

Technology Cluster

Area: approx. 3.5 ha

Eco-educational, innovation and ESG management platform for ADS ECO - integrating training, demonstration, laboratories, digital control, ESG monitoring, data governance and public awareness.



3.5 ha

Planned technology campus



ESG Hub

Monitoring & reporting



SCADA + IoT

Live data & control



Labs + Training

Innovation & capacity building

Core focus areas

1

Education

training and public awareness

2

Innovation

labs and technology demos

3

ESG Control

monitoring and reporting

4

Data

SCADA, IoT and dashboards



Technology platform for a smart circular complex

Training, innovation, ESG monitoring and live data systems support transparent and scalable operations.



Executive Overview

The Technology Cluster is the knowledge, training, innovation and sustainability management platform of the ADS ECO complex. It is designed for environmental education, professional training, technology demonstration, public awareness, innovation programs and ESG management.

The cluster may include training rooms, exhibition areas, laboratories, conference spaces, innovation labs, a digital control room, data infrastructure, ESG monitoring systems and visitor-oriented demonstration routes. Its role is to make the platform measurable and understandable while supporting reliable operations and long-term technological upgrading.



Bright investor-style digital control environment: no dark background, clean dashboards, live indicators and operational visibility.



Knowledge platform

Provides staff training, visitor education, public awareness and circular-economy demonstration programs.



ESG management

Collects, validates and reports data on waste diversion, energy, emissions, water, safety and social impact.



Digital operations

Links SCADA, IoT sensors, dashboards, asset management and data systems into a platform-wide control layer.



Innovation gateway

Hosts pilots, laboratories, technology suppliers, R&D partners and local capacity-building programs.

3.5 ha campus structure

The Technology Cluster is organized as a compact, accessible campus with public-facing education areas, secured digital control rooms, flexible labs, demonstration yards, innovation spaces and green public realm. The allocation below is indicative and can be refined during architectural and engineering design.



Conceptual masterplan: public education areas are separated from secured control and lab functions while remaining connected through a clear visitor and innovation route.

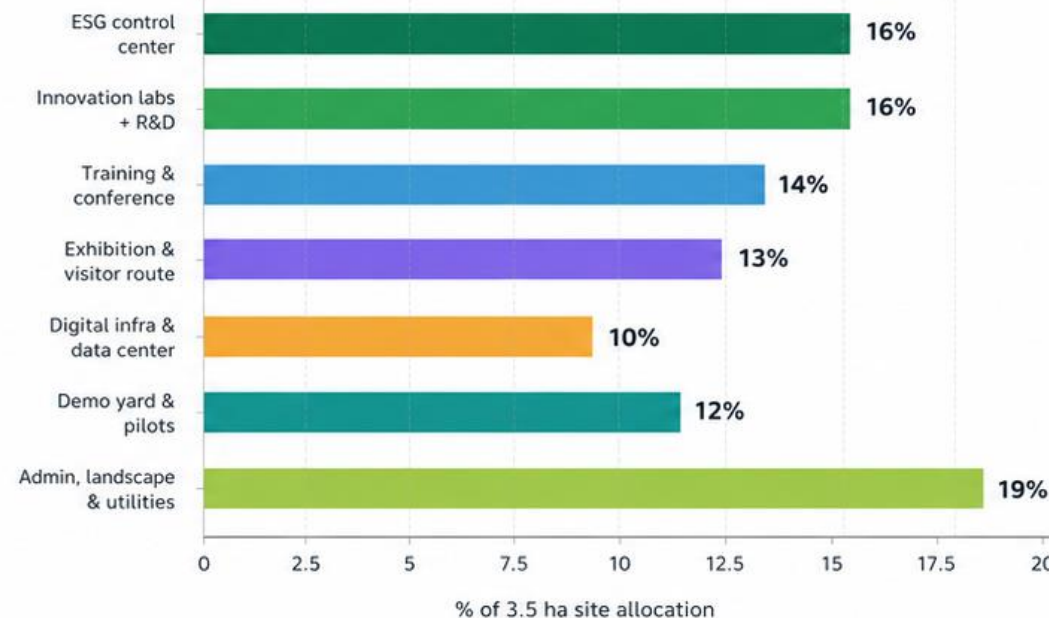


Indicative land envelope: 3.5 ha / 35,000 m².

Design reserve includes security buffer, landscape, utility rooms, service access, future technology expansion and public visitor movement.

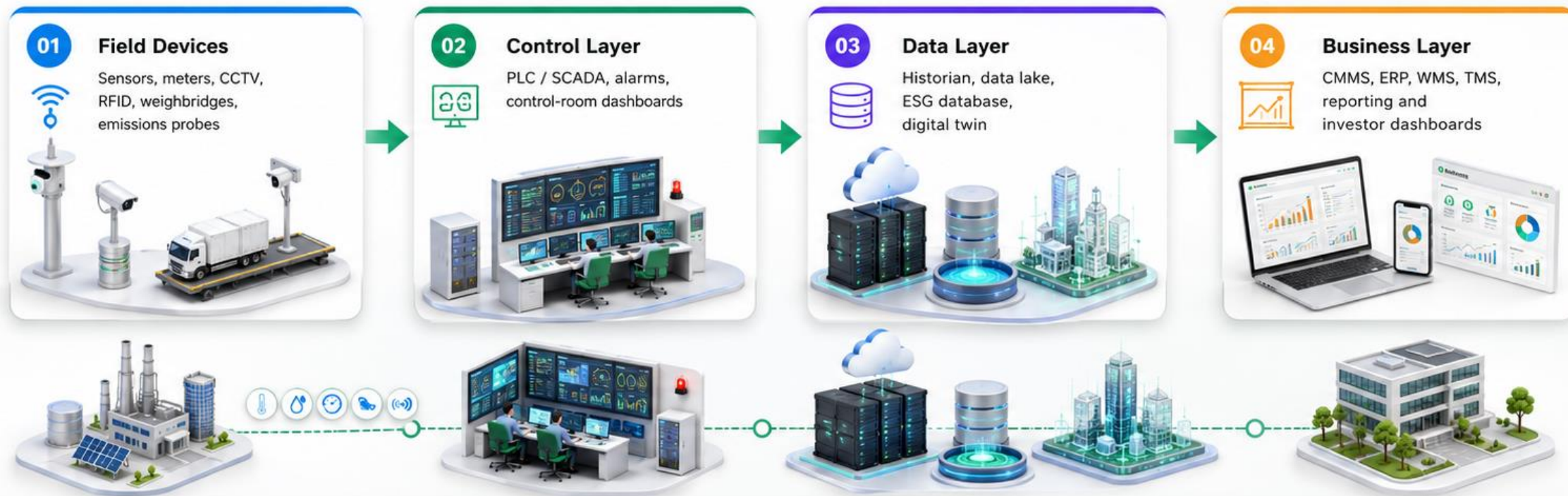


Indicative Area Allocation (% of 3.5 ha site)



Integrated data and control architecture

The cluster connects field sensors, process control, digital platforms and management dashboards into one operational intelligence layer. It does not replace industrial control rooms in each process zone; it consolidates visibility, reporting, diagnostics and decision support for the whole complex.



Security-by-design: network segmentation, role-based access, encrypted communication, backup policies, UPS/BESS continuity, incident logging, cybersecurity monitoring and vendor access control are built into the technology architecture from day one.



Core infrastructure components

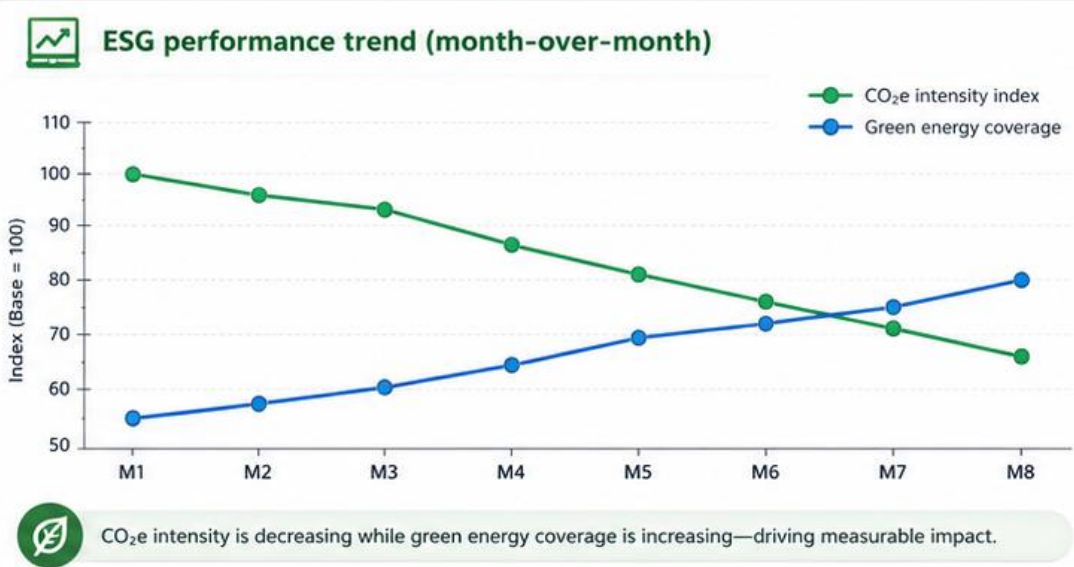
The Technology Cluster combines public, educational, operational, technical and secured infrastructure. The mix below provides a practical basis for detailed design and investment packaging.



Component	Main Function
 ESG Management Center	Central ESG dashboards, audit-ready data, sustainability reporting, carbon and circularity metrics.
 Digital Control Room	SCADA overview, live KPI screens, alarm visualization, process status, incident coordination.
 Training and Conference Center	Classrooms, auditorium, simulation room, operator training, visitor briefings and workshops.
 Innovation and R&D; Labs	Pilot testing, material QA, sensor calibration, AI/robotics demonstration and supplier pilots.
 Exhibition and Visitor Route	Public-awareness gallery, circular-economy pathway, technology showcase and educational content.
 ICT / Data Center Rooms	Servers, networking, cybersecurity systems, UPS, data historian, backup and cloud interface.
 Demonstration Yard	Outdoor pilot equipment, small-scale technology trials, containerized demo units and training setups.
 Admin and Support Areas	Offices, meeting rooms, welfare spaces, storage, utilities, maintenance and landscape buffer.

Measurable ESG performance

The cluster turns sustainability into measurable data. ESG monitoring links operational indicators to management dashboards, periodic reports, investor communication and compliance evidence. Each indicator should have a defined data owner, collection method, validation rule and reporting frequency.



Circularity

Waste accepted, sorted, recovered, recycled, reused, converted to energy and diverted from landfill.

Energy

PV output, CHP/ORC output, internal consumption, exported electricity, heat recovery and BESS status.

Emissions

CO2e reduction, combustion/thermal control data, avoided landfill emissions and logistics fuel indicators.

Social impact

Training hours, visitor programs, jobs, safety performance, local partnerships and awareness campaigns.

Public awareness and professional capacity building

The Technology Cluster makes ADS ECO accessible to employees, partners, investors, schools, universities, municipalities and the public. It translates complex industrial systems into clear learning routes and practical training programs.

Education and visitor experience: classrooms, exhibition route, conference



Operator training

Sorting, safety, maintenance basics, control-room procedures, emergency response and quality assurance.



Professional courses

Circular economy, resource recovery, green energy, ESG reporting, smart logistics and industrial safety.



Visitor experience

Guided exhibition route explaining waste intake, sorting, recycling, energy conversion, bio-industrial use and ESG.



Academic partnerships

University research, student internships, technical modules, laboratory projects and innovation challenges.



Supplier demos

Technology days, equipment demonstrations, pilot units, vendor workshops and localization sessions.



Community programs

Public awareness events, school visits, eco-education activities and local stakeholder engagement.



Education principle: simplify the full circular-economy chain into a clear, visual and measurable story - from waste reception to material recovery, clean energy, biological value creation and ESG performance.



Innovation and quality assurance layer

The lab and innovation component supports material quality, technology trials, process improvement and partner-driven R&D; It provides controlled spaces for testing, demonstration and validation before solutions are scaled across the complex.

Innovation laboratory: materials testing, environmental QA, sensor calibration and AI demonstration



Materials QA lab

Plastics, paper, metals, glass and composite samples; purity, moisture, contamination and product classification.



Environmental lab

Water, soil, compost, odor and emissions-related sample preparation; support for compliance and ESG evidence.



IoT and sensor lab

Calibration of meters, condition sensors, gateways, RFID/QR readers, dashboards and data-quality checks.



AI / robotics demo

Machine vision, robotic sorting pilots, dataset preparation, performance testing and vendor comparison.



Pilot technology bay

Containerized or modular demo units for small-scale trials, process verification and training.



Innovation incubator

Co-working, workshops, supplier collaboration, university projects and commercialization pathways.



Innovation logic: test locally, validate with data, train operators, document results, then scale successful technologies into the operational clusters of ADS ECO.

Reliable data is a project asset

For investors, operators and public stakeholders, data must be traceable, secure and audit-ready. The Technology Cluster therefore defines data ownership, validation rules, system interfaces, backup procedures and cybersecurity protocols.



Data model

Standard IDs for materials, batches, equipment, buildings, meters, vehicles, training records and ESG indicators.



Interfaces

SCADA, WMS, TMS, ERP, CMMS, laboratory information, weighbridge, CCTV, access control and ESG reporting tools.



Cybersecurity

Segregated networks, firewalls, MFA, user roles, patching policy, audit logs and controlled vendor access.



Continuity

UPS, backup server, cloud backup, disaster recovery procedure, manual fallback and incident playbooks.



Integrated data hub connecting process clusters, logistics, energy, labs and ESG reporting.

Performance targets and phased implementation

The Technology Cluster should be implemented in phases: core building and training spaces first, followed by the ESG control room, data platform, labs, digital twin, advanced dashboards and supplier demonstration programs. This allows the system to grow with the wider ADS ECO complex.



Technology Cluster KPI Targets



Phased Implementation Roadmap

- 1

Phase 1
 Core building, classrooms, basic exhibition, ICT rooms
- 2

Phase 2
 ESG control room, SCADA overview, dashboards, data historian
- 3

Phase 3
 Labs, pilot yard, digital twin, university and supplier programs
- 4

Phase 4
 Full ESG reporting, innovation accelerator, regional training hub



Key Takeaway. The Technology Cluster transforms ADS ECO into a measurable, teachable and continuously improving circular-economy platform. By combining ESG monitoring, digital control, laboratories, innovation programs, education and public awareness in a compact 3.5 ha campus, it strengthens operational transparency, investor confidence, community value and long-term technological resilience.