



# Steering tomorrow's raw materials

**245 million kilograms**  
of discarded appliances,  
lamps and batteries collected

**4** action plans for  
maximum collection

**7 billion kilograms of raw materials**  
contained in electrical appliances in  
Dutch households and businesses

**+14.000**  
affiliated producers  
and importers



Steven van Eijck, Chairman of Stichting OPEN  
Jan Vlak, Managing Director of Stichting OPEN

## Through collection **building a secure and sustainable supply of critical raw materials**

The secure supply of strategic and critical raw materials (Critical Raw Materials – CRMs) is under pressure worldwide. At the same time, demand is growing due to the energy transition and digitalisation. Europe wants to become less dependent on raw materials from outside Europe and is working towards a circular and more self-sufficient economy by 2050. In this context, the work of Stichting OPEN is more relevant than ever. Discarded appliances, lamps and batteries are not waste, but an urban mine: an important source of future products and raw materials that Europe needs now and in the years ahead.

On behalf of thousands of producers and importers, Stichting OPEN fulfils the legal extended producer responsibility for electrical appliances, lamps and batteries. Together, we have built a robust system in the Netherlands: a nationwide network of 30,000 collection points and more than 20 sorting locations, where different types of appliances, lamps and batteries are carefully separated. This is where raw material recovery begins. By collecting and carefully sorting discarded products, we lay the foundation for preparation for reuse and high-quality recycling.

## **A UNIQUE COLLECTION AND SORTING STRUCTURE AS THE BASIS FOR RAW MATERIAL RECOVERY**

In 2025, we further strengthened and expanded this system. For the fifth consecutive year, we collected more discarded appliances, lamps and batteries and made the network safer and more efficient. At the same time, we took targeted steps to enable preparation for reuse, reducing the need for new raw materials. We also made important progress in improving recycling processes to recover raw materials at an even higher quality.

We can be proud of this. The Netherlands has one of the most organised collection systems in Europe. It is a system that can only function through close cooperation across the entire chain: from producers and retailers to municipalities, thrift stores, collectors, sorting centres, refurbishers and recyclers.

## **RECOVERY OF CRITICAL RAW MATERIALS REQUIRES INNOVATION AND INVESTMENT**

At the same time, major challenges remain. Some strategic and critical raw materials, such as copper and aluminum, are already being recovered effectively from discarded appliances, provided they are properly collected and processed by specialised recyclers. Other strategic and critical raw materials are much harder to recover. They are present in very small quantities or are technically difficult to separate. This creates a clear challenge: to build a circular future by making better use of critical raw materials from the urban mine. It also shows the need for new

partnerships between government, knowledge institutions and industry to determine how to invest in research, innovation and advanced recycling technologies. Effective supporting policy is also needed.

European developments are also on the horizon, including new regulations and initiatives such as right to repair. These underline the importance of keeping products in use for longer and designing them in ways that make reuse and recycling easier. This requires movement across the entire chain: from design and use to disposal and raw material recovery.

This calls for targeted choices. It starts with collecting more discarded appliances and batteries. Stichting OPEN is working hard on this, but enabling policy is also needed, including the introduction and enforcement of mandatory handover obligations to prevent leakage and illegal processing. More insight into and control over export flows is also necessary. Above all, we need investment in technological development and European cooperation, so that even the raw materials that are difficult to recover today can be recovered in the future.

In this annual report, we show how we continued to build this system in 2025: how we strengthened collection, took steps in preparation for reuse and worked with our partners on innovation and knowledge development. We are proud that this year we also invited leading experts to share their views on the importance of critical raw materials and circularity.

Finally, we would like to thank everyone who contributes to this work. We build this system together. Only through cooperation, innovation and shared responsibility can we build a circular electronics chain and secure the raw materials of tomorrow.

### **Jan Vlak**

*Managing Director of Stichting OPEN*

### **Steven van Eijck**

*Chairman of Stichting OPEN*

# Building a **circular disposal chain together**

**Stichting OPEN organises and manages the collection and recycling of discarded electrical appliances, lamps and batteries in the Netherlands on behalf of producers and importers. Through one nationwide network of collection points, certified recyclers and our Wecycle brand, Stichting OPEN ensures that products reach the right place for preparation for reuse or high-quality recycling.**

In 2025, Stichting OPEN sharpened its mission, vision and pay-off to place greater emphasis on value retention, raw materials and chain cooperation. The renewed mission and vision reflect a broader role: not only organising collection and recycling, but also stimulating maximum collection, reuse of products and recovery of raw materials.

Key system developments also took place in 2025. The new generally binding declaration (AVV) for electrical appliances for 2026–2031 secures continuity for the coming five years. The collection target is shifting from 65% of Put on Market to 85% of WEEE Generated, a method that better reflects the real waste stream and longer product lifetimes. Stichting OPEN also developed the 2025–2030 Action Plan for WEEE, aimed at increasing collection, reducing leakage, improving registration and strengthening cooperation with municipalities, retailers, installers and processors.

Several action lines were started in 2025, including the further development of incentive schemes, a national baseline study of municipal waste collection sites, the connection of new thrift stores and the development of wholesalers as a new collection channel.

## **Extended Producer Responsibility (EPR) to make the end-of-life chain as circular as possible**

- one solid collective system for producers and importers
- a level playing field with a fair distribution of costs
- a reliable chain with high quality standards, and
- a future-proof approach that positions the Netherlands as a leader in circular collection systems

**stichting**  
**OPEN**  
nu inzamelen voor  
hergebruik van morgen



# Batteries and e-bike batteries: safety and a growing material stream

**Batteries are a rapidly growing and technically complex product stream. The rise of lithium-ion batteries in e-bikes, electronics and energy systems increases both collection volumes and safety requirements.**

Since 2024, Stichting OPEN has fulfilled extended producer responsibility for portable batteries and e-bike batteries on behalf of producers. In 2025, extra attention was given to safe collection, specialised logistics and cooperation with new chain partners.

Key developments include improved service during the winter peak, the expansion of collection via new partners,

presence at industry events and a national campaign for the safe collection of e-bike batteries. The e-bike battery campaign reached more than 4 million people and led to almost 500 new registrations of bicycle shops as collection points.

The Doe Maar Apart campaign focused on preventing waste fires caused by batteries and battery-containing appliances in residual waste. Stichting OPEN also ended school battery collection for safety reasons, while continuing its educational programme for schools.

## From waste management to raw material control

Stichting OPEN's role is increasingly shifting from waste management towards raw material control. Based on the European FutuRaM research, Stichting OPEN calculated the raw material stock in the Netherlands for the first time. The analysis shows that Dutch households and businesses contain more than 7 billion kilograms of raw materials in electrical appliances, including 764 million kilograms of strategic and critical raw materials.

These materials, such as copper, aluminum, neodymium and cobalt, are essential for the energy transition, digitalisation and defence. The chapter explains that the disposal chain should not be seen as an end point, but as the beginning of value retention.

At the same time, the recovery of many critical raw materials remains technically and economically difficult. Current processing mainly focuses on metals that can already be recovered economically. Together with TNO, Stichting OPEN explored which CRMs offer future recovery potential, including tungsten in microwaves, neodymium in motors of large household appliances and nickel in heating elements and heat exchangers.



Stichting OPEN's data position and chain coordination role form an important foundation for future development.

At the same time, large-scale recovery of critical raw materials requires additional processing capacity, innovation and stable policy at both national and European level.

Allard Castelein, Special Representative for Raw Materials Strategy, places critical raw materials in a broader geopolitical context and argues that circularity is not only an environmental issue, but also a matter of economic resilience and strategic autonomy.



## COLUMN - FROM WASTE TO AUTONOMY



Allard Castelein

From the screen you are probably reading this on, to LED lighting at home, medical equipment in hospitals and solar panels: the production of almost all electronics depends on critical raw materials. These materials, such as lithium, cobalt and rare earth elements, form the foundation of the energy transition, the expansion of the defence industry and the digital economy.

Decades of globalisation have brought us prosperity. At the same time, they have also made us vulnerable. Time and again, we chose the cheapest option, the shortest route, the most efficient supply chain. Meanwhile, the majority of the mining, refining and processing of these raw materials has become concentrated in a single country, causing us to lose control

over the supply chain as well. We are now paying the price for this in the form of dependency. In a world where economic dependency is increasingly used as a geopolitical tool, this is no longer an abstract risk.

The question is no longer whether we need to take action, but how. Action is needed on several fronts: strategic stockpiling, building European processing capacity, international cooperation with reliable partners, innovation, and the development of a circular economy. The circular transition is more than an environmental ambition. It is also a necessary next step in our industrial development and a response to geopolitical realities.

The key lies in cooperation between businesses and government. Governments have a driving role to play and can create the right conditions for the circular economy to flourish further. Businesses are essential to making the transition happen.

According to recent figures from Stichting OPEN, electrical appliances in Dutch households and businesses alone contain more than 7 billion kilograms of valuable raw

materials. The critical raw materials currently available in discarded electronics here and across Europe represent our own "urban mine." Circular product design, effective collection and high-quality processing are not only sustainable, they are a geopolitical and economic necessity for the Netherlands, the European Union, and your business or sector. Every critical raw material recovered is one less that needs to be imported.

Complete self-sufficiency is an illusion for Europe. At the same time, governments and businesses must work together to build a resilient, circular economy in which we use products and raw materials as efficiently as possible. Through smart cooperation within the EU and with resource-rich countries such as Australia, Canada and South Africa, and by strengthening our own circular value chains, we can create a new business case for Europe's economic and strategic future.

### **Allard Castelein**

Special Representative for Raw Materials Strategy  
(Ministry of Economic Affairs and Climate Policy)

# Producer responsibility

## in practice

**Extended Producer Responsibility (EPR) has enabled producers and importers to jointly organise the collection and recycling of discarded appliances, lamps and batteries for more than 25 years. The system is financed through the waste management fee, which covers collection, transport, sorting and recycling.**

Stichting OPEN divides the total system costs for collection, transport, sorting and processing over the products placed on the market (Put on Market) in the same year. In 2025, Put on Market decreased by 7%, while collection increased to a record 245 million kilograms. This means more discarded products entered the system while fewer new products were available to distribute the costs over.

Costs per ton for collection, transport, sorting and recycling increased by 9% compared to 2024, driven by inflation, higher wages, transport costs and investments in safety and recycling. The contribution per product increased more strongly, by 23%, because

total costs were spread over fewer products.

The system remains efficient: 85% of costs are directly related to collection and recycling, while 15% is linked to overhead such as research, audits and stakeholder consultation.

Stichting OPEN also continued its freerider approach, incentive schemes for own collection and export registrations for reuse. In addition, Stichting OPEN further contributed to the development of Pronexa, a European collaboration that supports producers in centrally organising producer responsibility across multiple countries, as well as to the further development of Producer Services.

Barbara Baarsma, Chief Economist at PwC Netherlands and Professor of Applied Economics at the University of Amsterdam, explains the economic logic behind collective producer responsibility.

### COLUMN - WITHOUT COLLECTIVE RECYCLING, THERE IS NO AUTONOMY



Prof. dr. Barbara Baarsma

Circularity used to be seen mainly as a sustainability issue: important, but not a priority once it came at a cost. That framing no longer holds. Circularity is also a geopolitical instrument. When access to critical raw materials is left in the hands of a small number of countries, strategic autonomy is lost.

This directly affects the materials our economy depends on: critical raw materials such as rare earth elements, magnesium and manganese, all essential for digitalisation, the energy transition and industry. Mining, and especially processing and refining, are heavily concentrated outside

Europe. In such a world, secondary raw materials are no longer waste, but a strategic asset.

And this is exactly where things too often go wrong. Europe does collect materials, but strategically valuable streams continue to leak away: battery black mass, copper and aluminum scrap, and rare-earth magnets are exported to foreign hubs for pre-processing and refining. We then buy them back, upgraded, as semi-finished or finished products. That is not efficiency; it is surrendering control.

The most pragmatic step is not to immediately aim to recycle everything ourselves. Full-scale recycling requires scale, technology and stable material volumes. And those conditions are not yet in place for all materials. What can be done immediately, however, is to get the foundation right: retaining strategic material streams and investing in sorting, dismantling, buffering and pre-processing. In other words,

building a pre-recycling infrastructure that prevents valuable materials and strategic control from flowing away, while also creating the necessary springboard for future recycling scale-up.

The tension remains: recycling is often a difficult business case financially, with long payback periods and volatile raw material prices. But the societal value is substantial: reduced vulnerability to geopolitical shocks. And the potential is real: over time, recycling can cover a meaningful share of demand for certain critical materials.

In short: autonomy starts with collective recycling: collecting, sorting and retaining materials together. Only then can strategic materials remain available for reuse.

#### **Prof. dr. Barbara Baarsma**

Chief Economist at PwC Netherlands and Professor of Applied Economics at the University of Amsterdam

The white goods sector shows how transparency in the waste management fee, operational efficiency and a level playing field go hand in hand within producer responsibility.

## INSIGHT – WHITE GOODS SECTOR: FOCUS ON TRANSPARENCY, EFFICIENCY AND A LEVEL PLAYING FIELD



Roland Knoester (APPLiA en ANStEC) & Bruno Vermoesen (ANStEC)

Bruno Vermoesen (ANStEC) and Roland Knoester (APPLiA en ANStEC) represent the white goods sector within Stichting OPEN. Together, they work with producers and importers to build an effective and cost-efficient system for the collection and processing of discarded electrical appliances.

### Transparency and continuity

For the sector, 2025 was marked by transparency and continuity. With the extension of the AVV for electrical

appliances, the foundation has been secured for the coming years. At the same time, greater insight has been provided into the structure of the waste management contribution.

Knoester: “Producers and importers are increasingly being informed about how the contribution is determined. That is essential, especially as costs continue to rise.”

### Level playing field and freeriders

The system can only function effectively if all parties contribute equally.

Knoester: “If not everyone participates, the pressure falls on the parties that are doing the right thing.”

### Broad focus on raw materials

The sector recognises the growing attention for raw materials, but stresses the importance of maintaining a broad perspective.

Vermoesen: “Critical raw materials are important, but we must not lose sight of other material streams, such as plastics.” Collaboration and efficiency According to the sector, the strength of the system lies in its collective approach. Economies of scale help keep costs manageable and enable efficient operations.

Vermoesen: “By working together, you benefit from economies of scale and keep the system affordable.”

### Looking ahead

In 2026, the focus will be on strengthening the freerider approach, safeguarding an efficient system, and making realistic choices in raw material recovery.

Read the full interview via the QR code.

The lighting sector is also actively working to strengthen collection and raw material recovery, with growing attention for the value of materials throughout the chain.

## INSIGHT – WORKING TOGETHER ON RAW MATERIAL RECOVERY IN THE LIGHTING SECTOR



Gied van Hoorn  
LightRec

Gied van Hoorn is Managing Director of LightRec, the organisation representing producers and importers of lamps and luminaires. In this role, he represents the sector within Stichting OPEN and brings market insights into policy and decision-making.

### Collection as the foundation for raw materials preservation

For the lighting sector, circularity starts with effective collection of discarded lamps and luminaires. Luminaires in particular

contain valuable materials such as copper and aluminum that can be reused in new products.

Van Hoorn: “There is still a significant gap between the materials we could theoretically recover and what is actually being recovered.”

### Increasing complexity of products

At the same time, recycling is becoming more complex due to the growing technological complexity of products. LED products in particular are often difficult to dismantle because of adhesives and complex product compositions.

Van Hoorn: “LED products are often difficult to dismantle because of adhesives and complex compositions. This makes material recovery more complicated.”

### Collaboration and scale within the chain

According to the sector, collaboration within

Stichting OPEN is essential for collectively organising producers and importers and creating sufficient scale and impact in the collection and processing chain. Attention for critical and strategic raw materials is also increasing.

Van Hoorn: “By working together collectively, we can better utilise collection potential and organise the system more efficiently.”

### European cooperation and outlook

Looking ahead, the sector sees opportunities in improving collection, gaining greater insight into material flows, and strengthening European cooperation in recycling and raw material recovery. The sector also aims to involve producers and importers even more closely in the collection and recycling chain.

Read the full interview via the QR code:

# A nationwide network for safe collection and recycling

**Stichting OPEN manages a nationwide network of more than 30,000 collection points, logistics partners and certified recyclers. In 2025, this network was further strengthened and made safer, more professional and more efficient.**

A key example is the placement of 2,500 new collection units in retail locations, including 420 Action stores. These units are designed with multiple collection fractions, allowing different discarded product streams to be separated more safely and effectively. Behind these units lies a major logistical operation: design, production, storage, distribution, maintenance, emptying, cleaning, repair and replacement.

Cooperation with municipalities and thrift stores was further expanded, alongside the professionalisation of the municipal benchmark and the mapping of thrift stores across the Netherlands.

New contracts with specialised chain partners secure long-term capacity for collection, transport and processing. These contracts cover existing streams and new product groups such as solar panels and lithium-ion batteries. Innovation agreements were also developed, for example for the recovery and reuse of plastics from discarded appliances.

## High-Quality Solar Panel Recycling in the Netherlands

In 2025, Stichting OPEN signed a contract with Mirec for the first high-quality recycling of discarded solar panels in the Netherlands. This prepares the country for the rapid growth in end-of-life solar panels expected in the coming years.

Mirec's specialised process enables the recovery of valuable materials such as glass, aluminium, copper, silicon and silver, helping to build a more circular and future-proof recycling chain.

The solar panel sector demonstrates how the chain is preparing for a future-proof system for collection, processing and raw material recovery.

## INSIGHT – SOLAR PANEL SECTOR PREPARES FOR FUTURE RECYCLING CHALLENGES



Michiel van Schalkwijk & Jens Weerdenburg  
Holland Solar

Michiel van Schalkwijk and Jens Weerdenburg from Holland Solar represent the solar energy sector within Stichting OPEN. Together, they are working on a system that is prepared for the future stream of discarded solar panels.

### Solid foundations, focus on the future

According to the sector, the foundation for extended producer responsibility is well established. At the same time, the biggest challenge lies ahead. Due to the long lifespan of solar panels, waste volumes are still relatively limited today, but are expected to increase significantly in the coming years.

### Preparing for growing volumes

Van Schalkwijk: “We know the large volumes are still to come. Processing capacity and technology need to be prepared for that now.”

### Investing in systems and capacity

The sector is responding by taking a long-term approach and gradually building financial reserves for future collection and processing. At the same time, investments are being made in innovation for recycling and raw material recovery. In the Netherlands, the first processor for high-quality solar panel recycling, MIREC Recycling Solutions, is now operational, with further capacity expansion underway.

### Collaboration and affordability

Attention for lifespan extension and reuse is also increasing, although these activities are still limited at this stage. Collaboration within Stichting OPEN remains essential to creating an efficient and affordable system.

Van Schalkwijk: “By organising this

collectively, we keep the system efficient and ensure costs remain manageable.”

### Public support and responsibility

Public support is becoming increasingly important as well. The sector wants to demonstrate not only that it contributes to sustainable energy generation, but also that the processing of discarded solar panels is organised responsibly and becoming more sustainable over time.

Weerdenburg: “For public support, it is essential that we show we process our discarded products responsibly and continue to improve.”

### Looking ahead

In the coming years, the focus will be on further developing the system, preparing for future waste volumes, and stimulating innovation in recycling and raw material recovery.

Read the full interview via the QR code.

The consumer electronics sector emphasises the importance of an efficient collective system for the collection and processing of discarded appliances, with a focus on economies of scale, cost efficiency and realistic choices in raw material recovery.

## INSIGHT - CONSUMER ELECTRONICS: EFFICIENCY THROUGH SCALE AND COLLABORATION



Frank Rozenberg and Kadeem van de Pol of industry association FIAR represent the consumer electronics sector within Stichting OPEN. Together, they work on behalf of producers and importers of audio, imaging and television products to support an efficient and practical system for the collection and processing of discarded appliances.

### A solid foundation

For the consumer electronics sector, 2025 was marked by continuity. With the extension of the AVV for electrical appliances, the collective system can continue in the years ahead. Rozenberg: "Without the AVV and the waste management contribution

agreement, it is impossible to collectively fulfil producer responsibility. That remains the foundation of the OPEN system."

### Raw materials: realism and feasibility

Public attention for critical raw materials continues to grow, but the sector emphasises that recovering these materials from discarded appliances is not straightforward.

Van de Pol: "Where possible, raw materials should be recovered, but the question is whether this is economically and technically feasible."

### Collaboration and efficiency

According to the sector, collaboration is essential to keep the system efficient and affordable. Rozenberg: "By working together, you create scale. Fulfilling producer responsibility individually is neither effective nor efficient." The scale, expertise and experience within Stichting OPEN help ensure that the system functions effectively. At the same time, attention to freeriders and cost efficiency remains important.

### Role in the end-of-life phase

According to the sector, the strength of Stichting OPEN lies in the collection and processing of discarded appliances, lamps and batteries. This forms the foundation of the system.

The knowledge and data generated in the end-of-life phase can also help manufacturers and chain partners improve products and processes.

### Engaging the sector and sharing knowledge

FIAR actively focuses on knowledge sharing and engaging its members. Van de Pol: "We actively share knowledge with our members and also want to better reach companies that are not yet affiliated."

### Looking ahead

In the coming years, the focus will remain on strengthening efficiency, tackling freeriders and making realistic choices in raw material recovery.

Read the full interview via the QR code.



# From Behaviour Change to **Lifestyle**

## VISIBILITY AND IMPACT OF WECYCLE IN 2025

**Through its layered brand strategy, Wecycle encouraged consumers and businesses in 2025 to safely return discarded electrical appliances, lamps and batteries for reuse and recycling. The brand continued to grow in visibility through education, awareness campaigns, events and a nationwide network of recognisable collection points.**



In 2025, Wecycle further strengthened its positioning around circular consumption and entrepreneurship with the launch of the new campaign: "There's a future in appliances, lamps and batteries." Building on the renewed brand identity introduced in 2024, the campaign highlighted the positive impact of proper collection on raw material recovery, resource security and the circular economy. Wecycle also achieved a notable milestone by reaching position 174 in the ranking of the Netherlands' 500 most influential brands.

Throughout the year, targeted campaigns focused on key moments when electronic waste is most likely to arise. Special attention was given to the introduction of Wecycle collection points for e-bike batteries in bicycle stores, new collection furniture in supermarkets and joint awareness campaigns promoting proper disposal and recycling.

Consumers were engaged through major public events such as the Huisdoubbeurs and Winterfair, where visitors could test their knowledge about safe disposal and received free home collection boxes. Businesses were reached through trade fairs, trade media and targeted B2B campaigns.

The National Wecycle Week in October 2025 combined a nationwide collection campaign with the presentation of the Wecycle Awards, recognising successful circular initiatives and raising awareness about the large number of unused devices still stored in Dutch households. These products contain valuable materials that can contribute to reuse, recycling and future raw material security.

Additional campaigns focused on specific target groups and moments, including moving house, Black Friday, King's Day and garden equipment disposal. A social-media-driven youth campaign in collaboration with walking app Lawa and influencer Bram Krikke helped engage younger audiences.

Education also remained an important pillar in 2025. New educational materials, escape rooms, theatre performances and E-waste Races were developed, while 4,500 primary schools received a free Wecycle newspaper.

For businesses, campaigns such as "Clean Up Your Office Day" and the promotion of Wecycle for Businesses encouraged companies and professional users to responsibly dispose of electrical waste that often remains unused in offices, warehouses and workspaces.



# From small-scale to **scalable** reuse in the disposal phase

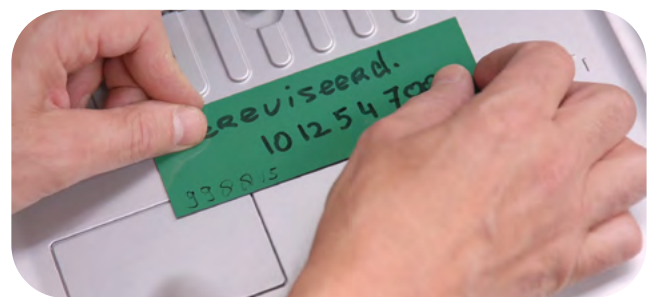
**In 2025, Stichting OPEN further strengthened its focus on reuse in the disposal phase. The foundation remains high-quality recycling, but Stichting OPEN increasingly works across the R-ladder. Products that last longer, are reused or have components reused retain more value for the circular economy.**

Stichting OPEN has built a unique national network for preparation for reuse. Discarded appliances and parts can be selected for a second life before recycling takes place. In 2025, almost 1.8 million kilograms of appliances were given a second life through this approach.

The journey of a product increasingly extends beyond collection and recycling alone, from design and use to maintenance, repair, collection, sorting and preparation for reuse. Stichting OPEN further developed its platform “Wat is mijn apparaat waard?”, strengthened cooperation with RepareerSimpel and expanded collaboration with refurbishers.

Concrete results in 2025 included the development of a circular action plan, extra capacity for refurbishment partners, analysis of collection and sorting streams, quality conditions for refurbishment and several pilots. A pilot at the Amersfoort municipal waste collection site showed that better sorting can increase reuse.

On 21 November 2025, Stichting OPEN organised the first ‘Dag van het Hergebruik’, together with partners from across the chain.



## COLUMN - CIRCULAR BEHAVIOUR STARTS WITH PRODUCT DESIGN



Prof. dr. ir. Ruth Mugge

The circular economy for consumer electronics is often approached from a recycling perspective because of raw material recovery. But recycling, however valuable, is ultimately the final stage. To reduce environmental impact and preserve critical raw materials, action must also be taken earlier in the product lifecycle by extending product lifespan through maintenance, repair, refurbishment and reuse. Less disposal, more lifespan extension, and smarter use of what we already have.

Yet this ideal often clashes with daily reality. Devices that start malfunctioning are quickly discarded. Not necessarily because repair is impossible, but because replacement has become the norm. People simply do not know what is wrong, whether the product can be repaired, or whether it is still worth repairing. Faced with that uncertainty, the decision too often shifts towards buying a new product.

Changing behaviour in this context is complex and requires more than awareness alone. But complex does not mean impossible. Research shows that targeted design interventions can make a real difference. Examples include maintenance reminders and smart diagnostics that, supported by AI, can quickly and clearly identify problems. Users then receive practical information: what is wrong, how serious

the issue is and, crucially, step-by-step guidance on how to solve it. The result? Less uncertainty, greater confidence to act and, ultimately, a stronger incentive to repair and extend product lifespan. When the right conditions are created, consumers do appear willing to change their behaviour.

If we take the circular transition seriously, we must look beyond recycling and awareness campaigns alone. Product design itself, combined with digital support systems, should also be used as a behavioural tool to make repair and lifespan extension the natural choice again. Perhaps the future of circular electronics is not only about throwing less away, but also about devices that tell us: “I’m not done with you yet.”

**Prof. dr. ir. Ruth Mugge**  
TU Delft

The digital sector is increasingly focusing on reuse, lifetime extension and the retention of valuable raw materials.

## INSIGHT – DIGITAL SECTOR FOCUSES ON REUSE AND RAW MATERIAL RETENTION



Jeroen van der Tang (NLdigital)

Jeroen van der Tang is responsible for sustainability and circularity at NLdigital. As Public Policy Manager Sustainability, he represents the ICT sector on the board of Stichting OPEN. NLdigital represents more than 600 companies in the digital sector, including ICT hardware producers participating in the collective system for the collection and recycling of discarded electrical equipment.

### Collection and registration as the foundation

According to Van der Tang, effective collection and registration of discarded devices are central to the system. At the same time, attention within the sector for reuse and raw material recovery is increasing.

“You can see that we are doing more and more with what we collect. Reusing discarded devices or components where possible, and where that is not possible, recovering materials as efficiently and at as high a quality level as possible.”

### Focus on critical raw materials

The digital sector also plays an important role in the debate on critical raw materials, as many of these materials are used in electronic devices. According to Van der Tang, it is therefore important to recover more raw

materials and to invest at both European and national level in new recycling technologies.

### Reuse increasingly becoming the first step

The way companies view the end-of-life phase is also changing. More and more often, devices are redeployed before being recycled. During and after the COVID-19 pandemic, for example, thousands of used laptops were refurbished and redistributed through Allemaal Digitaal to people without access to digital resources.

### Looking ahead

In the coming years, the sector sees opportunities particularly in further improving collection and registration, increasing reuse, and strengthening cooperation around raw material recovery.

Read the full interview via the QR code.

The technological industry demonstrates how cooperation, knowledge development and shared responsibility contribute to a more efficient and circular system for discarded appliances.

## INSIGHT – FOCUSING ON RAW MATERIALS, DESIGN AND AN EFFICIENT SYSTEM



Vera Ortman (SMR) & Robert van Beek (FME)

Robert van Beek and Vera Ortman represent the technology industry within Stichting OPEN. In their roles, they work together with producers and importers on a system focused on raw materials, product design and efficiency throughout the chain.

### Strengthening the system through targeted investments

The technology industry sees 2025 as a year of strengthening and further developing the system. With the extension of the AVV, the foundation has been secured, while additional

investments through the Action Plan 2025–2030 are helping to improve collection and move closer to achieving collection targets.

Ortman: “The system has not become cheaper, but demonstrably more is being done and we are taking important steps towards the collection targets.”

### Growing pressure on raw materials

At the same time, electrification and digitalisation are increasing pressure on raw materials and driving growth in the number of devices entering the market. This requires an integrated approach in which collaboration and scale are essential.

### Product design determines impact

The sector emphasises that product design and the end-of-life phase must become more closely connected. Increasingly complex products make high-quality recycling more difficult and increase recycling costs.

Van Beek: “What seems efficient at the front

end often leads to higher costs and fewer opportunities for raw material recovery at the end of the chain.”

### Knowledge and insight as accelerators

Collaboration in knowledge development is also considered essential. Strengthening the Dutch Materials Observatory is providing greater insight into the availability of and risks surrounding raw materials, forming the basis for future policy and investments.

### Looking ahead

Looking ahead, the focus will be on increasing collection volumes, gaining better insight into valuable material streams, and strengthening enforcement to prevent leakages from the system.

Read the full interview via the QR code.

# Knowledge, Collaboration and Policy Development for a Circular Electronics Chain

**In 2025, Stichting OPEN further strengthened its role as a knowledge partner, connector and advocate for a circular electronics chain. The organisation contributed to European cooperation through the WEEE Forum and Eucobat, helping shape practical and effective policies for collection, recycling and producer responsibility. Stichting OPEN also participated in European research projects such as FutuRaM, focused on critical raw materials and future resource availability.**

Research and innovation remained important priorities in 2025. Together with TNO and other partners, Stichting OPEN investigated opportunities for recovering critical raw materials from discarded electronics. Research also showed that significant amounts of e-waste still end up in residual waste streams, underlining the importance of better collection, awareness and

reducing leakages from the system. Knowledge and research outcomes were shared through [CirculaireKennis.nl](https://www.circulairekennis.nl).

At the same time, Stichting OPEN actively contributed to policy development and public affairs. The organisation advocated for circular collection targets, faster implementation of mandatory hand-in obligations and stronger enforcement to prevent valuable material streams from leaving the circular chain.

Collaboration throughout the value chain was further expanded through initiatives such as the Taskforce Circular Electronics Chain, the Battery Fire Taskforce and the “Long Live Electronics” coalition. Together with producers, municipalities, retailers, recyclers and other partners, Stichting OPEN continued working towards a safer, more circular and future-proof electronics chain.

The electrical power tools sector highlights the importance of cooperation, awareness and shared responsibility within a circular electronics chain.

## INSIGHT - ELECTRICAL POWER TOOLS SECTOR FOCUSES ON COOPERATION AND AWARENESS



Rob de Koning & Vera Ortmanns (SVEG)

Rob de Koning (SVEG), board member of Stichting OPEN, and Vera Ortmanns (SVEG) represent the electric power tool and garden tool sector within Stichting OPEN. Together, they work with producers and importers on a well-functioning system for the collection and processing of discarded electrical tools.

### Collaboration as the foundation

For the sector, 2025 was characterised by collaboration. The extension of the new AVV for electrical appliances created greater unity and a shared vision for the future.

De Koning: “Especially over the past year, you can see producers truly starting to act as one sector. Without that shared vision, you cannot build a system like this.”

### From niche behaviour to the norm

At the same time, perceptions around collection are changing. What was once behaviour mainly associated with a small group of consumers is becoming increasingly normal. Awareness is also growing that collection is not only about discarded products, but about recovering valuable raw materials for new products.

### From recycling to value retention

The sector’s view of recycling is also evolving. The focus is increasingly shifting towards reuse and value retention, rather than processing alone. Ortmanns: “We are increasingly looking at what can be reused and which

materials can be recovered for new applications.”

### European alignment and clear regulations

The sector also stresses the importance of clear and achievable legislation, with strong European alignment.

De Koning: “We operate in an international market. It simply does not work if every country has its own rules.”

### Looking ahead

In the coming years, the focus will remain on further growth in collection, awareness, high-quality recycling and raw material recovery, while continuing to strengthen cooperation throughout the value chain and alignment at European level.

Read the full interview via the QR code.

# The people behind the system

The system of Stichting OPEN is unique and supported by a large network of people and organizations working together on the collection, reuse, and recycling of discarded appliances, lamps, and batteries. This collaboration, based on alignment, knowledge sharing, and responsibility, ensures a future-proof and effective system.

Producers and importers play a central role in governance, alongside sector representatives from eight sectors. They

connect practice and policy, make decisions on topics such as fee development and system improvements, and ensure support within their constituencies.

Within Stichting OPEN, a dedicated team of professionals analyzes data, develops policy, and translates legislation into practice. Together with partners across the value chain, they continuously work on an efficient system that preserves resources and contributes to a circular economy.



## FACTS AND FIGURES

# Electrical appliances and lamps

In 2025, we once again collected more discarded electrical appliances and lamps. Through a nationwide network of collection points, municipalities, retailers and collection partners, we ensure that these discarded products are safely collected and processed. This enables valuable materials to be recovered and, where possible, gives discarded devices a second life.

### PUT ON THE MARKET

# 5,904

affiliated producers and importers of electrical devices and lamps

# 610,073,921 kg

devices and lamps placed on the market (put-on-market, PoM)

### TAKEN OFF THE MARKET

**+3%**  
compared  
to 2024

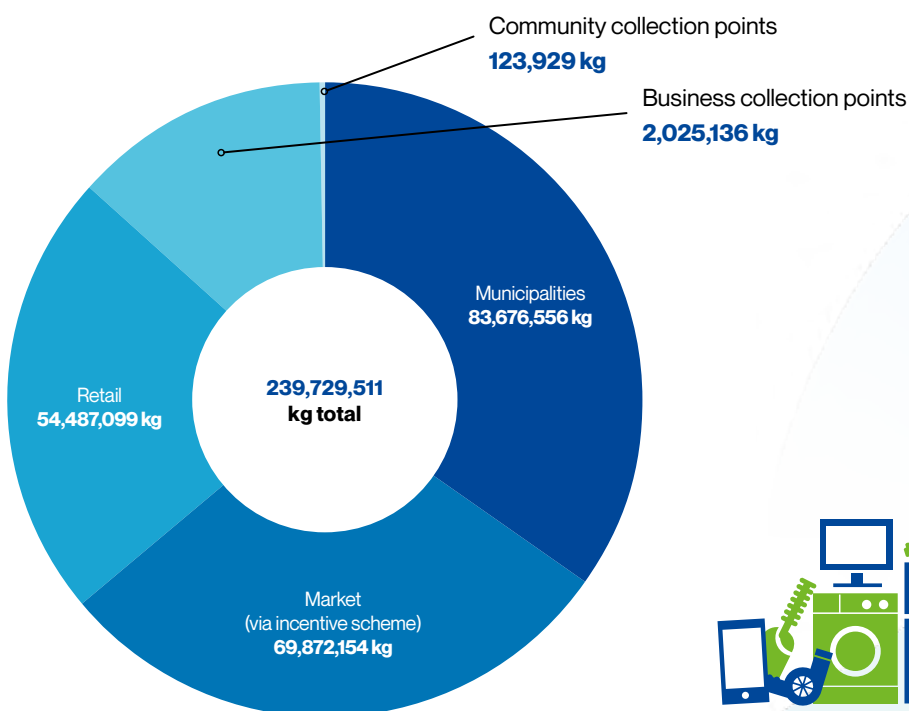
New collection record

# 239,729,511 kg

of devices and lamps collected

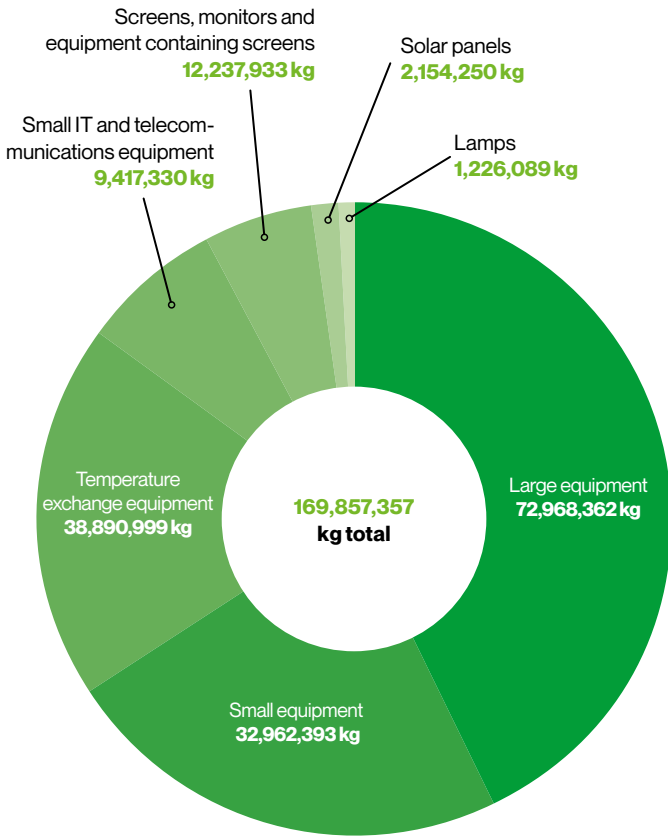
### THE COLLECTED KILOGRAMS

Distributed across different collection channels



## RECYCLING

Figures excluding market collection  
(via the Incentive Scheme)



## RECYCLING RATE PER CATEGORY

### Temperature exchange equipment

Recycling rate: **82%** | target 80%

### Screens, monitors and equipment containing screens

Recycling percentage: **74%** | target 70%

### Lamps

Recycling percentage: **85%** | target 80%

### Large equipment

Recycling percentage: **82%** | target 80%

### Small equipment

Recycling percentage: **74%** | target 55%

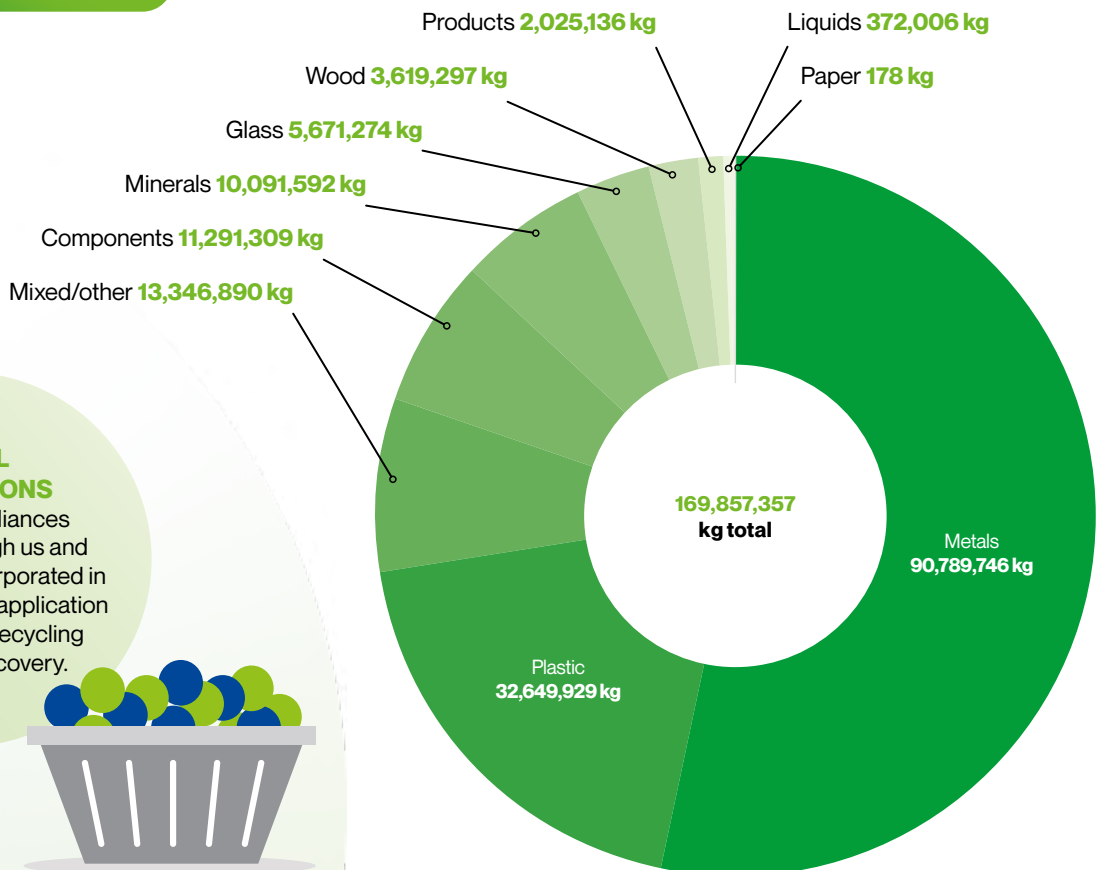
### Small IT and telecommunications equipment

Recycling percentage: **80%** | target 55%

### Solar panels

Recycling percentage: **80%** | target 80%

## RECYCLING BY MATERIAL



### USEFUL APPLICATIONS

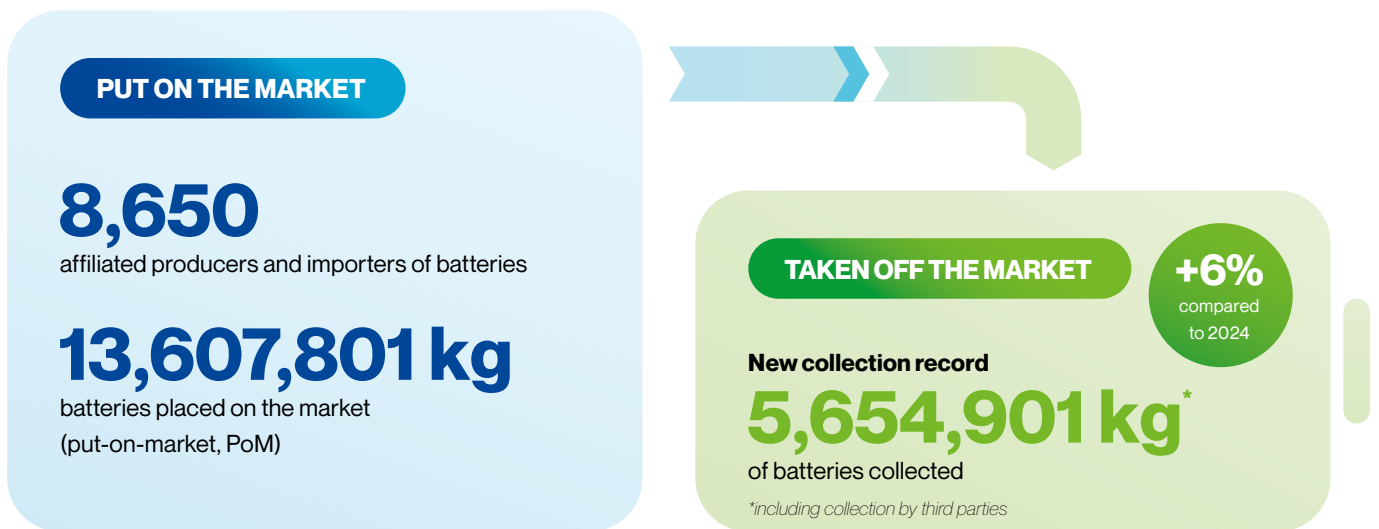
99% of all appliances collected through us and the materials incorporated in them find a useful application through reuse, recycling and energy recovery.



# FACTS AND FIGURES

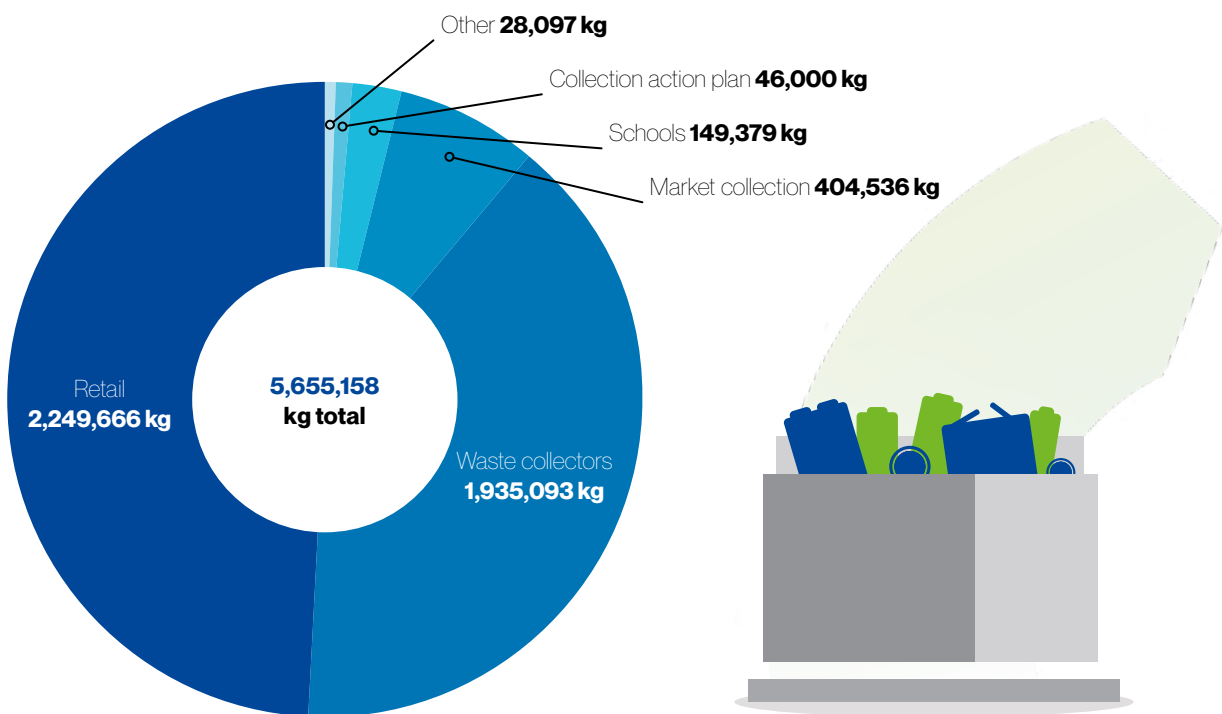
## Batteries

The collection of discarded batteries continues to grow. This is important, as discarded batteries contain both valuable and potentially hazardous materials. By collecting them separately, we ensure safe processing and the recovery of raw materials. Together with our partners, we continuously work on improving and expanding the collection network.

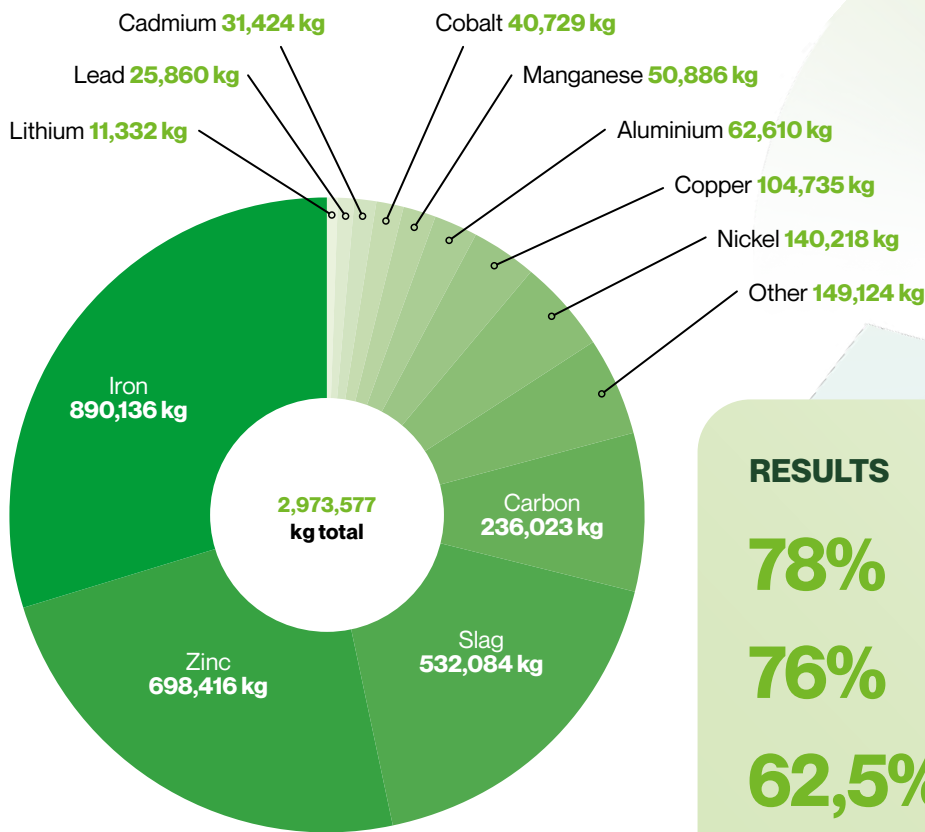


### THE COLLECTED KILOGRAMS

Distributed across different collection channels



**RECYCLING - METAL RECOVERY\***



**RESULTS**

78%	Achieved recycling rate <b>LEAD</b> target 65%
76%	Achieved recycling rate <b>NIKKEL-CADMIUM</b> target 75%
62,5%	Achieved recycling rate <b>OTHER</b> target 50%

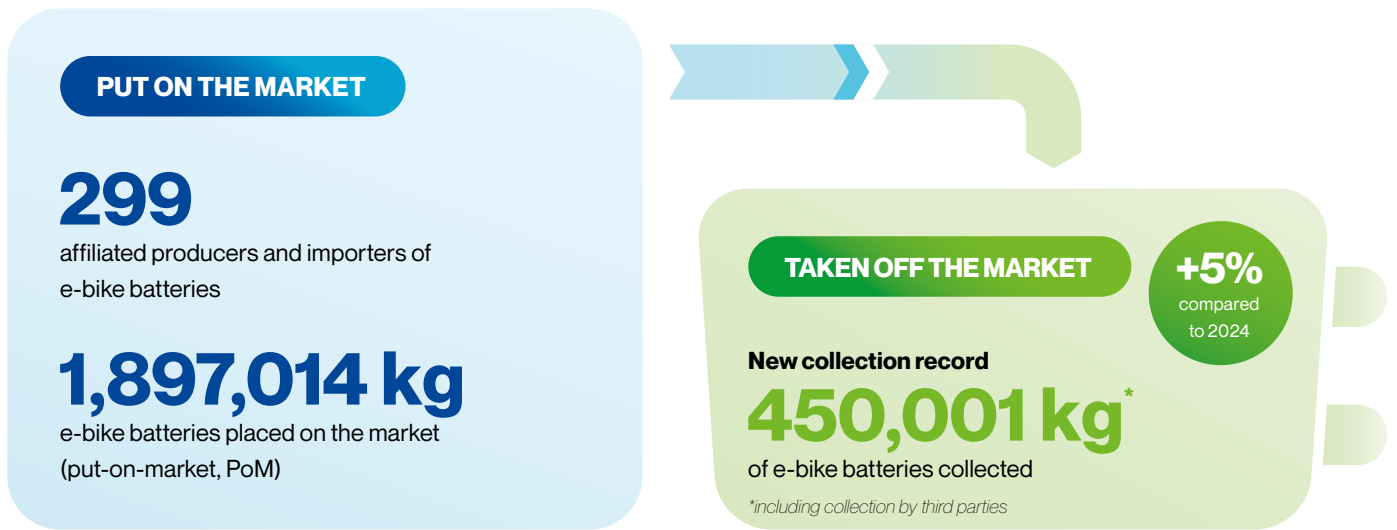
\* Estimate based on 2024 recycling results.



# FACTS AND FIGURES

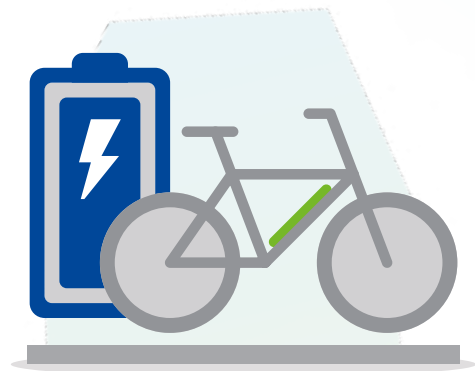
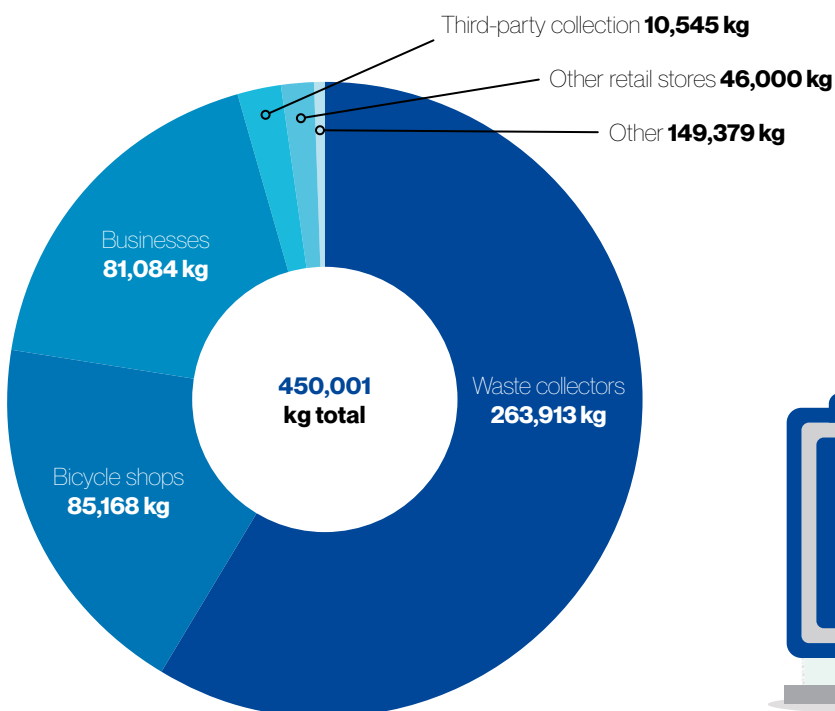
## E-bike Batteries

The collection of discarded e-bike batteries is increasing rapidly due to the growing popularity of electric bicycles. At the same time, this waste stream requires additional attention for safety and processing. Through targeted collection and collaboration with retailers and other partners, we ensure that discarded e-bike batteries are collected safely and that valuable materials are preserved.

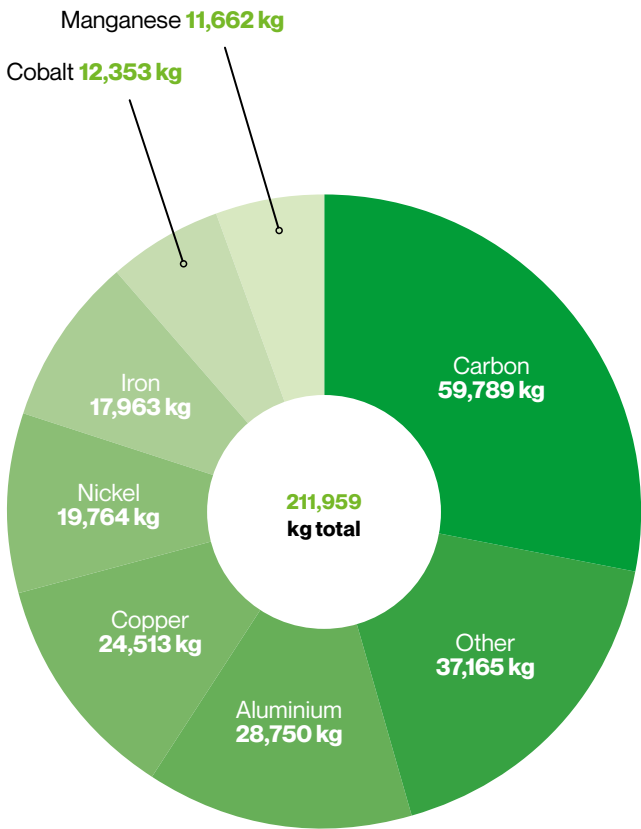


### THE COLLECTED KILOGRAMS

Distributed across different collection channels



**RECYCLING – METAL RECOVERY\***



**RESULTS**

**75%**

Achieved recycling rate  
**NIKKEL-CADMIUM** target 75%

**67%**

Achieved recycling rate  
**OTHER** target 50%

*\*Estimate based on 2024 recycling results.*



# Stichting OPEN

## Preliminary Results 2025

Preliminary Results 2025				
	Total	Devices	Batteries	E-bike Batteries
Euro *1,000				
<b>Revenue</b>				
Waste management contribution	€ 100,971	€ 78,351	€ 20,745	€ 1,875
<b>Operational costs physical network</b>				
Compensation to collection points	€ 22,268	€ 21,497	€ 714	€ 57
Collection, transport and sorting	€ 61,599	€ 54,582	€ 6,529	€ 488
Processing costs	€ 45,658	€ 42,536	€ 2,613	€ 509
Processing revenues from recovered materials	€ -52,121	€ -52,121	€ -	€ -
Provision for future costs	€ 6,996	€ -	€ 6,853	€ 143
<b>Total operational costs</b>	<b>€ 84,399</b>	<b>€ 66,494</b>	<b>€ 16,709</b>	<b>€ 1,197</b>
<b>Action plan costs</b>	<b>€ 11,894</b>	<b>€ 11,452</b>	<b>€ 282</b>	<b>€ 160</b>
System costs	€ 15,058	€ 10,050	€ 4,177	€ 831
Other costs	€ 1,561	€ 1,391	€ 152	€ 18
<b>Total costs</b>	<b>€ 112,913</b>	<b>€ 89,386</b>	<b>€ 21,320</b>	<b>€ 2,206</b>
<b>Collected volume in tonnes</b>	<b>245,419</b>	<b>239,730</b>	<b>5,250</b>	<b>439</b>
<b>Total EUR/tonne *1,000</b>	<b>€ 0.46</b>	<b>€ 0.37</b>	<b>€ 4.06</b>	<b>€ 5.03</b>

### Waste management fee (in Dutch: Afvalbeheerbijdrage (ABB))

The revenues of Stichting OPEN consist of waste management contributions paid by producers and importers. These contributions finance the nationwide system for the collection, sorting, preparation for reuse and processing of discarded devices, lamps and batteries.

The 2025 revenues are based on the declarations submitted by producers and importers. At the time of publication, the collection of these contributions is still partly in progress.

Within the devices category, revenues from waste management contributions in 2025 are lower than the costs. For devices, a pay-as-you-go system is applied, and surpluses built up in previous years were returned through lower waste management contribution (ABB) rates in 2025. Batteries and e-bike batteries operate under a capital funding system, where the waste management contribution rate is intended to cover future collection and processing costs.

## Operational Costs

Operational costs relate to the physical collection and processing system. These include compensation paid to collection points, as well as costs for transport, sorting and processing. Projects aimed at improving and making collection safer are also included. Revenues from recovered materials are deducted from the processing costs.

## Action plan costs

Through the action plan, Stichting OPEN invests in additional measures to further increase collection through the market itself. These include incentive schemes, pilots, campaigns and partnerships aimed at reducing leakage flows and improving separate collection. The volume collected through the incentive scheme contributes significantly to the total collection volume. In 2025, 69.1 million kilograms of devices were collected through the incentive scheme.

## System costs and other costs

System costs and other costs relate to the organisation and support of the collective system. These include personnel costs, marketing and communication, research, checks on PoM declarations, governance costs and strategic projects, such as applications for the extension of the binding agreement (AVV). System costs (also referred to as overhead costs) account for 15% of the total costs. The remaining 85% consists of operational costs and volume-driven reimbursements for the action plan.

## Increase in total costs

Total costs increased by 15% in 2025 compared to 2024. This increase can partly be explained by investments in safety, stricter regulations and the further strengthening of the collection and processing system. The largest share of the total costs is directly spent on the collection, sorting and processing of discarded devices, lamps and batteries.



# Outlook 2026

With the Generally Binding Declaration (AVV) for batteries and the extension of the AVV for electrical appliances for the next five years, a strong foundation is in place to continue building a circular electronics chain. In 2026, Stichting OPEN will continue this course through the implementation of the action plan, focused on increasing collection, strengthening preparation for reuse and further developing high-quality processing.



At the same time, European and national developments require clear choices in the further design of the system. Discussions around new targets, instruments and legislation show that the transition towards a circular chain is still evolving. It is essential that new measures genuinely contribute to increased collection, preparation for reuse and high-quality recycling, and thereby to the retention of valuable raw materials.

The urgency remains high. The security of supply of strategic and critical raw materials is under pressure, while demand continues to grow. Discarded appliances have the potential to become an important source of these materials, but this potential can only be realised if the system functions effectively. At the same time, the reality is that many of these raw materials can still only be recovered to a limited extent today. This requires further technological development as well

as realistic choices in the design of the system.

The Netherlands has a strong and fine-meshed collection and sorting structure, in which different product streams are carefully separated. This provides a unique starting point for retaining more value from discarded products. The next step is to determine, together with chain partners and government, how this value can be used more effectively and how the necessary investments can be organised in a balanced way.

This requires commitment from the entire chain: from producers designing products more circularly, to consumers returning their appliances, lamps and batteries, retailers and municipalities facilitating collection, and collectors, sorting centres and recyclers ensuring the maximum recovery of materials. Only through this joint effort can the circular electronics chain be further strengthened and the value of raw materials better preserved for the future.



“The Netherlands has a strong collection infrastructure. Now it is time to unlock greater value across the chain.”

