

Electricity
Transmission

EIS 2025

Engineering a smarter, cleaner SF₆-free grid

SF₆ Whole Life Strategy

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national**grid**



Contents



SF₆ – usage and challenges



Proposed solutions



Work packages and deliverables

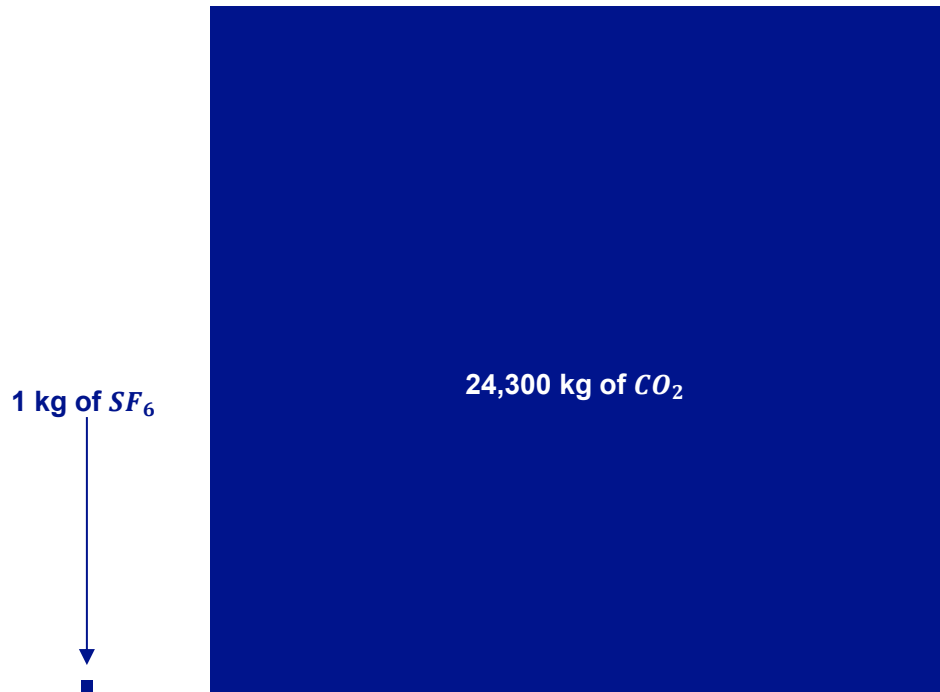


Impact, benefits and engagement



Looking Ahead – Q&A

SF₆ in the GB Power Sector



National Grid

Annual Emissions of SF₆ between 2012 and 2022 rose by

~47%

SF₆ inventory within GB transmission substations

1100 tonnes

% of National Grid's scope 1 emissions from SF₆ leakage
(excluding losses)

92%

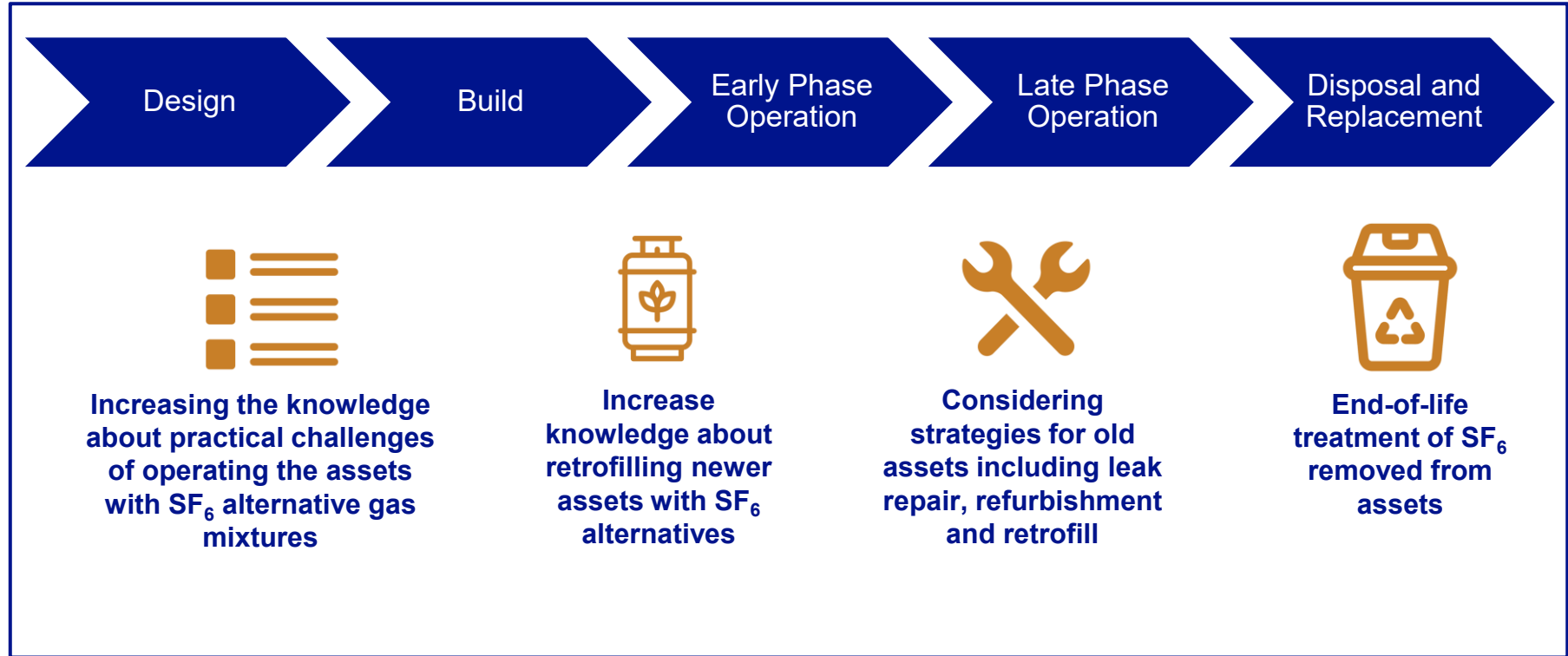
National Grid has the ambition to reduce SF₆ emissions by

50% by 2030

And committed to Net Zero by

2050

SF₆ Whole Life Related Challenges



Project Consortium for Beta Phase

Funding – The project is funded by network users & consumers under the Strategic Innovation Fund (SIF), an Ofgem program managed in partnership with UKRI.

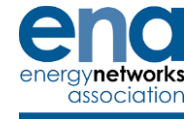
Project Lead **nationalgrid**

Technical Advisory Board (open to additional members, contact prem.ranjan@nationalgrid.com)

Project Partners



TRANSMISSION



Project Summary

WP1

Title: Site Handling of Non-SF₆ Gas Mixtures

Objective: Assess the behaviour and stability of non-SF₆ gas mixtures across different sites and asset types.

Lead: NGET

WP2

Title: Retrofill Solutions

Objective: Develop and implement retrofill solutions for older equipment that lack OEM support, including cost-benefit analysis and testing.

Lead: DNV and NGET

WP3

Title: Lifecycle Management of SF₆ and Alternatives

Objective: Demonstrate innovative methods for the disposal of SF₆ and compare their performance and energy efficiency.

Lead: University of Manchester

WP4

Title: Visibility of SF₆ Leakage

Objective: Enhance leakage monitoring by installing new sensors and developing predictive models for SF₆ leakage.

Lead: NGET and Univ of Manchester

WP5

Title: Project Management and Governance

Objective: Ensure effective project management, reporting, and dissemination of results through regular meetings and workshops.

Lead: DNV

WP6

Title: Technical Advisory Board

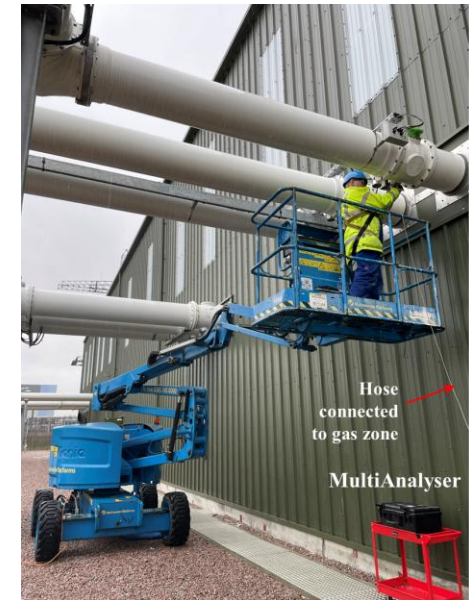
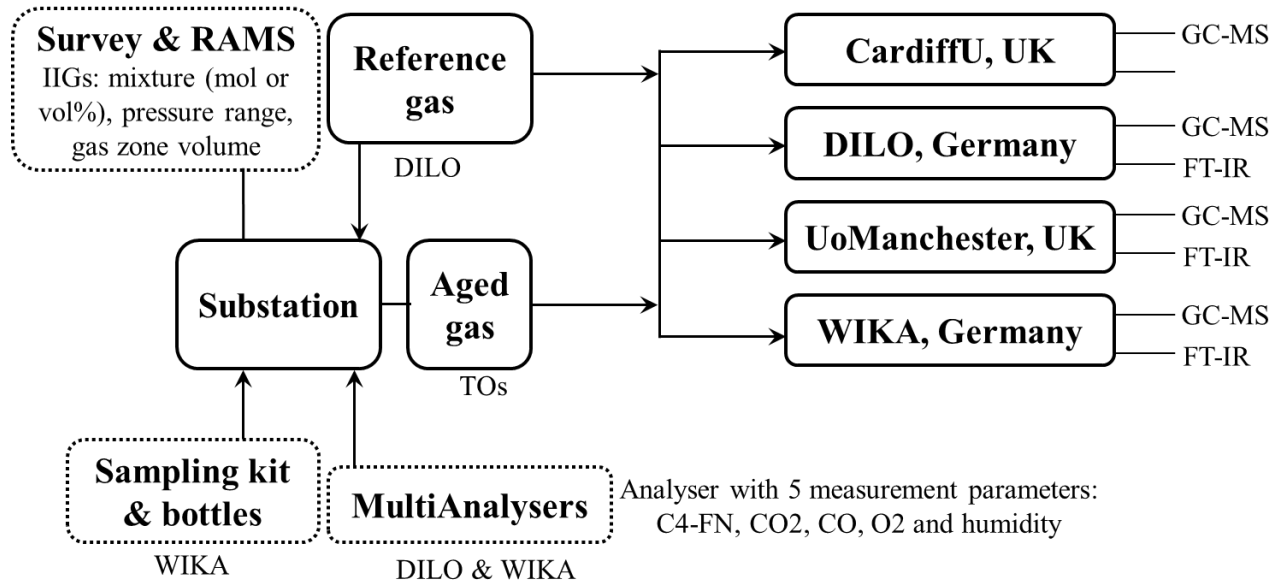
Objective: Provide technical oversight and review progress to ensure the project meets its core objectives.

Lead: NGET

WP1 Site Handling of Non-SF₆ Gas Mixtures

Scope – Sampling of in-situ SF₆ alternatives in a larger targeted population of assets with varying asset types and age.

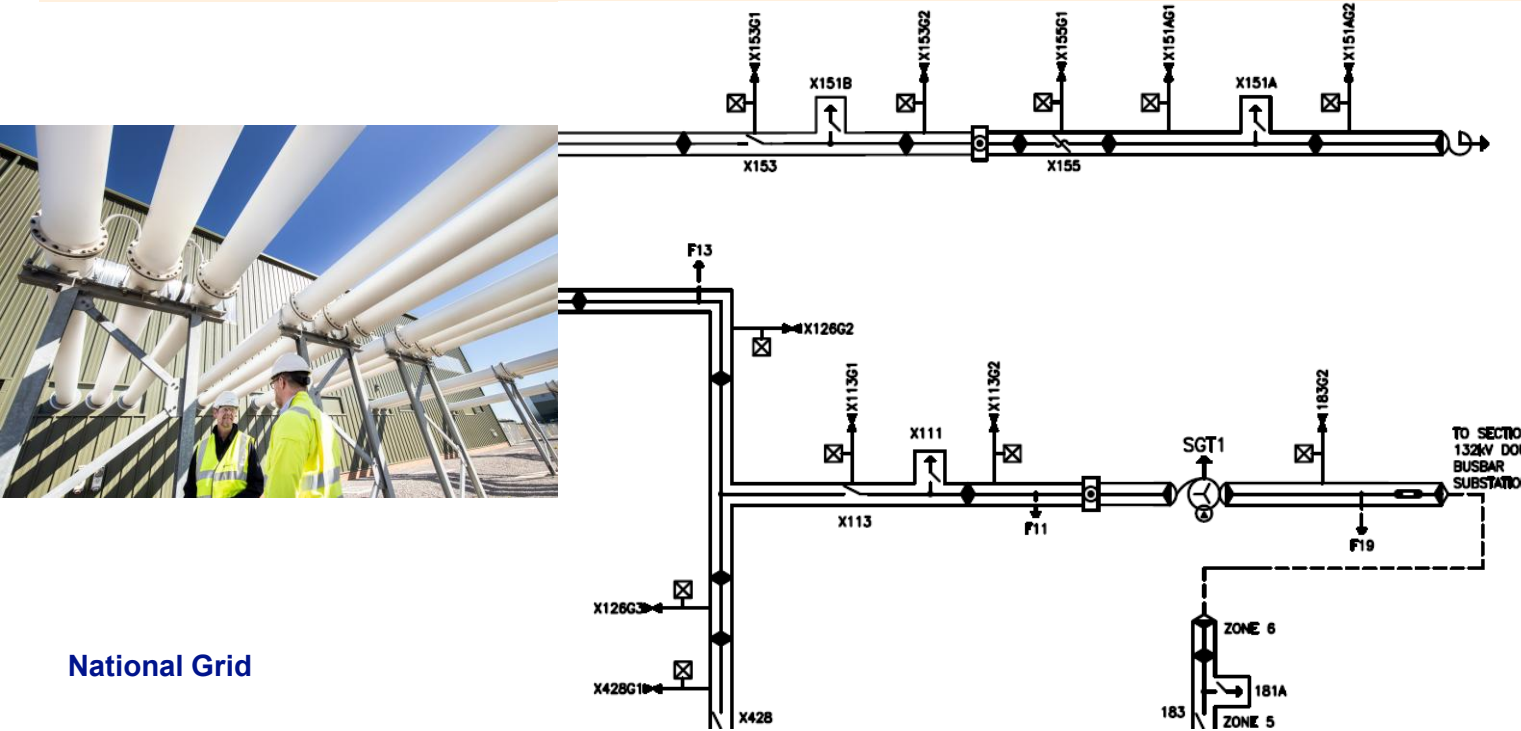
Output – Verify the stability and define the sampling procedure and frequency of non-SF₆ gas blends in network and check if any differential leakage.



WP2 Retrofill Solutions

Scope – Develop and test solution for non-OEM supported retrofill. Includes Stagegates to ensure that solutions meets necessary KPIs.

Output – Define the feasibility of retrofill for non-OEM supported assets. Developed & tested solution for rolling-out retrofill through regulatory funding.



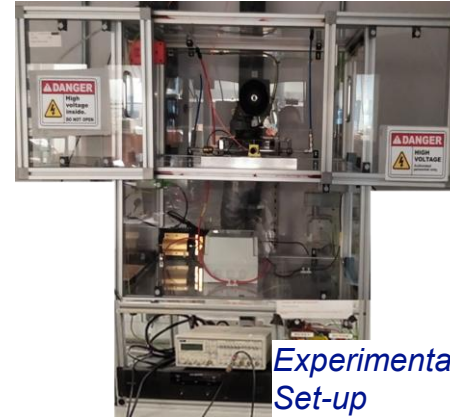
WP3 End of Life Management of IIGs

Scope – Proving the viability of large-scale demonstration of Packed Bed Plasma Reactors and developing the TRL.

Output – Greener way to dispose non-recyclable/reusable SF_6 coming out of the network.



*Walk-in fume cupboard
where system will be built*



*Experimental
Set-up*

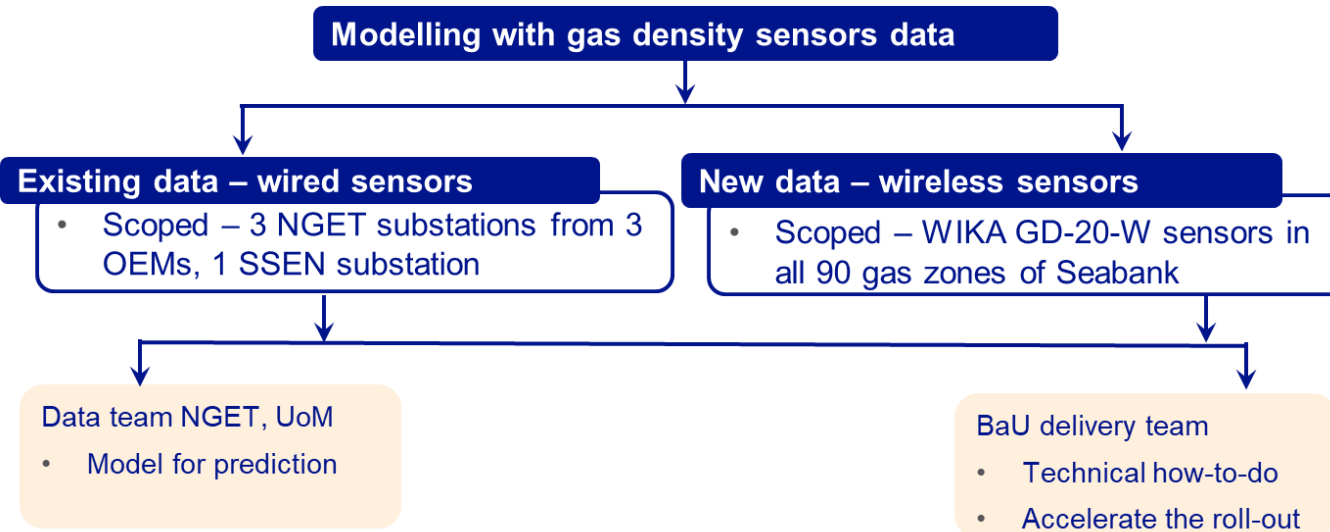


Plasma Reactor

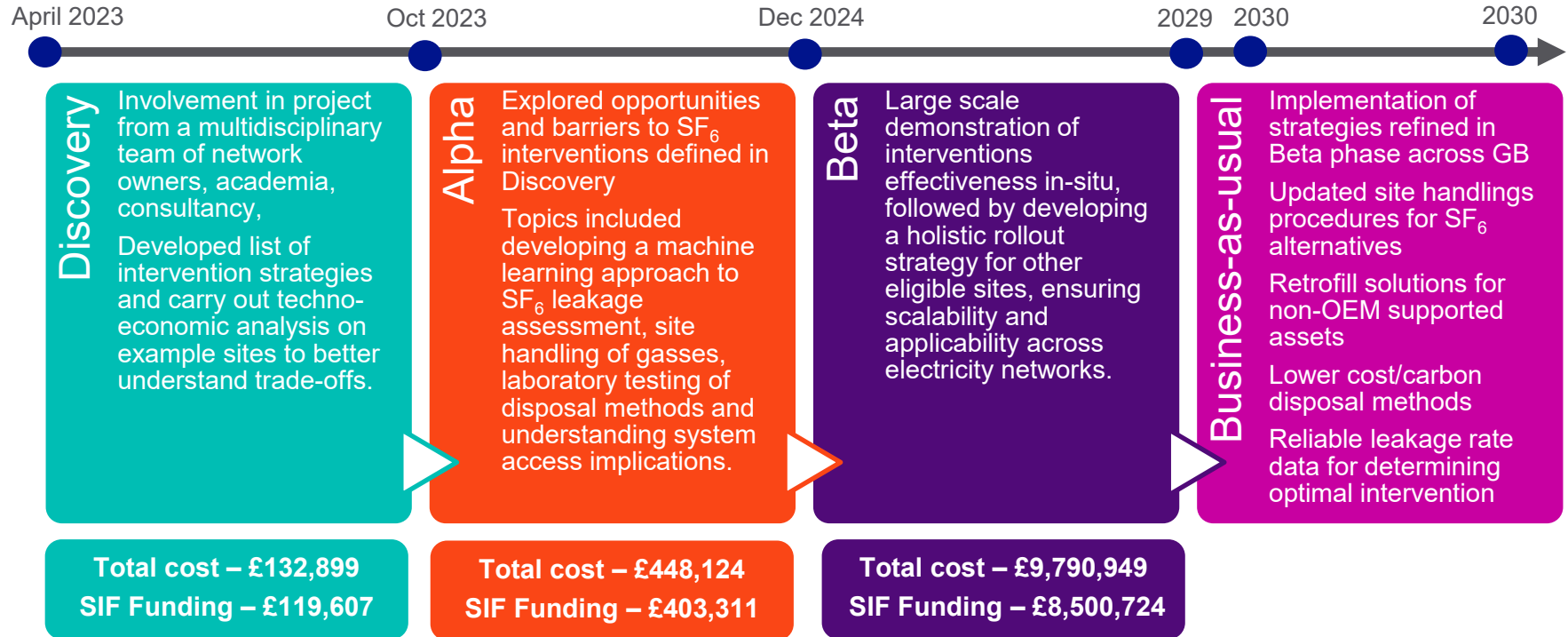
WP4 Visibility of SF₆ Leakage

Scope – Develop the process for gathering and analysing SF₆ leakage rate data to enhance leakage forecast capabilities.

Output – Provide access to existing data across substations (solution rolled out through regulatory funding), open-access software to predict leakage performance of assets, option of wireless monitoring of assets.



Stages of Project



Disseminate findings to increase adoption rates, inform commercial strategies and understand impact of regulatory changes

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