

# FuelSphere

## Airline Fuel Lifecycle Management Solution

*FuelSphere is a comprehensive airline fuel management solution built on SAP Business Technology Platform that transforms fragmented fuel operations into an integrated digital backbone. By connecting flight operations, fuel suppliers, and SAP S/4HANA Finance, FuelSphere enables airlines to automate fuel ordering, capture real-time delivery data, and streamline invoice verification — reducing accounts payable processing time while ensuring complete compliance and audit trails.*

### The Business Challenge

Airlines operate complex fuel supply chains spanning hundreds of airports, multiple suppliers, and millions of transactions annually. Traditional approaches rely on disconnected systems, manual processes, and paper documentation — creating operational inefficiencies and financial risks.

- **Fragmented Operations** — Fuel ordering, delivery capture, and invoice processing operate in silos with manual handoffs
- **Paper-Based Documentation** — Fuel tickets and proof of delivery rely on physical documents that delay processing
- **Limited Visibility** — Actual fuel consumption data arrives days after flights, hindering cost analysis
- **Manual Reconciliation** — Three-way matching between orders, deliveries, and invoices requires extensive manual effort
- **Compliance Burden** — Audit preparation demands significant time gathering documentation across systems

### Solution Overview

FuelSphere addresses these challenges through five integrated applications that span the complete fuel lifecycle — from master data governance and annual planning through financial close. Built natively on SAP BTP and designed for seamless SAP S/4HANA integration, FuelSphere extends your existing SAP investment into fuel operations.

Application	Key Capabilities
Master Data	Centralized fuel master data management, real-time S/4HANA synchronization, supplier and product data governance, Master Data Cockpit for monitoring
Planning	Annual fuel demand forecasting, price planning with SAP CPE integration, budget versioning, SAP Analytics Cloud integration
Fulfillment	Schedule-driven fuel order automation, milestone tracking, supplier dispatch via SAP Integration Suite, purchase order creation
Operations	Digital fuel ticket capture, electronic proof of delivery with e-signatures, ACARS/EFB integration, remaining-on-board tracking

Application	Key Capabilities
Invoicing	Automated three-way matching, tolerance-based exception handling, approval workflows, journal posting to S/4HANA

## Key Capabilities

### Schedule-Driven Fuel Order Automation

FuelSphere integrates with flight schedule systems (SSIM format) to automatically generate fuel orders based on planned flights. The system calculates required uplift quantities using aircraft-specific fuel requirements and route parameters, then dispatches orders to suppliers via SAP Integration Suite. Milestone tracking monitors each order from creation through delivery confirmation.

### Digital Proof of Delivery

Station coordinators capture fuel deliveries using mobile devices with electronic signature capability. Digital fuel tickets replace paper documentation, enabling immediate availability for invoice verification. The ePOD-triggered workflow automatically creates goods receipts in SAP S/4HANA upon signature capture, reflecting the operational reality of aviation fuel procurement.

### Automated Invoice Verification

Three-way matching automatically compares purchase orders, electronic proof of delivery, and supplier invoices. Configurable tolerance thresholds route exceptions to approval workflows while clean invoices post directly to SAP S/4HANA Finance. The system supports dual approval for exceptions exceeding defined thresholds, ensuring proper financial controls.

### Real-Time Fuel Burn and ROB Tracking

Integration with ACARS and Electronic Flight Bag systems captures actual fuel consumption per flight in real-time. The remaining-on-board (ROB) ledger tracks fuel inventory by aircraft tail using the formula:  $ROB_{current} = ROB_{previous} + Uplift - Burn$ . This enables accurate consumption accounting and variance analysis against planned figures.

## Technology Architecture

FuelSphere is built on SAP Business Technology Platform using SAP Cloud Application Programming Model (CAP) with Node.js runtime. The solution leverages SAP HANA Cloud for data persistence and SAP Fiori Elements for a consistent, responsive user experience across devices.

Layer	Technology
Platform	SAP Business Technology Platform (Cloud Foundry)
Database	SAP HANA Cloud
Backend	SAP Cloud Application Programming Model (CAP) — Node.js
Frontend	SAP Fiori Elements, SAPUI5, SAP Fiori 3 Horizon theme
Integration	SAP Integration Suite (CPI), SAP Event Mesh, OData V4
Analytics	SAP Analytics Cloud (SAC)
Authentication	SAP IAS/IPS, XSUAA, OAuth 2.0

## SAP S/4HANA Integration

FuelSphere integrates natively with SAP S/4HANA using standard APIs, supporting Public Cloud, RISE with SAP (Private Cloud Edition), and On-Premise deployments. All integrations follow SAP Clean Core principles with no modifications to the S/4HANA system.

Business Process	SAP API	Direction
Supplier Master	API_BUSINESS_PARTNER	S/4HANA → FuelSphere
Material Master	API_PRODUCT_SRV	S/4HANA → FuelSphere
Purchase Orders	API_PURCHASEORDER_PROCESS_SRV	FuelSphere → S/4HANA
Goods Receipts	API_MATERIAL_DOCUMENT_SRV	FuelSphere → S/4HANA
Supplier Invoices	API_SUPPLIERINVOICE_PROCESS_SRV	FuelSphere → S/4HANA
Journal Entries	API_JOURNALENTYITEMBASIC_SRV	FuelSphere → S/4HANA
Purchase Contracts	API_PURCHASECONTRACT_PROCESS_SRV	Bidirectional

## External System Connectivity

FuelSphere connects with aviation industry systems to enable end-to-end automation. Pre-built integration adapters accelerate connectivity while SAP Integration Suite provides the foundation for custom integrations as needed.

System	Purpose	Protocol
ACARS	Automated fuel burn data from aircraft systems	REST/JSON via CPI
Electronic Flight Bag	Pilot-entered fuel data and flight information	REST API
Shell Skypad	Fuel delivery coordination and confirmation	REST API
SSIM / Jeppesen	Flight schedule data for demand planning	File / API
Legstate TripRecord	Flight movement and fuel data	REST API
Platts / Argus	Market price indices (via SAP CPE)	SAP CPE

## Business Value

- **Accelerated Invoice Processing** — Automated three-way matching eliminates manual verification bottlenecks, enabling same-day invoice processing
- **Complete Digital Documentation** — Electronic proof of delivery replaces paper fuel tickets across all stations, ensuring audit-ready records
- **Streamlined AP Operations** — Exception-based workflows allow finance teams to focus on discrepancies while clean invoices post automatically
- **Flight-Level Cost Visibility** — Real-time dashboards provide granular fuel cost insights for route optimization and budget management
- **Reduced Manual Effort** — Schedule-driven automation eliminates repetitive data entry across fuel ordering, delivery capture, and reconciliation
- **Enhanced Compliance** — Built-in maker-checker controls, embargo screening, and complete audit trails support regulatory requirements

## Implementation Approach

FuelSphere implementations follow SAP Activate methodology, ensuring a structured and proven approach to deployment. A typical implementation spans 24 weeks from project initiation to hypercare completion.

Phase	Duration	Key Activities
Prepare	2 weeks	Project planning, team onboarding, environment setup, governance model
Explore	6 weeks	Requirements validation, fit-gap analysis, solution design, integration mapping
Realise-Build	4 weeks	Configuration, customization, data migration, integration development
Integration Testing	3 weeks	End-to-end testing, S/4HANA validation, external system connectivity
User Acceptance Testing	3 weeks	User acceptance testing, business scenario validation, training delivery
Deploy	2 weeks	Production cutover, data migration, go-live readiness
Hypercare	4 weeks	Post go-live support, issue resolution, performance optimization

## Why FuelSphere

- **SAP-Native Architecture** — Built on SAP BTP using CAP and Fiori Elements, ensuring seamless integration with your SAP landscape
- **Clean Core Compliant** — Standard API integration with S/4HANA requires no custom code in your ERP system
- **Industry-Specific Design** — Purpose-built for aviation fuel operations with deep domain expertise
- **Proven Methodology** — SAP Activate-based implementation approach with structured deliverables
- **Flexible Deployment** — Supports S/4HANA Public Cloud, RISE with SAP, and On-Premise editions
- **Continuous Innovation** — Quarterly platform updates deliver new features and enhancements

## Get Started

FuelSphere is available on the SAP Store with per-aircraft subscription pricing. Contact Diligent Global for a personalized demonstration and to discuss how FuelSphere can transform your airline's fuel operations.

<b>SAP Store</b>	store.sap.com (search 'FuelSphere')
<b>Website</b>	www.diligentglobal.com
<b>Email</b>	fuelsphere@diligentglobal.com