks

We have a yearly process to evaluate and update our sustainability risks. In 2024, we made some minor adjustments that did not affect the end result, and we concluded that our risks and mitigation actions remained the same. As part of this process, we conducted an internal analysis that assessed our sustainability risks in the context of the current urban socio-political and geographical environment.

This analysis included reviewing demographic trends, local policies, and socio-economic factors that may influence our operations and the communities we serve.

By aligning our sustainability efforts with these insights, we can better anticipate risk mitigation and identify opportunities for collaboration.

Pipe network inside an Envac terminal

	Risk	Risk if not Controlled	Risk Mitigation	
Environment	**Climate change emissions** Envac's main emission impact comes from operation of our customer's systems	• Unnecessary use of energy at customer sites • Unnecessary use of fossil fuels in transport • Cost of manufacturing and raw material	• Global R&D process • Optimising energy use at customer sites	High
Environment	**Climate change emissions** Manufacturing of products including transport to installation is a contributor to emissions	• Unnecessary emissions from fossil fuels	• Transport efficiency measures through supplier partnership with transport companies • Local sourcing for the majority of our products	Medium
Environment	**Climate change** Envac's internal energy use comes from company fleet and office energy use	• Unnecessary use of fuel • Unnecessary use of electricity, heating and cooling	• Fuel efficiency/electrification • Energy sourcing via rental agreements	Medium
Environment	**Climate change** Pipes of steel and coating is put in the ground as a part of the waste handling solution. The compound of that material can have an impact on the soil.	• Pollution of the ground	• Global R&D process • Relevant third party evaluation of our products	Low
Environment	**Product material & design** The design of the product is important to make sure the quality of life of residents keeps improving	• Noise levels • Colour • Cleanliness of the system • Presence of vermin	• Global R&D process • Professional design in each customer project • Continuous improvement through global reporting system	Low
Environment	**Supplier sourcing** If suppliers do not handle their responsibility correctly this indirectly effects Envac's sustainability impact	• Environment issues • Fair business ethics • Quality of products	• Supplier evaluations • Supplier code of conduct • Business agreements	Medium
Environment	**Operation & maintenance** Our O&M team maintains the system for optimal operation and a long life cycle	• Unnecessary use of energy at customer sites • Less waste go to recycling	• Continous improvement of O&M best practices	Medium-High
Environment	**Modernisation** Envac's new technologies can be used to upgrade exisiting installations to improve efficiency and extend the waste systems life	• Unnecessary use of electricity • Shorter life span of customer systems	• Global R&D process • Continous improvement of O&M best practices	Medium-Low
Environment	**End of use/Life of products & services** At the end of life, the customer considers various solutions such as demounting hazardous and recycling materials	• Hazardous material in old buildings • Injuries while dismounting the system	• Risk assessments • OHS policies and procedures	Low
Social Responsibility	**Own workforce - Health & safety** Lack of understanding the OHS risks in the installation process could lead to physical or medical incidents	• Injuries at work • Severe injuries for employees	• Risk assessments • Global OHS Policy • OHS policies and procedures	High
Social Responsibility	**Responsible communication & marketing** Envac communicates that we enable a smart, efficient and more sustainable urban development	• Unclear sustainability marketing/communication • Bad brand reputation • Greenwashing/Greenhushing • Loss of market share	• Third-party evaluations • Follow acknowledged standards • Transparency in sources of statements	Medium-Low
Human Rights	**Workers in the value chain - Health & safety** Lack of understanding the OHS risks in installing our system we might end up with physical or medical incidents (contractor or subcontractor)	• Injuries at work • Severe injuries to third party workers	• Subcontractor agreements • Risk assessments • OHS policies and procedures	High
Human Rights	**Discrimination** Envac is a global business that believes in the strength of diversity and inclusion	Unethical behaviour related to: Gender, age, ethnic origin, sexual orientation, political opinion, religion, trade union activity, pregnancy or other legally protected characteristics	• Code of Conduct • Supplier Code of Conduct • Global Diversity & Inclusion Policy	Medium
Anti-corruption	**Business conduct** Envac does business with private customers and municipalities. This also includes working with public tenders. Envac also works with different joint organisations and comes in contact with policymakers. This responsibility also means we need to make sure our suppliers keep a fair business practice.	• Unethical business • Corruption and bribery • Unfair competition	• Code of Conduct • Supplier Code of Conduct	Medium

Quality of life

For a better quality of life

At Envac, we are committed to improving people's quality of life – both today and for the future. Our waste solution has a visible impact on the places where people live and work, making communities cleaner, greener and safer.

Safer streets

Unlike traditional waste rooms or garbage bins, our inlet system with its underground pipe network swiftly and silently removes waste from public spaces in a completely sealed environment. This minimises unsightly trash, unpleasant smells and the spread of disease from vermin infestations, creating a more hygienic and enjoyable urban environment.

By reducing the need for heavy garbage trucks to collect waste from multiple locations, our system helps lower traffic congestion, minimises noise pollution and reduces the risk of accidents caused by these vehicles. Fewer trucks mean lower emissions, leading to cleaner air and a healthier cityscape.

Simple, convenient and accessible

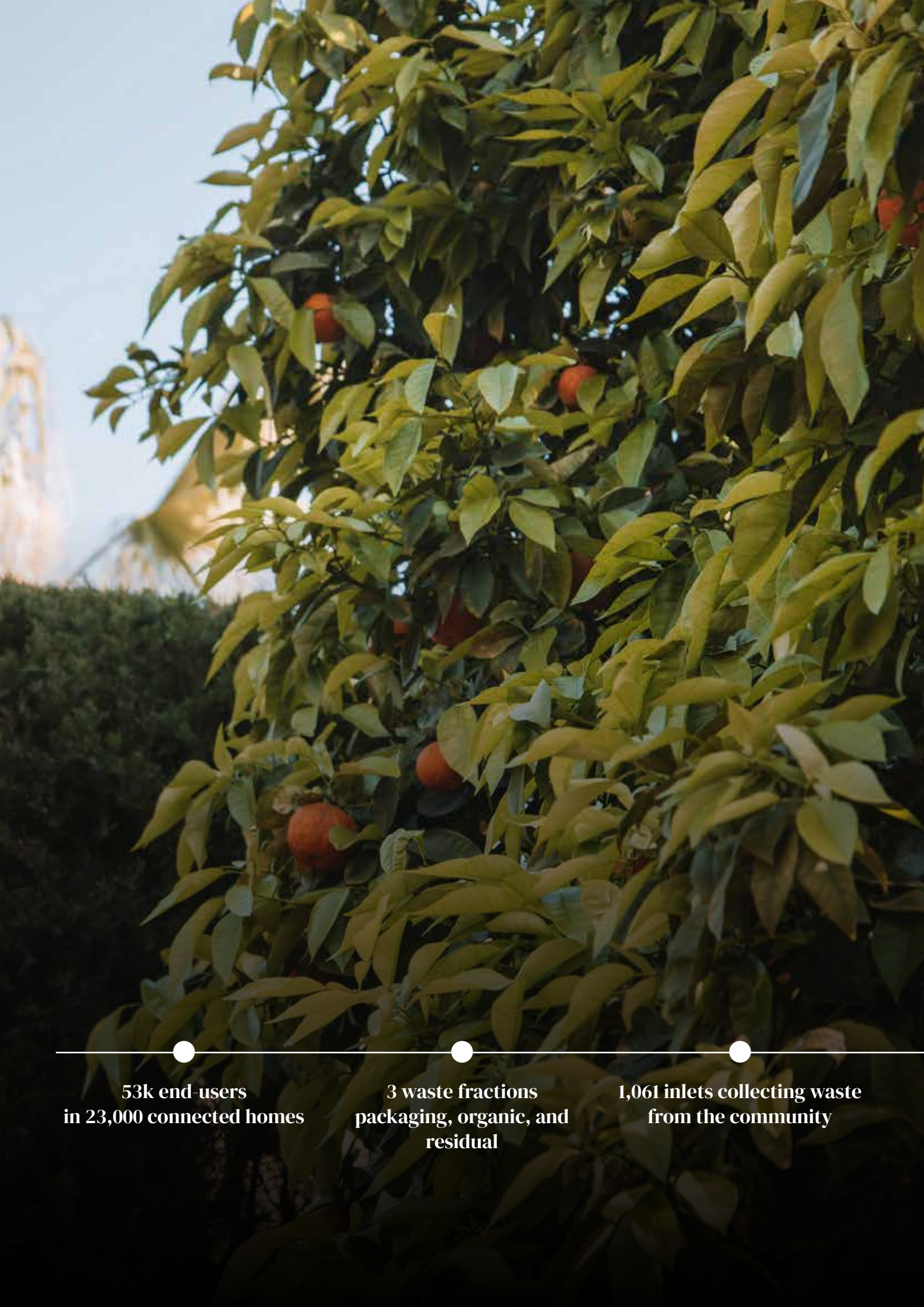
Our waste inlets are placed close to where people live and work, providing a simple and efficient disposal solution that is accessible 24/7, 365 days a year. With no overflowing bins or manual handling, waste collection becomes nearly effortless and hassle-free.

More space for greener cities

By eliminating the need for waste bins and traditional collection points, our system frees up valuable above-ground space, creating opportunities for more parks, green areas, bike lanes and pedestrian-friendly streets. This contributes to more attractive, sustainable, and liveable cities.

Inside buildings, our solution reduces the need for dedicated waste rooms, allowing building owners to repurpose space for commercial use or additional apartments.

Inlets for general, paper and packaging waste in a residential neighbourhood in Barkabystaden, Sweden



53k end-users
in 23,000 connected homes

3 waste fractions
packaging, organic, and
residual

1,061 inlets collecting waste
from the community

Customer case: Quality of Life

Majadahonda, Spain

The City of Majadahonda, outside Madrid in Spain, was an early pioneer in providing sustainable public services to both residents and businesses. As early as 1999, the city council implemented its first Envac system. Since then, it has launched five pneumatic waste collection centres to provide more efficient, sustainable waste management for its growing population.

Improving environmental sustainability and a community's quality of life

Today Majadahonda is a city with one of the most extensive implementations of such automated collection systems in all Europe. Envac's technology serves about **70% of its population, a percentage** considerably higher than many other cities that have similar systems.

Together, the five systems in operation cover roughly 23,000 residences and collect around 8,000 tonnes of waste each year. They have involved the installation of more than 1,000 waste inlets and 30 kilometres of underground pipes, through which waste flows to the collection centres.
The city collects three fractions: organic, residual, and plastics and packaging waste. With separate inlets for each waste fraction, residents are encouraged to separate and classify their waste appropriately. The initiative reflects the positive attitude of the municipality and its residents towards efficient waste management, helping to maintain a cleaner, safer environment and to improve the community's quality of life.

25 years of successful operation and beyond

Using pneumatic vacuum technology to collect and transport waste away from urban centres has become increasingly popular in urban areas worldwide. The system significantly enhances citizens' overall quality of life by minimising traffic, pollution and noise. Its success in Majadahonda has also inspired planners to consider using the system for new developments included in the municipality's urban development plan, offering a template for other cities and municipalities to follow.

289k hours of operation and 8,000 tonnes of waste collected annually

25 years with the Envac system

“The preservation of the environment in cities and the improvement of the quality of life in urban environments are two of the most important challenges that public managers will have to face in the next 30 years. Addressing them will require collaboration among all citizens in addition to technological innovation.”

Carlos Bernad
CEO of Envac EMEA

Collection station/terminal in Los Negrillos, Majadahonda Spain

“It’s a cleaner system, we don’t have issues with odours and garbage bags on the street, and residents can get rid of their waste 24 hours a day, every day of the week.”

Marina Pont
Environmental councillor at Majadahonda City Council

Residents give high marks to pneumatic waste collection

A survey carried out by the third-party market researcher firm Sigma Dos found that pneumatic waste collection systems enjoy high approval among local residents and users. An impressive 94.7% of users expressed their satisfaction, rating the system an average of 7.88 out of 10. When asked about the system’s most valued benefits, respondents highlighted reliable operation (49.7%), convenience (27.5%) and improved cleanliness (24.4%).

End user customer survey 2024

94.7%
users gave an average satisfaction score of 7.88/10

Most valued benefits

49,7%
Reliable operation

27,5%
Comfort and convenience

24,4%
Improved cleanliness

Minimise emissions

Energy efficiency is essential for combating climate change, since it significantly cuts down on both direct greenhouse gas emissions (GHG) from fossil fuel use and indirect emissions from electricity generation. Envac's technology and automation helps facility and infrastructure managers save energy and minimise emissions.

Driving energy efficiency savings

Facilities can significantly reduce their carbon footprint and operational costs by implementing energy-efficient technologies and practices. The integration of renewable energy sources, such as solar panels, further enhances sustainability by delivering long-term financial benefits alongside reduced emissions. Efficient energy management not only cuts utility bills, but supports corporate social responsibility - benefitting both the planet and the bottom line results.

The Envac system exemplifies these principles by reducing the emissions associated with waste management. Through advanced automation and sensor-driven technology, it optimises energy consumption and operational efficiency. Real-time monitoring and control of energy assets allow loads to be adjusted based on user-defined peak thresholds, ensuring that the system operates only when necessary. For instance, level sensors are activated only when capacity is reached, optimising space utilisation and scheduling collection efficiently.

Intelligent automation with the Envac Automation Platform

At the heart of this innovation is Envac's Automation Platform (EAP), the software that drives more efficient, sustainable and resource-saving waste operations. The platform continuously learns and optimises performance, enabling cities and businesses to gain clear insights into their waste production. This data-driven approach supports better monitoring, planning and real-time decision-making, leading to both energy savings and a reduced environmental footprint.

EAP platform maximising efficiency by reducing energy and cost. Eriksberg, Sweden

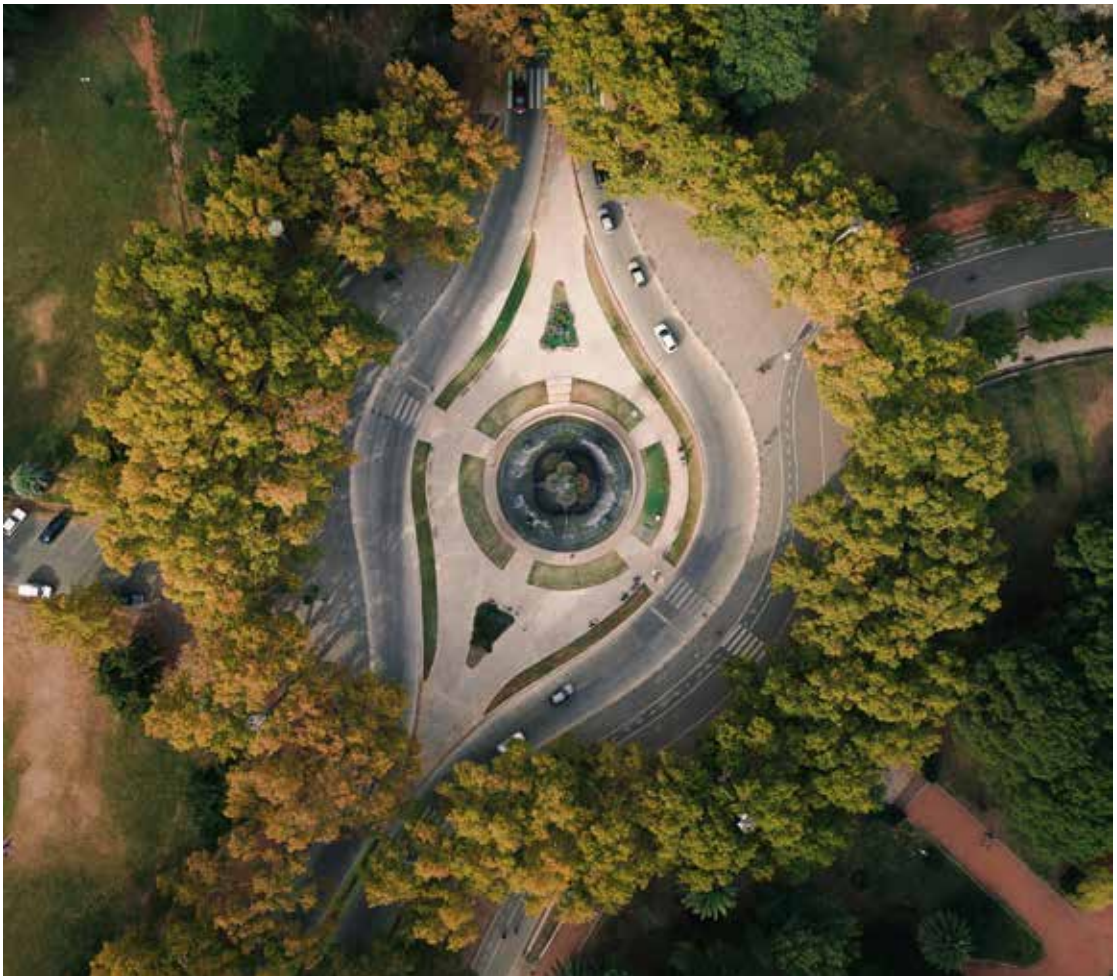
This strategy drastically reduces power consumption – by as much as 70%

While traditional automated waste collection systems have faced criticism for their energy use, the latest version of Envac's platform has made significant strides in energy efficiency. Its peak-shaving feature, for example, can pause operations automatically when a specified kilowatt threshold is exceeded, and then resume at the start of the next hour. This strategy reduces power consumption – thereby lowering operational costs, reducing reliance on fossil fuels and shrinking the overall carbon footprint.

Less truck traffic helps to slash transport emissions

By eliminating the need for conventional waste collection vehicles, the system also decreases truck traffic and transport emissions, and the risks associated with manual handling.

Compared to the traditional practice of multiple pick-ups, automated waste collection and disposal using pneumatic tubes has been shown to **reduce carbon emissions by up to 90%** – making the Envac system a key component of change for achieving the UN's sustainable development goals.

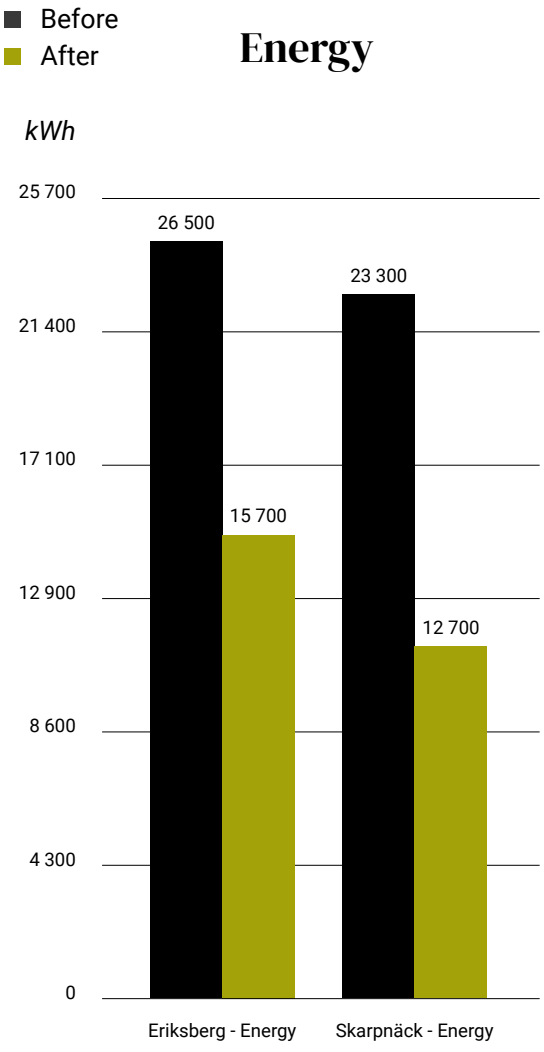


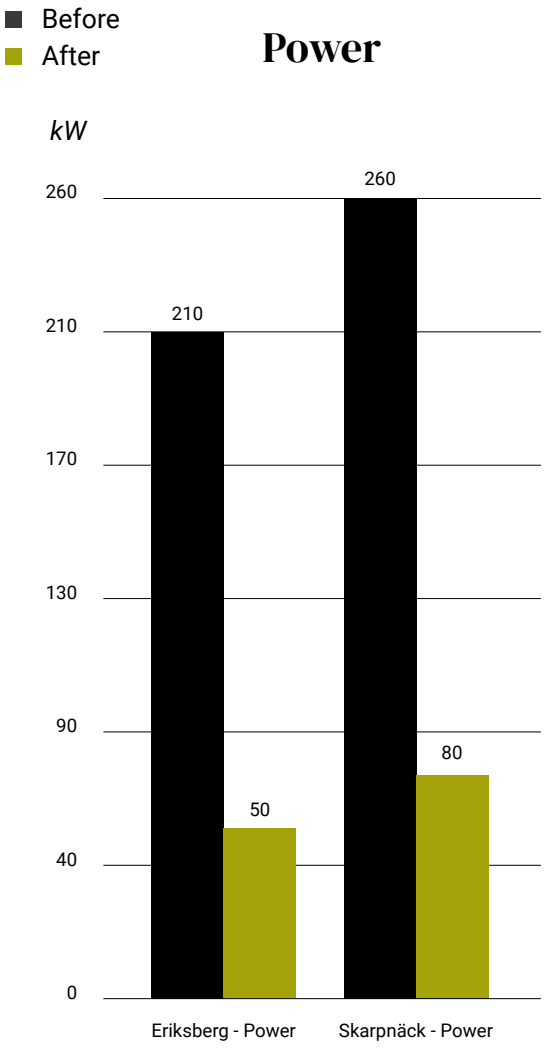
Major cost and energy savings for facility owners

In the Eriksberg district of Gothenburg, Sweden, Envac's smart automation system has made a real difference in energy use. By managing power more efficiently, the system helped cut electricity demand significantly over the course of 2024. From winter to summer, energy consumption dropped noticeably, helping the facility owner save a substantial amount on electricity bills.

Similarly, in Skarpnäck, just outside Stockholm, energy usage was also significantly reduced. Envac's improvements brought down both peak power demand and overall consumption, leading to major energy savings. As in Gothenburg, these changes are helping the facility owners save on energy bills. These examples show how Envac's technology is helping cities become more energy-efficient and cost-effective.

System efficiency based on calculations for reduction in power and energy use





Power = The kW needed to collect the waste. i.e a fan has the power of 75 kW.

Peak shaving = Optimising the use of power over a defined period of time without any quality decrease for the operation of the system or the end-user experience.

Energy = The total power (kW) used when collecting the waste kW per hour. i.e we use the 80kW fan for 30 minutes to collect the waste that uses 40 kWh of energy.

Envac Automation Platform features for greater energy efficiency

Dynamic emptying times
Adjusts collection schedules based on load and flow, ensuring run times are kept to a minimum.

Demand-related emptying
Offers greater flexibility and maximises the utilisation of inlets.

Intelligent pneumatic regulation
Allows the system to operate at lower average power, conserving energy and extending service life.

Enhanced error handling
Includes auto-correcting capabilities in some instances to reduce downtime.

Comprehensive operating data
Provides easily accessible insights to monitor performance and identify where adjustments are needed.

A live status map of Eriksberg in Sweden

Waste collection inlets in Eriksberg, Sweden

Resource circularity

Boosting resource circularity

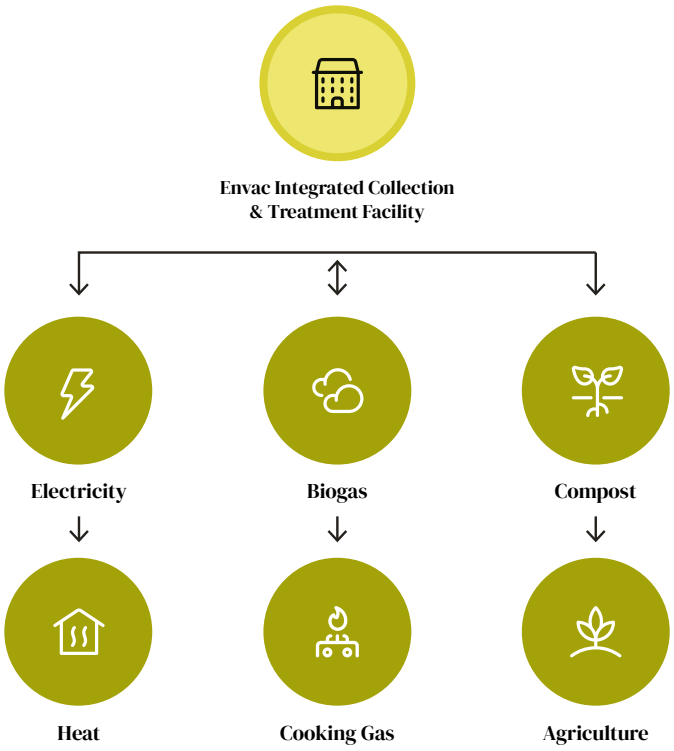
Envac is making it easier for people to turn waste into worth. We are helping cities across the world make it simple for their citizens to change behaviours and get involved in achieving climate and recycling goals with solutions such as, *Optical Sorting and ReFlow*, that supports resource circularity.

How we help to make every action count

Envac's automated waste collection system integrates waste collection into the circular economy. Our system handles multiple waste streams — helping to ensure that materials are sorted and reused. For example, food waste can be transformed into bioenergy and biofertilisers, while other materials can be repurposed for recycling or energy recovery. This streamlined approach improves recycling rates, but also eases the environmental burden on landfills and helps lower carbon emissions.

Promoting source separation, recycling and beyond

By offering dedicated inlets for specific waste fractions—such as newspapers, compostable materials, and combustibles—we make it easy for residents to sort waste at the source. Strategically placed near or within residential areas, these inlets facilitate proper separation, which in turn enables treatment facilities to process each fraction more efficiently. Combustible waste can be incinerated for heat, compostable materials converted into biogas or fertiliser, and newspapers recycled into new paper products.



Streamline logistics

Reduce transport costs

Lower emissions

Dedicated sorting solution

Envac's sorting solution uses a system of colour-coded bags to simplify the recycling process. Whether integrated with our pneumatic collection system or retrofitted into traditional setups with kerbside pickup, each recyclable material is placed in its designated bag. This clear, user-friendly method not only assists new users in properly sorting their waste, but also allows all bags to be collected together and sorted by colour at a central facility. Improved sorting can help reduce overall environmental footprint and enables the end user to make better waste handling decisions.

ReFlow citizen app boosts engagement

The ReFlow citizen app is an innovative digital tool designed to improve waste management for both individuals and municipalities. Developed alongside experts in social and behavioural sciences, ReFlow leverages urban data streams to visualise waste flows and educate citizens on recycling best practices. The app offers tailored guidance on sorting recyclables and provides feedback on users' recycling performance and environmental impact. It also promotes community engagement by enabling the sharing of recyclable goods and displaying real-time recycling information on apartment entrance screens.

Recent studies indicate that ReFlow contributes to a **12% reduction in waste generation** and a **15% increase in plastic recycling**, underscoring its role in driving behavioural change and user-friendliness.

How Envac ReFlow enables behavourial change

- Real-time data empowers users to make informed choices that reduce waste generation.
- Guidance on waste sorting helps minimise landfill contributions.
- Feedback on recycling performance and support for continuous improvement.
- Digital solutions foster asset sharing and reuse, advancing overall resource circularity.

Waste seperation at home as first step that enables the user-friendly sorting at source

Customer case: Resource Circularity

ReFlow drives waste reduction and recycling at Stockholm Royal Seaport

The Stockholm Royal Seaport project — Sweden's largest urban development — has reimagined a former industrial port into a modern, emissions-free community. At the heart of this transformation is a comprehensive Reduce, Reuse & Recycle initiative that has revamped waste management in the area.

Empowering citizens with Envac ReFlow

Envac ReFlow app, digitalises and visualises the pneumatic waste collection system. This tool helps residents reduce residual waste and enhance recycling by offering:

- Real-time guidance: Step-by-step instructions on waste sorting and disposal.
- Error reporting: Features for flagging issues with disposal chutes and self-healing inlets.
- Educational support: Tips, guides to to waste rooms and recycling facility information.

Citizen participation was a key focus from the planning stage, and the project exceeded its engagement target — 38% of households (975 units) joined ReFlow compared to the initial goal of 25%.

User feedback & behavioural change:

A survey conducted by LocalLife in July and August 2024 highlighted significant improvements:

80%
user satisfaction

61%
gained better knowledge on proper sorting methods

>50%
of users reported increased motivation to sort waste correctly

67%
adopted changes at home to recycle more effectively

Waste composition improvements:

Analysis comparing 2023 and 2024 data shows progress in sorting accuracy in Stockholm Royal Seaport:

- Packaging & newspapers: Incorrect sorting in residual waste dropped by 19%
- Plastic packaging: Correct sorting increased by 10%, while food waste contamination in the plastic fraction decreased from 0.03 kg to 0.01 kg per household per week
- Recycled paper: Maintained over 90% accuracy in proper sorting

These outcomes improve recycling quality, and contributes to reduced emissions from waste incineration.

Looking ahead

Ongoing waste analysis will continue to monitor and refine behavioural trends, ensuring that initiatives like Envac ReFlow keep driving the transition towards a circular economy. The success at the Royal Seaport demonstrates how digital innovation and active citizen engagement can pave the way for more sustainable urban environments.

Waste disposal inlets turned into monsters for the kids. Monsters are 'always begging for bags'.

“We are very pleased with the positive results from the Envac ReFlow project in Stockholm Royal Seaport. That 8 out of 10 users are satisfied with the service and that over half of the residents in an area already known for its sustainability focus now report improved waste sorting clearly shows that the technology makes a difference. We also see quality improvements in waste sorting, particularly with plastic packaging and reduced food waste. This indicates we are on the right path towards more sustainable waste management and increased recycling,”

Klas Leksell
Head of Service and ReFlow Lead at Envac Sweden

“The reduction in packaging and newspapers in residual waste is a positive development. At the same time, the proportion of plastic in the plastic packaging fraction has increased, and the proportion of other packaging has decreased. I dare to say these changes are interrelated and should be seen as a result of changing behavioural patterns among residents,”

Ina Maslo Vukicevic
CEO of Envir, who conducted the waste analysis

Customer case: Resource Circularity

Smart waste management in China's urban transformation

As China accelerates its urban expansion and transformation, sustainability is at the forefront of its development strategy. Envac's smart waste collection technologies have already been deployed in projects such as Tongzhou New Town in Beijing and Hainan Cancer Hospital.

Cloud Bay Palace: Setting a new standard for sustainable living

In Qingdao, one of China's largest cities, the Cloud Bay Palace project — developed in partnership between by Qingdao Railway Real Estate and White Peak — will become the city's first residential community to introduce Envac's automated waste collection system (AWCS), modelled on a Swedish eco-city. Expected to be operational in March 2025, the project blends innovative design with sustainability to create green, comfortable and safe living spaces.

Covering 25,000 square metres of land with a gross floor area of 1.3 million square metres, Cloud Bay Palace is uniquely positioned, surrounded by the sea on three sides and adjacent to the 50,000-square-metre Tuandao Hill Park. This integration preserves the natural ecosystem while creating a low-carbon urban oasis that combines leisure, entertainment, reading and research. The development's commitment to sustainable design is recognised through its BREEAM-Excellent (4-star) certification.

Key project benefits: Cloud Bay Palace, Qingdao, China

Environmental protection and energy savings

- The closed-loop design and vacuum collection system effectively prevent litter, sewage runoff and odour dissemination.
- A 6-tonne daily waste collection runs for just one hour, using approximately 170 kWh — equating to 0.028 kWh per kg of waste. (equivalent 28 kWh per tonne)

1

Space optimisation and beautification

- Eliminating on-site waste storage frees up valuable community space.
- Underground waste collection maintains the community's cleanliness and visual appeal.

2

Intelligence and automation

- The system operates autonomously 24/7, eliminating the need for human intervention.
- Remote sensing and monitoring provide real-time management of the system.

3

Health and safety

- Automated collection reduces direct human contact with waste, lowering the risk of disease transmission.
- The reduction of noise, emissions, and odours boosts property values and residents' quality of life.

4

Economic efficiency

- Long-term savings from reduced labour and transportation cost.
- Automated waste collection is completed in minutes, outpacing traditional methods and reducing traffic congestion via underground pipelines.

5

Qingdao Project master plan rendering

The Hammarby Model: A Blueprint for Sustainable Urban Living

The Hammarby Model, pioneered in the Hammarby Sjöstad district of Stockholm, Sweden, stands as a global benchmark for sustainable urban development. Designed as a closed-loop system, it integrates energy, waste, water, and transport systems to minimise environmental impact and promote circular resource use.

1st Generation

Hammarby Sjöstad, Sweden

A flagship eco-district that became the original model for sustainable urban regeneration in Sweden.

Envac's Role:

- Serves over 12,700 apartments, as well as commercial and mixed-use spaces
- Eliminating the need for street-level bins
- Supports Stockholm's ambition to become fossil-fuel free
- Improves recycling efficiency
- Boosts quality of life through reduced noise and odour

2nd Generation

Yantai Hammarby Eco-City, China

A ground-breaking collaboration between Sweden and China, adapting the Hammarby Model.

Envac's Role:

- Integrated waste handling directly into the masterplan, ensuring system-wide efficiency
- Supports source-separated waste to maximise recycling and minimise landfill use
- Improves public hygiene and urban aesthetics in one of China's most ambitious eco-city projects

3rd Generation

Qingdao Cloud Bay, China

A smart urban district in Qingdao, influenced by the core values and technologies of the Hammarby Model.

Envac's Role:

- Providing a scalable, sustainable waste infrastructure aligned with smart city principles
- Supporting city planners with technical expertise in waste logistics and integration
- Positioning Qingdao as a leader in low-carbon urbanisation with data-driven waste operations

Across every project, Envac plays a transformative role — not merely collecting waste, but helping cities evolve into cleaner, quieter, and more sustainable places to live.

Envac's systems:

1. Lower carbon emissions and urban traffic
2. Improve air quality and reduce noise pollution
3. Encourage recycling and circular waste practices
4. Enable data integration for smart city development

Business responsibility

Envac is committed to ensuring that both our employees and external partners operate responsibly and safely. Guided by corporate governance policies and principles, our approach to business responsibility rests on three key pillars: fair and ethical business, ethical supply chains, and healthy, safe workplaces.

1. Fair and ethical business

Fair and ethical business practices form the foundation of our safety culture. We maintain a comprehensive code of conduct that is regularly communicated through training and signed off on by all employees. A dedicated whistle-blowing system is available to every stakeholder, and regular internal audits confirm compliance with our standards.

2. Ethical supply chains

Our commitment to ethics extends through our supplier value chain. Envac's mandatory supplier code of conduct, which reflects our high ethical and sustainability standards, is signed by all key suppliers. We conduct regular evaluations of supplier performance and implement targeted action plans to correct any deviations. This systematic approach not only upholds our standards but also builds stronger, more transparent relationships with our supply partners, ensuring that ethical practices are maintained at every stage of our operations.

3. Healthy, safe workplaces

Envac is creating healthy and safe workplaces for our employees and the broader communities that are impacted by our solutions. We have waste collection solution that minimises manual handling, a leading cause of lost-time injuries in waste management. By reducing physically demanding tasks, we also benefit sectors like healthcare, where activities like handling soiled linen and waste pose significant risks.

At Envac, safety is on every meeting agenda, with global policies and guidelines established to prioritise safety across the board. We conduct yearly employee surveys to measure physical and psychological safety and overall health. The Employee Safety at Work Index has remained consistently stable over the past four years, reflecting a established safety culture with an average score of 4.30 out of 5 (2021-2024).

We have established a diversity & inclusion policy and structured guidelines for moving forward. In 2024, we collaborated with external companies to introduce foreign talent into our Swedish workforce, offering paid internships and development programs, along with cultural integration. We are working to be a more inclusive workplace.

Employee Safety at Work Index score

4.30/5.00

Innovation in action: Transforming hospital hygiene with Envac

A study from the Royal Institute of Technology in Stockholm demonstrates that Envac's automated, hermetically sealed pipe system significantly reduces bacterial contamination in hospitals compared to traditional waste management methods.

The research compared bacterial levels at Hospital A, which has been using Envac's automated system since 1972, with Hospital B, which is transitioning from conventional methods. The findings showed up to 49.3% fewer colony-forming units (CFUs) at Hospital B, demonstrating the system's effectiveness in curbing microbial spread.

49.3%

fewer colony-forming units in hospitals with a closed pipe system for waste

>50%

in potential savings for healthcare by reducing healthcare-associated infections

“These results emphasise the need to rethink hospital waste management logistics in both new and existing facilities. Our technology not only contributes to more efficient hospital laundry and waste disposal but also to a safer healthcare environment.”

Magnus Sjöstrand
Envac healthcare expert

Healthcare savings potential

A 2023 report* from the Public Health Agency of Sweden (Folkhälsomyndigheten) estimates that up to SEK 1.6 billion (about €144 million) can be saved by reducing healthcare-associated infections. Optimising logistics, enhancing waste management and improving medical procedures not only elevates hygiene standards but also offers substantial cost benefits.

Addressing a critical gap in research

This research fills an important void by examining how logistics systems themselves influence bacterial levels — a factor previously overlooked. Envac’s closed pipe system segregates dirty laundry, general waste and infectious hospital waste into separate pipelines, drastically reducing physical contact between staff and contaminated materials. This innovative approach creates a safer environment for both patients and healthcare personnel.

Access the full study to learn more about promoting hospital hygiene and contributing to healthier, safer healthcare environments.

An illustration of how the Envac system works at hospitals.

*Access the report from Folkhälsomyndigheten, Sweden here.

United Nations
Sustainable Development Goals

Every year, the world produces over two billion tonnes of municipal solid waste – a staggering volume that is fuelling a triple planetary crisis: climate change, pollution and biodiversity loss. This global challenge not only poses severe environmental risks but also raises pressing questions of social and environmental justice, as communities grapple with the impacts of inadequate waste management.

Envac's automated waste collection system offers a forward-thinking solution to these challenges. By modernising how waste is collected and managed, our technology reduces environmental harm and promotes healthier, more sustainable urban living. In doing so, Envac not only supports the efficient handling of waste but also aligns with key Sustainable Development Goals to create cleaner, safer and more equitable communities.

Good health and well-being

Envac's system eliminates the need for unsafe waste practices, such as dumping or open burning, thereby safeguarding public health. Our touchless, automated technology prevents unsanitary conditions, minimises odours and deters vermin infestation that can lead to disease. By reducing waste collection traffic in densely populated areas, we further decrease the risks of traffic accidents. In healthcare facilities, our solutions ensure the secure handling of contaminated laundry and medical waste, ultimately fostering safer environments for all, especially the most vulnerable.

Decent work and economic growth

Envac is committed to driving sustainable business practices through our automated waste collection platform. By streamlining operations and adopting green energy initiatives, we help the economy grow circularily. Our innovative business models improve resource efficiency while creating safe, decent work opportunities – building a sustainable future for communities and economies worldwide.

Industry, innovation and infrastructure

Designed for resilience, Envac's decentralised system operates continuously – even under extreme weather conditions – and can be seamlessly retrofitted in sensitive or historic urban areas. Our installations in Bergen, Norway, and Leon and Barcelona, Spain serve as prime examples of how innovative infrastructure can attract private investment, stimulate local technology development and boost entrepreneurial opportunities. In doing so, our solution promotes resource efficiency and reduces financial risks for municipalities.

Sustainable cities and communities

Envac's automated system reduces waste collection traffic, thereby improving air quality and creating opportunities to transform urban spaces – replacing congested roads with walkways, bike lanes and green areas. By ensuring efficient waste management, we contribute to building safe and resilient communities that focuses on the quality of life for all residents.

Responsible consumption and production

Envac's system is a key solution in promoting responsible consumption. By integrating waste collection into the circular economy, we streamline the sorting and recycling of multiple waste fractions, enabling the transformation of waste into reusable resources. Our approach minimises water usage and help convert food waste into bioenergy and fertilisers. This demonstrates how collaborative efforts among companies, governments and citizens can promote responsible consumption by also reducing waste usage and curb-side pollution.

Climate action

Envac's pneumatic waste collection system is a powerful tool in the fight against climate change. By cutting carbon emissions from waste transport by up to 90%, our technology directly addresses harmful emissions – from methane at landfills to black carbon from open burning. Pneumatic waste collection is recognised by the European Commission as a best practice for urban areas, and cities around the world like Singapore, Stockholm and Seoul rely on our system. Additionally, initiatives like our ReFlow citizen app have been shown to significantly boost recycling behaviour, further amplifying our impact on climate action.

Performance Indicators

Based on our sustainability strategy, we have developed key performance indicators and future targets to monitor our progress towards the strategy in 2024. The targets and KPIs show our direct and indirect focus on improving our own impact and empowering our customers to make smart, green, and sustainable decisions. Working with these targets will guide us on what to focus on and open up added-value partnership discussions.

Topic	Focus	KPI	Current Figures	Target
Quality of life	Envac system users	Number of users	2023: ~6.600.000 users 2024: ~7.000.000 users	2030: ~8.000.000 users
Quality of life	End-User satisfaction	Satisfaction survey index	Will be based on 2025 results	2026: Minimum 4 out of 5
Minimise emissions	Energy efficiency	New or upgraded installations (EAP4)	Will be based on 2025 data	2030: < 50 KwH/Ton
Minimise emissions	Energy efficiency	Number of installations running on renewable energy	Will be based on 2025 data	2030: 25%
Resource circularity	Empower behavioural change with ReFlow	Number of ReFlow Users	2024: 19,600 users	2027: >100.000 users
Business responsibility	Internal OHS	LTIR (Using 200.000 factor)	2023: 16,4 2024: 1,6	0
Business responsibility	Third party incidents	Number of External OHS accidents	2023: 4 2024: 1	0
Business responsibility	Business ethics	Employees trained and signed Code of Conduct	2023: 99,3% 2024: 100%	100%
Business responsibility	Business ethics	Key supplier signed supplier code of conduct	2023: 87% 2024: 72%*	100%

*At the end of 2024 we redefined key suppliers in preparation to upcoming CSDDD regulations. Hence, decrease in number of key suppliers signed Supplier Code of Conduct.

Sustainability Environmental Data

In 2024, we analysed our significant scope 3 impact areas in our business together with external support. We identified our non-relevant, low, medium, and high-level scope activities from the outcome. All of these are in line with the GHG protocol corporate standard. Our main impact areas are defined by our work in Scope 3 emissions, which aligns with our commitment to energy efficiency. As we move forward, we will remain focused on innovative strategies to further reduce our emissions and drive positive change in our operations.

Impact	Category	Response	2024 tCO^2e	2023 tCO^2e	2022 tCO^2e	Comment
Scope 1	Fuel for vehicles	Operational efficiency	757	667	N/A	
Scope 1	Heating & Cooling	Operational efficiency	39	137	131	Improvement and changes in reporting principles. 2022 & 2023 data not comparable to 2024
Scope 2	Total emissions - Market based electricity Heating & Cooling	Operational efficiency	188	73	N/A	Improvement and changes in reporting principles. 2023 data not comparable to 2024
Scope 2	Total emissions - Location based electricity Heating & Cooling	Operational efficiency	163	551	N/A	Improvement and changes in reporting principles. 2023 data not comparable to 2024
Scope 3	Purchased goods - Category 1 • Equipment for customer installations • O&M - Spare parts & consumables • Subcontractor installation works • Office supply • Office IT and related equipment	Operational efficiency Code of conduct	30876	N/A	N/A	New category
Scope 3	Fuel related activities - Category 3	Operational efficiency	50	N/A	N/A	New category
Scope 3	Transport of products to customer sites - Category 4	Operational efficiency Code of conduct	568	672	863	

Scope 3	Business travel - Category 6	Operational efficiency Code of conduct	496	677	N/A	
Scope 3	Employee commute - Category 7	Minimise emissions Employee satisfaction	655	N/A	N/A	New category
Scope 3	Upstream leased assets - Category 8	Operational efficiency	68	N/A	N/A	New category

Social & Governance data

Business Responsibility is a key focus area for us to reach our strategy. We are gender inclusive, and all employees, managers, and occupational health and safety workers must follow business ethics. We collect yearly data to monitor this topic.

Business region	Number of employees	Number of managers	Global executive board members	Number of accidents (With and without abscence)	Number of whistleblowing cases
North Europe	Male: 133 Female: 26	Male: 13 Female: 7	Male: 1 Female: 0	7	0
China including South East Asia, India	Male: 152 Female: 22	Male: 12 Female: 5	Male: 0 Female: 1	7	0
North America	Male: 33 Female: 7	Male: 6 Female: 1	Male: 1 Female: 0	2	0
Korea & Australia	Male: 108 Female: 8	Male: 6 Female: 0	Male: 1 Female: 0	3	0
Europe, Middle East & Africa	Male: 204 Female: 17	Male: 14 Female: 4	Male: 1 Female: 0	9	0
Headquarters (Sweden)	Male: 10 Female: 8	Male: 2 Female: 2	Male: 2 Female: 2	0	0
Total	Male: 640 Female: 88	Male: 53 Female: 19	Male: 6 Female: 3	28	0

Water usage in waste management: Traditional bins vs. Envac's automated system

Water consumption in traditional waste management is compared to Envac's system, highlighting the sustainability benefits and alignment with the UN Sustainable Development Goals (SDG 6 and SDG 11).

Water consumption in traditional waste collection

Cleaning household bins consumes 1,360 litres of water per year per home. Given a garden hose's 34 litres per minute flow rate, a 10-minute cleaning session uses 340 litres.

Additionally:

- Bin-cleaning trucks carry 6,000 litres of water per trip, making multiple rounds in residential areas.
- Cleaning waste collection rooms in high-density areas further increases water demand.
- Vehicle maintenance for diesel-powered trucks requires water for engine cooling, washing, and upkeep.

Across a traditional waste collection system's 60-year lifespan, this results in excessive water wastage.

Envac's Automated System: A water-saving alternative

Envac eliminates the need for frequent bin cleaning by using sealed underground pneumatic pipes that transport waste directly to a central terminal. This prevents residue build-up, odours, and spillage, reducing water demand.

Key water-saving advantages:

- No need for regular bin cleaning, unlike conventional waste collection.
- Minimal water use for pipe maintenance rather than frequent high-pressure washing.
- Elimination of chemical cleaning agents, reducing environmental contamination.

Over 60 years, traditional systems use over 10 million litres of water, while Envac requires only 1.99 million litres - **an 80% reduction** (based on data from the United Kingdom).

Environmental, economic & health benefits

- Lower Carbon Footprint: Fewer cleaning vehicles mean reduced emissions and water transport-related fuel consumption.
- Cost Savings: Less water usage lowers municipal utility bills, and fewer cleaning trucks reduce operational costs.
- Improved Hygiene: With no overflowing waste or dirty bins, urban areas stay cleaner and healthier.

Inside the terminal building in Sunshine Coast, Australia

Envac has expanded its adoption by collaborating with cities and developers to integrate automated waste collection into urban projects, reducing carbon footprints. We have continuously innovated and optimised our system by incorporating smart technology to improve efficiency and sustainability. Additionally, Envac has actively advocated for and educated stakeholders on the benefits of sustainable waste management, supporting policies and initiatives that drive eco-friendly urban development.