

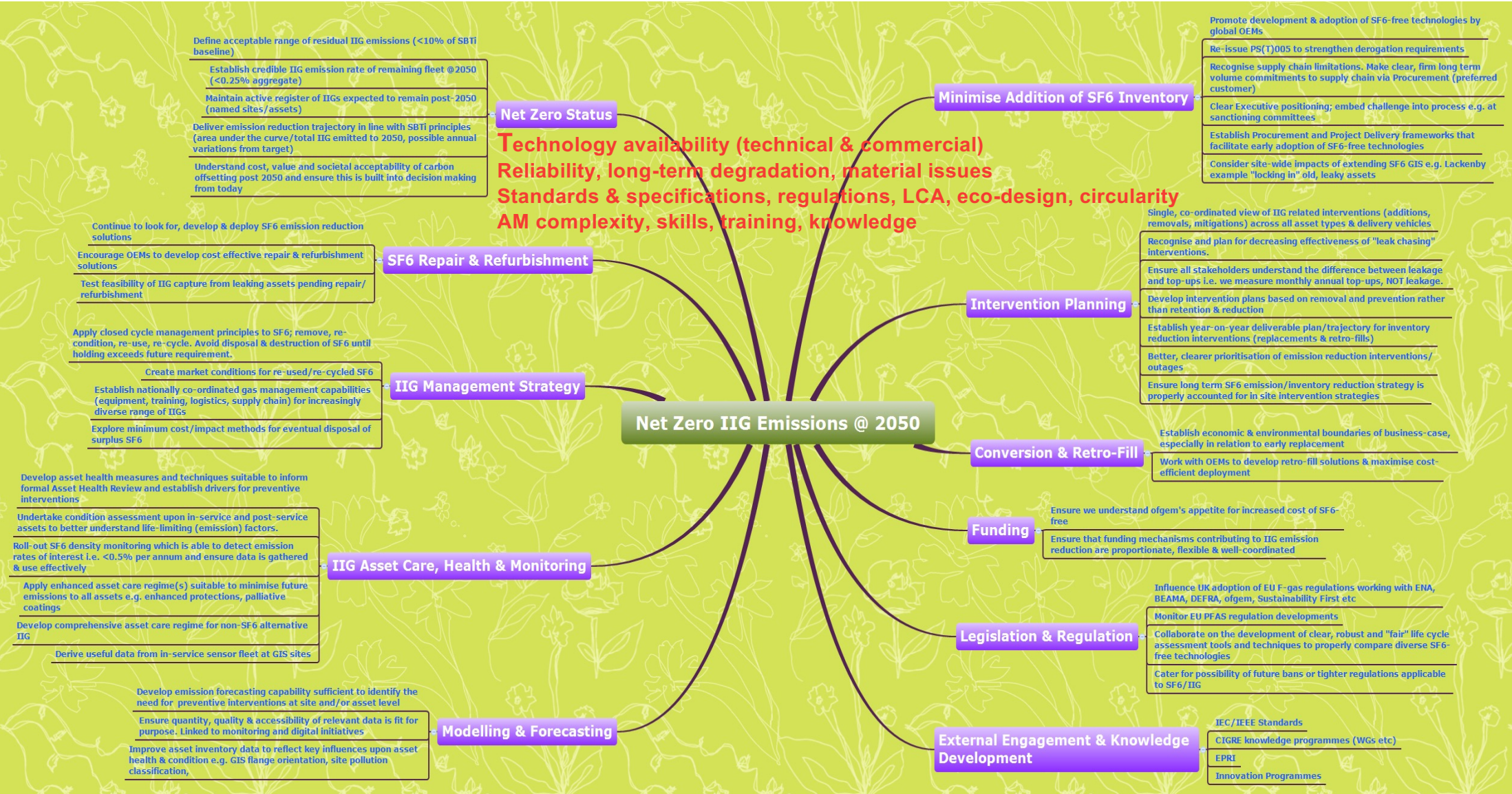
IIG/SF₆ challenges & outlook (short version!)

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The future of IIG is a complex (and brightly coloured) picture



Climate transition plan scenarios

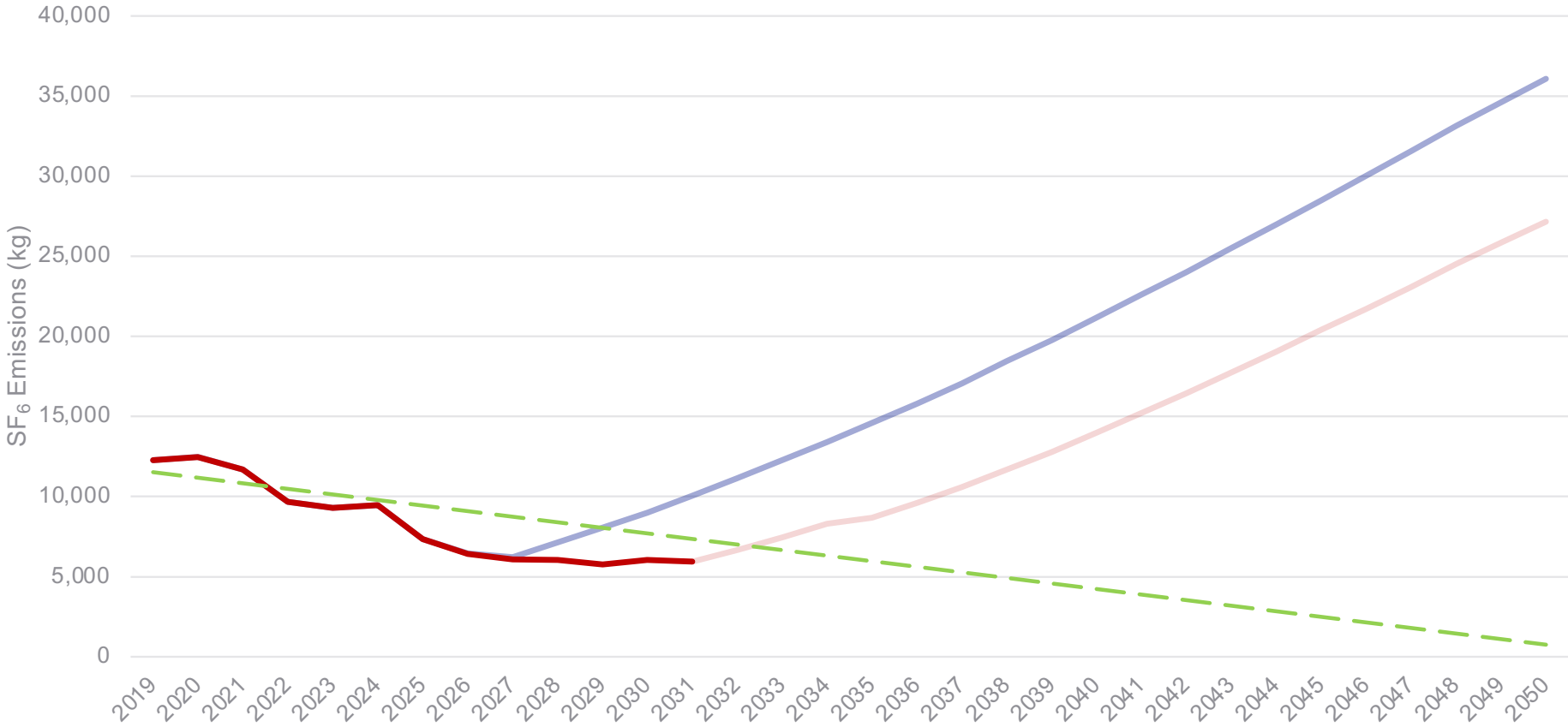
Scenario	Reduction (2050)	Dependency
1	90% emissions reduction	<ul style="list-style-type: none"> Managing all (existing and future) SF6 to 2012 IEC standard would achieve 90% emissions reduction Change in Asset Management required to meet IEC 0.5% p.a. SF6 leakage rate achievable 18% SF6 assets still significant, may not be acceptable to stakeholders Would require 29,950kg SF6 to be removed each year
2	96% emissions reduction	<ul style="list-style-type: none"> 10% SF6 assets broadly aligns with principles of 90% reduction, likely more favourable to stakeholders' expectations, reduced exposure to risk of future SF6 bans Managing all (existing and future) SF6 to 0.25% p.a. would achieve 96% emissions reduction 0.25% p.a. leakage accounts for retaining new equipment built to IEC 2022 (0.1%) and IEC 2012 (0.5%) Change in Asset Management required to meet IEC 0.25% p.a. SF6 leakage rate challenging, but achievable Would require 32,900kg SF6 to be removed each year
3	98% emissions reduction	<ul style="list-style-type: none"> All SF₆ removed and replaced with non-SF₆ IIGs Removing 100% SF6 represents a 98% IIG emissions reduction Would require 36,500kg SF₆ to be removed each year

Limitation to these outlooks

- There are two main levers: (1) the leak rate of the assets (both individually and aggregate across the population) and (2) the SF6 inventory.
- Although some assumptions were made for each scenario, in reality each glidepath presented can be achieved by a wide range of combinations of these levers. They do not represent a single version of the truth.
- If we could manage our asset fleet to a very low leak rate (e.g. 0.1%) we could theoretically keep a very large proportion of our SF6 inventory to 2050 and still hit the proposed 2050 reductions. In the real world there are very real practical issues with managing older assets to a 0.1% leakage rate so we have to assume that we have more chance of managing assets that are new/young today to that level.
- Another consideration is our ability to remove inventory at the required rate. To put some sort of context around this, and just because the numbers are easy, if we aimed to remove 60% of inventory (too low) over 30 years (too long) we'd have to remove the equivalent of three Richborough 400kV GIS substations each year for the next 30 years.

T3 intervention planning

SF₆ Emissions Forecast - RIIO-T3 Proposal



National Grid

— Do Nothing in RIIO-T3 — RIIO-T3 Portfolio - - - Linear (Net Zero Glidepath)

SF6 Emission Abatement Portfolio – RIIO-T3 Submission Overview

Strategic Site Interventions - £81m

On going Site Works at 13 Sites:

	£(m)
City Road 132kV	█
Ealing 275kV	█
Greystones 275kV	█
Hams Hall 400kV	█
Humber Refinery 400kV	█
Killingholme 400kV	█
Langage 400kV	█
Legacy 400kV	█
Macclesfied 400kV	█
Ryehouse 400kV	█
Sellindge 400kV	█
St. John's Wood 400kV	█
Baglan Bay 275kV	█
TOTAL	█

Retro-fill – Phase 1 - £11m

Phase 1 includes Retro-filling 4 ABB substations with C4FN Mix:

	£(m)
Richborough 400kV	█
Canterbury 400kV	█
Middleton 400kV	█
Connah's Quay 400kV	█
TOTAL	█

Palliative Coating - £8m

Ongoing Palliative Coating works at 38 Sites:

	£(m)
314 gas zones	█
TOTAL	█

Gas Density Monitoring and SF6 Emission Forecasting - £34m

Make GDM data remotely accessible at 53 substations. Includes sensor installation where not already available.

	£(m)
29 sites where no GDM exists	█
24 Sites where Access to GDM data is required - Gateways	█
Improve Emission Forecasting	█
TOTAL	█

SF6 Free IIG Management - █
 Alternate Gas Handling Equipment, Gas mixing plant etc.