electricity north west

Bringing energy to your door

Third Round of Climate Change Adaptation Reporting

Third round of Climate Change Adaptation Reporting

Electricity North West Summary

1. Introduction

In 2018, we were invited to submit our third climate change adaptation report within the requirements of the Climate Change Adaptation Reporting Power within the Climate Change Act 2008.

In response, this report sets out the activities that have been undertaken by Electricity North West in response to the challenges of climate change identified in our first two reports in June 2011 and June 2015 and our work to identify new risks.

It is designed to be read in conjunction with the ENA Engineering Report – "3rd Round Climate Change Adaptation Report" published in March 2021 which is attached as an appendix to this document. Electricity North West led the ENA working group which produced this cross-sector engineering report.

Whilst the ENA report gives a detailed view of the national picture and the technical reviews which have taken place, this document is designed to provide a summary of the activities we are undertaking within Electricity North West to adapt to the consequences of climate change. It also refers to our new climate change adaptation strategy which we produced and published in 2021 as part of our RIIO-ED2 (2023-2028) submission to our regulator, Ofgem.

This report was completed as Storm Arwen impacted our network and events such as this give us the opportunity to learn in terms of network adaptation and preparedness actions. We look forward to the forthcoming Ofgem and BEIS reviews which will enable us to work with our colleagues in the industry and with climate experts to update our thinking on storms and their potential impacts.

Contents

2. The role of Electricity North West and the potential impact of Climate Change

Electricity North West is the electricity distribution company for the North West of England. We own and operate the network that transports electricity from the National Grid and local generators to our customers' homes and businesses.

As an electricity distribution company, we have two main functions:

- Ensuring that our network has sufficient capacity so that all our demand and generation customers can connect to the network at a reasonable cost; and
- Ensuring that we have a reliable network so that our customers are able to utilise that capacity, with the minimum number of interruptions.

We recognise that it is not economically viable to prevent all faults and interruptions to supply, but we work to minimise the number of failures, and when we do have a fault we aim to restore the supply to customers as quickly as possible.

As these two measures are so important to us and our customers we report on our performance to our regulator each year and we are incentivised to minimise the frequency and duration of power cuts.

When looking at the impact that Climate Change could have on our business we are primarily looking at how the changes in climatic conditions could impact on the provision of capacity and the number and length of interruptions.

In December 2021 we submitted our price review submission for our next regulatory period which is known as RIIO-ED2 and will run from 2023 to 2028. As part of that submission we have published our first Climate Resilience Strategy[1]. We have committed to update the strategy annually to ensure we reflect the latest learning and developments in our adaptation approach.

[1] https://www.enwl.co.uk/globalassets/about-us/regulatory-information/riio2/december-final-submission/annexes-final/annex-11-climate-resilience-strategy.pdf

3. Conclusions in our 2011 and 2015 reports

Since the publication of our first and second round reports we have continued to work with colleagues in industry and academia to identify potential risks from climate change. The publication of the updated UK Climate Projections in 2018 (UKCP18), to replace UKCP09, gave us an opportunity to review our previous analysis. Whilst UKCP18 provides greater granularity of forecasts over a range of scenarios, there have been no significant changes in the risks presented by the changing climate since 2011, so the challenges we face today are largely the same as those we faced ten years ago. These were summarised in our 2011 report as follows:

Extract from the covering letter to our Climate Change Adaptation Report - June 2011

At Electricity North West we are aware that climate change will have an impact on the infrastructure that we are responsible for. We are undertaking work to meet current challenges and we are taking part in a number of research projects to quantify the impact in the future.

However, the impact of climate change will be just one of the drivers for change on our network over the next forty years. The move to the low carbon economy with the introduction of smart grid technology, the connection of new generation and the growth in use of electric vehicles will lead to major changes. This will take place at the same time as we are replacing aging assets.

Consequently, we expect that much of the work to adapt to climate change will be built into our ongoing business-as-usual procedures.

The main potential impacts identified for Electricity North West can be summarised as follows:

- **Flooding** – we expect that the number of flooding incidents will increase, and we are currently taking action to protect vulnerable substations from floods.
- **Increase in temperature** – as temperatures increase the performance of our equipment will change. Typically, we expect this to reduce the capacity of the equipment by less than 0.2% per year. We expect demand on our network to increase by up to 2% a year in the long term, so the climate change adaptation activity will be built into our programme to meet increased load.
- **Increased vegetation growth** – change in climate is expected to lead to an acceleration in the rate that trees grow, so we will need to modify our inspection and cutting programmes to minimise the interference from trees on our overhead lines.
- **Resilience to extreme events** – whilst all electricity networks can be vulnerable to lightning and high winds there is currently no evidence to suggest that the intensity of these events will increase in the future. We will continue to work with industry experts to monitor research in this area.

With the exception of flooding we expect that the impacts on our business from climate change will be gradual, largely indistinguishable from other factors, and that we will be able to deal with them with a long-term approach. We will continue to work with our colleagues in the industry and other expert bodies to regularly assess our vulnerability to climate change, and we will adapt our policies and procedures accordingly when required.

Consequently, our major focus in adapting to climate change has been the development of defences against flooding, so this document concentrates on our work in this area.

We have also been active in protecting our network from trees that may fall during high winds and strengthening our overhead line networks, both through the ENA committee which reviews the guidance on vegetation management and through the delivery of our tree cutting programme.

Climate change, climate change adaptation and flooding are all included as risks in our corporate risk register. The register is reviewed regularly at the highest levels within the company. As flooding is one of our highest scoring risks, updates are provided to the Chief Executive and his leadership team on a monthly basis.

We continue to support research work undertaken in the academic community and with other network companies to identify and investigate other potential impacts of climate change. As part of the ENA work to develop the industry report we commissioned the Met Office to undertake a review of the UKCP18 data and existing studies in order to understand the changes in potential impact to energy infrastructure assets from climate change. The report from this research has been used to assess the current risks to the energy network, and to guide future mitigation or management actions.

4. Working with others

Our sector already has well-established co-ordination arrangements to respond to major events. This includes liaison through the Energy Networks Association (ENA), collaborative work on co-ordination with other sectors and mutual aid and support arrangements. Where specific risks are identified, we work together to develop and implement the appropriate response through new or revised technical approaches or specifications. We are seeking to strengthen these co-ordinating actions and to reach out further to other sectors and infrastructure operators who are affected by the same impacts to ensure we have included whole systems thinking into our adaptation actions.

The Climate Change Adaptation Working Group (CCAWG) was formed in 2010 as an ENA group to develop the industry wide Climate Change Adaptation Report. This group has been superseded by the Climate Change Resilience Group (CCRG), established in 2021 under the auspices of the ENA, "to develop an energy industry strategy to assess, manage and mitigate the impact of climate change on electricity network assets and operation".

Whilst the Climate Change Adaptation Reporting Working Group (CCARWG) met for the sole purpose of developing the industry adaptation report, the CCRG will build on this work to develop strategies, review scientific evidence, engage with stakeholders, produce guidance and investigate the introduction of metrics for resilience. Currently there are no nationally agreed metrics for the resilience of a network. A major focus of the CCRG will be to understand what a meaningful measure would be and how it would be applied.

Following Storm Arwen, a focus of the CCRG work will be to understand the potential impact of long duration storms and storms coincident with other climate risks.

More locally, we have worked closely with regional partners and stakeholders in supporting their development of resilience plans and also collaborating through our Local Resilience Forums (LRFs). We will encourage the further development of this multi-agency working to ensure not only that our emergency planning is aligned, but also that the steps we take to assess and respond to adaptation risks are co-ordinated and aligned for best societal impact.

5. Providing capacity

Monitoring capacity

As noted in the introduction one of our primary functions is to ensure that there is sufficient capacity on the network to meet the needs of our customers.

We measure the utilisation of each of our major substations using Load Indices (LI) based on the ratio of peak demand to firm substation capacity and the amount of time any substation exceeds its firm capacity. An overloaded substation will still function effectively, but persistent overloading may shorten the life of the asset.

Using the percentage loading and the hours over capacity we allocate substations to different Load Index Bands using the following criteria:

Ranking	Loading (percentage)		Duration Factor (hours)	
	Lower bound	**Upper bound**	**Lower bound**	**Upper bound**
LI1	0%	<80%	n/a	n/a
LI2	80%	<95%	n/a	n/a
LI3	95%	<99%	n/a	n/a
LI4	99%	n/a	0	<9
LI5	99%	n/a	9	n/a

Using these measures, we can prioritise the substations that we will need to reinforce immediately as they are overloaded and plan ahead so we know which substations will require reinforcement in the next few years.

Each year we report the number of substations in each band and the number of customers that they serve to our regulator Ofgem. In our 2021 we reported the following figures:

	EHV		132kV	
	Substations	**Customers**	**Substations**	**Customers**
LI1	324	2,100,922	63	2,185,522
LI2	31	234,143	2	79,352
LI3	2	8,308	-	-
LI4	2	2,221	-	-
LI5	1	1,333	-	-
Total	**360**	**2,346,927**	**65**	**2,264,874**

So, we can see that the vast majority of our customers are served by major substations where the peak loading is currently below 80%.

We expect that demand on our network will grow significantly over the next decades, associated with economic growth, but also due to the uptake of low carbon technologies such as electric vehicles and heat pumps as we move towards Net Zero.

Combining the knowledge of current loading with forecasts of demand for each substation we can develop a programme of interventions including network and non-network (eg flexibility) solutions so that we always provide sufficient capacity.

The impact of climate change on capacity

As the climate changes and temperatures increase the performance of our equipment will change. Typically, we expect this to reduce the capacity of the equipment by around 0.2% per year.

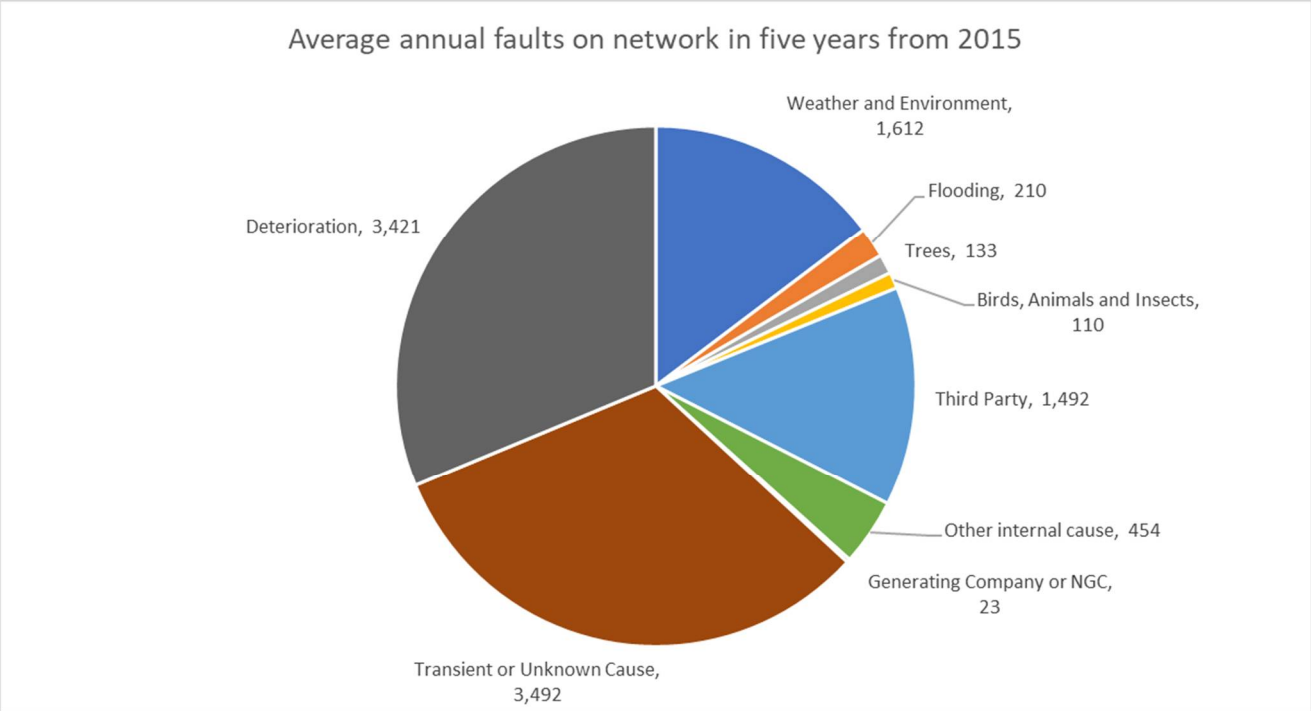
The consequence of this is that we will have to reinforce our substations at a slightly quicker rate, which we will build into our long-term assessment processes, but this impact is far outweighed by the pressure to provide new capacity as we transition to Net Zero.

6. Monitoring and evaluation of network reliability

Recording Faults

As an electricity distribution company, we have a comprehensive system of recording and reporting the occurrence of faults, in particular their causes. Each year we provide a report to our regulator, Ofgem, giving details of each fault which causes a customer interruption, showing the location, numbers of customers interrupted and their time off supply.

On average we have around 11,000 faults each year, which have the following causes.



As well as flooding we record ten other weather-related causes:

- Lightning
- Rain
- Snow, Sleet, Blizzard
- Ice
- Freezing Fog and Frost
- Wind and Gale (excluding Windborne Material)
- Solar Heat
- Airborne Deposits (excluding Windborne Material)
- Condensation
- Windborne Materials

Using our fault data, we can monitor how weather and climate is affecting the reliability of our network, which enables us to identify trends and respond accordingly. We have been recording data in this format since 1984 so have a significant dataset to interrogate. We are aware that the quality of this data has improved significantly since 2001 so place more reliance on data for the last twenty years.

Incentives on network reliability

Since 2002 we have been incentivised to avoid loss of supply through the Interruptions Incentive Scheme (IIS).

Under the IIS scheme we agree targets with Ofgem for the number and duration of interruptions and we can gain additional revenue by beating these targets or lose revenue if we do not meet them. The cost of an individual customer going off supply for over three minutes is currently around £13.63, with every additional minute costing a further £0.33[2].

At the end of the RIIO-ED1 period our IIS targets for unplanned interruptions is that on average customers would only lose supply due to an unplanned incident every 27 months and that interruption would last an average of 80 minutes. We plan to improve our level of performance by 20% over the five years of the RIIO-ED2 period.

Our exposure to IIS is capped at £16m each year (in 2020/21 prices), which means that if we perform well we can increase our revenue up to that amount, but if we perform badly it will cost us up to £16m.

We are also incentivised through the Guaranteed Standards of Performance. Under this scheme, if a domestic customer is off supply for more than 12 hours during normal weather conditions we will pay them £75, with an additional £35 for each subsequent twelve-hour period. A non-domestic customer will receive £150 for the first 12 hours. These values will vary during severe weather events. Our exposure to guaranteed standards payments is uncapped.

Whilst we would always aim to provide our customers with an excellent service, these incentives give us a clear financial signal of the importance of keeping customers on supply, whether the risk is weather-related or from any another source.

[2] Figures quoted in 2020/21 money.

7. Managing the risk from flooding

Our approach to flood risk

In the last five years there have been over a thousand faults caused by flooding. The impact of these faults will range widely, from those that affect a handful of customers for a short time to the flood during Storm Desmond in December 2015 which left around 60,000 of our customers in Lancaster without electricity for up to 48 hours. Flooding is the first tangible impact of Climate Change to affect our network, so is the main focus of our adaptation programme.

Our approach to managing the risk of flooding has been guided by the Energy Networks Association's (ENA) *Engineering Technical Report ETR 138 - Electricity Substation Resilience to Flooding*. This sets out industry guidance on:

- standards of resilience
- how to take account of increasing risk due to climate change
- methods of assessing the likelihood and impact of flooding
- measures to reduce flood risk
- cost-benefit analysis of measures.

Electricity North West was an integral part of the ENA group which developed ETR 138, working with representatives from other network companies, Ofgem, DECC (prior to introduction of BEIS), the Environment Agency (EA), Scottish Environment Protection Agency and the Met Office.

Following ETR 138 guidance we use the Environment Agency Flood Maps and other supporting data to identify major substations that are at risk of flooding. The EA maps show areas that would be affected by flooding, if there were no defences, categorised as follows:

- flooding from a river by a flood that has a 1 per cent (1 in 100) or greater chance of happening each year.
- flooding from the sea by a flood that has a 0.5 per cent (1 in 200) or greater chance of happening each year;
- a major flood, with up to a 0.1 per cent (1 in 1000) chance of occurring each year.
- areas where flooding from rivers and the sea is very unlikely. There is less than a 0.1 per cent (1 in 1000) chance of flooding occurring each year.

We will then plan our work programme to prioritise those substations where the largest number of customers are at the greatest risk of interruptions to supply due to flooding.

The diagrams below show examples of flood risk maps for an area of Stalybridge containing two substations, illustrating both the fluvial risk from streams and rivers and the pluvial risk due to surface water in periods of heavy rain.

Fluvial flood risk at Heyrod 33kV

Pluvial flood risk at Heyrod Primary

The type of flood defence to be deployed will depend on the flooding risk and the layout of the substation to be protected. It may take the form of a waterproof membrane, such as the one protecting the switchgear house in the following illustration:

or we may increase the height of a bund wall as in the picture below. The bund wall will originally have been built to protect against oil escaping into the environment if a leak occurs. By increasing the height of the wall, it will also protect against flood water entering the substation and affecting the equipment inside the wall.

Following the Lancaster flooding incident in 2015 we decided to remove the risk by raising the substation by 3.6m to 11m above sea level as shown in the following image.

Our approach for many years was to only employ permanent flood defences at our major substations, connected at 132kV and 33kV. If flooding occurs at lower voltages it will usually be the case that the communities that those substations serve will also be flooded, so for safety reasons we will disconnect those properties from the electricity supply. Once the flooding has subsided we will

then check that every property is safe before re-energising the supply. This will involve an engineer entering each property individually.

Our experience in flooding incidents in Carlisle in 2005 and Cockermouth in 2009 was that for the lower voltage substations we are generally able to repair or replace any damaged equipment before customers' premises have been dried out sufficiently to be re-connected to the network. However, during subsequent floods in 2015 we identified a number of HV substations that were vulnerable to highly localised flooding so we are currently proactively protecting these substations.

We do have the ability to deploy temporary flood defences when we receive a warning from the Environment Agency of a flood that may affect one of our substations. This is illustrated in the picture below showing a HV substation in Burnside, Carlisle, being protected from flooding in January 2015.

In addition to the basic level of protection provided by sand bags, we have temporary flood protection equipment located at seven of our major sites which can be relocated as required. Additional support from our contractors is also available through our civil framework contracts during periods of heightened risk identified though weather warnings and flood alerts.

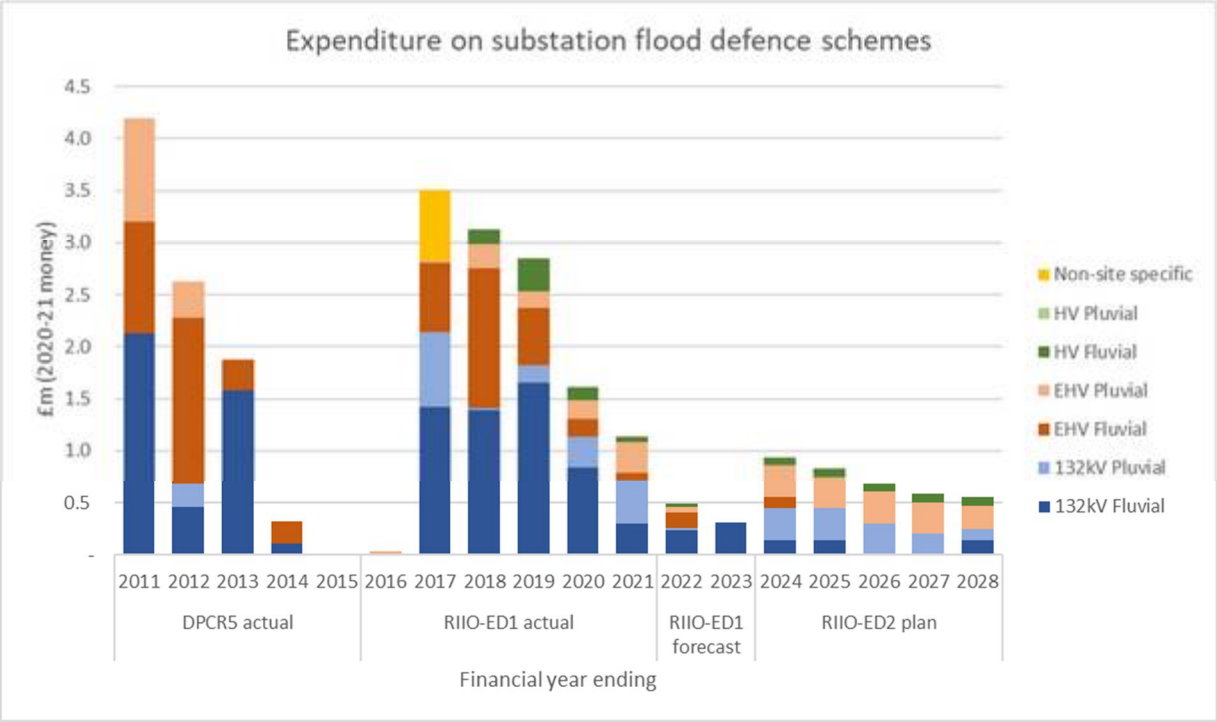
Financing our programme of work

As a monopoly network company our income is regulated. Our allowed revenue is agreed at periodic price reviews, based on our planned programme of works. Because our economic regulator, Ofgem, was involved in the development of ETR 138, they are fully aware of the issues that we are facing from flooding and the processes that we are following to mitigate the risks.

Consequently, in both the DPCR5[3] price review, for the period from 2010 to 2015, and the RIIO-ED1[4] review, for the period from 2015 to 2023, the regulator agreed that our submission for flooding expenditure was appropriate and made no adjustments in calculating our allowances.

Since 2010 we have spent £22m (in 2020-21 money) mitigating flooding risk at 67 major and 15 HV substations protecting all major substations to at least a 1 in 100-year flooding risk in line with ETR 138. This will include provision for the forecast impact of future climate.

Our expenditure profile for flooding schemes over the last eleven years and the forecast for the next seven years is shown in the following chart. We accelerated the programme of defence installation in DPCR5 to deliver our commitment earlier than originally planned. The revised maps to enable study of pluvial (surface water) risk were issued by the EA in early 2014, enabling us to plan for the development of this further phase of flood protection to be delivered early in the RIIO-ED1 period and to plan for the RIIO-ED2 period which will run from 2023 to 2028.



In preparation for our RIIO-ED2 submission, we engaged a consultant to carry out flood risk assessments for our portfolio of 524 grid and primary substations in line with ETR138. This assessment incorporated the revised and updated flood data from the Environment Agency, the National Flood Resilience Review[5] recommendations for assessing primary substations supplying more than 10,000 customers to a higher 1/1000 flood risk, and the remedial and mitigation works we have already completed at some of our sites.

The first stage of the assessment was a desktop exercise which identified 300 substations with a potential flood risk. More detailed flood mapping of these and comparing with existing levels of

[3] DPCR5 is the fifth Distribution Price Control Review

[4] RIIO-ED1 is the first electricity distribution price review under the RIIO framework (RIIO: Revenue = Incentives + Innovation + Outputs)

[5] National Flood Resilience Review (publishing.service.gov.uk)

protection, followed by some site visits resulted in the production of 44 detailed flood risk assessments. From these we have identified 36 sites that will require flood mitigation in RIIO-ED2.

Electricity North West Business Plan Output commitments

In our price review submission for RIIO-ED1, the Well Justified Business Plan[6], we made forty commitments to our customers which we will deliver in RIIO-ED1, known as Business Plan Outputs. They were developed following stakeholder consultation and reflect the obligations placed on us as a distribution business.

Our Business Plan Output for flood risk mitigation read as follows:

> **Flooding risk** – we will continue our programme of protecting substations against the risk of flooding. All our major substations identified as being at risk will be protected against a once in 100-year flooding risk (in line with the national specification ETR 138) by the end of RIIO-ED1.

We publish our progress against this target each year as part of our obligation to report on all our output commitments[7].

For the next price review period, RIIO-ED2 which runs from 2023 to 2028, we have included a series of Benefits in our Business Plan[8], including a successor proposition on flooding which commits to:

> **Protect 36 sites from risk of flooding in a 1 in 100-year storm event**
>
> This programme will increase flood protection to 15 existing substation defences and install defences at 21 newly identified as at risk serving 345,000 customers at a forecast cost of £3.6m. Its completion means that all of our major substations will be protected to at least 1 in 100-year flood risk, including assumptions on future climate change impacts.

The work on the fifteen existing sets of defences will improve those defences to protect against 1 in 200 and 1 in 1,000-year storm events.

[6] http://www.enwl.co.uk/about-us/regulatory-information/business-plan

[7] Our latest report can be found here (Flooding is commitment#13) - business-plan-commitment-report-2021.pdf (enwl.co.uk)

[8] https://www.enwl.co.uk/globalassets/about-us/regulatory-information/riio2/december-final-submission/our-plan-to-lead-the-north-west-to-net-zero-2023-28.pdf

8. Vegetation management

Vegetation management is an important area of work because falling trees and branches interfering with overhead lines can be a major cause of faults, particularly in stormy weather. We currently spend around £5m annually on cutting and felling trees, but still experience around 130 tree-related faults each year under normal weather conditions.

We have two programmes of vegetation management, which are referred to by the names of the technical guidance documents we follow: ENATS 43-8, which focuses on safety compliance, and ETR 132, which focuses on network reliability.

- ENATS 43-8 is the Energy Networks Association Technical Specification for Overhead Line Clearances, published in 2004. Under this programme we cut back vegetation to meet legal requirements for the clearance from overhead lines, with the intention that we would normally return every five years to ensure safety compliance.

- ETR 132, *"Improving Network Performance Under Abnormal Weather Conditions by Use Of A Risk Based Approach To Vegetation Management Near Electric Overhead Lines",* deals specifically with the risk of disruption due to falling or uprooted trees in storms. This will generally require a higher level of cutting or complete removal of the tree.

ENATs 43-8 is our 'routine' programme of cutting back trees to avoid contact with overhead lines. In our initial Climate Change Adaptation Report we observed that climate change could cause an acceleration in vegetation growth, which would lead us to modify our inspections and tree cutting programme. Current observations are that we are beginning to see evidence of sustained increase in vegetation growth, so we have started to increase the frequency of cuts.

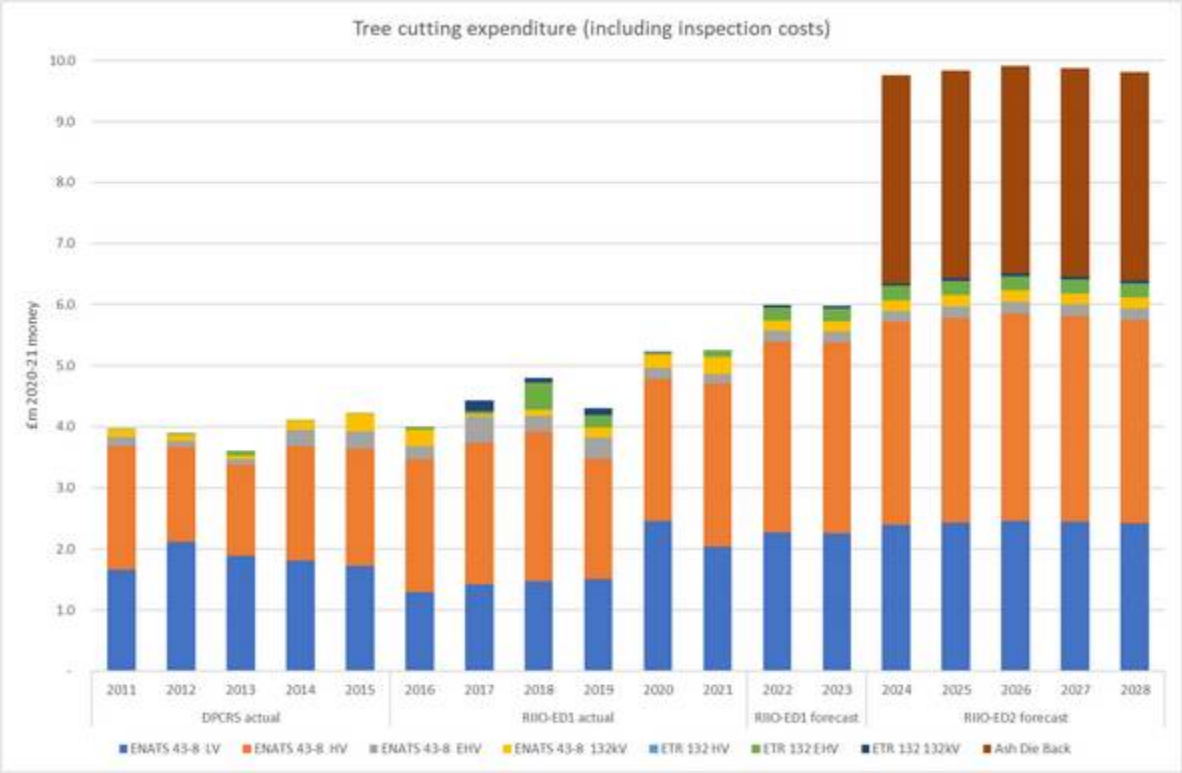
ETR 132 is a specific programme to reduce the risk of trees falling into lines in stormy conditions. Since the programme started in 2009 we aim to make 0.8% or 86km of our overhead network resilient to the risk of falling trees each year, in line with industry recommendations. Our initial focus has been on our EHV network because this is where the greatest numbers of customers are at risk. The success of this approach is demonstrated by the fact that we experienced only a single fault at this voltage during Storm Arwen despite the volumes of fallen trees due to the high winds.

Following the winter storms of 2013-14 a review of ETR 132 was initiated, to ensure that any lessons learned from those storms are reflected in the document and particularly the potential impact of prolonged heavy rainfall and high winds. We expect that a further review will take place to assess the lessons learned from Storm Arwen.

All vegetation management activity is also covered by ENA Engineering Recommendation (EREC) G136 – Vegetation Management near Electricity Equipment – Principles of Good Practice which sets out the industry standard good practice principles for conducting site works, discussions with landowners etc. to ensure that we are able to conduct the required works (which are often heavily reliant on securing permission from landowners).

In addition to these two programmes, we are also facing the emerging challenge of Ash Die Back with an increasing prevalence of the disease in the North-West and consequently the risk of dead trees falling onto overhead power lines. We will be introducing a specific programme to deal with diseased trees in the vicinity of our lines; however work is still ongoing to agree the appropriate mechanism for this.

Our annual expenditure on these three programmes for the last eleven years and the proposal for the next seven years is shown in the chart below.



For both ENATS 43-8 and ETR132 tree cutting programmes we are meeting our targets for delivery. Whilst we are only beginning to see the impact of climate change in this area, ensuring that we have been meeting or beating our targets means that we are in a good position to move forward as an acceleration to our regular programme may be required.

9. Summary

We believe that we are at the forefront in preparing for changes to the climate with:

- Well established risk assessment procedures;
- Well developed programmes of resilience measures, both through our flooding programme and our tree cutting programmes; and
- Detailed progress reporting through our annual regulatory reporting cycle.

Our flooding programme remains our main area of adaptation work because of the immediate risk it poses to our customers and we plan to complete our current programme of work by 2028. We will continue to assess the changing risks from flooding and will develop further programmes if required.

Whilst we have not experienced a sustained increase in the rates of tree growth yet, the fact that we are successfully meeting all our targets for vegetation management means that when the expected acceleration occurs, we are well positioned to meet the challenge.

The impact of Storm Arwen will be the subject of investigations into network resilience and to the response from network companies. We will incorporate learning from these investigations into our adaptation planning and we will work with colleagues nationally to ensure that learning is included in the industry resilience strategy.

We will continue to monitor other potential impacts and work with our partners to investigate solutions if required, but as noted in our original submission, the scale of these impacts is likely to be dwarfed by the other work which we will be undertaking on our network to facilitate the move to net-zero and the increased demand for electricity, so our climate change work will be largely incremental to our business-as-usual practices.

10. Appendix - Glossary

Acronyms used in this document:

132kV	Equipment operating at 132kV – the highest voltage on our network.
CCARWG	ENA Climate Change Adaptation Reporting Working Group
CCC	Climate Change Committee
CCRA	Climate Change Risk Assessment
CCRG	ENA Climate Change Resilience Group
DPCR5	Distribution Price Control Review 5 for the period from 2010 to 2015
EA	Environment Agency
EHV	Extra High Voltage – on our network this relates to equipment operating at 33kV
ENA	Energy Networks Association
ENATS	Energy Networks Association Technical Specification
ETR	Engineering Technical Report – an ENA published document
HV	High Voltage – on our network this refers to equipment running at 6.6kV and 11kV.
IIS	Interruptions Incentive Scheme
kV	Kilo-Volts
LI	Load Index
NGC	National Grid Company – owners of the transmission network in our area
NIC	National Infrastructure Commission
RIIO	Framework for energy network price reviews (Revenue = Incentives + Innovation + Outputs)
RIIO-ED1	First electricity distribution price review under the RIIO framework for the period from 2015 to 2023
RIIO-ED2	Second electricity distribution price review under the RIIO framework for the period from 2023 to 2028
UKCP09	United Kingdom Climate Projections published in 2009
UKCP18	United Kingdom Climate Projections published in 2018