Intelligent Gas Grid

The Summit 2023

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SGN

Your gas. Our network.

SGN

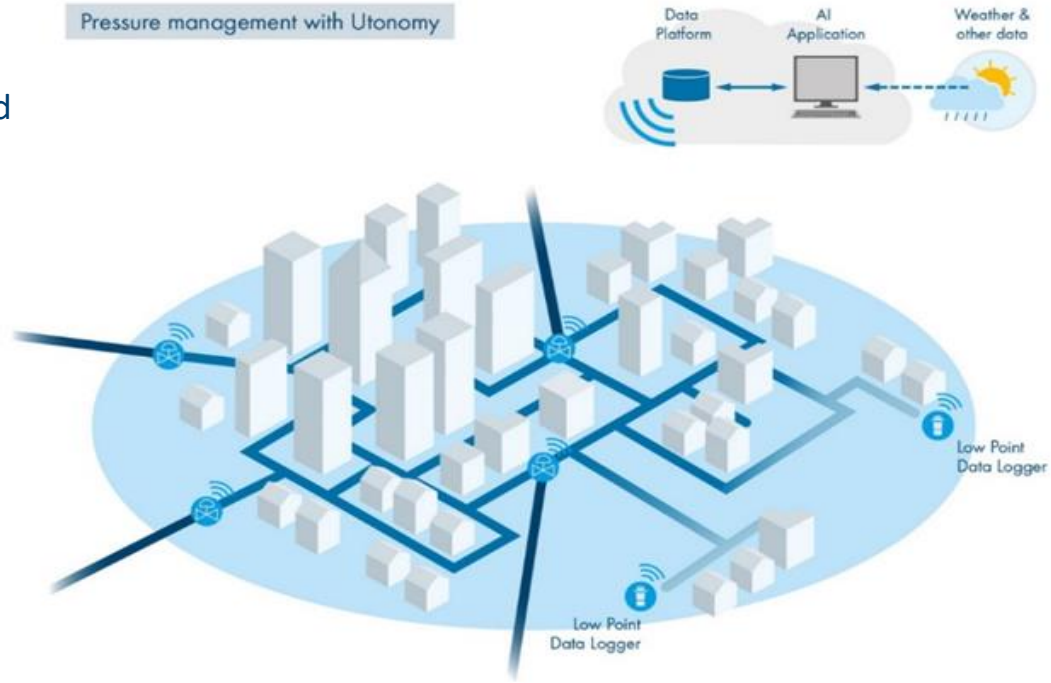
utonomy

“Intelligent gas grid to enable digitalised net zero transition”

The intelligent gas grid

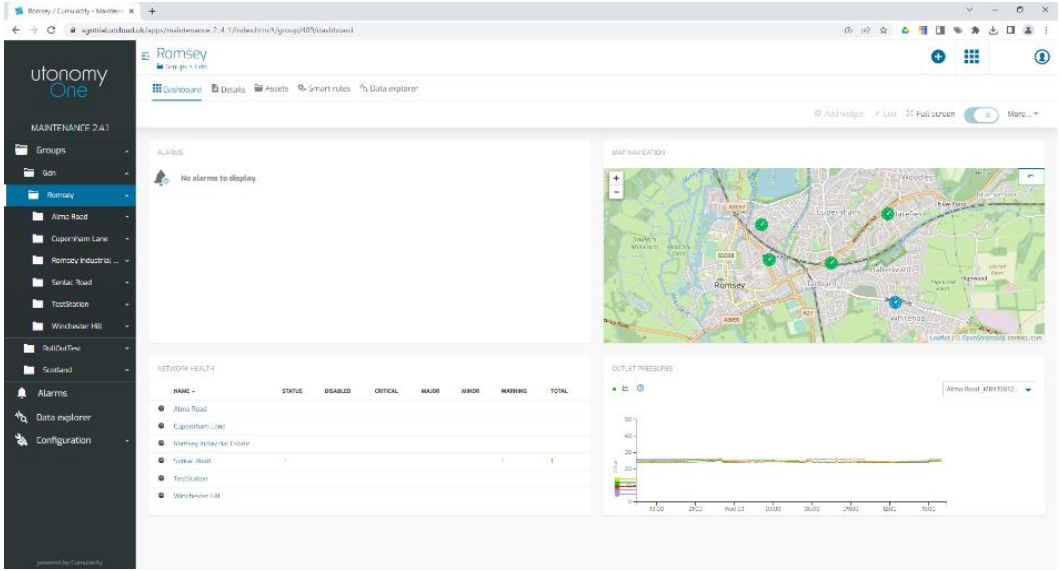
Autonomously and intelligently monitor, control and optimise networks using AI and machine-learning technology and a data-led approach:

- **Methane leakage reduction**
- **Anomaly detection**
- **Green gas injection**
- **Hydrogen**



The background

SGN & Utonomy have collaborated to develop innovative new technology to digitalise the gas distribution networks to reduce methane emissions, increase biomethane feed-in and prepare the networks for net zero

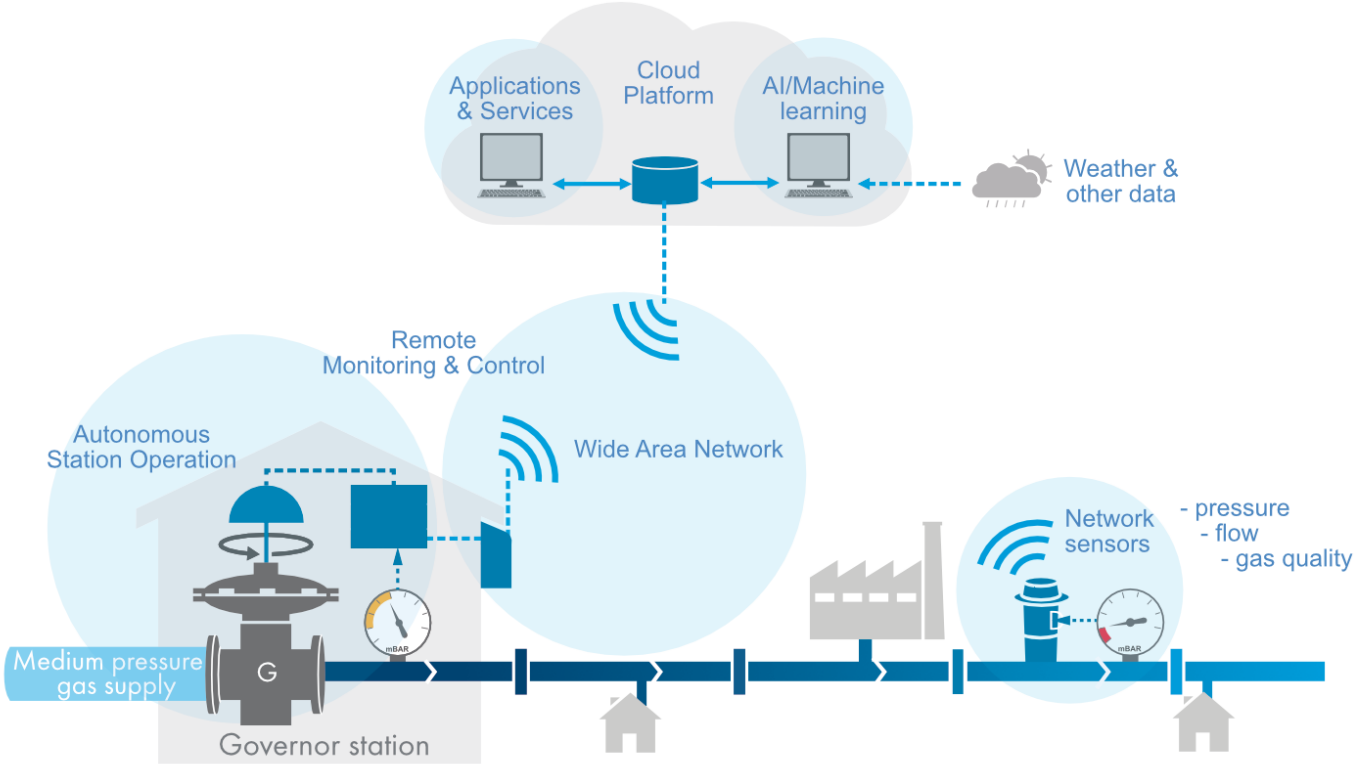


2018 – 2021: Pressure Control & Management NIA (including Wales & West Utilities)

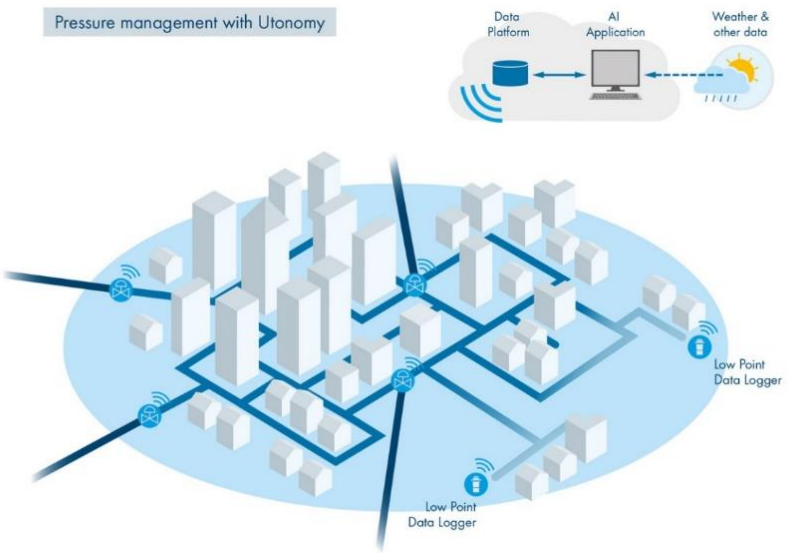
2022 – 2023: utonomyOne rollout to BAU

2035: Blend to 100% H2

Intelligent gas grid overview



Use case 1:
Optimising the grid to reduce emissions



PROBLEM

What pressure should I set each of my governors at to minimise pressure/leakage?

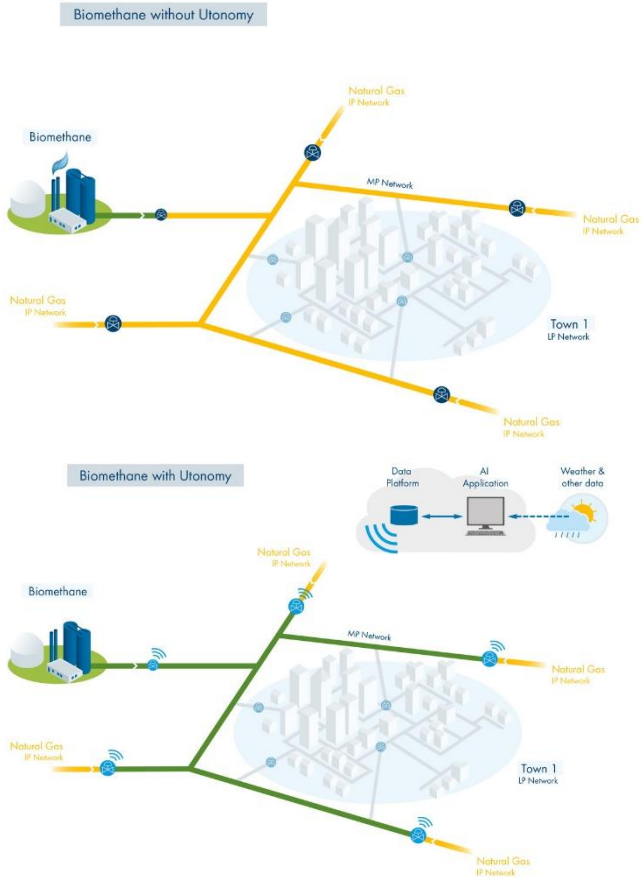
- Demand is changing continuously
- The networks have multiple governors all influencing each other
- No point in the network must be allowed to go below a minimum pressure threshold

SOLUTION

Machine learning and AI:

- Predictive models forecast demand from a range of factors including weather data
- Machine learning models are created for the network and updated regularly and automatically
- Using both models a schedule of governor set-points is created and downloaded to the governor stations once a day

Use case 2: Increasing biomethane feed-in



PROBLEM

Fixed seasonal settings of regulators inhibit biomethane entry:

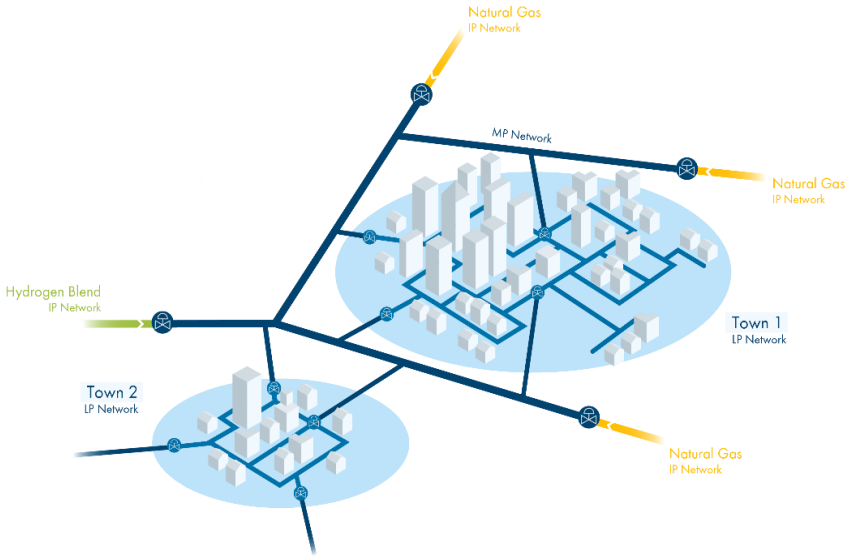
- Artificially high pressures down stream stop injection upstream
- Creates storage constraints at the entry point location
- Potential flaring required to manage

SOLUTION

Governor pressures are continuously adjusted to the minimum level needed to maintain security of supply :

- Priority of biomethane at all times
- Biomethane plant now able to maximise its feed in
- Network volume can also be used to store surplus biomethane produced overnight

Summary of Intelligent gas grid benefits



- Reduce methane emissions – 347,000 tCO2e*
- Reduce manual intervention i.e. making seasonal adjustments to governors
- Increase biomethane feed-in capacity – 1.7m tCO2e*
- Improve visibility and management of networks for hydrogen blending and ultimately 100% hydrogen
- Increase efficiency of network operations: detection and diagnosis of network and asset faults

*SGN/Utonomy IGG SIF Beta project estimates over 10 years for GB

The pathway

Initial roll out in SGN network proves technology and establishes commercial viability

Rollout to BAU across the GB distribution networks; initial focus on methane leakage reduction and green gas injection

Technology evolutions support CV monitoring and flow measurements in parallel with increasing amounts of blended Hydrogen

Full digital network supports sensing and control of dynamic networks and up to 100% Hydrogen

2023

2030

2035

Thank you

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