

QBS



# LAL A.I.

Reimagining Energy Production

## LAL A.I. – Decision Support

Text mining, n-grams, vector search and enterprise context injection for decision support

### Turns real enterprise data into decisions

LAL A.I. ingests ERP/DB/REST data, builds n-gram and embedding representations,

injects live context into prompts via RAG, and produces clear, auditable decision texts.

User feedback is fed back into the system; versioned templates provide measurable, iterative improvements.

### Performance

- Up to 40% faster decision cycles
- +15% decision accuracy (with feedback loop)
- +25% user adoption (simplified UX)

#### LAL PERCEPTION

- Text Processing
- Text Cleaning

#### LAL AI ENGINE

- LLM Integration

#### LAL CORE

- Memory Management



#### INTEGRATION LAYER ORACLE

- ERP CRM System Integration





# LAL A.I Capabilities

## N-gram Analysis

Key terms/patterns from free text; TF-IDF / PMI signal scoring.

## Prompt Templates & Versioning

Versioned templates with A/B comparisons.

## Data Governance

Field masking, audit logs, role-based access.

## Vector Search

Sentence/record embeddings; similarity via cosine/dot.

## Workflow & Orchestration

Preprocess → inference → validation → publish.

## Live Connectors

SAP (OData/BAPI), Wolfram ERP, REST, SQL; scheduled/event-driven.

## RAG & Context Injection

Auto-inject ERP/DB context into prompts.

## Feedback Loop

User rating/explanation → quality metric → continuous tuning.

## Model Support

Cloud (OpenAI etc.) + local models; hot key switching.

# RAG

Generation with live context

# A/B

Template benchmarking

# RBAC

Role-based access

# LAL A.I Features

## Dashboard

## Personnel Management

- Employees
- Roles

## Accounts Management

- Suppliers
- Customers
- Cost Centers

## Maintenance Management

- Maintenance Plan
- Machine Tracking Card
- Fault Notification
- Hydroelectric Plant Site Observation Form
- Diesel Generator Control Form
- Transformer Control Form
- Power Transmission Line Control Form
- TSKB Monthly Report

## Product Management

- Products
- Services
- Equipment
- Price Information
- Data
- Categories

## Planning

- Maintenance Plans
- Resource Planning
- Calendars

## Vehicle Task Card

## Service / Maintenance

## Document Management

- Documents
- Text Headers
- Templates
- Design

## Tender Management

- Tenders
- Tender 360

## Energy Production Management

- Production Entry
- Biomass Energy Plant (BES) Management
- Green Energy Operations (YEO) Tracking
- Solar Power Plant (SPP) Management
- Wind Power Plant (WPP) Management
- Waste-to-Energy (WtE) Management

## Construction Management

- Site Preparation
- Permits and Pre-Construction
- Infrastructure and Construction Start
- Construction Activities
- Facilities
- Occupational Safety & Operational Monitoring
- Testing and Commissioning

## Finance Management

- Purchase Requests
- Sales
- CAPEX Management
- OPEX Management
- Incentives and Credits



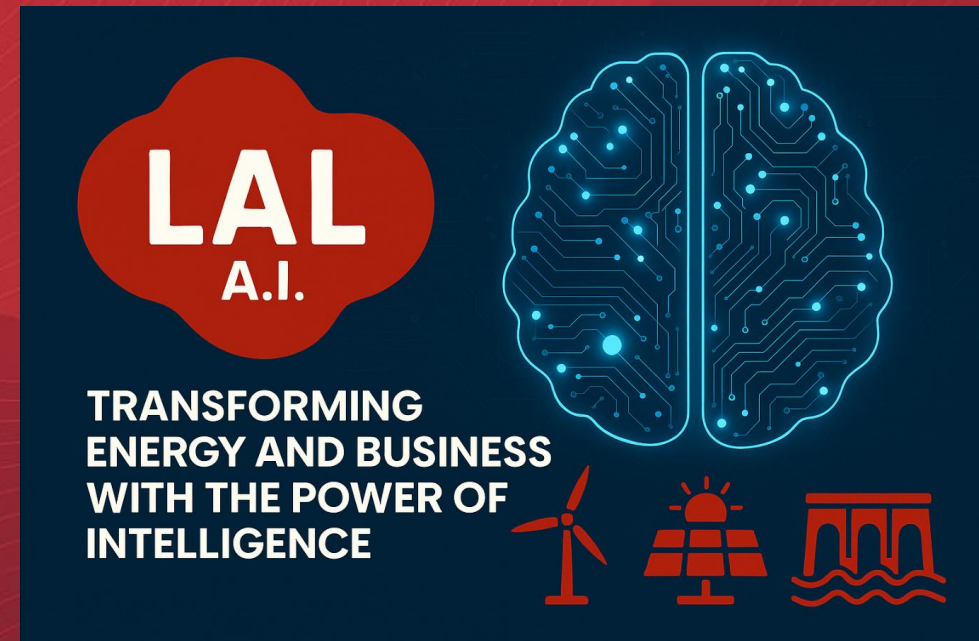
**LALA.I**  
Energy

**QBS**



# Problem & Need

- **Content (bullet points):**
- Enterprises operate with **fragmented data** from multiple sources (ERP, CRM, tender platforms, IoT, market prices).
- **Keyword search** and classical AI often fail due to **semantic drift**, leading to inaccurate results.
- Decision-making processes are **slow, lack foresight**, and are not explainable.
- There is a growing demand for **real-time, context-aware decision support** in tendering, energy, and financial operations.



# LAL A.I Engine

LAL A.I. **General Dashboard** enables organizations to analyze all tender, finance, HR, and project data from a **single center**.

**Tender Management:** Total tenders, status distribution (draft, published, completed), country-based amount analysis, and AI summaries (win rate, risk assessment).

**Financial Projects:** NPV, IRR, margins, and profitability analysis, supported with monthly trend graphs.

**Human Resources:** Key metrics such as personnel count, absenteeism, leave requests, training completion, and shift compliance.

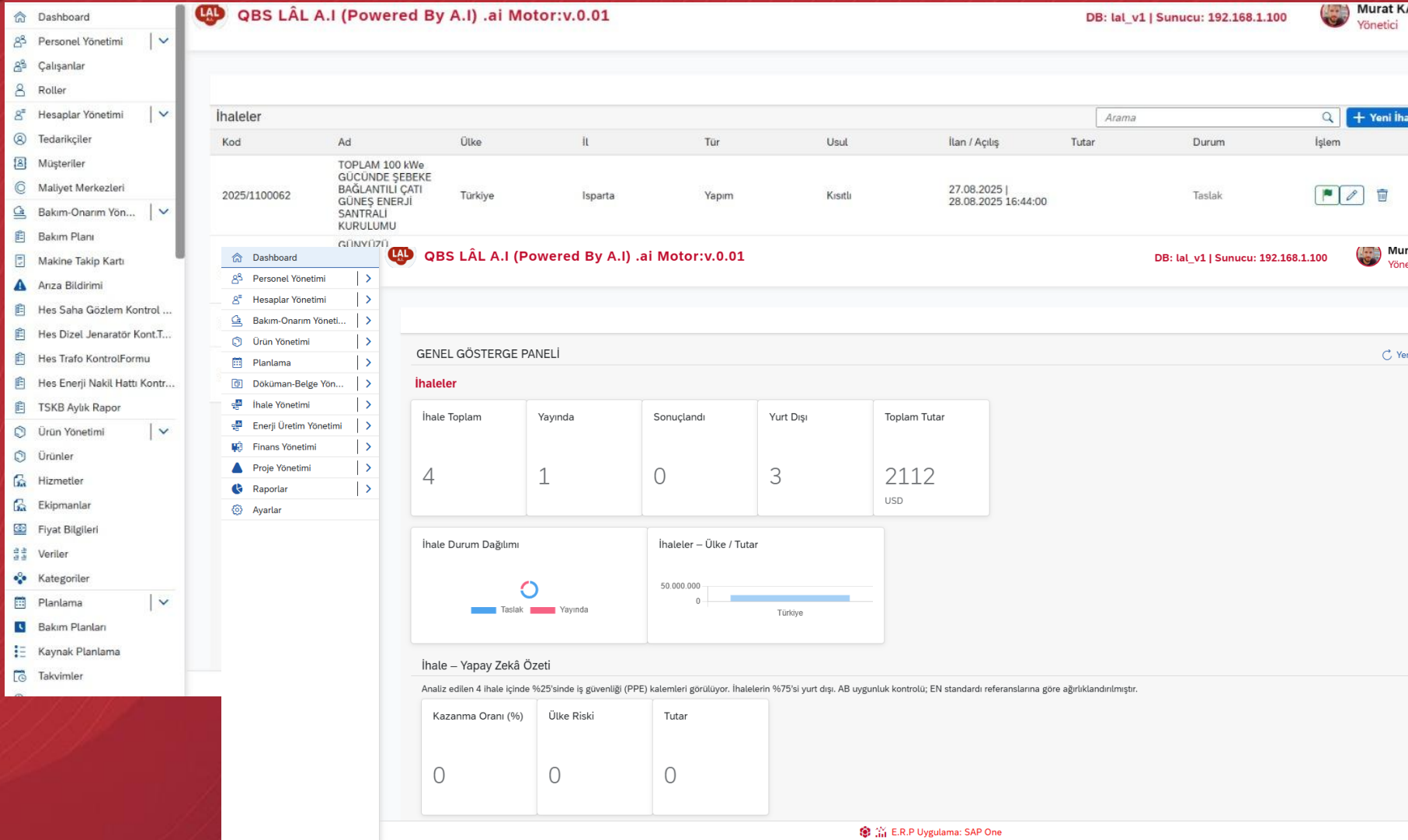
**Document Management:** Number of documents, pending approvals, expired documents, labeled and version-controlled files.

**Corporate Health:** On-time completion rate, policy violations, delays, data alerts, and audit findings.

**AI Status:** AI health, coverage, response quality, drift risk, and latency metrics.

**Planning:** Calendar compliance, resource utilization, upcoming tasks, and overdue jobs.

**Project Management:** Number of projects, active projects, average progress, and budget utilization. This holistic approach allows management to make **fast, reliable, and data-driven decisions** at both **operational and strategic levels**.





# LAL A.I Engine

## Maintenance Management Maintenance Plan

Periodic maintenance plans by plant, department, and equipment. Time-based or meter-based maintenance intervals can be defined.

## Machine Tracking Card

Unique card for each machine: code, name, criticality, commissioning date, and operating hours. Service history is tracked.

## Fault Notification

Records of faults, assignment of responsible staff, and monitoring of resolution process.

## Hydroelectric Plant Field Observation Form

Observations and technical inspections conducted on-site in hydroelectric plants.

## Hydroelectric Plant Diesel Generator Check

Monitoring performance, fuel, and maintenance of diesel generators.

## Hydroelectric Plant Transformer Inspection Form

Condition, maintenance, and safety inspections of transformers.

## Hydroelectric Plant Power Transmission Line Check

Field inspections of transmission lines, risk assessments, and maintenance logs.

## TSKB Monthly Report

Monthly summary report of tenders, services, and maintenance costs.

## YEO (Green Energy Operations) Maintenance Module

### Solar Power Plant (SPP) Maintenance Plans

Periodic maintenance of solar panels and inverters.

### Wind Power Plant (WPP) Maintenance Plans

Maintenance plans for turbines, rotor blades, and wind measurement devices.

### Biomass Energy Plant (BES) Maintenance Plans

Maintenance of biomass plant fuel feeding systems and boilers.

### Waste-to-Energy (WtE) Maintenance Plans

Maintenance of incineration systems, filters, and emission control equipment in waste-to-energy facilities.

### Bioenergy Maintenance Plans

Maintenance of organic waste processing facilities, biogas units, fermentation tanks, and energy conversion systems.

Dashboard

Personel Yönetimi

Hesaplar Yönetimi

Tedarikçiler

Müşteriler

Maliyet Merkezleri

Bakım-Onarım Yönetimi

Bakım Planı

Makine Takip Kartı

Anıza Bildirim

Hes Saha Gözlem Kontrol Formu

Hes Dizel Jenarator Kont.Tak.

Hes Trafo KontrolFormu

Hes Enerji Nakil Hattı Kontrol...

TSKB Aylık Rapor

Ürün Yönetimi

Planlama

Doküman-Belge Yönetimi

İhale Yönetimi

Enerji Üretim Yönetimi

Finans Yönetimi

Proje Yönetimi

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DB: la\_l\_v1 | Sunucu: 192.168.1.100

Periyodik Bakım Planları

Plan Kodu	Plan Adı
HFB-0001	Haftalık Bakım Planı

Plan Kartı

Genel İş Kalemli Malzemeler

Santral: ZOE Elektrik Santrali

Makine Kartı

Genel Teknik & Varlık Konum & Sorumlu Servis Geçmişi

Makine Kodu\*: PMP-BFP-04

Makine Adı\*: Kazan Besleme Suyu Pompası - A

Santral: ZOE Elektrik Santrali

Bölüm: A Bölümü

Ekipman (ops.): Ekipman Seç

Durum: Aktif

TSKB Aylık Rapor

Toplam İhale	Servis Sayısı	Servis Maliyeti
4	1	1200 TRY

Durum Dağılımı

Durum	Adet
Taslak	3
Yayında	1

Ülkeye Göre Tahmini Tutar

Ülke	Para	Tutar
Türkiye	TRY	10000000.00
Türkiye	USD	6120000.00
Türkiye	EUR	5000000.00

Servis Türü

Servis Türü	Adet	Maliyet	Para
Periyodik			TRY

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Murat KARAHAN Yönetici

İptal

Kaydet

## Document Analysis → Tender Decision Support → Construction Workflow

- **Integrated Management:** Document analysis → tender decisions → construction progress reports are all monitored in a single dashboard.

 E.R.P Uygulama: SAP One



# LAL A.I Engine-Tender Management

## Tender Management

### 1. Tender Dashboard

- Status of all tenders (total, draft, published, completed, canceled).
- Country-based amount distribution, CAPEX / EBITDA forecasts.
- AI analysis highlights PPE (safety equipment) compliance scores.
- Risks and missing items are automatically flagged, with recommendations provided.

### 2. Risk Analysis

- Identifies missing PPE (Personal Protective Equipment) or compliance gaps in tender documents.
- Risk scores are visualized on a 0–100 scale.
- Recommendation module suggests corrective actions.

### 3. Tender Comparison (Bid / No-Bid)

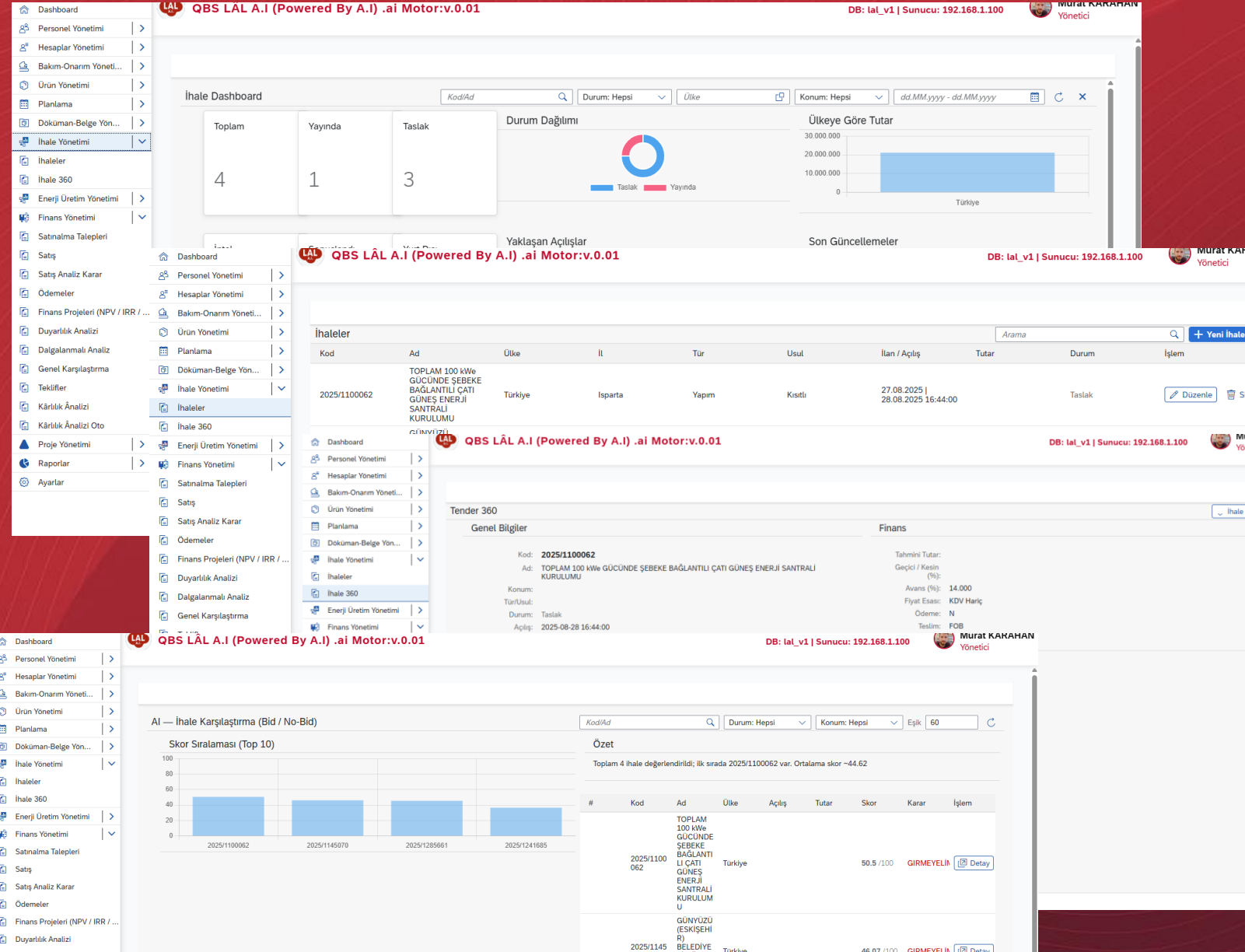
- Multiple tenders are scored and ranked simultaneously.
- Decision support mechanism answers “Should we bid or not?” using insights from past tenders.
- Average scores, risks, and profitability parameters are presented in a comparative view.

### 4. Tender 360

- Provides a holistic view of a single tender:
  - **General Info:** Code, name, opening date, type/procedure, financial parameters.
  - **KPIs:** Items, tasks, notes, documents, activities.
  - **Finance:** Estimated amount, advance rate, payment and delivery terms.
  - **Tasks & Calendar:** Related steps and responsibilities.

### 5. Added Value

- Time Savings:** Tender evaluation cycles reduced by up to 50%.
- Risk Mitigation:** Critical deficiencies are detected early.
- Strategic Decisions:** AI-driven analysis determines which tenders to pursue.
- Transparency:** End-to-end tender workflows managed in a single dashboard.



# LAL A.I Engine-Finance Management

## Financial Decision Support

### Financial Decision Support

#### 1. Sales & Procurement

- Procurement Requests:** Collecting project-based purchasing needs.
- Sales Management:** Tracking offers, orders, and collections.
- Sales Analysis Decision:** AI-powered Bid/No-Bid analysis to decide which opportunities to pursue.

#### 2. Payments & Cash Flow

- Payments Module:** Planning supplier and customer payments.
- Cash Flow Table:** Monitoring balance of income and expenses.
- Scenario-Based Cash Flow:** Financial projections under optimistic, base, and pessimistic scenarios.

#### 3. Financial Projects & Analysis

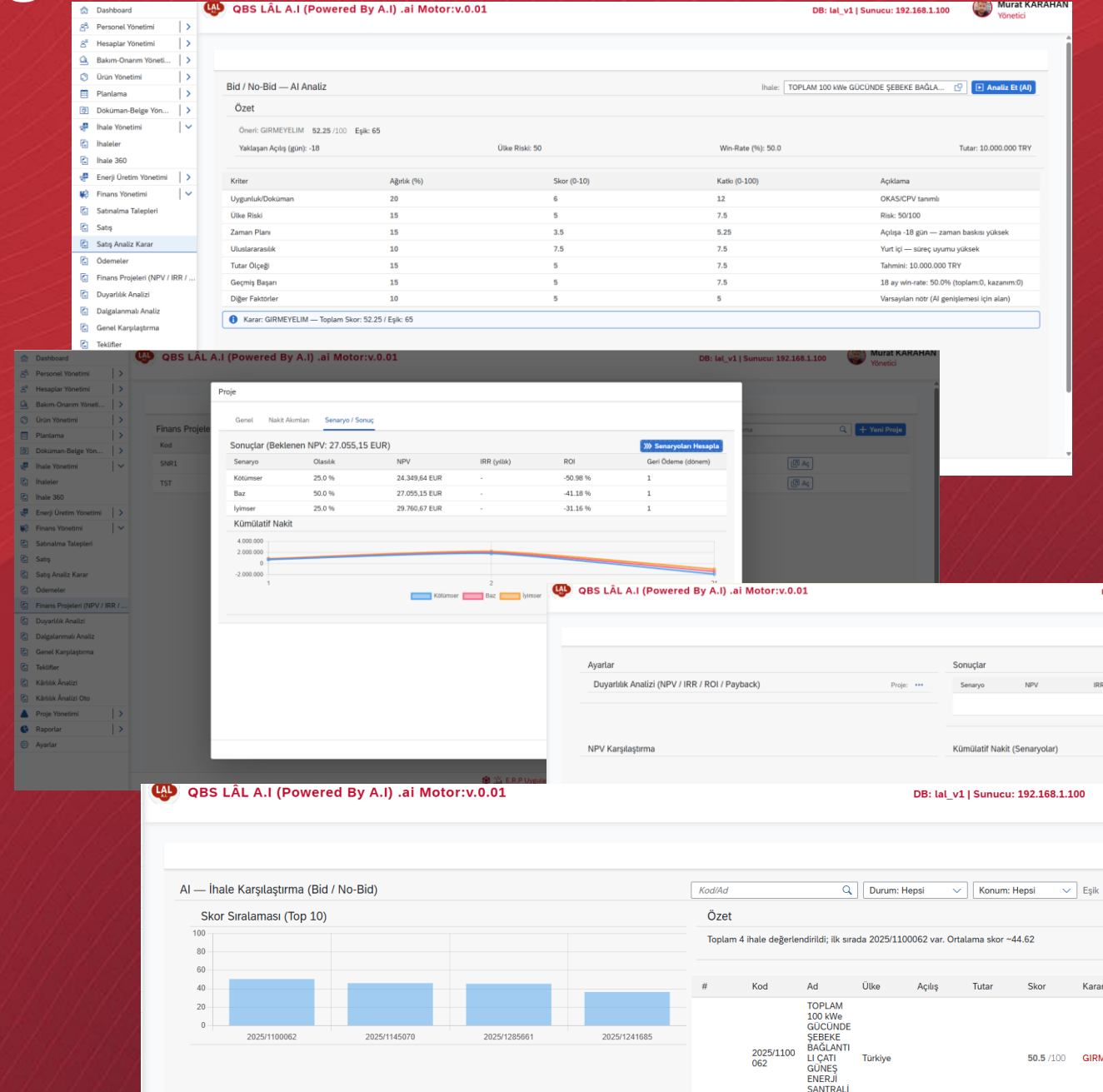
- NPV (Net Present Value):** Calculation of projects' net value today.
- IRR (Internal Rate of Return):** Annual return rate of investments.
- ROI (Return on Investment):** Profitability ratio of projects.
- Sensitivity Analysis:** Simulations of project outcomes under changing parameters such as FX rates, material costs, and interest rates.
- Volatility Analysis:** Evaluating risk vs. benefit under financial market fluctuations.

#### 4. Profitability Analysis

- Project & Tender Profitability:** Revenue, net profit, margin, and risk analysis.
- AI Analysis:** Margin optimization and profitability forecasting using insights from similar projects.
- Automated Profitability:** Continuously updated profitability reports for all bids and tenders.

#### 5. Decision Support Impact

- Time Savings:** Automated financial analysis speeds up decision cycles.
- Risk Management:** FX volatility, cost deviations, and financial uncertainties are predicted.
- Strategic Decisions:** Management chooses projects to invest in with data-driven insights.
- Investor Confidence:** Financial indicators become transparent and predictable.





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Murat KARAHAN

Yönetici

Bid / No-Bid — AI Analiz

İhale: ÇATI ÜSTÜ GÜNEŞ ENERJİ SANTRALİ MAL

Analiz Et (AI)

Özet

Öneri: GİRMEYELİM 51.75 /100 Eşik: 65

Yaklaşan Açılış (gün): -21

Ülke Riski: 50

Win-Rate (%): 50.0

Tutar: 120.000 USD

Kriter	Ağırlık (%)	Skor (0-10)	Katkı (0-100)	Açıklama
Uygunluk/Doküman	20	5	10	Doküman tamlığı zayıf
Ülke Riski	15	5	7.5	Risk: 50/100
Zaman Planı	15	3.5	5.25	Açılış -21 gün — zaman baskısı yüksek
Uluslararasılık	10	4.5	4.5	Yurt dışı — dil/lojistik/regülasyon riski
Tutar Ölçeği	15	8	12	Tahmini: 120.000 USD
Geçmiş Başarı	15	5	7.5	18 ay win-rate: 50.0% (toplam:0, kazanım:0)
Diğer Faktörler	10	5	5	Varsayılan nötr (AI genişlemesi için alan)

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Ödemeler

Arama

+ Yeni Ödeme

Tarih	Tip	Kurum/Şirket	Santral	Proje	Belge No	Tutar	Durum	İşlem
02.09.2025	Tahsilat	Anadolu Metal Sanayi A.Ş.	ZEO-1 Elektrik Santrali	Yeşil Enerji Üretim ve Yönetim Hizmet	3423	60.000.056,00 TRY	Açık	<div>Düzenle</div> <div>Sil</div>
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# LAL A.I Engine- Process Integration (Project Cycle)

## 1. Process Integration (Project Cycle)

### Tender Award → Kick-off

•**ERP integration:** Finance, Procurement, HR.

•**Investment model:** Equity, loans, government incentives, carbon credits.

### Project Financing & Leverage

•Equity contribution: 20–30% (cash flow buffer).

•Government incentives: Investment incentive certificate, VAT exemption, interest discounts, green energy grants.

•Other levers:

- ECA (Export Credit Agency) loans,
- ESG funds,
- Municipality/Industrial Zone-backed credit lines.

### Construction & EPC Management

•Integrated with modules:

- **Planning:** Critical path, Gantt, CPM.
- **Procurement:** BOM → ERP connection.
- **Site Management:** Workforce, subcontractors.
- **Quality & Safety:** HSE, worker safety, PPE.

### Plant-Type Specific Adjustments

•**Biomass/WtE:** Fuel logistics, emission/FGT integration.

•**Solar:** PV panel sourcing, inverters, BOS logistics.

•**BES/GES shared:** Civil works, transformers/switchyards, SCADA.

### Operational Readiness

•Testing & commissioning,

•OPEX simulation,

•Staff training.

## 2. Module-Based Architecture (Interconnected)

### •Finance Module

- Equity ratio
- Incentive/progress payment tracking
- FX/hedging plan

### •Project Management Module

- Tasks/Gantt, critical path
- ERP connection

### •Procurement & Logistics Module

- Vendor list, bid collection
- Logistics coefficient (FX + transport)

### •Construction & Site Module

- Workforce, subcontractors, progress payments
- Safety (PPE, certifications)

### •Technical Module

- Biomass/WtE: fuel analysis & FGT
- Solar: yield/layout

### •Reporting & Decision Support

- CAPEX/OPEX monitoring
- Scenario analysis (FX, fuel, delays)
- Management dashboard

## 3. Roadmap

### Short term (0–3 months):

•ERP integration (equity + incentive module connection)

•Construction & EPC module triggered post-award

### Mid term (3–6 months):

•Biomass/WtE FGT/Emission checks embedded

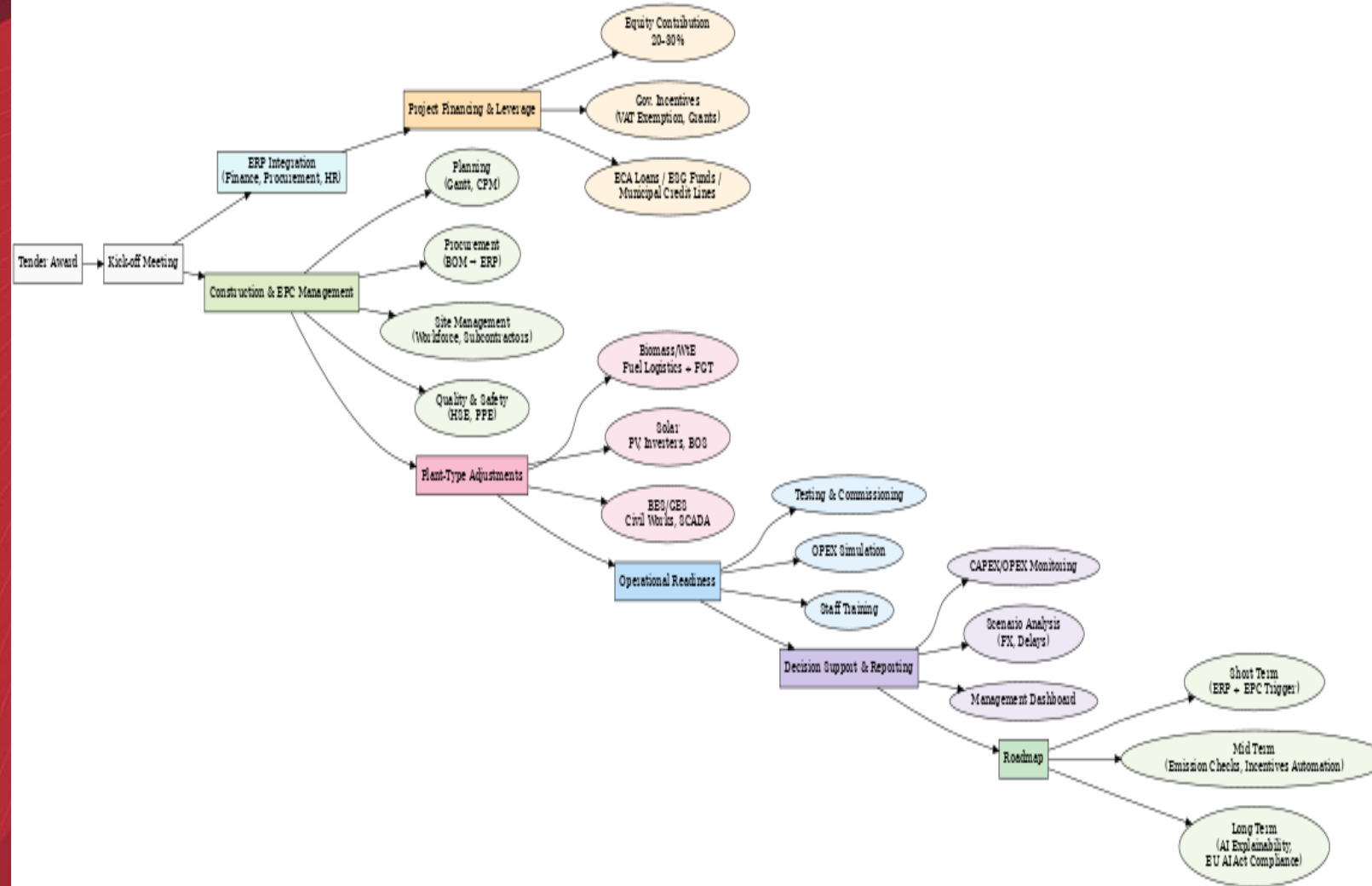
•Incentive/progress payment processes automated (Investment Incentive Certificate integration)

### Long term (6–12 months):

•Decision engine aggregates all modules → “real-time NPV, IRR, Cash Flow” updates

•AI explainability (traceability of decisions)

•EU AI Act compliant reporting



# LAL A.I Engine- Site Setup & Construction Process – Operational Flow

## Site Setup & Construction Process – Operational Flow 1. Site Preparation

- Land handover & boundary setting
- Geotechnical soil study, topographic survey
- Temporary site office, warehouse, security barriers
- Temporary infrastructure (electricity, water, internet)
- Safety zones (PPE distribution, assembly points, first aid cabin)

## 2. Permits & Pre-Construction

- Environmental permits (EIA)
- Construction permits, municipality/industrial zone approvals
- Site registration for insurance & HSE
- Heavy equipment rental (cranes, forklifts) & logistics planning

## 3. Infrastructure & Construction Start

- Excavation & foundation works:
  - **Biomass plants (BES):** boiler building, bunker foundation
  - **Solar plants (GES):** panel area leveling, fencing
- Roads & access: site roads, drainage, stormwater channels
- Temporary power line: generator / grid connection

## Critical Points in Operations

### Resource Management

- Workforce planning (labor, subcontractors, engineers)
- Daily manpower reports
- Equipment/machinery utilization plan

### Progress Payments & Financial Flow

- Subcontractor progress payments (monthly % completion)
- Cash-out tables integrated with Finance Module
- Management of incentives & progress certificates

### Quality Control

- Incoming material quality checks (cement, steel, panels, cables)
- Welding/concrete testing
- Certificates (EN/ISO, CE compliance)

### Reporting

- Daily Progress Reports
- Weekly site meetings (employer/EPC/subcontractors)
- Monthly progress reports (finance, schedule, risks)

## Summary

- Site setup** = logistics, permits, infrastructure, HSE zones.
- Construction flow** = excavation → foundation → civil works → mechanical/electrical installation → testing.
- Operational management** = workforce, payments, quality, HSE, reporting.
- Biomass-specific:** bunker + fuel handling + FGT system.
- Solar-specific:** panel layout + tracker system + DC/AC cabling.

## 4. Main Construction Activities

- Concrete and steel structures (boiler house, transformer building, inverter room)
- Equipment foundations (turbines, boilers, ESP/FGT, transformers, panels)
- Heavy lifting operations (turbines, panels, switchyard)
- Mechanical installation: piping, ducts, fuel-feeding conveyors
- Electrical installation: cabling, inverter-transformer, SCADA infrastructure

## 5. Support & Auxiliary Facilities

- Administrative building, canteen, locker rooms
- Fire safety systems, hydrant lines
- Rainwater & waste management facilities
- HSE equipment (PPE, fire drills, safety kits)

## 6. Health, Safety & Operational Monitoring

- Daily toolbox meetings (task allocation + safety reminders)
- HSE rules: PPE checks, harness/tower climbing permits, hot work permits
- Separation of vehicle & pedestrian routes on-site
- Subcontractor audits (contract compliance + HSE compliance)
- Environmental management (dust, noise, waste segregation)

## 7. Testing & Commissioning

- Mechanical completion → punch list
- Electrical testing (transformers, cable insulation, SCADA signals)
- Cold test → hot test
- Performance tests → acceptance certificates

