

RIIO-ED2 Decarbonisation and the Environment Working Group



RIIO-ED team
9 December 2019

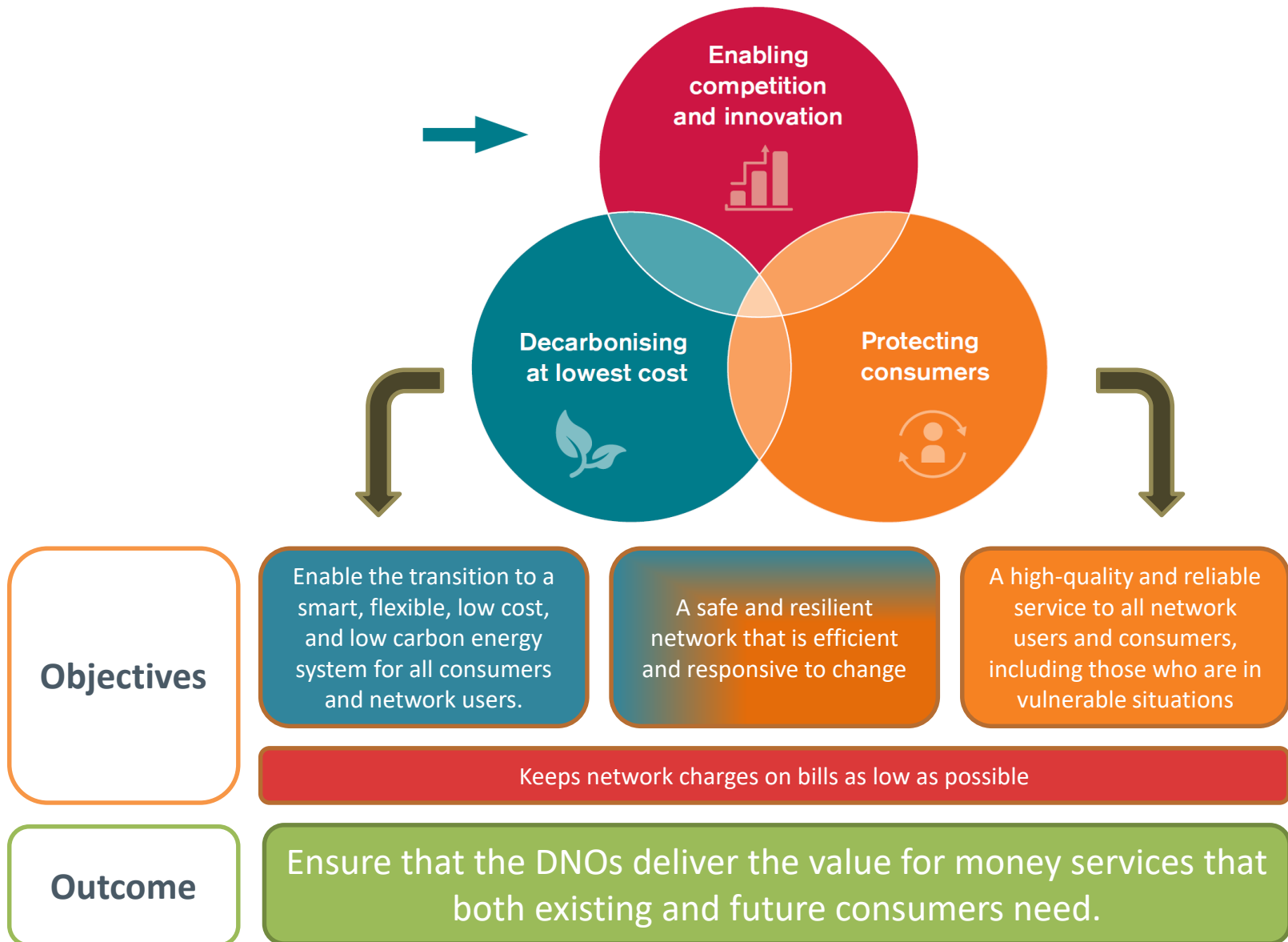
In today's introductory session we will:

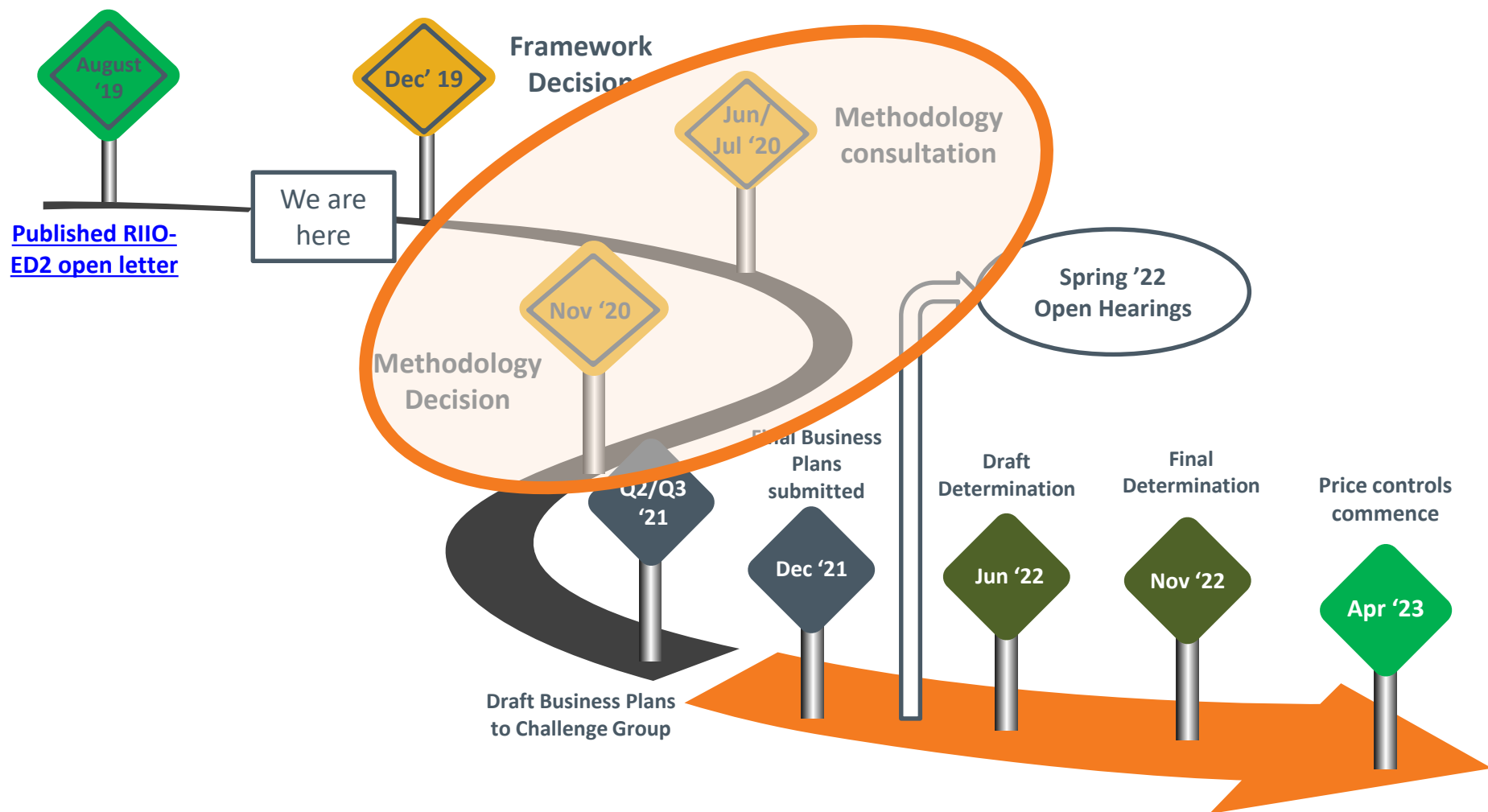
- Set out and seek views on Terms of Reference (ToR) for the Decarbonisation and the Environment Working Group
- Review arrangements and performance in RIIO-ED1 and high level views expressed in RIIO-ED2 open letter
- Begin discussions on considerations for RIIO-ED2 and priorities for the D&E WG

Timings	Agenda item
10:00 – 10:30	1. Welcome and introductions
10:30 – 11:15	2. What is the working group seeking to achieve? a) Aims and objectives of the Group incl. review of Terms of Reference b) Proposed programme of work, timelines for activities and deliverables
11:15 – 12:15	3. What can we learn from RIIO-ED1? a) Review of current arrangements and high level performance b) Views expressed in Open Letter
12:15 – 13:00	Lunch
13:00 – 15:00	4. Thinking about decarbonising the networks and reducing the environmental impact of network activity: - What has been achieved in ED1 and what more could DNOs be doing in this space? - How should we measure DNO performance in this area in ED2? - Thinking specifically about decarbonising the networks, where does the sector need to be by the end of ED2 to be in a good place to meet Government targets? Presentations and roundtable discussion
15:00 – 15:30	Actions and next steps

Item 2: What are we seeking to achieve?

What are we seeking to achieve in RIIO-ED2?





Objective

Deliver an environmentally sustainable network: Enable the transition to a smart, flexible, low cost, and low carbon energy system for all consumers and network users.

Purpose:

- Inform the development of regulatory policy, including outputs and incentives, related to decarbonisation and the environment in RIIO-ED2. Outputs will inform proposals included in the RIIO-ED2 Sector Methodology Consultation in June/July 2020.

Scope:

- The Group will identify key challenges and barriers to ensuring DNOs deliver an environmentally sustainable network. This will include consideration of how DNOs:
 - (i) Decarbonise networks with emphasis on business carbon footprint and embedded carbon in networks
 - (ii) Reduce the environmental impact of network activity eg pollution, resource waste, bio-diversity loss and other local effects
 - (iii) Support the transition to a smarter, more flexible, sustainable low carbon energy system.
- The Group will identify and provide the analysis necessary to inform the development of regulatory policy.

Output:

- The provision of evidence and information that Ofgem can use to:
 - Analyse the effectiveness of current arrangements and their applicability for RIIO-ED2,
 - Establish options for change and provide the analysis that can help to assess the impact of these options,
 - Identify interlinkages with other parts of the RIIO programme,
 - Identify and evaluate the costs, benefits and risks associated with these options; and
 - Identify resourcing implications for progressing, implementing and operating options.

The Group is an advisory, rather than a decision making, body. Ofgem will participate in discussions and consider views raised by members of the Group.

- We propose to hold a WG session approximately every three-four weeks.
- We plan to run sessions in the Glasgow and London Ofgem offices.
- Depending on room availability, we may need to restrict the number of representatives that each member organisation sends to meetings of the Group

WG session	Date	Time	Location
1. Introductory session	9 December 2019	10am-4pm	Ofgem London offices (Room 1.11)
2. TBC	28 January 2020	10am-4pm	Ofgem Glasgow offices (Rooms 1 and 2)
3. TBC	19 February 2020	10am-4pm	Ofgem Glasgow offices (Rooms 1 and 2)
4. TBC	TBC	10am-4pm	TBC
5. TBC	TBC	10am-4pm	TBC
6. TBC	TBC	10am-4pm	TBC
7. TBC	TBC	10am-4pm	TBC

Item 3a: What can we learn from RIIO-ED1?

RIIO-ED2 objective

Deliver an environmentally sustainable network: Enable the transition to a smart, flexible, low cost, and low carbon energy system for all consumers and network users.

RIIO-ED1 arrangements

Environment (and decarbonisation)

Obligation to manage losses

Business Carbon Footprint (BCF)

Limiting emissions of Sulphur Hexafluoride (SF6)

Fluid filled cable leakage

Noise pollution

Visual impact allowance for undergrounding OHL in AONB and National Parks

Standard Licence Condition 47:
Environmental report

- **Financial: LDR of up to £32m across all DNOs**
- **Reputational incentive: publish annual progress**
- **Licence obligation: keep losses as low as reasonably possible**

**Reputational incentive,
DNOs publish annual
progress**

**Reputational incentive,
performance in
utilisation of a funding
pot of £103.6m**

**Licence obligation,
reputational incentive**

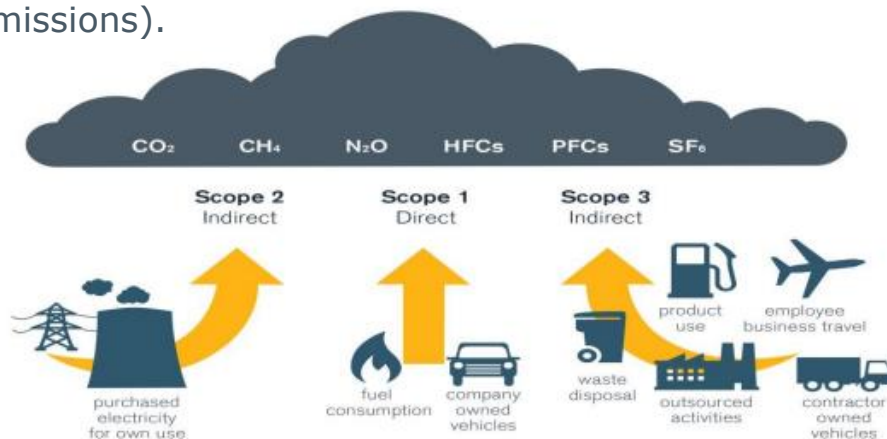
Business Carbon Footprint

What is it?

- BCF is a measure of greenhouse gas emissions from all activities across a company, including energy used in buildings, logistics and company owned vehicles.
- The BCF mechanism is a reputational scheme based on a league table of each DNO's annual BCF reduction against a baseline (baselines are different for each DNO). DNOs report:
 - Scope 1 emissions: Direct emissions, eg fuel consumption in company vehicles
 - Scope 2 emissions: Indirect, mainly electricity consumption
 - Scope 3 emissions: Indirect emissions (not included in Scope 2) that occur in the value chain of the reporting company (i.e. contractor emissions).

How have DNOs performed?

- At sector level on average, BCF fell by 39% in first 3 years of RIIO-ED1 (excluding losses and contractors).
- At company level, performance is mixed and changes in how DNOs are reporting/recording indicators means it is difficult to understand impact of figures.



Key questions:

- Noting that DNOs may have less control over some components of BCF and that the reporting requirement is not financially incentivised, how has this requirement influenced business practices and performance?
- DNOs have a sizeable carbon footprint, what value do consumers attribute to a reduction in BCF?
- How can we improve consistency in reporting?

Sulphur Hexafluoride (SF₆)

What is it?

- SF₆ is a greenhouse gas with global warming potential of approx. 23,900 tCO₂. It is used in electrical switchgear, transformers and substations for electrical insulation, arc quenching and as a cooling medium, but can leak following faults or from old equipment. There is currently no viable alternative.
- The SF₆ mechanism is a reputational scheme based on a league table of each DNO's annual SF₆ reduction against a baseline. DNOs report:
 - Their SF₆ 'bank' ie total amount
 - SF₆ emitted
 - SF₆ emitted as % of bank

How have DNOs performed?

- Performance against SF₆ emissions is mixed across the industry: some DNOs continue to make good progress, but others have suffered isolated incidents that have increased their overall emissions. DNOs also state some changes in performance are a result of changes to reporting methodologies.
- All DNOs have committed to achieving their targets by the end of the price control.

Key questions:

1. How has this requirement influenced business practices and performance?
2. Given the future direction of SF₆ and the rise of potential alternatives, if we are going to continue incentivising reductions in SF₆ leakage what should this look like for RIIO2?
3. What value do consumers attribute to a reduction in SF₆?
4. How can we improve consistency in reporting?

Fluid filled cables

What is it?

- DNOs use oil-based fluids as electrical insulators on older types of higher voltage cables (33kV and above). Any leakage from these cables can be detrimental to the environment.
- Leaks from fluid-filled cables can occur due to eg cable damage, failure of ancillary oil equipment such as pipe work, monitoring gauges and oil tanks, and cable joint failure.
- The FFC mechanism is a reputational scheme based on a league table of each DNO's performance against a baseline. DNOs report:
 - Oil in service cables
 - Top up as % of oil in service

How have DNOs performed?

- The total amount of oil leakage has reduced since the start of the price control, although there was a significant increase recorded in 2017-18 compared to the previous year.
- Like in BCF and SF6 emissions, there are differences across DNOs, with seven DNOs (ENWL, EMID, SPN, EPN, SPMW, SSEH and SSES) now recording increases in oil leakage since the start of RIIO-ED1.

Noise reduction

What is it?

- Reporting requirement along with enhanced reporting to explain the steps taken by the DNOs in cases where noise reduction activities have been conducted.

How have DNOs performed?

- There were 139 noise complaints made against DNOs in 2017-18. We have been working with the DNOs to improve data collection on noise pollution and, for the first time in the price control, now have data from all DNOs.
- 13 DNOs provided comparative figures for 2016-17 and, based on this, noise complaints fell from 148 to 139.

Key questions:

1. How have these outputs driven business practices and performance?
2. How can we improve consistency in reporting?

Visual amenity – Undergrounding of AONBs and NPs

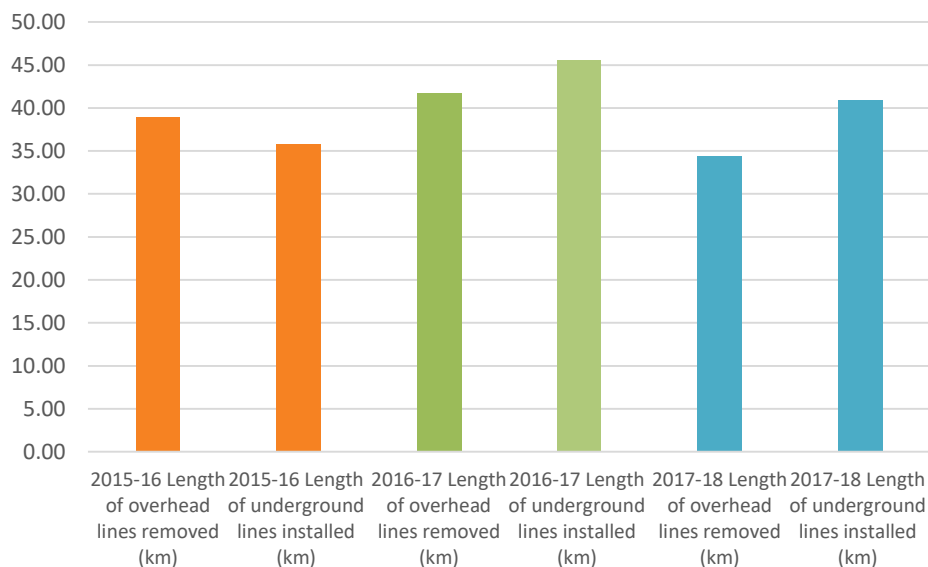
What is it?

- The objective of the undergrounding scheme is to ensure the DNOs protect the landscape in certain designated areas. Non-mandatory scheme that funds the DNOs to bury overhead lines in areas of outstanding natural beauty, national parks and national scenic areas in Scotland. Stakeholder-led process.
 - Funding pot:** £103m (across all licensees), calculated considering length of price control, recent historical prices and a WTP exercise.
 - 10% allowance:** We gave DNO ability to spend up to 10% of allowance on undergrounding OHL located outside boundaries of designated areas, ie AONBs and NPs.

How have DNOs performed?

- In the first three years of ED1, DNOs have spent £16.45m of a possible £103m and have undergrounded ~120km of OHL.

Undergrounding in ED1



Key questions:

- Should DNOs continue to deliver mitigation outputs in protected areas in ED2?
- If so, how should this be funded and how should the amount of money available for delivering these outputs be set?
- How should the scheme operate? Should DNOs submit funding requests during the price control or should they consult stakeholders on specific projects (and expenditure) as part of their business plan development?

- In the May 2019 SSMD, we introduced a common environmental framework across GD and T.
- Companies should embed environmental considerations into their RIIO-2 Business Plans in the form of an Environmental Action Plan (EAP), and to report annually on progress in their Environmental Impact Report in RIIO-2. In our decision, we set out that we expect TOs to consider as part of their ET-2 EAPs:

		Environmental EAP scope	RIIO-ED1 equivalent	To what extent does the ET2 EAP capture what DNOs should be considering in ED2?
Licence obligation, reputational incentive*		BCF: targets and actions to reduce emissions	BCF: Reputational incentive for DNOs to publish annual progress on BCF	
		Transmission losses: the TO's RIIO-ET2 strategy to minimise controllable losses on its network	Financial (LDR) and reputational incentives. Also a licence obligation for DNOs to manage losses	
		Embedded carbon: capturing and reporting embedded carbon for each project and for the whole network	?	
		Resource use and waste management: measuring and reporting on actions to reduce, reuse, recycle waste	?	
		Biodiversity and/or natural capital: identify metrics for measuring baselines and actions to increase value	?	
		Supply chain management: actions to build an environmentally sound supply chain	?	

* Not exhaustive environmental package in ET2, but sets out scope of EAP

How should DNOs work to minimise the impact of what they do on the environment and facilitate the transition to a low carbon energy system (incl. consideration of net zero)?

- Tackle losses and reduce waste, eliminate hazardous materials, reduce air and noise pollution and improve visual amenity
- Polychlorinated biphenyls (PCBs)
- Potential for energy efficiency measures to optimise and extend asset lives

What could this mean for the type of activities networks undertake, how these may be funded, as well as the outputs and/or incentives they should be exposed to?

- Continued transition to EV fleets, minimise travel and use all electric plants
- Reduce the emissions of DNO buildings/substations

How should DNOs' performance be measured, and how we should assess the value that consumers place on the provision of these services and activities?

- Need for enhanced CBAs, which take account of the true cost of carbon and the societal value of the options
- Greater standardisation of measurement and reporting

Emerging challenges for RIIO-ED2:

- How is the energy consumer benefit defined in relation to decarbonisation? What does this mean for the role of networks and the scope of the price control; strategic investment ahead of need; and strategic innovation funding?
- Should we promote the interests of low carbon technologies over non-renewables, for example by socialising more of the connection costs for low carbon electric vehicles?
- How do we future proof the networks to anticipate demands in 2050? How do we manage risks of stranding and closing down alternative pathways?
- What does it mean for a DNO to be environmentally sustainable in our current context?

News story

UK becomes first major economy to pass net zero emissions law

New target will require the UK to bring all greenhouse gas emissions to net zero by 2050.



How far do the RIIO-ED1 arrangements go to meeting the ED2 objective?

Objective

Deliver an environmentally sustainable network: Enable the transition to a smart, flexible, low cost, and low carbon energy system for all consumers and network users.

(i) Decarbonise networks with emphasis on business carbon footprint and embedded carbon in networks



Obligation to manage losses
Business Carbon Footprint (BCF)
SLC47: Environmental Report

(ii) Reduce the environmental impact of network activity eg pollution, resource waste, bio-diversity loss and other local effects



Limiting emissions of SF6
Fluid Filled Cables
Noise pollution
Visual impact allowance
SLC47: Environmental Report

(iii) Support the transition to a smarter, more flexible, sustainable low carbon energy system.



Item 4: Presentations and discussion

UK Power Networks — Environment and decarbonisation



Our strategy

DELIVERING OUR ENVIRONMENTAL COMMITMENTS

- **Sustainability of our operations**
 - Business Carbon Footprint (BCF)
 - Recycling and waste management
- **Sustainability of our networks**
 - Losses
 - Fluid filled cables
 - SF6

DEFINING OUR PLAN TO NET ZERO

Net Zero

- Define our plan for Net Zero operation of the network

LEADING THE LOW CARBON TRANSITION

- **Facilitating low carbon generation and storage connections**
- **Supporting roll out of electric vehicles**
- **Taking a flexibility first approach to load investment**
- **Whole Systems co-ordination with other DNOs and NG ESO**

Demonstrating action now

Delivering our RIIO-ED1 commitments



Business
Carbon
Footprint



Fluid filled
cable loss
reduction



Waste &
Recycling



Noise
reduction



SF6 loss
reduction

Setting new goals



Energy
consumption



Biodiversity
Net gain



Water
saving



NOx and
air quality



Circular
economy

Facilitating net zero



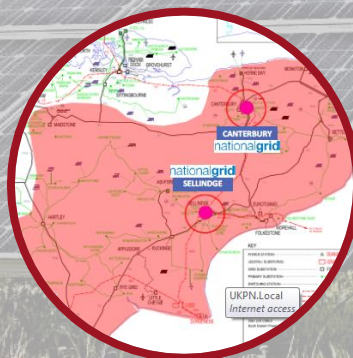
Flexibility first
market testing
200M
of HV reinforcement
W



Enterprise-wide ANM
investment in full roll-out of
Active Network Management



LV Visibility
Visibility of LV
network
monitoring in
PowerOn



1st
reactive power regional
market with ETSO

Facilitating net zero



LV monitoring

Investment in new
LV network
technologies



Flexible
Products and Services



Measuring
**customer
experience**
of EV drivers



Strategic
Investment Case

Considerations for RIIO-ED2

Internal

- Whether company business plans should be based on net zero operation
- Wider environmental improvement plans where there are synergies with the network and its operation – i.e. opportunistic betterment for the environment

External

- Decarbonisation pathways – electric v hydrogen, local v centralised
- Timescales – steady progression to 2050, accelerated, hockey stick
- Connections arrangements for Low Carbon Technologies
- Defining the role of DNOs in facilitating Net Zero
- Strategic investment – informed by all above

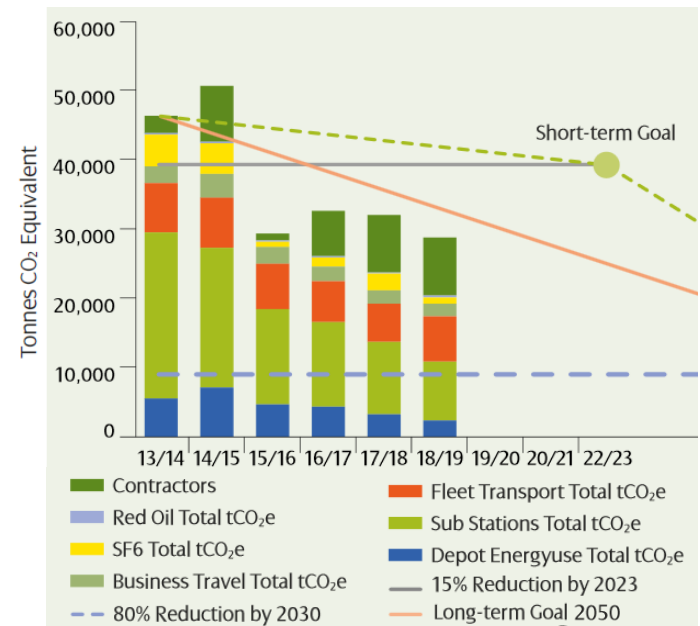
Decarbonising Networks

**What has been
Achieved by
DNOs in ED1
and what more
can be done?**

ED1 has successfully employed reputational measures, incentives and discretionary rewards to encourage DNO environmental improvements.

Examples

- Reputational BCF Mechanism
 - SPEN have achieved a **38% reduction in controllable Business Carbon Footprint** since 2013/14.
- Distributed Generation
 - **Increase to 4.3GW on SPEN networks**, primarily increases onshore wind.
- Network Losses
 - ENA Technical Losses Working Group, Losses Strategy and Losses Discretionary Reward encourages collaboration & innovation



*excluding network losses carbon impact

This combination of approaches has worked well in ED1.

Comprehensive stakeholder-led Sustainable Business Strategy in place since 2017, driven by increasing political and societal expectations

“Our vision is to be a sustainable networks business. We will embed the principles of sustainability in our decision making, by working with our stakeholders to:

- efficiently manage and develop our network in support of the Net Zero transition; and,
- achieve neutral or positive environmental and social impacts.

Our actions to become a sustainable network operator will drive our supply chain and support our customers and communities to become more sustainable.”



Decarbonisation and the Environment WG 1 9th Dec 2019

ENA Technical Losses Working Group

Key Objectives

- Sharing best practice and learning,
- Assess the Impact of the low carbon transition on losses; and
- Potential ED2 regulatory approaches

Key Findings

- Losses are inherent, vary by network topology and are **driven by customer behaviour**.
- Distribution Losses **cannot be accurately measured**.
- Technical losses **will increase** as we move to a low carbon future.
- Historic Regulatory Mechanisms cannot be readily applied.

Commissioned Independent Review of Losses Regulatory Approaches

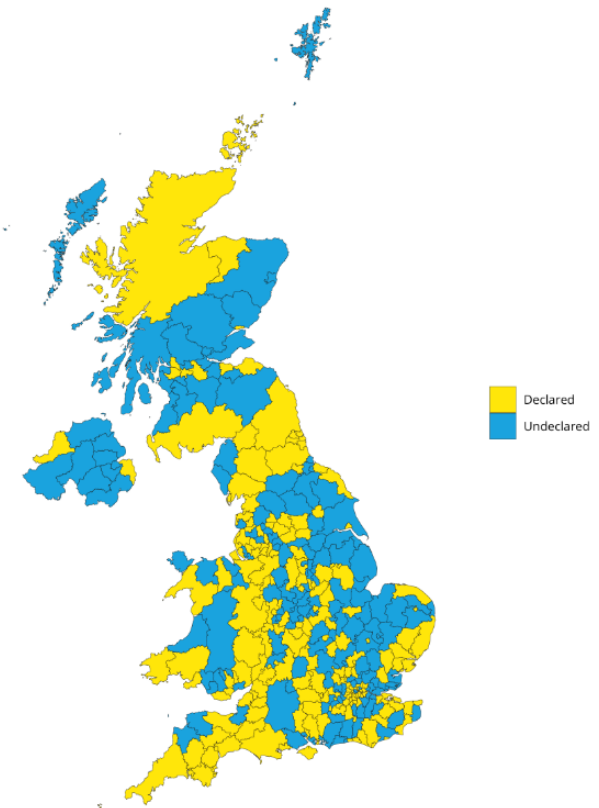
**Where does
the sector need
to be by the
end of ED2?**

DNOs must consider national, regional and local plans to deliver stakeholder ambitions

- **Differing legislation, Net Zero timelines and societal needs drive different starting points;**
 - Scotland 2045, Edinburgh 2030, Liverpool 2040 Net Zero targets
 - Differing stages of maturity in Biodiversity Net Gain legislation
 - Differing regional access to recycling and resource re-use channels
 - Differing starting points for network capacity
- **Environmental, social and economic considerations must be balanced for a Just Transition.**

Local decisions are best managed by local stakeholders and require agile approaches.

UK councils declaring a climate emergency
as of 15 July 2019



Contains Ordnance Survey data © Crown copyright and database right 2019
Data: climateemergency.uk

Environmental Sustainability at the Core of all Network Investments.

1. **SF₆, PCBs, Oil** - Removal of and alternatives to pollutants will be a key activity in ED2, the wider benefits of these solutions must be offset against their cost.
2. **Network Losses** - Losses must be managed and their respective carbon intensity considered.
3. **Biodiversity & Visual Impact** - Activities to ensure Biodiversity Net Gain and reduce the visual impact of networks in AONB.
4. **Climate Change Adaption** - Greater flood resilience, enhanced vegetation management and accelerated asset deterioration will be a factor in ED2.
5. **Supply Chain Impacts** - improving the environmental impacts of subcontractors and suppliers.

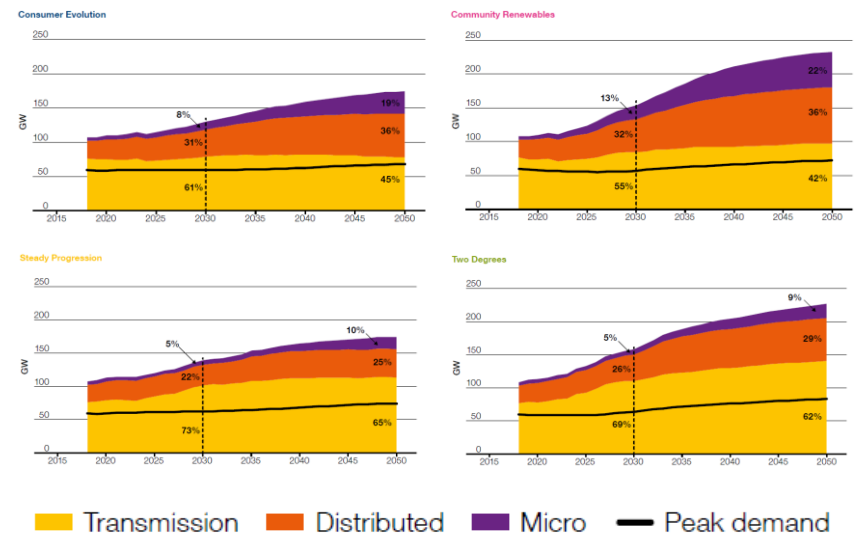
Activities efficiently benchmarked and aligned to environmental benefits

A clear and transparent methodology that enables environmental driven investment to meet Net Zero is required.

Networks must continue to facilitate the connection of Low Carbon Technologies and Renewable Generation to enable decarbonisation.

- LCTs and DG Forecasts are uncertain, ED2 should address this uncertainty.
- Network upgrades can take 10 years to deliver.
- Strategic Investment will enable Low Carbon Technology uptake and Net Zero
- The ED2 framework should firmly establish anticipatory investment as an effective tool.

Distributed Generation 2050 Forecasts



National Grid
Future Energy Scenarios
2019

A clear and transparent methodology that enables strategic investment to meet Net Zero is required.

How should we measure DNO performance in ED2?

Improve Environmental Performance Measurements for ED2



- Broadening of annual reporting including BP and RRP data tables to quantify costs and benefits.
- Life cycle analysis and CBA weighted to recognise the lifetime environmental & global warming impacts of assets/investments.
- Aligned with relevant recognised protocols and verified by external assessors.
- Agile reporting to reflect the maturing environmental agenda.
- Manage the regional variability of environmental and social capital.



Consider aligning Environmental Performance Measurement for RIIO-ED2 with RIIO-T2 where appropriate.

In DPCR4 and DPCR5, Ofgem operated a Distributed Generation (DG) hybrid incentive to encourage proactive, efficient investment for DG.

There are parallels between the objectives of the DG Incentive and the objectives of a Incentive for LCTs, EVs and decarbonisation investment within ED2...

- | | |
|--|---|
| <ul style="list-style-type: none">• Handles uncertainty well • Incentivises efficient investment and enables decarbonisation | <ul style="list-style-type: none">• Difficulties confirming actual LCT uptake for incentive driver • Is not costed and set in allowances upfront |
|--|---|

D4/5 DG Incentive:



1. Cap (2 x WACC) and Collar (cost of debt).
2. 80% of Investment as Pass Through.
3. Remainder as £/kW revenue driver, once DG had connected.

DG Incentive Mechanism principles could be developed to enable LCT growth in in ED2 to meet Net Zero

Review of Potential Incentive Mechanisms for Losses in ED2

- 1 **Reputational Incentive**
(e.g. score actions to manage/understand losses)
 - 2 **Cost-Benefit Analysis**
(e.g. CBA tools to justify losses interventions)
 - 3 **Mechanism based on measured losses**
(e.g. DPCR4 losses incentive mechanism)
 - 4 **DNO Procurement of Losses**
(e.g. capping losses rate in tariffs)
- ✓ } Complimentary to both incentivise and fund responsible losses activities
- ✗ Same issues as DPCR5 approach which was indefinitely suspended
- ✗ Used across Europe, would require wide scale industry change in GB

Development of an ED2 regulatory mechanism could combine Reputational and CBA justified activities elements.

Questions?

- Next meeting: 28 January 2020, 10am-4pm, Ofgem Glasgow offices

Our core purpose is to ensure that all consumers can get good value and service from the energy market. In support of this we favour market solutions where practical, incentive regulation for monopolies and an approach that seeks to enable innovation and beneficial change whilst protecting consumers.

We will ensure that Ofgem will operate as an efficient organisation, driven by skilled and empowered staff, that will act quickly, predictably and effectively in the consumer interest, based on independent and transparent insight into consumers' experiences and the operation of energy systems and markets.