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# Digital Innovation in the Energy Sector for Sustainability Goals

**Sector:** Energy & Utility
**Solutions:** Gas Transmission Data Sharing Infrastructure
**Data Classification:** AI classification approaches (rule-based, supervised ML, and hybrid)

## 1. Assessment & Vision Setting

### Current State Analysis

Energy & Utility sector is moving through the energy transition goals, due to the global emphasis on clean energy. Adoption of technology and involvement of different stakeholders is important to manage:

- Distributed assets
- Tighter network capacities
- Accurate access to data among stakeholders
- Integrated and flexible systems

| Challenge | Impact |
|---|---|
| Data Portal with fragmented or non-standardised data accessibility | Slow decision-making and limited visibility for all stakeholders |
| Legacy equipment & inconsistent data | Inefficient asset management and integration challenges |
| Machinery maintenance gaps and carbon tracking issues | Lack of Predictive maintenance, automated reporting |
| Ageing workforce and outdated training formats | Poor knowledge retentions |

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**Defined Objectives**

- Map the current data ecosystem across different Data Portals, identifying data flows, and gaps in the existing access models.
- AI-driven data classification to automate sensitivity triage across Public, Confidential, and Internal data tiers, supporting risk-based access control.
- Assess the technical readiness for interoperability with the NESO DSI architecture, including standards alignment with CIM, DCAT-AP, and federated identity frameworks.
- Develop actionable recommendations for RIIO-3 implementation.

# AI powered Smart Solutions for Energy & Utility sector

## 1. Gas Transmission Data Sharing

- ☑ Gas Portal Data Management improves interoperability and data quality across systems
- ☑ Using AI-powered data exchange protocols and role-based models. Stakeholders can access standardised data

## 2. Productivity Improvement

- ☑ Predictive Maintenance System: integrating IoT and AI to identify equipment usage patterns and prevent unexpected breakdowns
- ☑ Real-time dashboards enable visibility of asset performance and emission levels.

## 3. Safety Compliance & Knowledge Retention

- ☑ Digital training microsite to provides safety, security, and specific learning modules.
- ☑ Upskilling and real-time assessments ensure workforce readiness and compliance.

## 4. Operational Intelligence

- ☑ Integrated Digital Twin Platform visualises real-time data, combining 3D asset representation with scenario simulations and fault prediction.
- ☑ Predictive Asset Degradation Model leverages machine learning to forecast critical failures and recommend proactive maintenance measures.

**Mind and Matter** has been working with energy & utility clients to build a connected and data-driven ecosystem to enhances operational efficiency and achieve sustainability goals.