



ADS ECO ECO-INDUSTRIAL COMPLEX

CIRCULAR MANUFACTURING CLUSTER

Area: approx. 10.0 ha

A modern circular manufacturing and high-value material recovery platform converting waste streams into secondary raw materials, industrial inputs and marketable products.



90%+

Target material
recovery rate



95%+

Target material
purity for
selected outputs



10.0 ha

Integrated production,
recovery and logistics
land area



CIRCULAR VALUE
SUSTAINABLE FUTURE



Recover More. Waste Less. Create Sustainable Value.

Executive Overview



The Circular Manufacturing Cluster is a core production area of the ADS ECO complex. It transforms selected waste streams into **secondary raw materials**, **industrial inputs**, and **recovered resources** that can be reintegrated into manufacturing markets.



The cluster covers conventional recycling streams such as plastics, paper, cardboard, glass, ferrous and non-ferrous metals, wood, rubber, and textiles, while also enabling advanced streams including e-waste, Li-ion batteries, PV panels, Tetrapak, composites and other technically demanding fractions.



Its purpose is to create **circular material flows**, **reduce dependence on virgin resources** and convert waste management into a productive industrial platform with **diversified revenue**, **stronger ESG performance**, and **long-term resource security**.



Masterplan structure



Indicative 10.0 ha cluster layout



Indicative area distribution



Manufacturing halls 2.0 ha



Plastics and polymers 1.8 ha



Advanced recovery 1.4 ha



Storage and logistics 1.5 ha



Metals and mineral 1.2 ha



Utilities and safety 0.8 ha



Admin / QC lab 0.3 ha

End-to-end recovery process

From reception and AI classification to industrial distribution

1 Collection & reception



Incoming streams are weighed, checked, registered and directed to controlled buffer areas.

2 AI identification



Machine vision, sensors and data models classify material families and contaminants.

3 Advanced separation



Robots, optical sorters, magnets, eddy current units and air systems separate streams.

4 Purification & processing



Materials are cleaned, shredded, granulated, baled, refined or dismantled by product line.

5 Quality assurance



Lab testing verifies purity, grade, moisture, contamination and industrial compliance.

6 Market distribution



Products move to manufacturing, construction, packaging, automotive and energy markets.



Core operating principle

The cluster does not treat waste as a disposal burden. It treats selected material streams as industrial resources and progressively upgrades them into higher-purity, higher-value secondary materials.



Resource not waste



Upgrade and add value



Reduce virgin use



Enable circular industries



Control philosophy

- ✓ Every stream is traced from input to output.
- ✓ Critical lines include quality gates and safety checks.
- ✓ Digital dashboards connect production, inventory and ESG data.



Recover. Reuse. Reintegrate. Create sustainable value.



Material streams and product families

High-value material recovery

Advanced recovery



Key high-value material streams

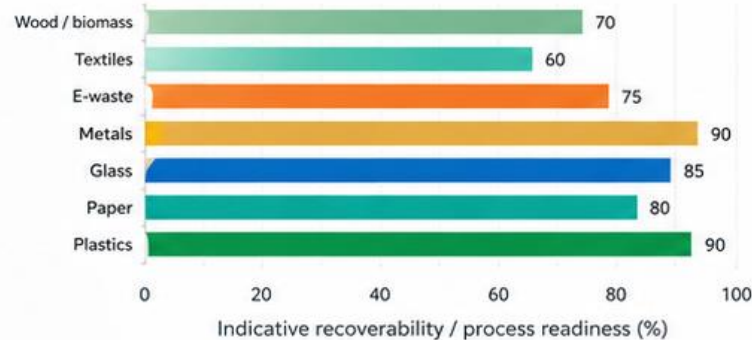
- Ferrous metals: steel and iron
- Non-ferrous metals: aluminum, copper and brass
- Engineering plastics, PET and HDPE polymers
- Glass cullet and mineral fractions
- Electronic waste components and cables
- Textiles, industrial fibers, wood and biomass resources
- Li-ion batteries, PV panels, Tetrapak and composites



Recovery readiness by material family



Building a balanced portfolio across conventional and advanced streams.



Recovery scope

The cluster combines multiple material families in one integrated industrial setting. Conventional streams provide stable baseline volume, while advanced streams create higher-value, technology-led opportunities and potential joint venture modules.



Advanced technology stack

| AI-driven sorting and process intelligence



Artificial intelligence

Material recognition, dynamic classification, optimization of sorting recipes.



Machine vision systems

RGB, hyperspectral and imaging analytics for object-level identification.



Robotic sorting

High-speed pick-and-place units for precision recovery and contamination removal.



Optical sensors

NIR, VIS, color cameras and optional XRF/LIBS for advanced material detection.



Digital twin technology

Simulation of process bottlenecks, yield, maintenance and line performance.



IoT monitoring systems

Real-time status of equipment, belts, bins, energy use and safety conditions.



Dedicated process lines



Core systems and technical function

System	Technical role
 Plastics and polymers	Sorting, size reduction, washing, drying, extrusion, pelletizing and quality grading for PET, HDPE, PP, LDPE and engineering plastics.
 Paper and cardboard	Baling, contamination removal, fiber recovery interfaces and preparation for mills or packaging producers.
 Glass cullet	Color sorting, crushing, cleaning, sizing and preparation for glass, construction or mineral additive markets.
 Ferrous and non-ferrous metals	Magnetic separation, eddy current separation, density sorting, cleaning and sale to foundries and metal processors.
 Wood, rubber and textiles	Shredding, sorting, conditioning and conversion to industrial inputs, composite feedstock or specialized product pathways.
 E-waste and cables	Manual and automated dismantling, component separation, circuit board concentration, cable granulation and material recovery.
 Li-ion batteries and PV panels	Dedicated safe handling, discharge or isolation protocols, dismantling, glass/aluminum separation and specialist downstream partnerships.
 Tetrapak and composites	Layered material recovery through mechanical, hydropulping or partner-based specialized treatment routes.



Circular manufacturing outputs



From recovered resources
to marketable industrial products



Industrial applications

- ✓ Manufacturing components and semi-finished inputs
- ✓ Construction materials, panels, tiles and profiles
- ✓ Packaging industry feedstock and recycled polymers
- ✓ Automotive components and technical plastics
- ✓ Consumer products and household goods
- ✓ Renewable energy equipment support materials



Productization logic

Recovered material only creates full value when it becomes a reliable industrial product. The cluster therefore links recovery lines with conditioning, packaging, laboratory verification, inventory management and offtake agreements. This allows ADS ECO to move from waste treatment to product-driven circular manufacturing.





Quality assurance and specifications



Quality gates

- ✓ Incoming load inspection and digital registration
- ✓ Material family classification and contamination screening
- ✓ Process-line purity checks and sample testing
- ✓ Moisture, density, particle size and grade verification
- ✓ Batch labels, certificates and customer specification sheets
- ✓ Non-conforming material quarantine and corrective action



Lab and compliance layer



Purity



Moisture



Density



Contamination



Traceability

The cluster should operate with a laboratory and customer-specification mindset. Recovered output streams are prepared as industrial feedstocks, not anonymous waste fractions.



95%+

Target purity for selected high-grade streams



Batch ID

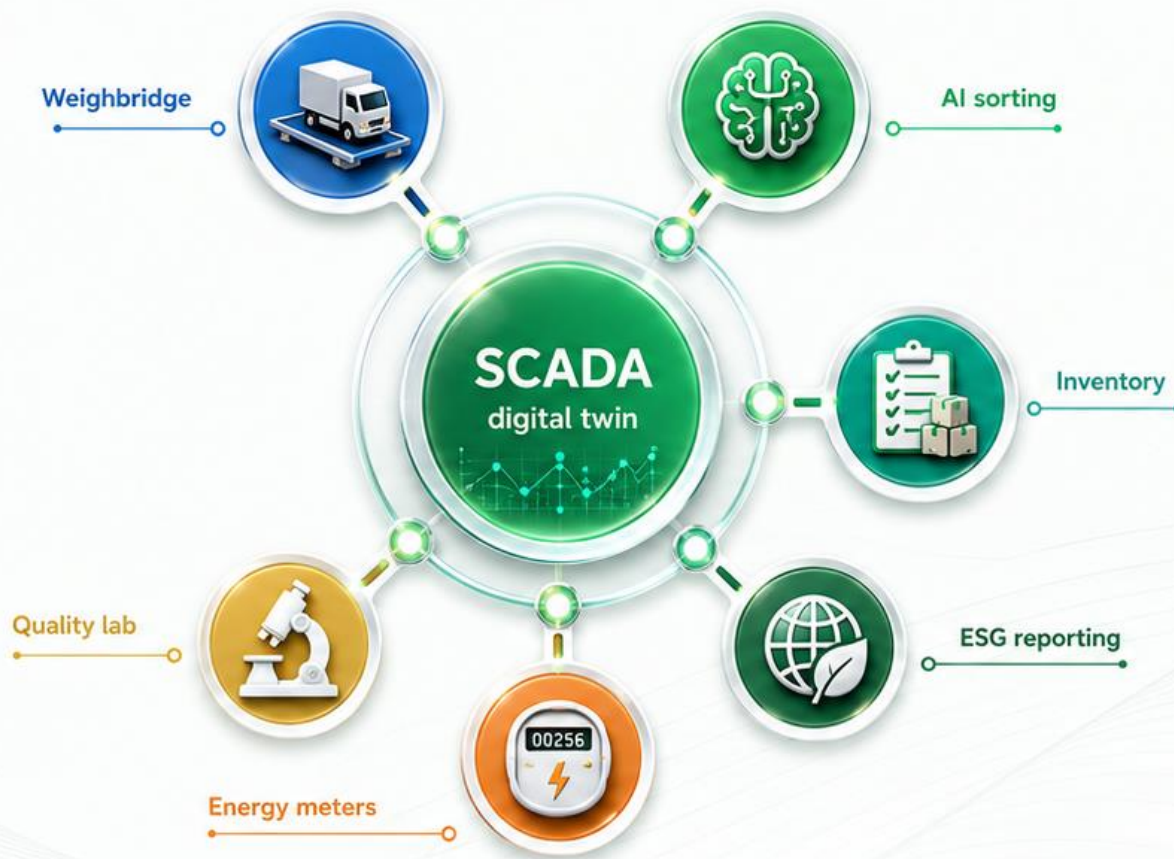
Traceable lot documentation and QA records

Digital operations and SCADA layer



Digital backbone

All critical flows should be digitally recorded: material source, weight, grade, route, process line, quality result, storage location, shipment and ESG impact; this creates operational visibility and supports investor-grade reporting.



Key data outputs

- Recovery rate by stream
- Inventory and contamination level
- Equipment uptime and bottlenecks
- Energy and water intensity
- CO2 and landfill-diversion indicators

ESG, carbon and resource security

Measurable circular-economy outcomes and industrial resilience



Reduced landfill disposal

More material is recovered and routed to productive use instead of final disposal.



Lower carbon footprint

Secondary raw materials can reduce the embedded impact associated with virgin resource extraction.



Resource security

Local recovered materials strengthen supply chains and reduce dependence on volatile global markets.



Industrial competitiveness

Circular feedstocks support manufacturing, construction, packaging and energy industries with stable, high-quality inputs.



ESG narrative

The cluster creates a clear and tangible ESG story: waste is converted into marketable products, primary resource pressure is reduced, emissions-related benefits can be measured, and industrial customers receive traceable secondary raw materials.





Commercial model and revenue streams

✓ From recovered inputs to trusted markets – creating long-term industrial value



Revenue logic

- ✓ Sale of secondary raw materials
- ✓ Sale of recycled pellets, cullet, metals and conditioned industrial inputs
- ✓ Toll processing for external material owners
- ✓ Long-term offtake contracts with manufacturers
- ✓ Joint ventures for high-value material lines
- ✓ Specialized service fees for e-waste, batteries or PV streams
- ✓ ESG and circularity reporting services for partners



Market connection model



Long-term value is strengthened when recovered materials are linked to industrial buyers through quality specifications, supply reliability and transparent traceability.





Key performance indicators



Target KPI framework

- ✓ Material recovery rate: 90%+ for selected stream portfolio
- ✓ Material purity: 95%+ for selected high-grade outputs
- ✓ Multiple revenue streams across products, tolling and JV modules
- ✓ High market-value products and reduced disposal burden
- ✓ Significant CO2 reduction potential through circular material substitution
- ✓ Strong circular-economy impact and ESG reporting credibility

90%+

Recovery

Total recovered value from target streams



95%+

Purity

Quality for selected premium outputs



6+

Markets

Manufacturing application families



High

Impact

Circular economy and CO2 reduction potential





Implementation roadmap and conclusion

1

1 Concept & design

Material audit, market mapping, zoning, technology packages and permitting strategy.

2

2 Core recovery lines

Install baseline sorting, plastics, metals, glass, paper and logistics interfaces.

3

3 High-value modules

Add e-waste, battery, PV, Tetrapak, composites and specialized recovery partnerships.

4

4 Manufacturing scale-up

Expand productization, offtake contracts, QA certifications and export channels.

5

5 Digital optimization

Deploy digital twin, advanced KPIs, ESG reporting and predictive maintenance.



Key takeaway

The Circular Manufacturing Cluster transforms ADS ECO from a waste-management platform into a high-value circular-industrial production system. By combining advanced sorting, recycling, high-value resource recovery, quality assurance, digital monitoring and market distribution, the cluster creates sustainable industrial value while reducing landfill disposal and dependence on virgin resources.

ADS ECO High-Value Materials Vision: Recover More. Waste Less. Create Sustainable Value.