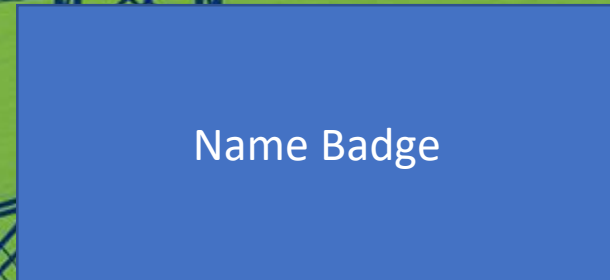


Operating a Resilient & Reliable Network

Edinburgh International Conference Centre,
5th March 2019

Welcome & Housekeeping



Agenda

- Welcome and housekeeping
- Introduction – Dave McKay, Director of Operations
- Session 1
- Session 2
- Coffee Break
- Session 3
- Session 4
- Engagement Exercise
- Lunch and networking

The order of the day

- 4 booths, each dedicated to a different theme
 - Booth 1: Managing and storing our materials
 - Booth 2: Black Start and network resilience
 - Booth 3: Intelligent network control
 - Booth 4: Our asset replacement programme
- Each of you has a coloured sticker on your name badge
- When you hear this sound, you move from your tables to a booth– to hear about our investment options
- When you hear this sound, you move from the booth to your table – to give your feedback on these options

Engagement exercises

- For each of the four topic areas we would like to hear your thoughts on which of the investment options presented is most appropriate for our T2 Business Plan
- The options are split into the following:

Minimum Standard

Responsible Operator

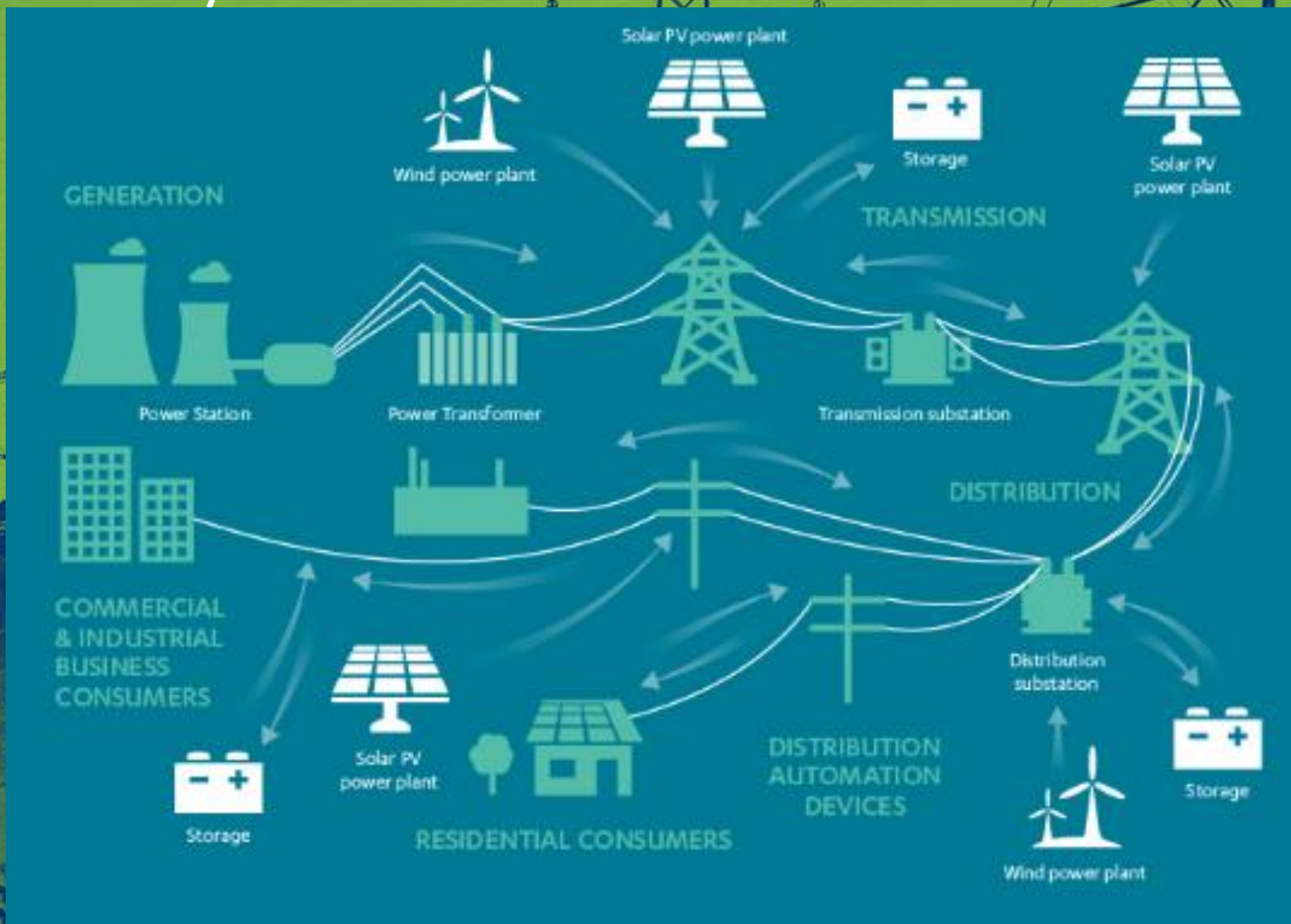
Progressive Network Enabler

- ... but each has a different cost implication
- At the end of the day, we will revisit your choices in light of these cost implications

Introduction

Dave McKay, Director of Operations

GB Electricity Network

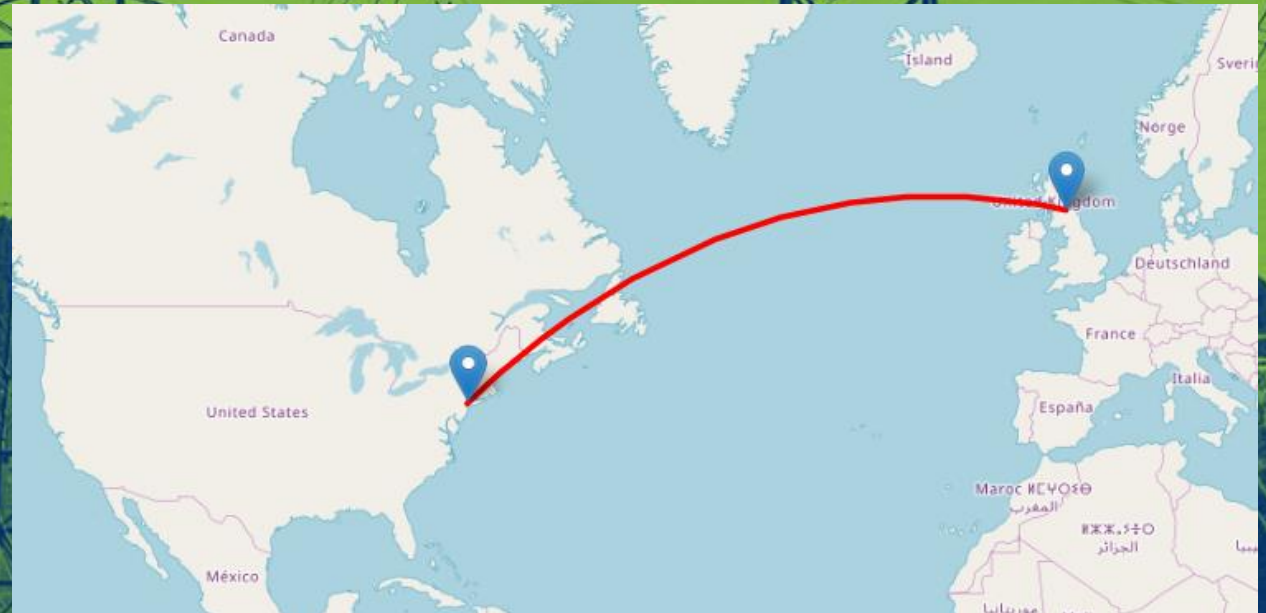


SHE Transmission



Cost to the consumer

- **Today: £4.48pa**
- **2026: £4.28 - £5.36pa**

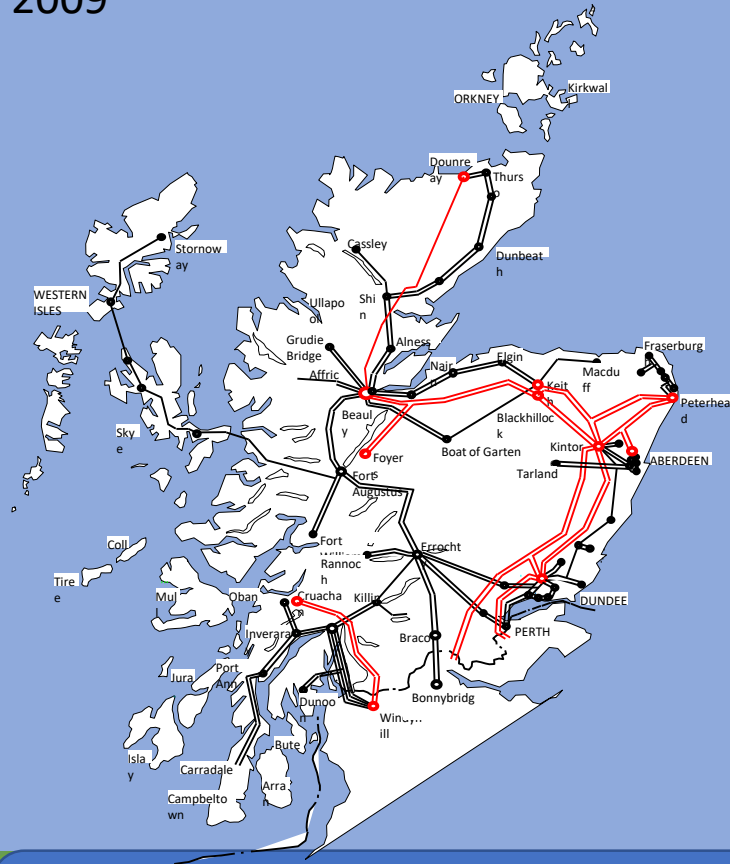


Operating Environment



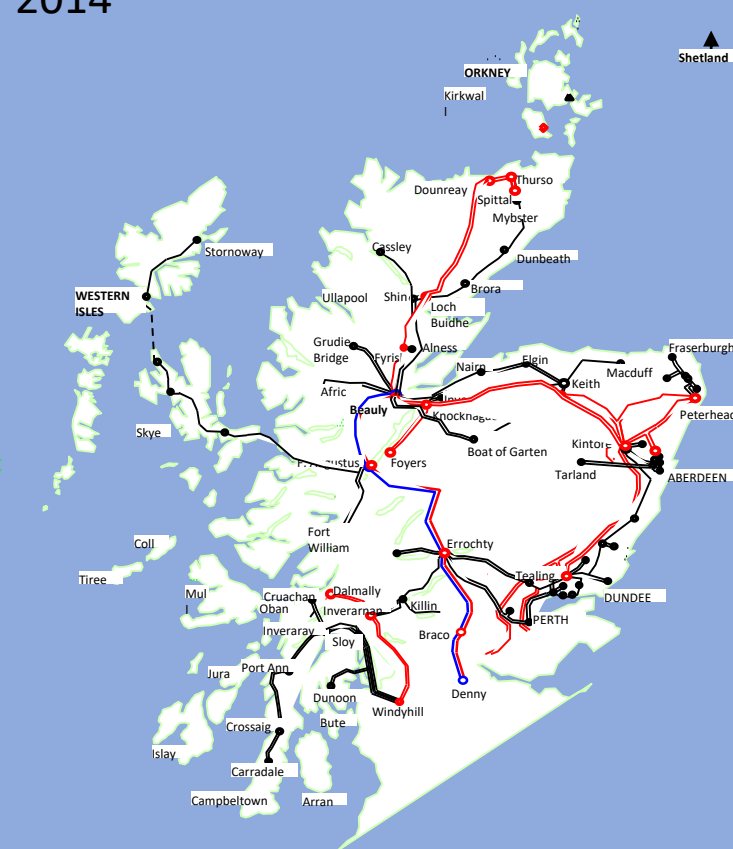
Growth of the network

2009



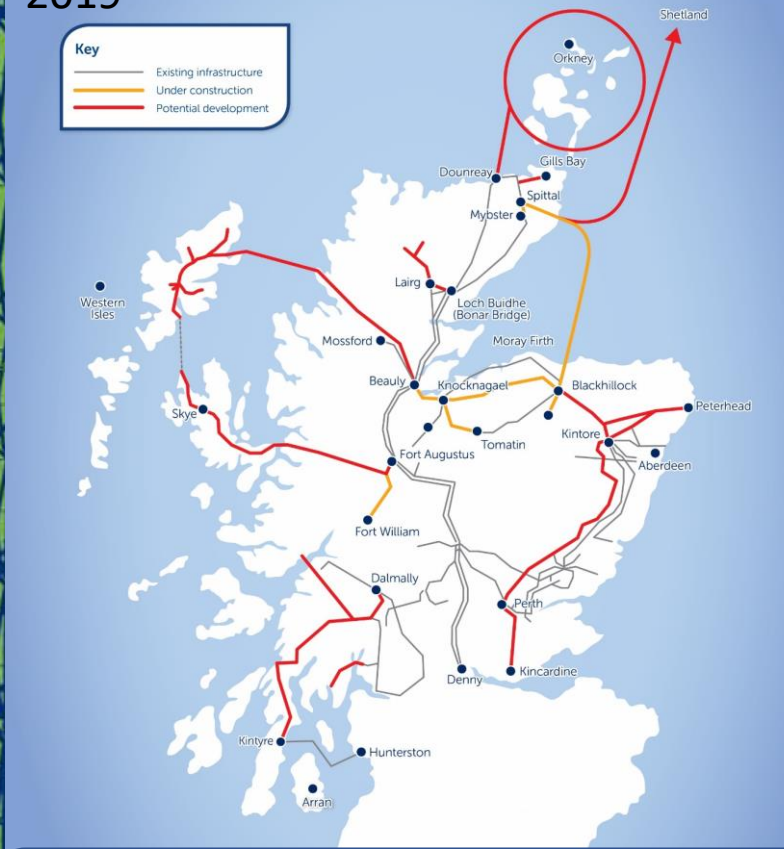
RAV = £0.4bn

2014



RAV = £1.3bn

2019



RAV = £3.5bn

Why is Electricity important?

Communications

Heating & Lighting

Business

Food

Transport

Banking

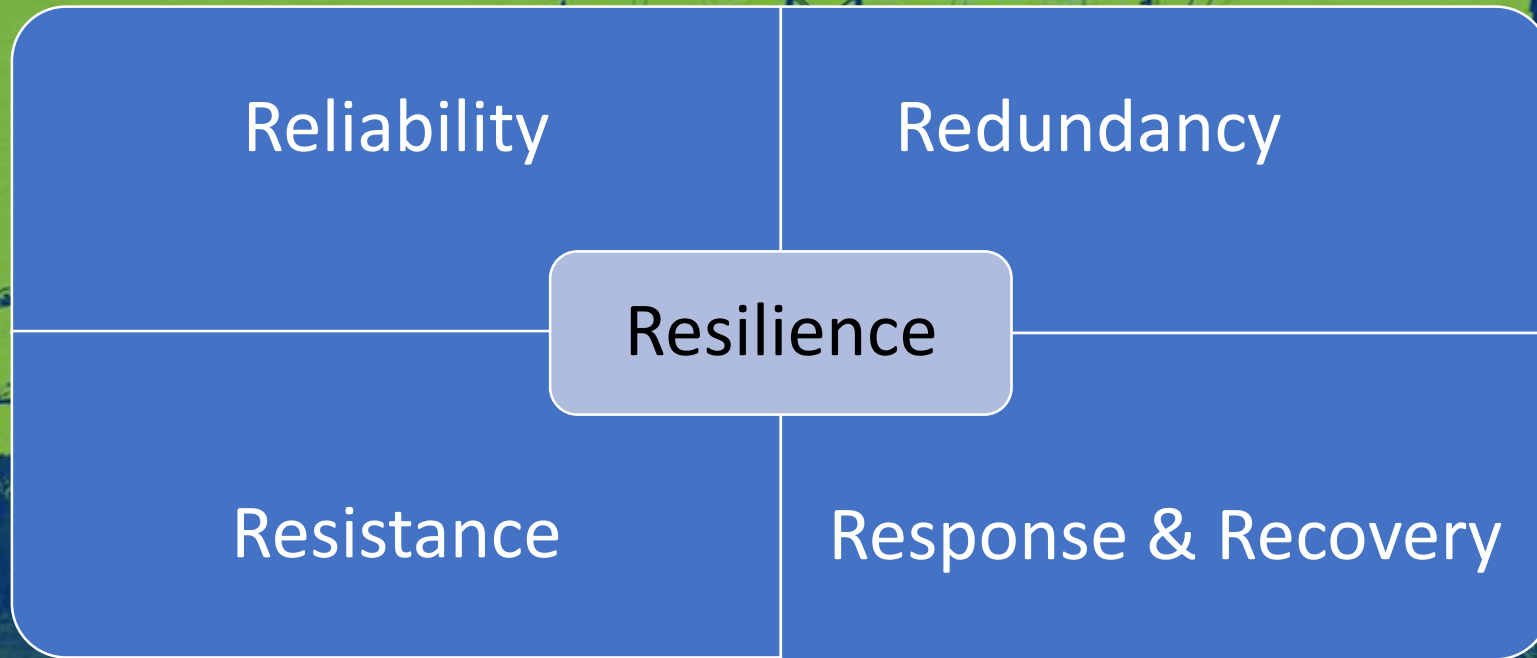
Water & Sewage

Emergency
Services

Environmental

Health &
Wellbeing

What is Resilience?

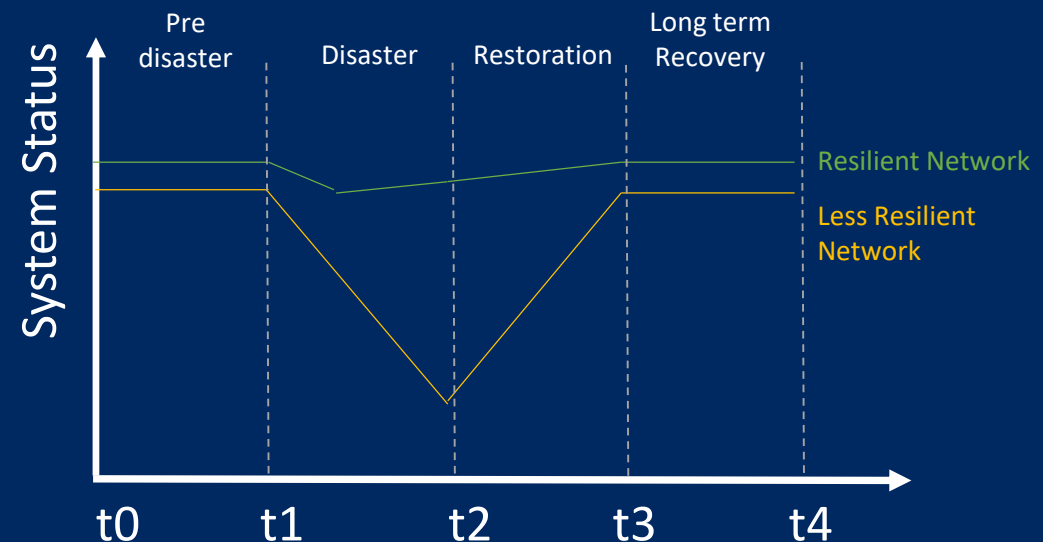
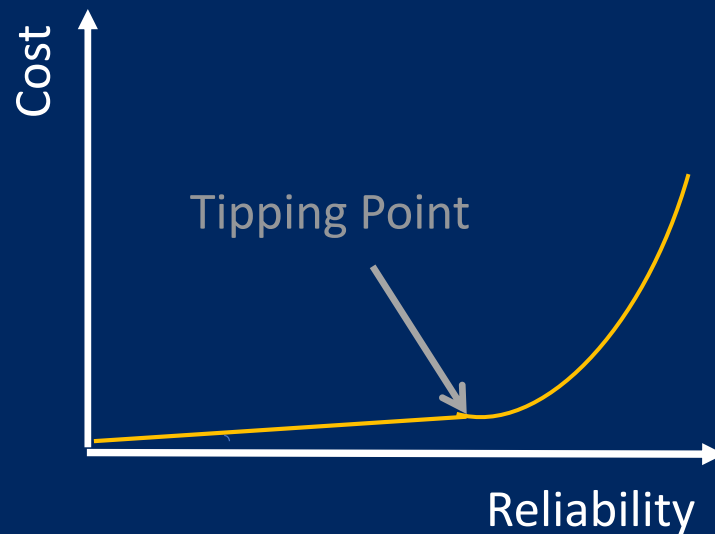


The cost for better reliability and resilience?



What is an acceptable investment level?

- Acceptance that no system can be made 100% reliable
- When does the costs outweigh the benefits?
- Cost Benefit Analysis to guarantee that the tipping point is never reached
- Beyond this tipping point the costs will rise exponentially for little benefit



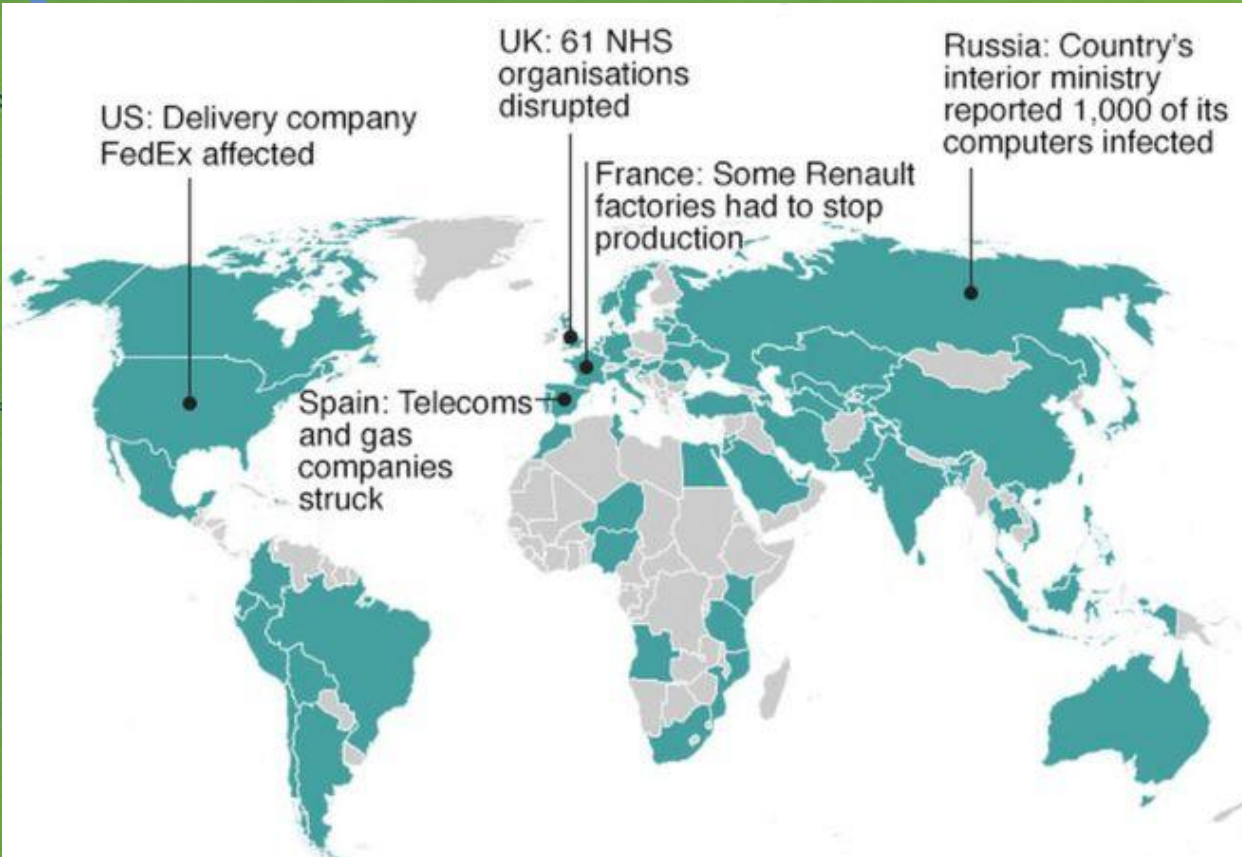
Threats to our Network



Threats to the reliability of the Electrical network

- **Technology**; Change to standards, malicious intent, technical failure, changes to global supply chain's focus
- **Geopolitical**; Political instability, societal expectations, physical and cyber attacks
- **Natural Hazards**; Geological hazards including fault lines and land slips, extreme weather including flooding and drought, solar storms, moorland fires, difficult to reach plant and equipment
- **Electrical Network**; Resource availability, capability, and knowledge, single points of failure, reliance on critical circuits, blackstart, ageing assets

External threats



- Wannacry Cyberattack May 2017
- 200,000 computers over 150 countries
- 1% of NHS activity impacted
- Cost to the NHS of £92m

Examples of Asset Issues



<https://vimeo.com/300997438>

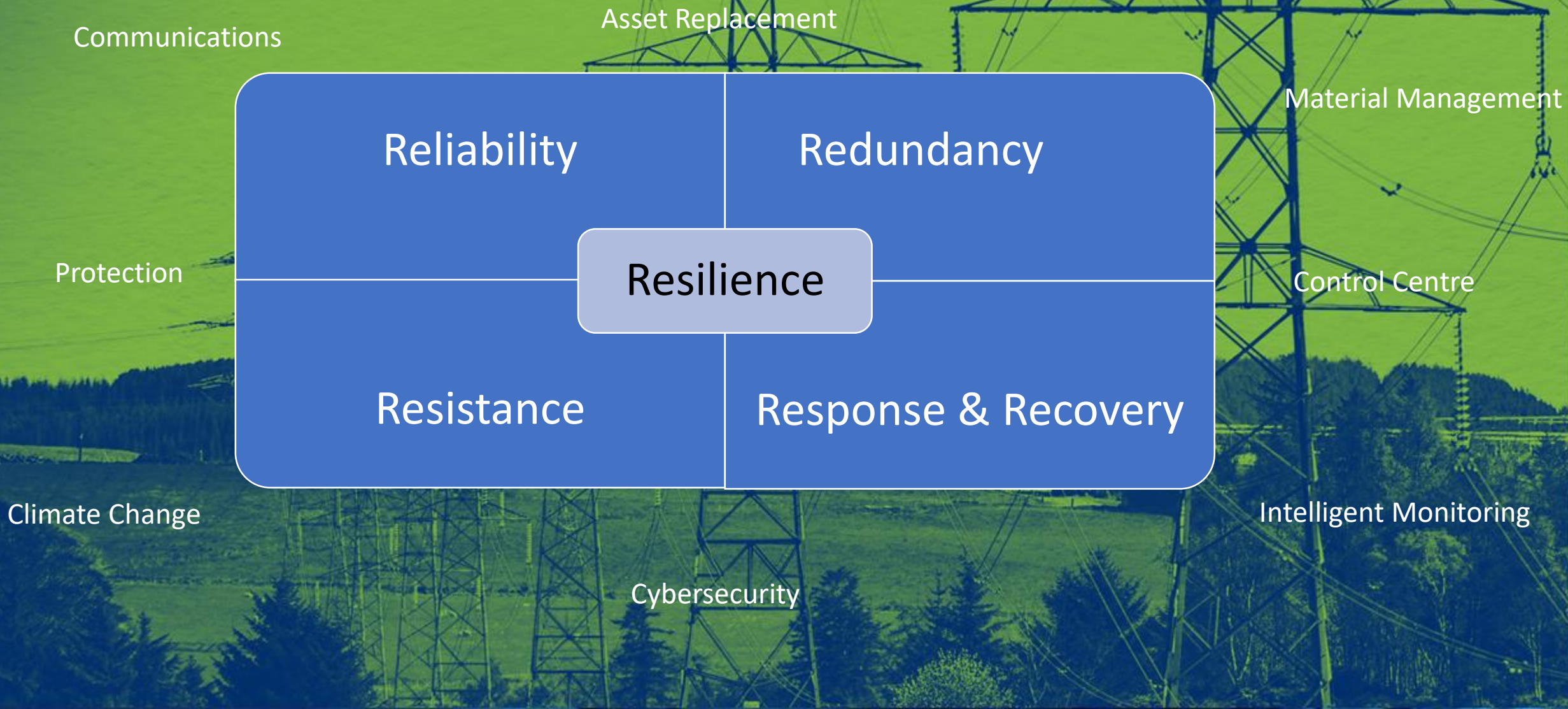
Mini-Blackout 2014

- Over $\frac{1}{4}$ of connected customers lost power
- Lasted up to 6 hours in some places
- The Unsupplied Energy was 133.9 MWhrs
- Annual Energy Not Supplied incentive breakeven is 120MWhrs
- Lost £1.7M in incentive payments for the event
- Small levels of compensation to generators
- DNO penalty costs were around £300K



Image Source: BBC

How do we secure our Network?



Delivering the Strategic Themes

Safe and Secure Network Operation



Use data efficiently to understand, predict and get the best network performance

Sector-leading Efficiency



Integrated approach to whole life development and operation, using risk-based engineering to deliver value

Stakeholder-led Strategy



Taking a whole system approach to network operation and development to meet current and future customers' needs

Leadership in Sustainability



Trusted partner of customers and communities, realising long term benefit for society, economy and environment

Stakeholder Led Strategy

Stakeholder-led Strategy



Taking a whole system approach to network operation and development to meet current and future customers' needs

- We need to ensure that our future plans meet the requirements of our stakeholders
- Your views are vital to our plans
- We will be discussing some of our proposals with you and asking for your opinions
- Climate Change is being discussed at a separate event

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Thank You

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Engagement Exercise



Thank You



<https://www.ssen-transmission.co.uk/information-centre/industry-and-regulation/riio-t2/>