

# Green Guardian: DNB's AI Sustainability Copilot

Team: DNB Hackathon 2024 Participants







# Sustainability is No Longer Optional, It's Essential

The financial industry is at the forefront of the green transition. Regulators, investors, and customers demand that we understand and manage the Environmental, Social, and Governance (ESG) impact of our portfolios. This creates both a massive challenge and a historic opportunity for DNB.

# We are Drowning in ESG Data

## Chaotic Labyrinth

Sustainability information exists as a chaotic labyrinth of unstructured data, making comprehensive analysis incredibly challenging.

## Fragmented Sources

Data is scattered across thousands of sources: PDF reports, news articles, regulatory filings, and third-party feeds.

## No Universal Standards

The absence of universal reporting standards makes direct comparison and robust analysis almost impossible.

# Manual Analysis is Broken

## Time Consuming

Our highly skilled analysts spend up to **80%** of their valuable time on low-value data hunting and aggregation.

## Inefficient

This manual process is slow, expensive, and fundamentally unscalable, limiting our capacity for growth.

## Missed Opportunities

Critical risks are often overlooked, and significant opportunities are left undiscovered due to the sheer volume of information.





Our Vision:

# An AI Copilot for Every Analyst

We envision a future where every employee at DNB is empowered with instant, intelligent sustainability insights. Our goal is to augment our human experts, not replace them. We want to transform data from a liability into our greatest strategic asset.

An abstract graphic on the left side of the slide featuring a dark background with a complex network of glowing green lines and nodes, resembling a digital or neural network structure.

# Introducing Green Guardian

## Your Single Source of Truth for Sustainability

Green Guardian is an AI-powered intelligence platform that understands natural language, transforming how DNB interacts with sustainability data.

It connects to all of DNB's unstructured data, creating a centralized, queryable knowledge base, allowing analysts to simply ask questions and get trusted, auditable answers in seconds.

# How It Works: The RAG Architecture

## Grounding AI in Factual Data



### Step 1 - Retrieval

When a question is asked, the system first retrieves the most relevant, factual information from our secure knowledge base in Azure Cognitive Search.



### Step 2 - Generation

This factual context is then passed to Azure OpenAI (GPT-4), which synthesizes a coherent, intelligent answer.

This powerful **Retrieval-Augmented Generation (RAG)** architecture ensures all answers are grounded in real data, not a generic AI model, effectively eliminating hallucinations and ensuring reliability.



# The AI "Brain"

## Agentic Reasoning with LangGraph



### Beyond Simple Q&A

Our AI agent goes beyond basic questions, capable of reasoning and using tools to solve complex inquiries.



### Built with LangGraph

Leveraging LangGraph, it decomposes complex, multi-part questions into logical, manageable steps.



### Mimics Human Workflow

It intelligently decides to perform multiple searches, synthesize results, and provide comprehensive analysis, mirroring a human expert's workflow.



# Live Demo - Use Case 1

## Portfolio Risk Analysis

**Scenario:** An analyst needs to understand the deforestation risk of a company in our portfolio.

**Action:** The analyst asks Green Guardian, *"What is Company X's deforestation risk in Brazil and what are their stated policies?"*

**Result:** Green Guardian quickly retrieves data from news reports and the company's own sustainability filings, providing a summarized risk assessment with direct links to the source documents for full audibility and deeper investigation.

# Live Demo - Use Case 2

## Regulatory Compliance Check

### Scenario

A compliance officer needs to check alignment with the EU Taxonomy for sustainable activities.

### Action

They ask: "Summarise our portfolio's alignment with EU Taxonomy for climate change mitigation."

### Result

The system analyses relevant documents, provides a high-level summary, and flags companies requiring further investigation, with full auditability.

## BUSINESS IMPACT

# Transform Your Workflow

### 10x Faster Insights

Reduce research time on a single company from hours or days down to mere minutes, giving your team more bandwidth.

### Unlock Analyst Potential

Free up your most valuable asset – your human experts – to focus on strategy, engagement, and high-level analysis, not tedious data gathering.





## BUSINESS IMPACT

# From Reactive to Proactive



### 100% Auditable & Compliant

Every answer is grounded in and cited from source documents, eliminating "black box" AI and providing transparency for regulators.



### Strategic Advantage

Identify emerging ESG risks and green investment opportunities ahead of the market, turning sustainability into a competitive advantage.

Green Guardian ensures that your sustainability efforts are not just compliant, but also contribute to superior market performance and risk mitigation.

## TECHNICAL FOUNDATION

# Secure, Scalable, and Pragmatic

Our architecture is built for performance and reliability, leveraging industry-leading technologies to ensure a robust and efficient system.

### Backend

A robust, monolithic application built with Python and the high-performance FastAPI framework, ensuring rapid data processing.

### Database

A combination of PostgreSQL for structured data integrity and Redis for high-speed caching, optimising data retrieval.

### Hosting

Built entirely on Azure PaaS services, like App Service, for unparalleled scalability and minimal operational overhead, reducing infrastructure costs.



TECHNICAL FOUNDATION

# Best-in-Class AI Services

1

## AI Models

Azure OpenAI Service provides secure, enterprise-grade access to GPT-4 and embedding models, powering intelligent analysis.

2

## Knowledge Base

Azure Cognitive Search serves as our powerful retrieval engine, enabling sophisticated hybrid search (vector + keyword) for comprehensive data access.

3

## AI Orchestration

LangChain and LangGraph provide the flexible framework for our intelligent agent, ensuring seamless integration and efficient task execution.

These technologies form the backbone of Green Guardian's analytical prowess, enabling deep insights into ESG data.



ENTERPRISE READY

# Built for the Modern Enterprise

- **Security:** End-to-end security with Azure Active Directory for authentication, Role-Based Access Control, and Azure Key Vault for secrets management, ensuring data protection.
- **DevOps:** Fully automated CI/CD pipeline using GitHub Actions for rigorous testing, security scanning, and infrastructure validation, guaranteeing code quality and stability.
- **Observability:** Deep monitoring and custom AI metric tracking with Azure Application Insights, providing comprehensive insights into system performance and usage patterns.



## THE ROADMAP

# Our Vision for the Next 6 Months

### Phase 1 (Now - Q3)

**Pilot Program:** Onboard the first team of risk analysts, refine the user experience, and expand the knowledge base with more internal data sources.

1

2

### Phase 2 (Next - Q4)

**Enhanced Capabilities:** Integrate geospatial data for location-based risk analysis and begin developing predictive analytics for identifying emerging sustainability risks.

This roadmap ensures continuous innovation and value delivery, building on Green Guardian's capabilities.

# The Future of Sustainability at DNB

1

## Phase 3 (Later - 2025): Platform Expansion

Evolve Green Guardian into a self-service platform where any team can onboard their own data sources, democratising access to ESG insights.

2

## Goal: Proactive Alerting & Full Rollout

Build a proactive alerting system for real-time risk notifications and execute a full, DNB-wide rollout, ensuring comprehensive coverage.

3

## Vision Statement: Strategic Platform

Green Guardian is not just a hackathon project; it's a strategic platform for DNB's sustainable future, driving long-term value.

# Let's build a greener future, together.

Project: Green Guardian

Questions?





Let's build a greener future, together.

# Green Guardian

Questions? We're ready to answer!

Contact: [Your Contact Info / Link to GitHub Repo]