

**Electricity  
Transmission**

# **Welcome to our webinar on SF<sub>6</sub>**

**A focus on decarbonising  
the electricity  
transmission network**

**19 September 2019**

**nationalgrid**



# SF<sub>6</sub> webinar agenda

Housekeeping

RIO 2 overview and business planning

SF<sub>6</sub> status in National Grid

SF<sub>6</sub> emission reduction strategy

Discussion & next steps

National Grid

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Technical Specialist



# Housekeeping



This webinar should last approximately one hour



You are on mute. Please turn off your camera, unless you are very eager to be seen



We will be recording the webinar



We are asking questions during the presentation



You can message us via the webex chat function



The recording, slides and any Q and A will be available on our website

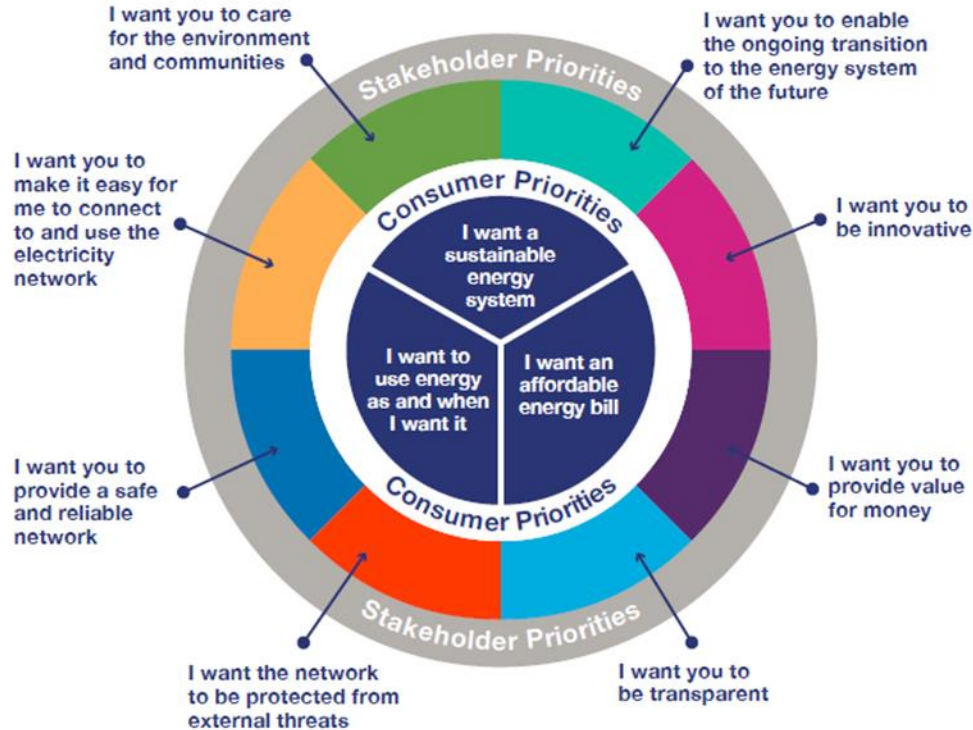
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## Overview of RIIO 2 and our draft business plan

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# We have developed our draft plan with our stakeholders



**We have built our draft business plan around your eight stakeholder priorities and three consumer priorities.**

Your views make a genuine difference to our business plan. Our independent stakeholder group has been making sure we take account of your views.

# We are finalising our draft plan

Our first draft plan was published in July 2019. We are due to submit our final business plan to our regulator, Ofgem, on 9 December 2019.

**We are still working on our business plan** and are continuing to engage with our stakeholders on particular topics. We will listen to your feedback on this draft plan.

Below are some examples of the main areas we are still working on.

## Consumer engagement

We are continuing our consumer engagement programme, including acceptability testing

## Safe and reliable network

We are continuing to engage with our stakeholders on options for reliability

## Energy system of the future

We are continuing to develop uncertainty measures and reflect the CCC's net zero report

## Protected from external threats

The government requirements will become clearer later this year

## The environment and communities

We need to assess the implications of meeting a science based target to limit warming to 1.5deg

## Value for money

We are still reviewing the benchmarking and efficiency evidence we have collected

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# The decarbonisation challenge

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# Quick Poll 1



## What is the reason for your interest today?

- Sales/business interest
- To offer technical advice
- To learn for my own business plans
- To understand where my electricity bill money is going
- Other



# Our direct SF<sub>6</sub> emissions



ET GHG, Scope 1&2  
Emissions (excluding losses)

- SF<sub>6</sub> = 91.8% ■
- Buildings = 6.7% ■
- Fleet = 1.5% ■

- SF<sub>6</sub> accounts for <1% of global manmade GHG emissions
- SF<sub>6</sub> has a global warming potential 23,500 times greater than CO<sub>2</sub>
- It has excellent arc interruption and insulation properties for transmission network equipment – meaning quicker, cheaper and smaller substation builds
- NGET currently have ~900,000kg installed on our network with average leakage of ~1.33% annually which is approx. 12 tonnes per year (282k tCO<sub>2</sub>e)

# The context – CO<sub>2</sub> emissions

- UK has passed legislation for net zero carbon emissions by 2050
- SF<sub>6</sub> is not covered by carbon markets such as the EU-ETS scheme
- CO<sub>2</sub>e emissions are split into 3 groups:
  - Scope 1 – Direct emissions (SF<sub>6</sub> emissions are counted here)
  - Scope 2 – Indirect emissions (electricity purchased and used by NGET)
  - Scope 3 – Other indirect emissions (infrastructure construction projects)
- This webinar focusses on our approach to managing SF<sub>6</sub> **emissions** in line with “Science Based Targets” and present legislation
- Building new assets and replacing assets earlier than planned contribute to Scope 3 emissions.

## Quick Poll 2



### When building our SF<sub>6</sub> emission reduction strategy should we:

- Focus solely on reducing direct emissions (Scope 1) to meet Science Based Targets
- Adopt a “total carbon impact” approach i.e. reduce SF<sub>6</sub> emissions only where there is a total carbon reduction across Scopes 1, 2 & 3
- Something else – we’d like to discuss this with you in more detail

# Technological context



- Our SF<sub>6</sub>-filled asset base is mainly Air Insulated and Gas Insulated Switchgear operating at 400kV, 275kV and 132kV
- We have experienced a marked difference in leak performance of outdoor assets compared to indoor assets
- We are already engaged with suppliers of alternative technologies including Air/vacuum, Fluoro-nitrile mixtures and Fluoro-ketone mixtures and are adopting them where they are technically and commercially viable

## Quick Poll 3 and 4



**When do you think SF<sub>6</sub> free technology will be technically and commercially viable up to and including 400kV**

- 2025
- 2030
- 2035
- Later
- Not sure

**What do you believe is a realistic cost compared to equivalent SF<sub>6</sub> technology**

- Less than SF<sub>6</sub>
- The same as SF<sub>6</sub>
- 0-20% more than SF<sub>6</sub>
- More than 20%
- Not sure

# Our SF<sub>6</sub> emissions reduction strategy

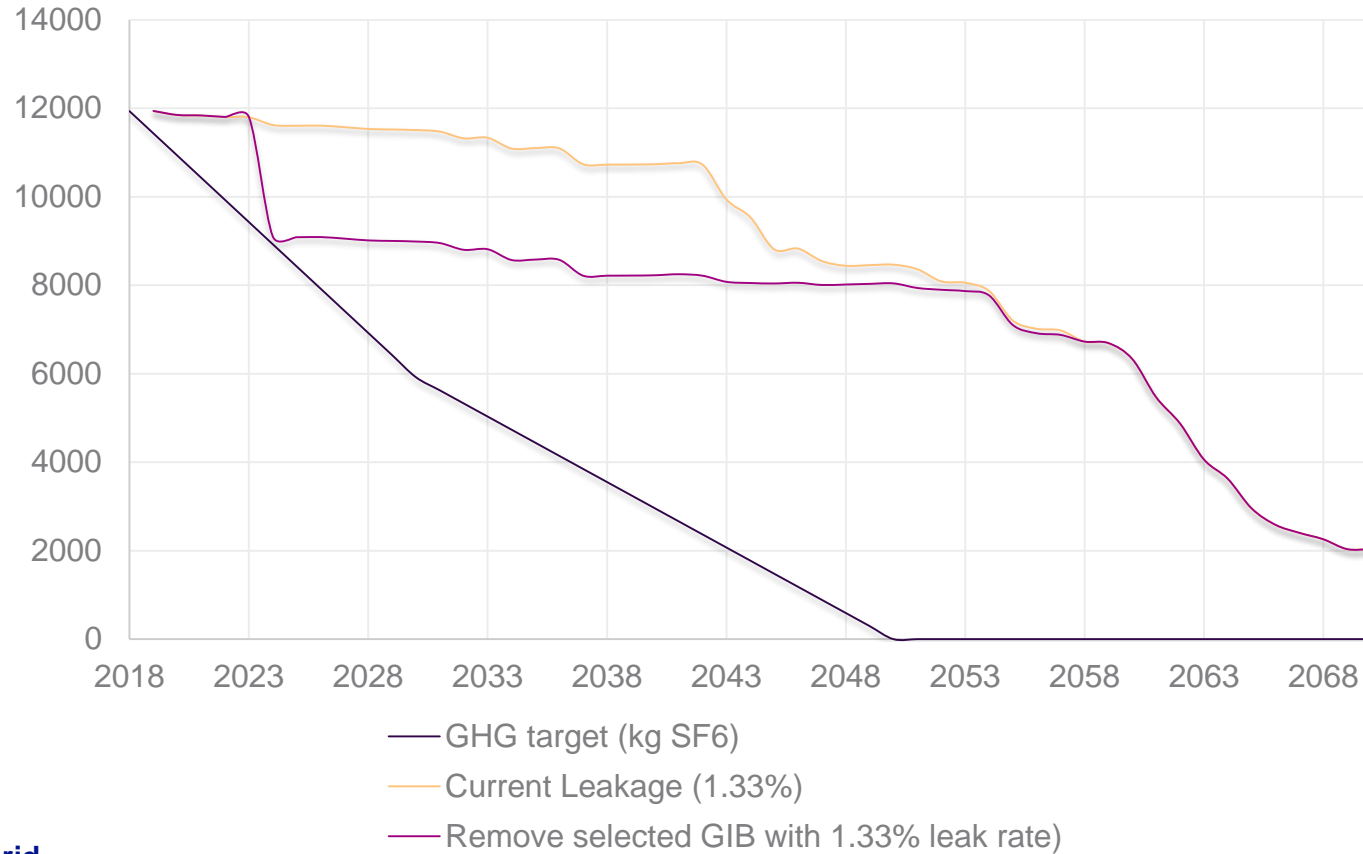
## Option 1 - continue with increased focus on leak repair

- Increase focus on leak repair
- Incremental annual reductions in percentage losses
- **Outcome: will not meet a science-based target trajectory and SF6 reduction unknown, estimated <10%**

## Option 2 – increase leak repair and replace highest leak assets

- Increase focus on leak repair
- Replacement of leaking/high-risk assets earlier than planned; targeted by asset knowledge
- **Outcome: will meet a science-based target, estimated 34% reduction**

# Future SF<sub>6</sub> emissions - outlook



## Quick Poll 5

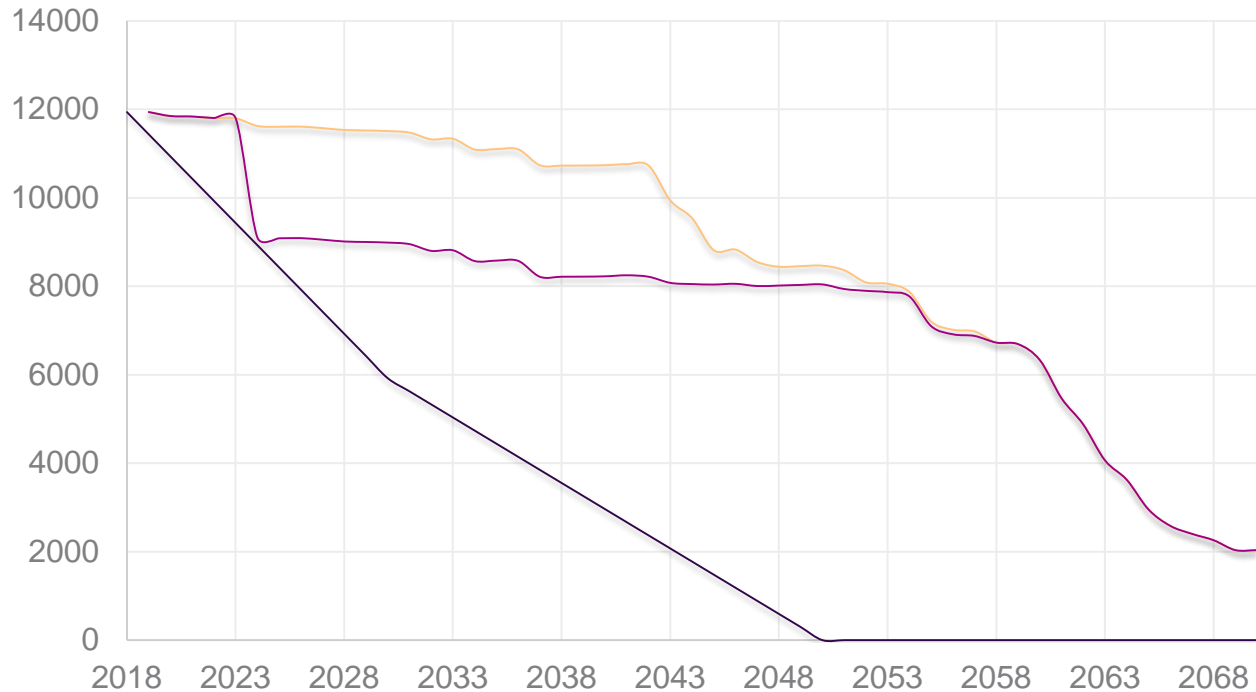


### Which option should we focus on?

- Option 1 – continue with repair only approach
- Option 2 – early asset intervention and leak repair
- I have another idea
- I don't know



# Future SF<sub>6</sub> emissions – cost implications



- GHG target (kg SF6)
- Current Leakage (1.33%)
- Remove selected GIB with 1.33% leak rate)

## Option 1

- ~£50m in T2 -  
    <1p bill impact
- Continued spend in subsequent price controls

## Option 2

- ~£150m in T2 -  
    5p bill impact
- Continued spend in T3 but decreasing beyond

## Quick Poll 6 – now including cost



### Which option should we focus on?

- Option 1 – continue with repair only approach
- Option 2 – early asset intervention and leak repair
- I have another idea
- I don't know

# Electricity Transmission

**Discussion and  
debate**

**Please submit  
questions /  
suggestions via  
the chat function**

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Next steps

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# How to provide feedback on this webinar or to discuss SF<sub>6</sub> further



We welcome your feedback on our draft plan

- You can message us via the webex chat function now.
- You can respond via our draft business plan [webpage](#).
- You can send your thoughts by email to: [gary.stokes@nationalgrid.com](mailto:gary.stokes@nationalgrid.com)
- You can write to: Gary Stokes, National Grid House, Warwick Technology Park, Gallows Hill, Warwick, CV34 6DA.

# Next Steps

- **Mid-August** - feedback from the RIIO 2 challenge group on our draft plan.
- **Autumn** - we are continuing to engage with our stakeholders, including your feedback on our plan.
- **1 October 2019** - we submit a second draft plan to Ofgem's Challenge Group.

- **9 December 2019** - we submit our final business plan to Ofgem.
- **First half of 2020** - Ofgem will scrutinise our business plan and will hold public hearings on any contentious issues.
- **June 2020** – Ofgem publishes its initial findings on our plan (and those from other network companies).
- **November 2020** - Ofgem publishes its final findings on our plan (and those from other network companies).
- **1 April 2021** - the next regulatory period begins.

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