OPTIPLAN
Smart Factory Solution

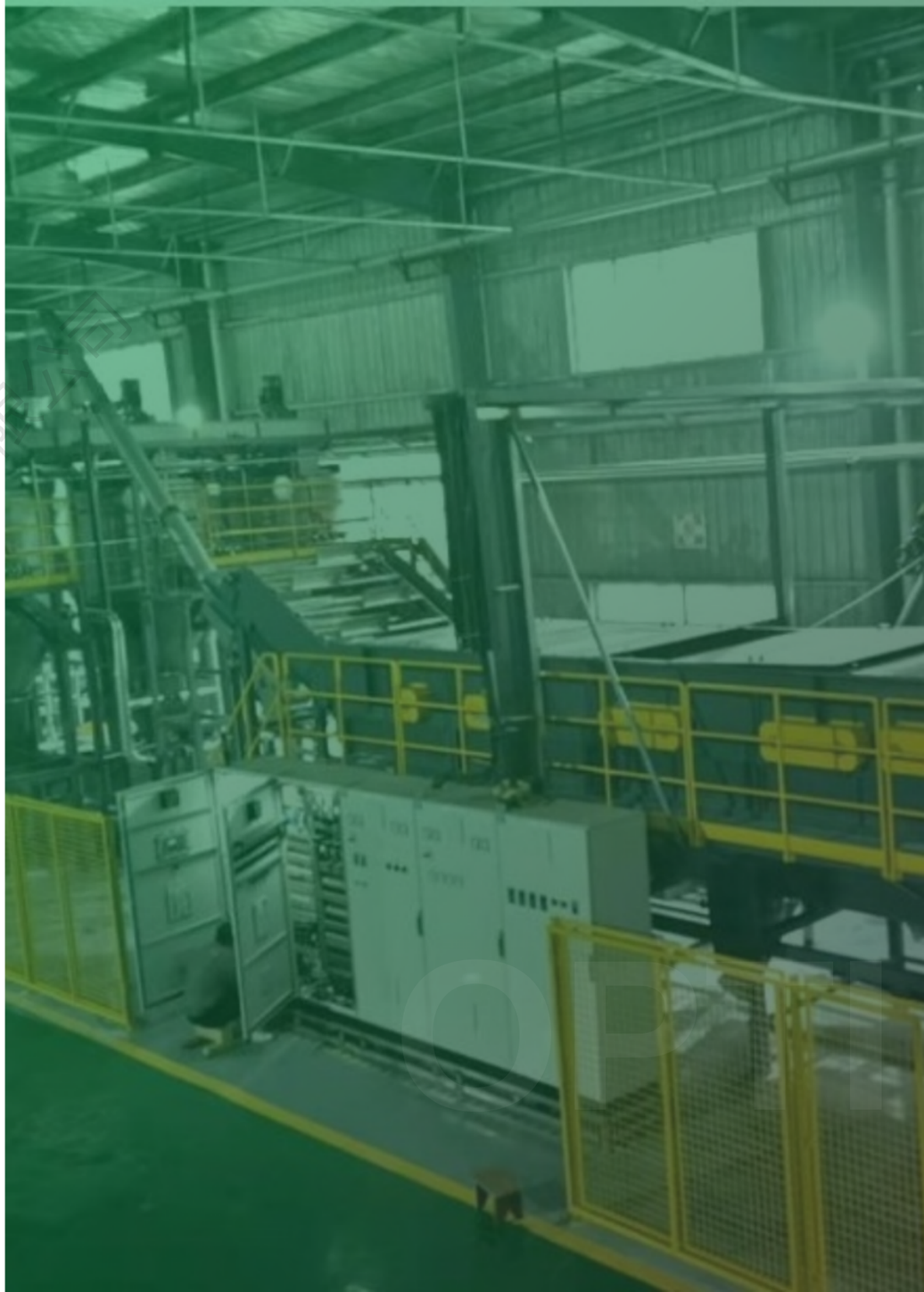
Data-driven management for continuous improvement

An integrated digital operations platform for recycled PET

Zhejiang BoReTech Environmental Engineering Co., Ltd.

www.bo-re-tech.com

Package: 1 OPTIPLAN platform, 1 high-performance server, and 1 SCADA gateway



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OPTIPLAN Smart Factory Solution / Overview

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Six hidden operating costs in recycled PET production and the measurable value of digital transformation.

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A digital foundation for production control, quality management, end-to-end traceability, predictive maintenance, and energy management.

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Pilot-line financial analysis and a standardized delivery process, from tailored estimates to a review of delivered value.

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PART 1 / INDUSTRY CHALLENGES AND VALUE

Industry Challenges

Common management challenges in recycled PET production

Limited Production Visibility

Long process chains, many machines, and complex parameters make work orders difficult to monitor. Without a unified platform, teams track production progress manually.

- Blind spots, slow responses, and lost capacity

Slow Quality Traceability

Inspection data is disconnected from production records. Paper logs and staff experience make quality investigations slow and prone to omissions.

- Slow complaint handling and audit responses

Manual Equipment Management

Equipment status, inspections, maintenance, and repairs lack centralized tracking. Incomplete histories and limited visibility weaken failure prevention.

- Frequent unplanned downtime and high repair costs

Disconnected Data

Independent systems scatter data across databases and platforms. Managers struggle to access complete, accurate operating information for decisions.

- Inconsistent metrics and decisions based on intuition

Reliance on Individual Experience

Knowledge stays with individuals and paper records. Departures disrupt operations, new hires take longer to train, and processes lack standardization.

- Staff turnover risk and loss of operational knowledge

Incomplete Improvement Cycles

Teams respond after problems occur. Limited process controls and follow-through allow the same issues to recur without a complete improvement cycle.

- Recurring problems and unmeasured improvements

These challenges grow as operations expand. Data-driven management and ongoing process control are increasingly essential.

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PART 1 / INDUSTRY CHALLENGES AND VALUE

Value Proposition

Data-driven management for continuous improvement

Data-driven management Continuous improvement

Built on BoReTech's experience in recycled PET, the platform manages the full production process digitally.

Experience-based	**Data-driven**
Reactive management	**Process control**
Results reporting	**Continuous Improvement**

Key Benefits

Lower Cost and Labor Needs

Automatic data collection and reporting reduce manual entry and compilation.

Reporting efficiency improves 90%+

Higher Yield

Process control reduces abnormal losses. Closed-loop quality management reduces defects.

Yield improvement: 0.5%-1%

Risk Control

End-to-end traceability identifies issues quickly. Predictive maintenance reduces unplanned downtime.

Traceability efficiency improves 80%+

Lower Energy Use

Monitor energy use in real time and flag abnormal consumption for action.

Energy consumption reduces 5%-10%

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PART 1 / INDUSTRY CHALLENGES AND VALUE

Estimated Annual Benefits

ROI estimates based on a pilot production line

Pilot Line Baseline Capacity: 4 metric tons/hour | Price: CNY 6,500-6,800/metric ton | Annual output: approx. 24,000 metric tons | Annual production value: approx. CNY 156 million

Revenue from Higher Yield

Process control reduces abnormal losses. Closed-loop quality management reduces defects.

CNY 0.78-1.56 million/year

Yield improvement: 0.5%-1%
Based on CNY 6,500/metric ton

Labor Cost Savings

Automatic data collection and reporting reduce manual entry and compilation.

CNY 0.30-0.50 million/year

Fewer reporting and recording positions
CNY 60,000-80,000 per person/year

Energy Cost Savings

Monitor energy use in real time and flag abnormal consumption for action.

CNY 0.20-0.60 million/year

Consumption reduces 5%-10%
Includes electricity, steam, and water

Maintenance Optimization

Predictive maintenance reduces downtime. Standardized maintenance extends equipment life.

CNY 0.30-0.64 million/year

Lower unplanned downtime losses
Lower repair and spare parts costs

Total Annual Benefits **1.58-3.30** million CNY/year

Estimates use a 4 metric ton/hour pilot line.
Actual benefits vary by operation. Tailored estimates are available.

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PART 2 / ARCHITECTURE AND CORE MODULES

Solution Architecture

Five digital layers aligned with the production process

Management Dashboard (Decision Layer)

- **Production** — Output, work order progress, yield
- **Quality** — Pass rate, defects, quality traceability
- **Yield** — Overall yield, process areas, losses
- **Energy** — Consumption, specific use, energy trends
- **Equipment** — OEE, status, alarms
- **Business** — Costs, profit, KPI performance
- **Reports** — Custom reports, exports, subscriptions

Data Platform (Data Layer)

- **Production** — Orders / Work orders / Yield
- **Quality** — Inspections / Defects / Tracing
- **Equipment** — Register / Inspection / Repairs
- **Energy** — Water / Electricity / Steam
- **Warehouse** — Stock / Lots / Locations
- **Business** — Costs / Losses / Analysis

Collection
Governance
Storage / Services
Analysis

Business Applications (System Layer)

- **MES Production Execution** — Planning / Work orders / Reporting / Feeding
  Process monitoring / Quality / Yield
  Reports / Traceability / Exceptions
- **WMS Warehouse Management** — Receipts / Stock / Locations / Issues
  Lots and barcodes / Warehouse operations
  Stocktaking / Inventory analysis
- **SCADA Process Monitoring** — Equipment / Process parameters / Alarms
  Trend analysis / Energy / Data acquisition
  Remote control / Video monitoring

Connected business systems
support efficient production, warehouse, equipment, and energy management.

Execution Layer (Production Process)

1. **Receiving** — Inspection, Putaway
2. **Bale Opening / Prewashing** — Open bales, Remove contamination
3. **Automatic Sorting** — Sort materials, Remove impurities
4. **Wet Crushing** — Wet size reduction, Contamination removal
5. **Hot Washing** — Hot wash, Remove oils
6. **Rinsing** — Flotation separation, Multiple rinses
7. **Flake Sorting** — Sort flakes, Color sorting
8. **Scrap Recovery** — Recover scrap, Reuse fragments
9. **Finished Goods** — Inspection, Bagging / Putaway

Full recycled PET process
Real-time process parameters
Material and lot control
Process data traceability
Higher product yield

- **Impurity Output** — Labels, caps, neck material
- **Wastewater / Sludge** — Water treatment system
- **Recirculated Flakes** — Crush and reuse
- **Scrap Recovery** — Return to upstream process

Sensing Layer (Equipment / Sensors)

PLC / DCS Meters Sensors Weighing devices Photoelectric devices Motors Utility meters Other equipment

Real-time acquisition from equipment, meters, and sensors supplies data to all upper layers.

Flows: Main product / Byproducts / Recirculation / Water treatment / Data

Five layers cover sensing, execution, business applications, the data platform, and management dashboards. Shared data standards and interfaces connect the full production process.

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PART 2 / ARCHITECTURE AND CORE MODULES

Production Control / Work orders connect the full production process

Business Value At 4 metric tons/hour, a 1% yield gain is estimated to add CNY 0.78-1.56 million in annual revenue. Work order control, material visibility, and real-time yield tracking make output measurable and traceable.

Work Orders and Material Feeding

Work orders / Material feeding

Work orders link raw material inputs, processing, and output. Feeding records automatically link lot numbers, weights, and material sources for transparent consumption tracking.

Production Reporting and Output

Production reporting / Output statistics

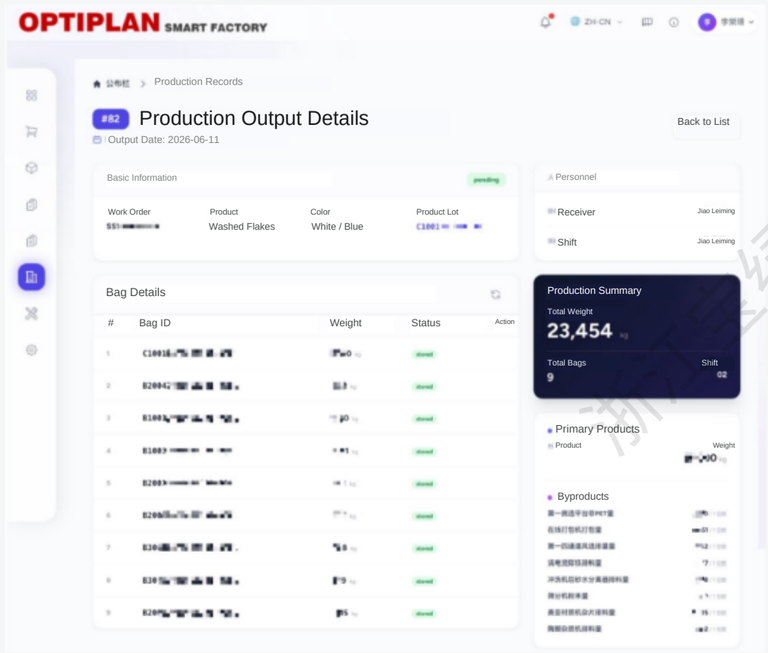
Report production by shift, process area, and work order. Automatically collect equipment data and classify primary products and byproducts to identify production losses.

Yield Analysis and Reports

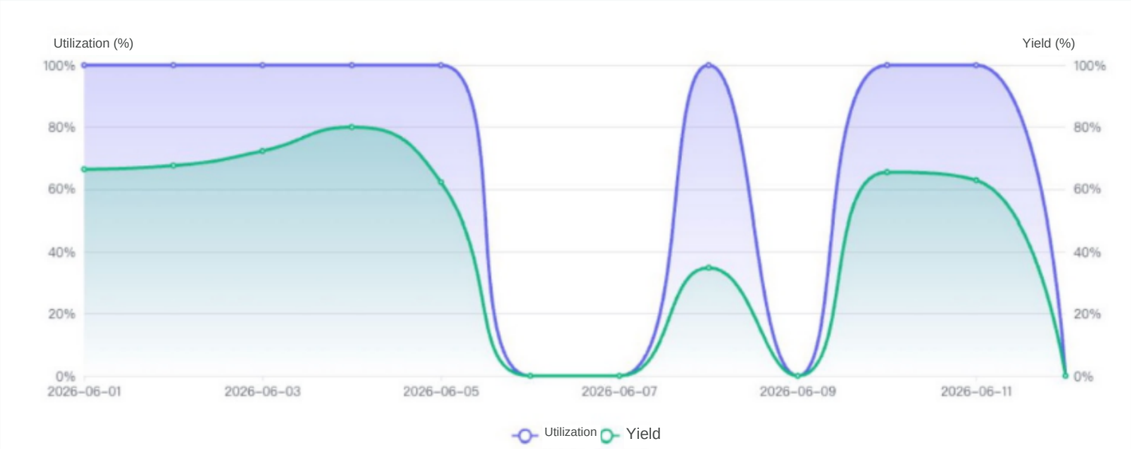
Yield analysis / Production reports

Calculate yield from material input and output. Analyze trends across dimensions and identify abnormal variation. Daily, monthly, and work order reports support management decisions.

Production Output Screen



Yield Analysis Report



Pilot observations: Real-time tracking identifies yield variation as it occurs. Separate primary product and byproduct statistics make the breakdown of losses visible.

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PART 2 / ARCHITECTURE AND CORE MODULES

Closed-Loop Quality / Raw materials to finished products (1)

Business Value A one-grade downgrade can reduce product price by CNY 500-1,000/metric ton. Standardized incoming, in-process, and finished product inspections reduce downgrade losses.

Incoming and Finished Product Inspection

Incoming inspection / Finished product inspection

Record the supplier, lot, grade, and decision for every incoming lot. Quarantine or return rejected materials. Test finished products against customer limits for L/B color values, moisture, and PVC residue. Link results to work orders and lots.

- Supplier Links
- Quarantine
- L/B Color Tests
- PVC Residue

Standardized Quality Management

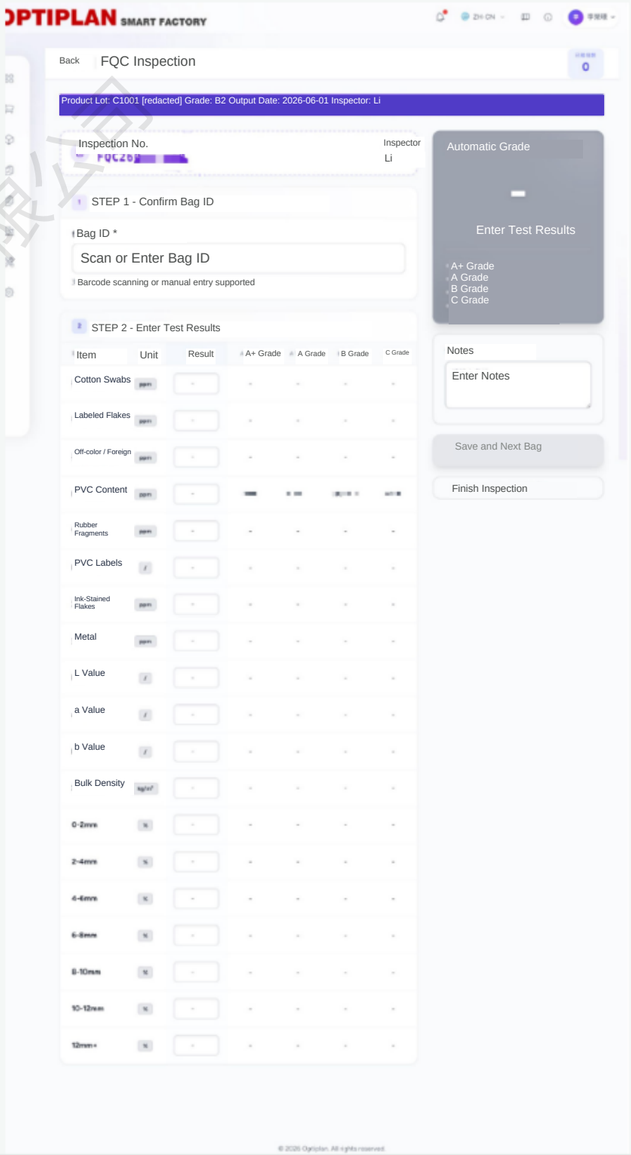
Quality records / Nonconformance analysis

Configure inspection items, frequency, limits, and exception rules by product and process area, from prewashing through bagging. Automatically record nonconformances and link work orders, lots, equipment, and personnel to identify the source.

- All Process Areas
- Automatic Records
- Linked Records
- Fast Investigation

Incoming inspections link suppliers and lots. Finished product tests link work orders. All nonconforming product handling leaves an audit trail.

Finished Product Inspection Screen



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PART 2 / ARCHITECTURE AND CORE MODULES

Closed-Loop Quality / Raw materials to finished products (2)

Quality Analysis Across Dimensions

Analyze incoming, in-process, and finished product quality. Track trends in L/B color values, moisture, PVC residue, and other key metrics.

- Incoming Quality
- Process Quality
- Finished Quality
- Trend Tracking

Quality Alerts

Automatically record out-of-limit results and link work orders, lots, process areas, equipment, and personnel for rapid investigation.

- Automatic Alerts
- Linked Records
- Fast Investigation

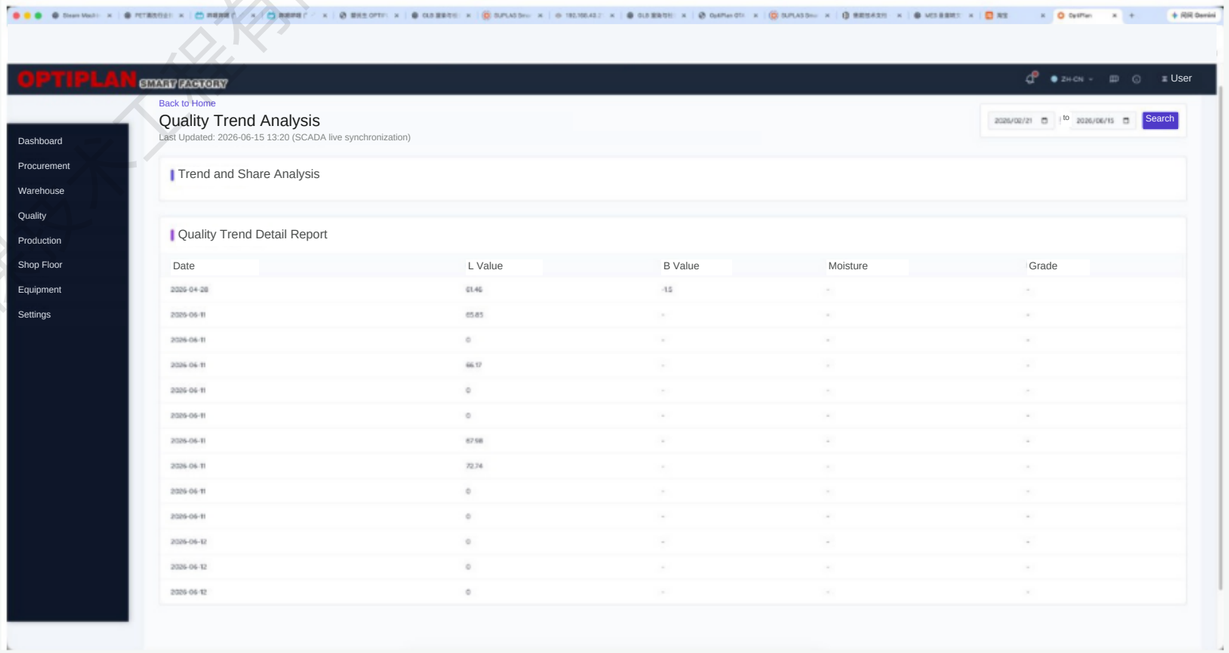
Continuous Quality Improvement

Build quality history, analyze variation, and optimize process parameters to improve consistency and customer satisfaction.

- Data History
- Variation Analysis
- Process Optimization

Real-time alerts replace delayed discovery. Quality investigations shorten from days to minutes.

Quality Analysis Report



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PART 2 / ARCHITECTURE AND CORE MODULES

End-to-End Traceability

Trace material sources, destinations, and accountability

Business Value
Traceability supports audits and order acquisition; quality investigations shorten from days to minutes.

Material Lots and Product History
Automatic lot records and one-click product history.

Bidirectional Traceability and Reports
Forward and backward tracing with multidimensional reports.

End-to-End Traceability Architecture

Material sources, destinations, accountability, and issue control

Product Lifecycle	**Raw Materials** Supplier / Material lot	**Production** Process control	**Quality Inspection** IQC / IPQC / FQC	**Warehousing** Putaway / Stock	**Sales / Shipment** Delivery / Logistics	**Customer Use** Feedback / Service
Traceability Data Chain (Collection / Links)	**Materials** Supplier Material lot Arrival time Weighing records Incoming inspections Receipt records	**Production** Work orders Feeding records Process area records Equipment operation Process parameters Output and losses	**Quality** Incoming inspection In-process inspection Finished inspection Inspection results Nonconformance actions Quality control plans	**Warehouse** Finished product lot Receipt time Warehouse / Location Inventory status Stock quantity Inventory movements	**Sales** Customer Sales orders Shipment lots Shipment quantity Shipment time Logistics	**Customer Service** Customer feedback Complaints Resolution records Improvement actions Service records
Data Links / Traceability Engine	**Unified OPTIPLAN Data Platform** Master data / Lot links / Rules / Validation / Relationships | Unique lot IDs / Linked data / Live synchronization / Traceability chains					
Tracing Methods	**Forward: Materials to Products to Customers** Supplier > Raw material lot > Work order > Product lot > Customer	**Backward: Customers to Products to Materials** Customer > Product lot > Work order > Raw material lot > Supplier	**Rapid Investigation** Locate affected lots Assess scope / Root cause Determine responsibility			
Traceability Reports	**Product History** Production / Quality Inventory / Shipping	**Material Flow** Destinations / Lots Customer distribution	**Customer Lots** Product lots Production / Shipping	**Abnormal Lots** Affected lots / Products Resolution tracking	**Traceability Stats** Counts / Quantities Exception trends	**History Export** PDF / Excel Templates / Printing

Traceability Value

Audit and Certification
Complete traceability records for product certification and customer audits.

Quality Response
Find the source faster and reduce investigation time and losses.

Impact Assessment
Identify affected lots, products, and customers to narrow recall scope.

Better Management
Use data to improve processes, quality, and competitiveness.

Lasting Data Assets
Build operational data assets for business analysis and decisions.

Trace raw materials through production, quality, warehousing, and sales. Customer audit responses shorten from days to minutes.

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PART 2 / ARCHITECTURE AND CORE MODULES

Equipment Management

Lifecycle management, preventive maintenance, and operating visibility

Business Value

Unplanned downtime costs CNY 26,000/hour. Preventive maintenance reduces failures and downtime losses.

Equipment Register and Monitoring

Centralize equipment records by process area and collect operating data in real time.

- Equipment master data: records and manuals
- Equipment list: status, location, and classification
- SCADA console: live monitoring and acquisition settings

Prewashing | Sorting | Crushing | Hot Washing | Rinsing | Bagging

Inspection, Maintenance, and Repairs

Standardized inspections, preventive maintenance, and closed-loop repair work orders.

- Maintenance plans: schedules and reminders
- Maintenance records: results and execution history
- Repair requests: work orders and troubleshooting
- Repair history: refine maintenance strategies

Motor Operation | Bearing Temperature | Lubrication Check | Belt Inspection | Chain Maintenance

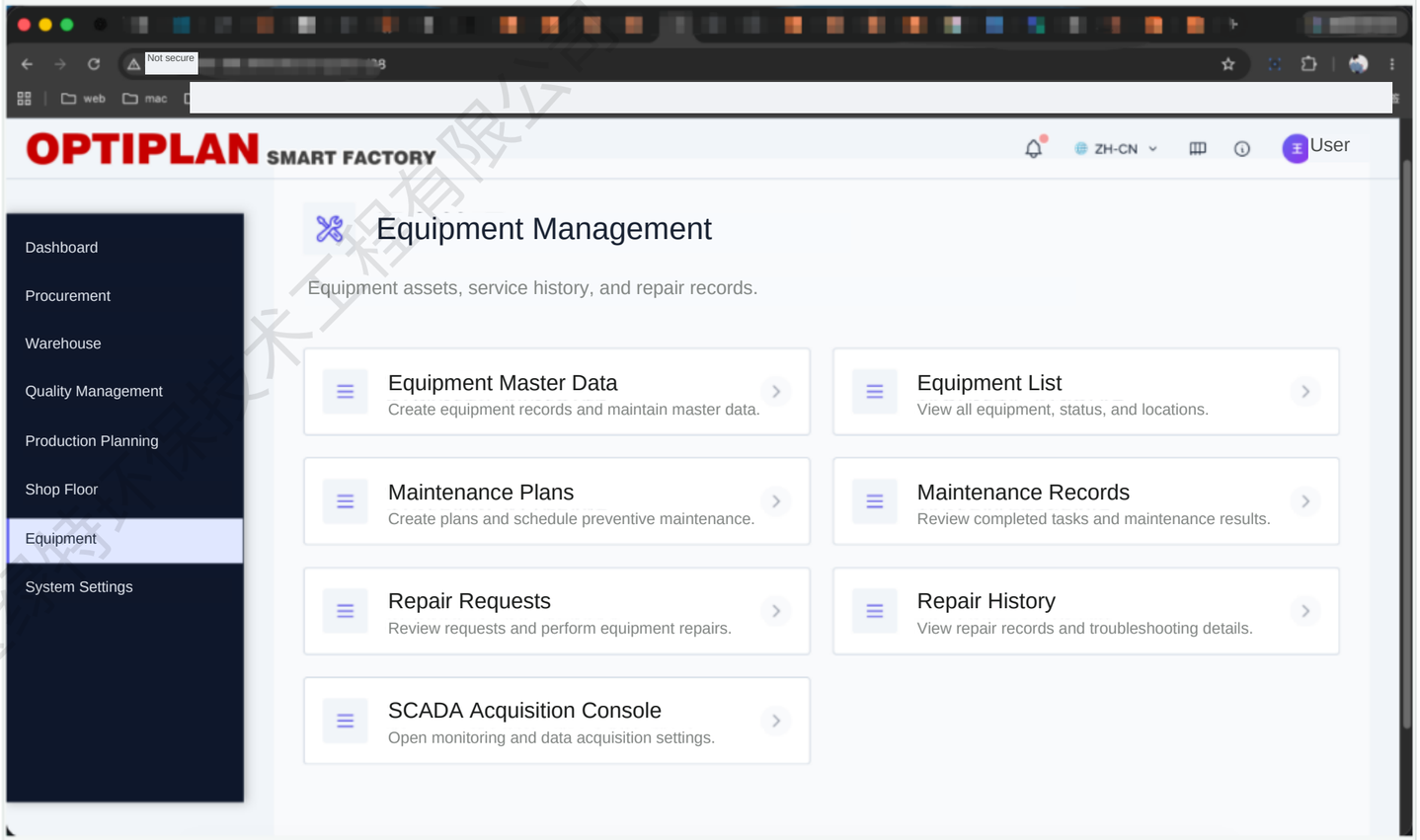
Spare Parts and Equipment Reports

Spare parts visibility, safety stock alerts, and equipment analysis across dimensions.

- Spare parts records and stock: prevent stockout downtime
- Equipment reports: OEE and downtime causes

Safety Stock Alerts | OEE Analysis | Inspection Statistics | Downtime Causes

Equipment Management Screen



Manage the full equipment lifecycle. Preventive maintenance reduces failures, spare parts control prevents stockout downtime, and repair history improves maintenance strategies.

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PART 2 / ARCHITECTURE AND CORE MODULES

Warehouse Management

Material movement control, lot traceability, and inventory visibility

Business Value

Inventory accuracy reaches 99%+. Lower material losses and excess stock save several hundred thousand CNY in annual warehouse costs.

Raw Material Receipts and Issues

Automatically link weighing records and match production issues to work order lots for full material control.

- Receipts: weights, suppliers, inspections, storage locations
- Issues: automatic work order/lot matching, full issue records
- Lot links: work order, issued weight, material lot, process area

Weighing Records | Supplier Management | Incoming Inspection | Automatic Matching | Cost Analysis

Finished Product Receipts and Shipments

Create finished product lots automatically, link inspections, and include shipment records in traceability.

- Receipts: work orders, product grade, inspections, bagging
- Shipments: customer, product lot, quantity, carrier details

Quality Links | Shipment Tracking | Customer Audits | Carrier Management

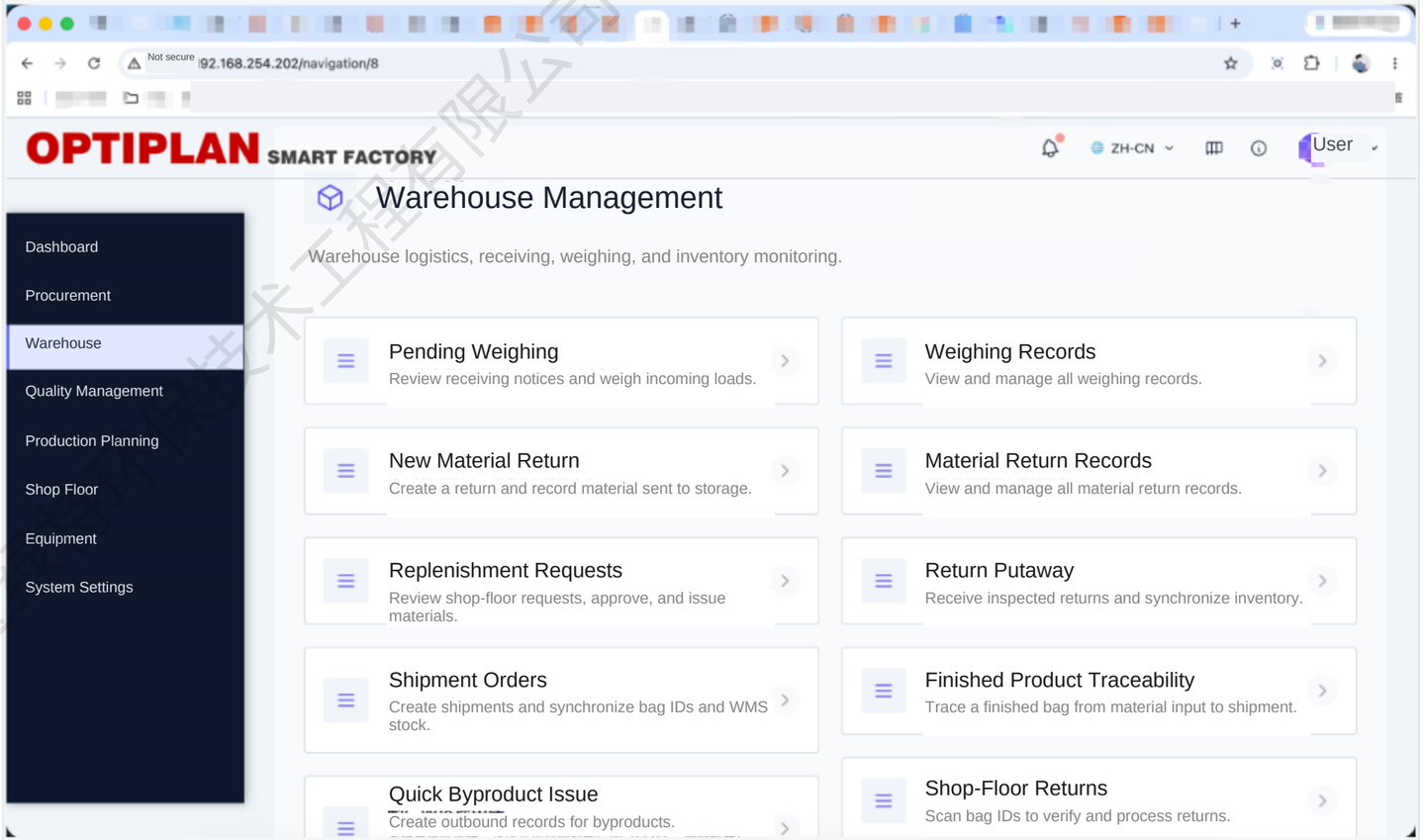
Inventory Control and Warehouse Analysis

Inventory queries, approval workflows, and warehouse reports support decisions.

- Inventory: on-hand, available, pending inspection, locked, safety stock
- Lots: shared codes link materials, production, quality, shipments
- Reports: balances, receipts/issues, stock age, turnover

Inventory Alerts | Stock Age | Slow-Moving Stock | Approvals | Turnover

Warehouse Management Screen



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PART 2 / ARCHITECTURE AND CORE MODULES

Data Platform and Management Dashboard

Shared data governance, operating visibility, and continuous improvement

Business Value
Connect data silos for a unified view of operations.

Data Governance
Shared models, standards, cleansing, master data, and access control.

Operations Dashboard
Production, quality, equipment, energy, and warehouse visibility.

Continuous Improvement
Yield variation, quality causes, failure patterns, and energy trends.

Data Platform Architecture

Unified data / Governance / Multidimensional analysis / Decision support / Business value

Presentation Layer

Live Operations Display

Real-time production line view
Equipment status and alarms
Production and energy KPIs
Historical trends

Reporting Center

Production: line output, daily/monthly reports, work orders, input/output, yield, byproducts, shifts
Quality: incoming, process, finished inspections, exceptions, trends
Warehouse: stock register, receipts/issues, inventory history
Equipment: OEE, inspections, maintenance, downtime
Energy: electricity, water, steam, specific consumption
Traceability: products, histories, material flow, customer lots
Custom: filters, templates, metrics, report previews, export/print

KPI Dashboard

KPI overview
Business analysis
Trend analysis
Alert monitoring

Mobile Apps

Approvals
Inspections
Notifications
Data queries

Analysis Layer

Production
Output / Yield
Work orders / Shifts
Process areas

Quality
Trends / Exceptions
Pass rate / Grade
Customer quality

Equipment
OEE / Failures
Inspections / Repairs
Downtime

Warehouse
Stock / Age
Receipts / Issues
Lot inventory

Traceability
Products / Material flow
Lot relationships
Customer lots

Energy
Electricity / Water
Steam / Specific use
Energy trends

Self-Service
Data selection
Multiple dimensions
Drag-and-drop models
Visual analysis

Data Platform

Data Warehouse (DW)

Subject areas: Production / Quality / Equipment / Warehouse
Traceability / Energy / Business

Data Governance

Standards / Master data / Data quality
Security / Data lifecycle

Data Storage

Relational databases
Time-series databases
File storage

Data Integration

Acquisition
Real-time / Scheduled

Synchronization
Incremental / Full

Cleansing
ETL / ELT

Validation
Rules / Exceptions

Interfaces
API / SDK

Messaging
MQ / Kafka

File Exchange
FTP / SFTP

Data Sources

MES
Production / Work orders
Feeding / Output
Quality / Process

WMS
Inventory / Receipts
Issues / Locations

SCADA
Equipment / Energy
Process parameters

Quality System
Inspections / Lab data
Quality records

Equipment System
Inspections
Maintenance / Failures

ERP
Materials / Orders
Customer data

Other Systems
Truck scales / Access
Video / Third parties

Future releases: AI root cause analysis linking yield loss, belt speed, missed maintenance, and downstream impact. Carbon footprint tracking and ESG support through end-to-end emissions accounting and green factory certification.

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PART 2 / ARCHITECTURE AND CORE MODULES

Energy Management

Real-time monitoring and consumption per ton support energy savings

Business Value

Energy accounts for 20%-30% of recycled PET production cost. Each 1% reduction in specific consumption saves tens to hundreds of thousands of CNY annually.

Electricity, Water, and Steam Statistics

Collect consumption in real time and analyze usage and trends over time.

- Electricity: production consumption, peak/off-peak analysis
- Water: production use and recirculating water monitoring
- Steam: consumption and utilization efficiency

Live Data Collection | Trend Analysis | Peak / Off-Peak Use | Recirculating Water

Specific Consumption and Energy Savings

Use production data to calculate consumption per metric ton and identify abnormal use and savings opportunities.

- Electricity/water/steam per ton: automatic calculation and trends
- Consumption alerts: flag deviations from baseline
- Savings opportunities: compare shifts and process areas

Consumption per Ton | Exception Alerts | Shift Comparison | Continuous Improvement

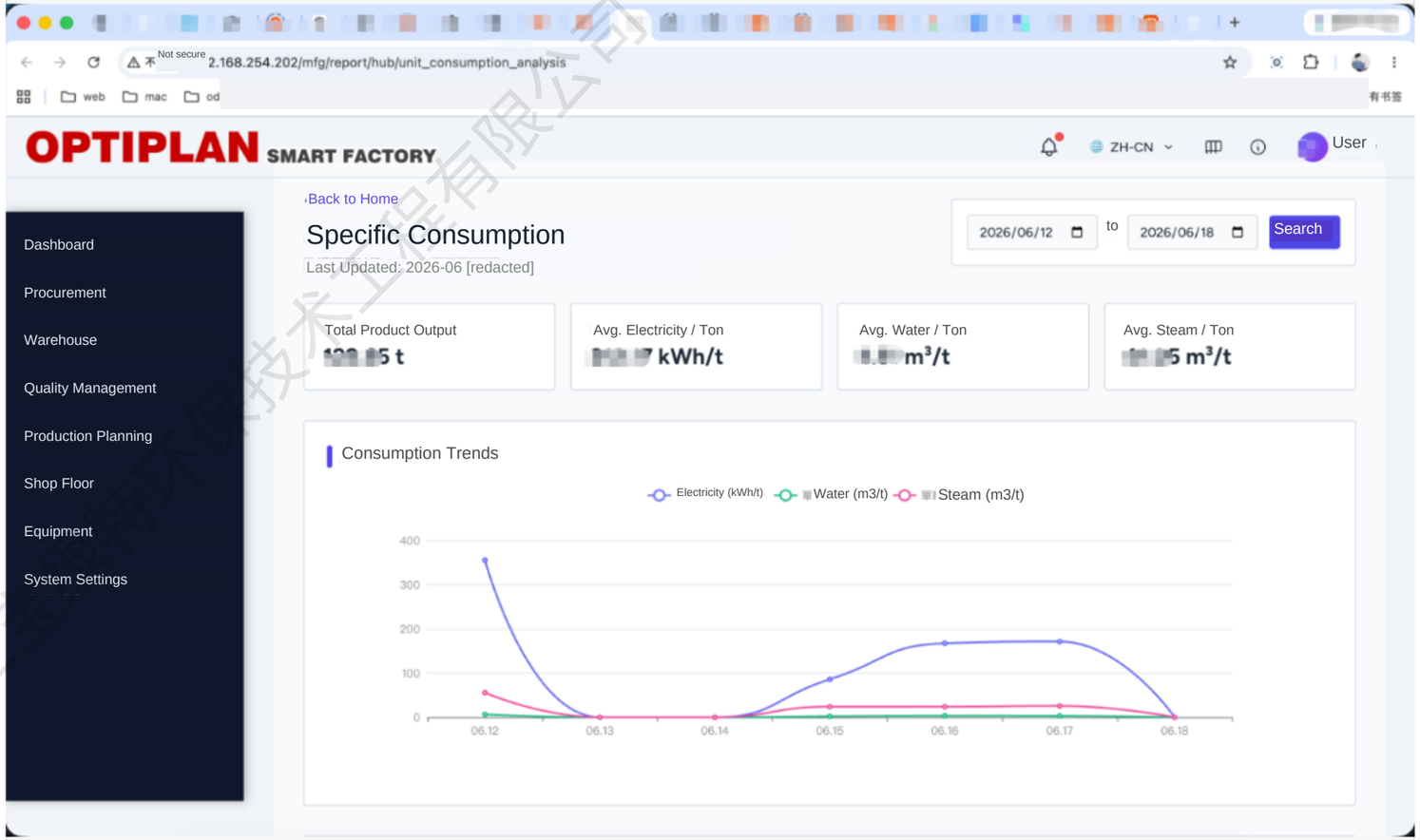
Energy Reports and Custom Analysis

Analyze energy across dimensions with custom queries and exports.

- Standard reports: daily/weekly/monthly use and specific consumption
- Custom reports: configurable dimensions, metrics, export formats

Excel Export | PDF Export | Multiple Dimensions | Customization

Specific Consumption Report



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PART 3 / ROI AND IMPLEMENTATION SUPPORT

Quantified ROI Analysis

Illustrative calculations using pilot-line data

Pilot Line Baseline

Capacity	Annual Output
4 metric tons/hour	**24,000 metric tons**
Unit Price	Annual Production Value
CNY 6,500-6,800/metric ton	**Approx. CNY 156 million**

Revenue from Yield Improvement

For the pilot baseline, a 1% yield gain adds 240 metric tons/year:
240 metric tons x CNY 6,500/metric ton = CNY 1.56 million/year

Yield Gain	Added Output / Year	Estimated Revenue (CNY 10,000/year)
0.5%	120 metric tons	**78**
1.0%	240 metric tons	**156**
1.5%	360 metric tons	**234**

* Illustrative estimates. Actual gains depend on the line baseline and management improvements.

- Accurate feeding reduces material waste
- Real-time process monitoring and optimization
- Online quality checks and exception alerts
- Investigate yield variation and improve continuously

Management Efficiency

1-2 hours of manual reporting → **Queries and reports in minutes**

Automatically aggregate data and generate production, quality, and inventory reports. Reduce duplicate records and manual compilation while improving visibility and execution.

Traceability Efficiency

Hours of cross-team work → **Responses in minutes**

For customer audits and quality investigations, use a lot number to retrieve product history, material sources, production records, and inspections quickly.

Continuous Improvement Capability

Reactive analysis and intuition → **Ongoing data-driven insights**

Accumulated operating data reveals causes of yield variation, quality issues, equipment failures, and energy trends, supporting cost reduction and efficiency gains.

Core Value

- Yield gains offer measurable revenue potential (see table)
- Management tasks shorten from hours to minutes
- Data-driven improvements build value over time

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PART 3 / ROI AND IMPLEMENTATION SUPPORT

Implementation Roadmap

Standardized delivery in seven stages

1. **Business Discovery**
   Review production processes, process areas, equipment, quality standards, warehouse workflows, and reporting needs.
2. **Solution Confirmation**
   Agree on MES, WMS, SCADA, data platform, and reporting scope. Prepare the implementation plan.
3. **System Configuration**
   Configure the organization, permissions, products, equipment register, inspections, and report templates.
4. **Data Integration**
   Connect PLCs, meters, truck scales, ERP, WMS, and other systems.
5. **Integration Testing**
   Test production, quality, warehousing, traceability, equipment, reports, and dashboards together.
6. **Pilot Operation**
   Pilot a representative line or business scenario. Collect site feedback and refine the system.
7. **Go-Live**
   Complete cutover, user training, operating support, and acceptance for stable production use.

Deployment Architecture / On-Premises

Application Services

- MES, WMS, equipment, traceability, and reports
- Quality, energy, data platform, and dashboards
- Hosted on local servers or a virtualization platform

Data Services

- Business data, time-series data, files, data warehouse
- Data security and access performance requirements
- Historical archiving and disaster recovery backups

Data Acquisition and Interfaces

- PLCs, meters, sensors, and SCADA data collection
- ERP, truck scale, and third-party integration
- Industrial protocols including OPC UA and Modbus

Delivery Milestones

Weeks 1-2

Discovery and Solution Confirmation

Review requirements and the solution. Deliver a discovery report and implementation plan.

Weeks 3-4

Configuration and Data Integration

Complete configuration and SCADA integration. Import historical master data.

Weeks 5-6

Integration Testing and Pilot

Test all modules, verify on site, train key users, and confirm operation.

Weeks 7-8

Go-Live and Acceptance

Deliver the system, hand over operations, sign acceptance, and provide ongoing support.

Training and Go-Live Support

Training by Role

- Management: dashboards, reports, key metrics
- Production: work orders, feeding, output, exceptions
- Quality: inspection records, QC plans, traceability
- Equipment: inspections, maintenance, repairs, spares

Operations Support

- System monitoring and database backups
- Interface monitoring and incident resolution
- System updates and report improvements
- Permission maintenance and audit log management

Acceptance Verification

- Core functions meet the agreed solution
- Accurate key data and working interfaces
- Training and operating documents delivered
- Performance and stability meet production needs

Deliverables

OPTIPLAN Platform	MES Production Execution	WMS Warehouse Management	Quality Management	End-to-End Traceability	Equipment Management	Energy Management
Reporting Center	Data Platform / Dashboard	Interfaces / Integration	User Manual	Configuration Guide	Training / Acceptance	Data Governance Documents

Implementation Commitments

Dedicated Project Manager
On-site coordination throughout delivery to manage quality and schedule.

Support: 12 h/day, 7 days/week
Remote support after go-live. On-site response within 4 hours for critical issues.

Ongoing Updates
Regular inspections and updates support long-term system stability.

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PART 3 / ROI AND IMPLEMENTATION SUPPORT

Service Support and Continuous Improvement

Long-term operating support and data-driven improvement

Operations Support Framework

- System Monitoring
- Interface Monitoring
- System Updates
- Access Maintenance
- Database Backups
- Incident Resolution
- Report Improvements
- Operating Log Audits

Regular inspections of critical production systems identify risks early and reduce disruption from failures.

Project Deliverables

- OPTIPLAN Platform
- MES Production Management
- WMS Warehouse Management
- Quality Management
- Traceability Management
- Equipment Management
- Reporting Center
- Data Platform and Management Dashboard
- Interfaces and Integration Services
- User Manual
- System Configuration Guide
- Training and Acceptance Records

Value of Continuous Improvement

Digital operations build lasting production and operating data assets across production, quality, warehousing, equipment, and energy management, extending the value beyond replacing paper records.

- Causes of Yield Variation
- Sources of Quality Issues
- Equipment Failure Patterns
- Energy Consumption Trends
- Byproduct Output

Data-Driven Improvement Cycle

Data Collection → Issue Detection → Cause Analysis → Take Action → Results Check

Experience-based decisions become data-driven. Process control replaces results-only management. Ongoing improvement replaces reactive analysis.

AI Root Cause Analysis Example

Investigating a 1% Yield Decline

Yield down → Lower belt speed at the bale-opening conveyor → Lower Feed Rate → Higher Chemical, Steam, and Energy Use → Missed Preventive Maintenance

Recommendation: Reinstate scheduled belt maintenance to prevent yield variation and energy waste from missed maintenance.

Future Development

Process Optimization
Use historical data to optimize process parameters and product consistency.

Predictive Maintenance
Equipment failure alerts reduce unplanned downtime risk.

Intelligent Analysis
AI identifies root causes and recommends improvements.

Carbon Footprint Tracking
Link energy use and carbon emissions to support ESG compliance.

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OPTIPLAN

Quality assurance and traceability support production management.
A shared data platform connects equipment, energy management, and dashboards.

Production Visibility

Visibility across the production process
Real-time line status

Efficient Management

Reporting shortens from hours to minutes
Higher management efficiency

Accurate Traceability

End-to-end lot traceability
Responses shorten from hours to minutes

Data-Driven Decisions

Build lasting operational data assets
Support decisions with data

Company
Zhejiang BoReTech Environmental Engineering Co., Ltd.

Website
www.bo-re-tech.com

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