electricity north west

Bringing energy to your door

Automated Transformer Monitoring System (ATMS)

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www.enwl.co.uk

Electricity North West – background

Operate and maintain over 56,000km of network

2.4 million connections

Supply around 5 million customers

Diverse geographical area

Switched on, adaptable and take pride in what we do

Kelvatek – our vision

We’re a trusted partner to leading energy operators across UK & Ireland

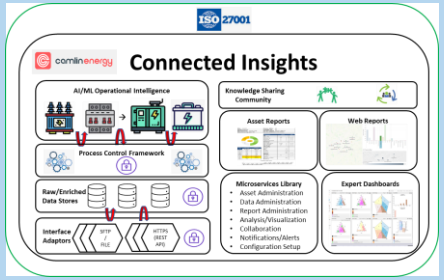
Our vision is to help build a smarter, more sustainable future through our highly accurate ability to target interventions and investment, all while minimising unplanned interruptions. Underpinning this is our industry-leading solutions and services for Fault & Load Management, Asset Monitoring and Biogas & Gas Monitoring.

What is ATMS?

Hardware

TOTUS G9 detects and measures all critical fault gases as well as moisture in oil, providing a comprehensive DGA profile as well as in-depth insight with highly accurate trend analysis. For this project a Through Fault Current module has been added to provide enhanced data collection.

Software



Connected Insights collects and consolidates data providing a digital service to translate diagnostic data from both offline and online sources into prescriptive actions. It does this by utilising a number of digital models to assess the health of transformer assets.

Outputs

DNO COMMON NETWORK
ASSET INDICES
METHODOLOGY

The data is provided by automated interface to ENW where CNAIM scoring is automatically produced to provide health rankings to aid and evidence asset investment programs

ATMS project progress so far

Work Packages

- WP1 Hardware Installation – IN PROGRESS
- Work Package 2 Data Management – IN PROGRESS
- WP3 Digital Transformer Reports with Advanced- Analytics – AWAITING DATA COLLECTION
- WP4 - Investigation on Transformer and Grid Digital Twins with advanced Machine Learning techniques – AWAITING DATA COLLECTION
- WP5 – Asset Management Integration – IN PROGRESS

WP1 hardware installation

Upgrades of existing TOTUS V1 units

Installation of Through Fault Current modules

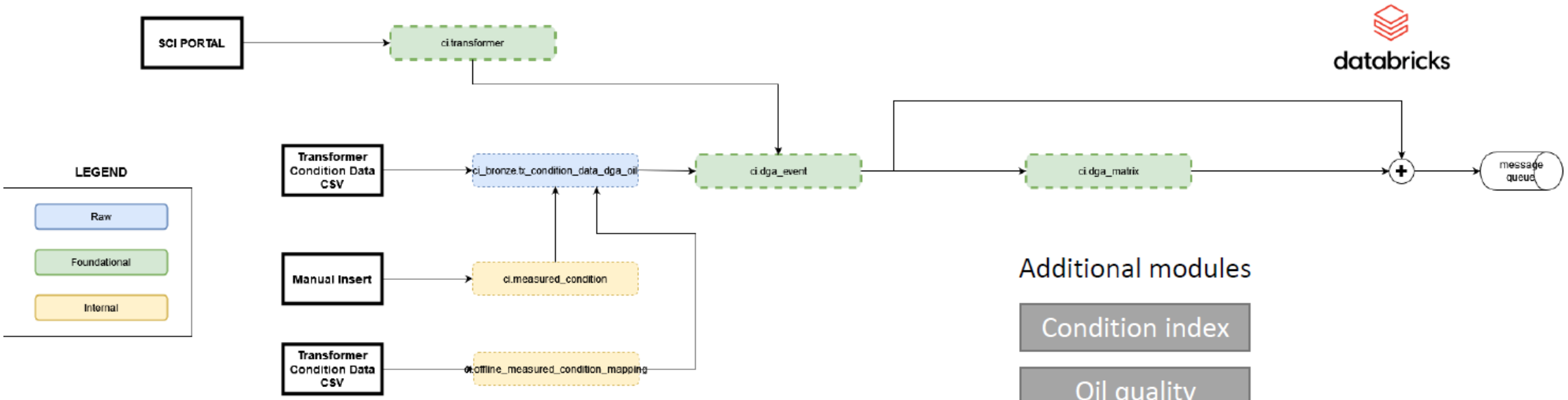
Installations & Upgrades taking place now to enable enhanced data collection to feed transformer AI/ML models.

WP2 data management

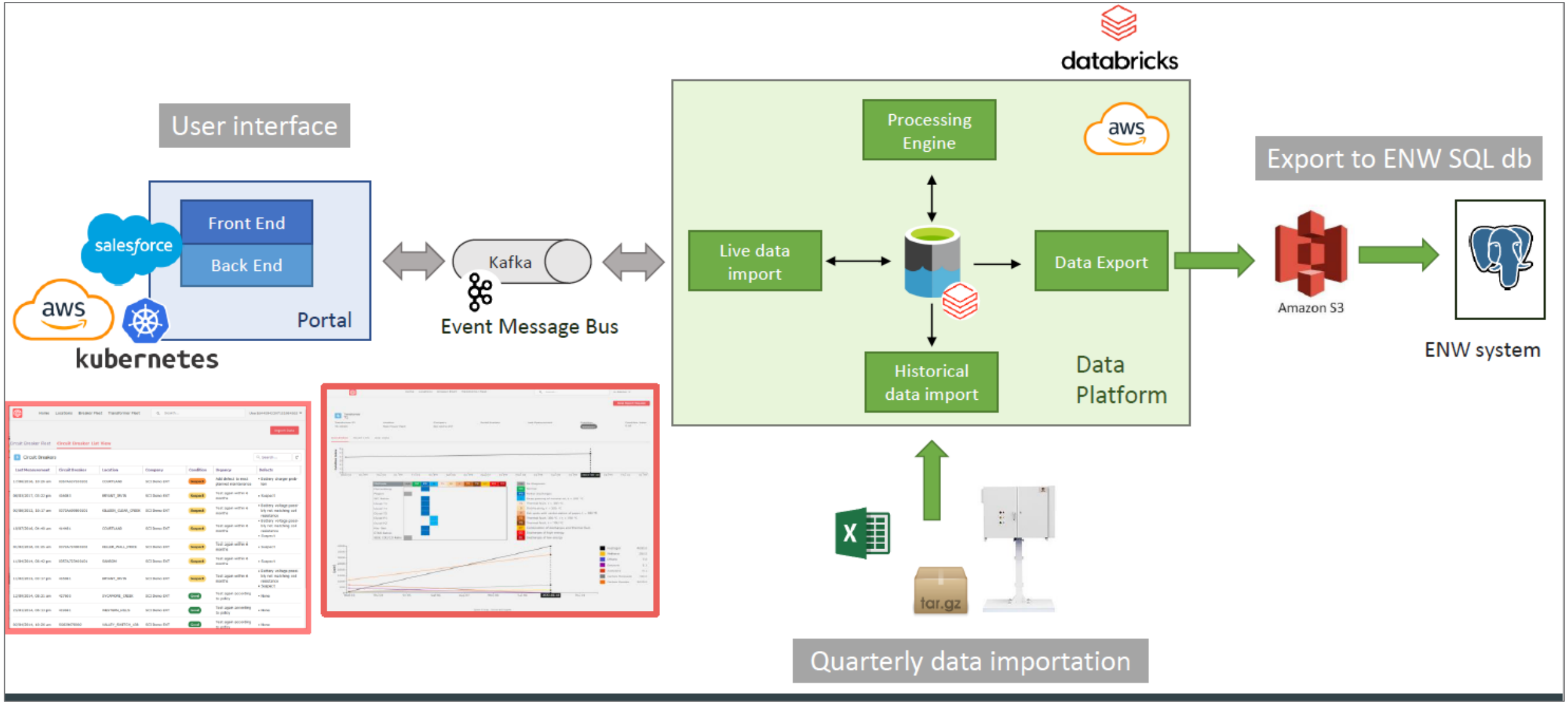
Creation of data framework for transformer models

Importation of historically collected data

Data catalogues defined and importation criteria specified



Final architecture



ATMS insights

Advanced Analytics

1. **Hot Spots**
2. **Losses**
3. **Predicted Top Oil temperature**
4. **Moisture in cellulose**
5. **Bubbling temperature**
6. **Ageing speed and accumulated ageing**
7. **Overloading capabilities**
8. **Oil Break Down Voltage**.

Investigation of AI/ML Models

Model 1: Network Interaction

Model 2: Anomaly Detection

Model 3: Failure Probability Matrix

Model 4: Failure Mode Model

Model 5: Intervention & Maintenance Model

QUESTIONS & ANSWERS

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