Welcome

Siobhan Barton

Head of Stakeholder Relations




Active Engagement

Annual stakeholder report

Emerging thinking:
Distribution System Operator (DSO)

Sli.do

Feedback forms

Filming (vox pops)

On-going
engagement plan

Welcome

Patrick Erwin

Policy & Markets Director




Unlocking the Energy Future for the North

Discuss with us:

1. The transition to a low carbon, decentralised and much more active network

2. Delivering an energy network that is prepared for the realities of a changing climate

3. Reshaping our network, enabled by new technology, so that it is more responsive to the needs and views of our customers

Guest speakers

Key Note Speaker

Rt Hon Lord John Hutton

Carol Botten
Chief Executive,
Voluntary Organisations' Network North East

Adam Scorer
Chief Executive,
National Energy Action

Francisco Sierra
Managing Director of Energy Service, Nissan Europe

Joshua Emden
Research Fellow,
IPPR North

Martin Budd
Environment and Climate Change Strategic Advisor, Hull City Council

Northern Powergrid – Our Team

Neil Applebee
Director of People
& Customer Service

Mark Drye
Director of Asset Management

Tom Fielden
Finance Director

Jim Cardwell
Head of Policy Development

Geoff Earl
Director of Safety,
Health & Environment

Nick Gill
Operations Director

Patrick Erwin
Policy & Markets Director

Unlocking the Energy Future for the North

Discuss with us:

1. The transition to a low carbon, decentralised and much more active network

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The Future as a Regional Energy Network

Rt Hon Lord John Hutton

Keeping our promises
Powering our region

Mark Drye

Director of Asset Management

Nick Gill

Operations Director

Our Business

Northern Powergrid is responsible for the electricity network that keeps the lights on for 8 million customers across the Northeast, Yorkshire and northern Lincolnshire.

Our dedicated team of more than 2,700 employees operate 24 hours a day, 365 days a year – no matter what the circumstances – to maintain
a safe, reliable and efficient electricity supply.

Our customers pay their energy supplier for the electricity they use. A small proportion of the money they pay as part of their electricity bill comes to us to cover the cost of keeping the network running safely, reliably and efficiently.

126 substations
with APRS installed to improve performance.

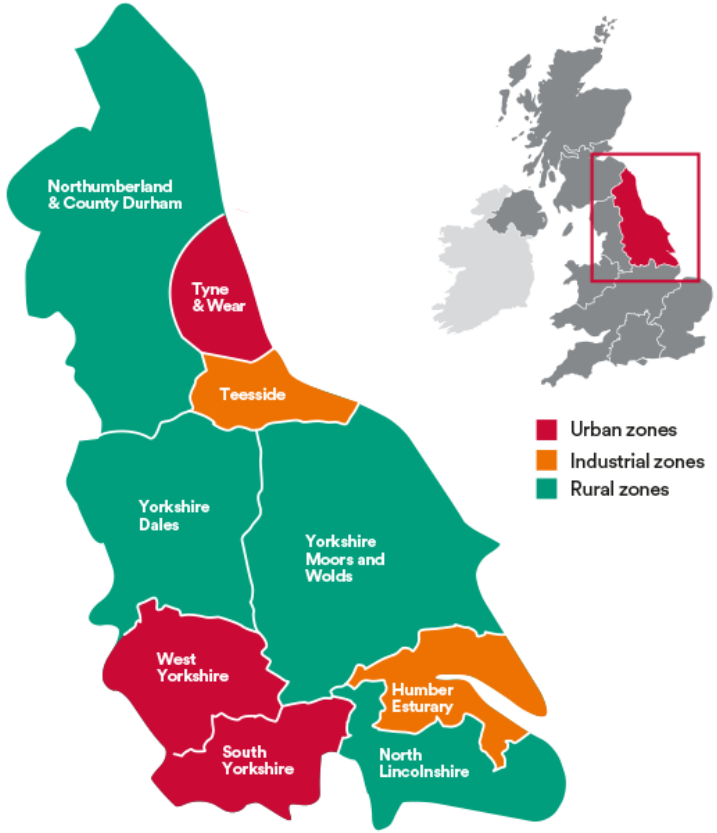
98 sites
added to our ED1 flood defence programme.

1.6GW
of capacity released for customers to connect generation via voltage reductions in the ED1 period to date.

8 million
customers.

Over 2,700
employees.

3.9 million
homes and businesses powered.



Business Priorities – what are we analysing?

Operational Excellence

High-quality efficient operations, running a smart, reliable system

Environmental Impact

Leaders in environmental respect and low carbon energy

Network Operations – Committed to keeping the lights on

Our Commitments

We committed to reducing the number of power cuts our customers experience and the amount of time the power is off, if a power cut occurs. And we're committed to making our network more resilient with clear targets to strengthen flood defences and use data to improve our performance

Our Achievements

38% shorter

unplanned power cuts.

1.65GW

of capacity created for connection of LCTs on local networks.

26% fewer

unplanned power cuts.

Smart Meter

We're SMETS2 Smart Meter ready!

Network Operations – Major incidents and extreme weather

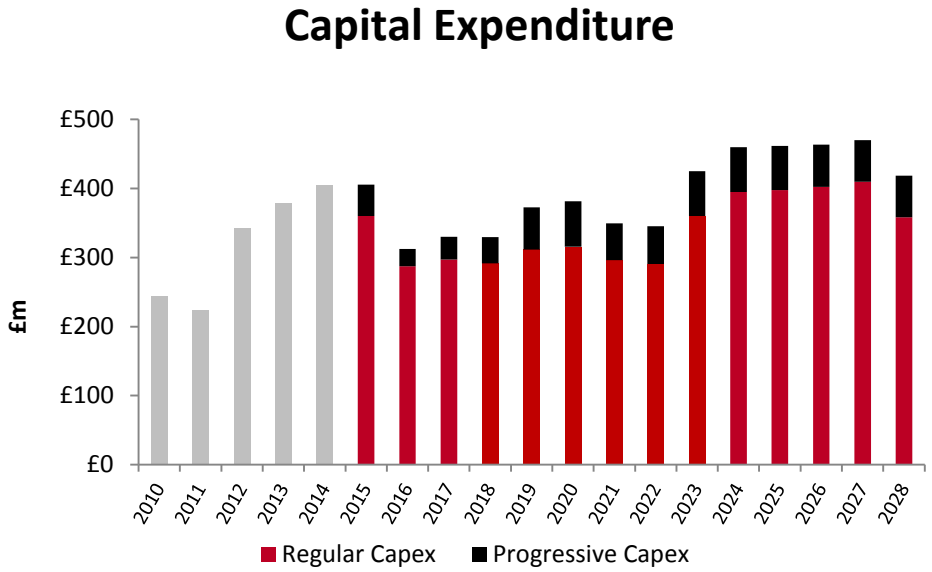
Always open for business – no matter what the circumstances.

We are responsible for keeping the electricity distribution network running safely, reliably and efficiently. We are open for business every hour of every day, 365 days a year – no matter what the circumstances.

During 2018, storms like 'The Beast from the East' caused disruption to thousands of homes and businesses across our region. We monitor weather conditions 24/7 so we know when a weather front is coming and our Major Incident Management Plans kick in. In partnership with emergency services and local resilience forums, we coordinate our response so that we can support our customers and restore supplies as soon as possible.

Investment in our Network

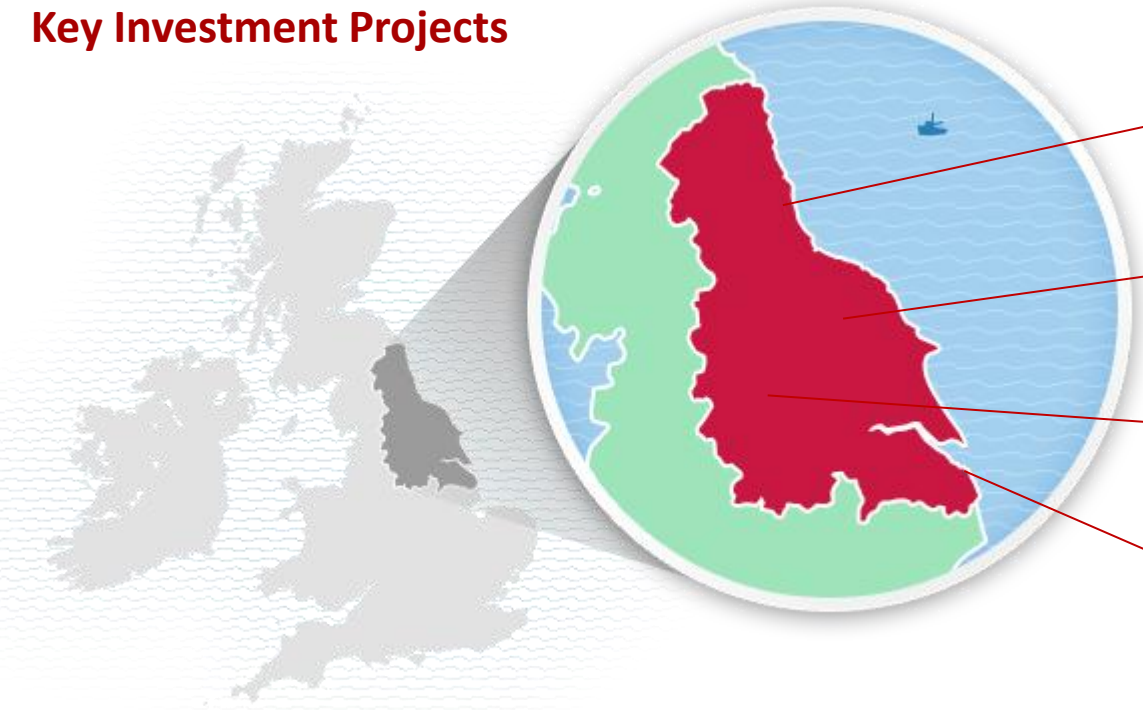
2015-2023	£m
Asset Replacement/Upgrades	£1.1bn
Replacement of Failed Assets	£719m
Diversions	£43m
Legal, Environment & Safety	£152m
Network Reinforcement	£189m
Low Carbon Driven Reinforcement	£44m
Flood Defences	£48m
Operational IT	£16m
Quality of Supply (inc. Automation)	£42m
Smart Grid Enabling Technology	£115m
Other Operational Capex	£18m
Non-Operational Capex	£141m
Total Capex	**£2.65bn**



15% of our capital program is to create enhanced smarter functionally to support the energy transition

Investment in our Network

Key Investment Projects



Seaham – £4.7m investment programme including the installation of 71 remote controlled smart switching devices to help automatically restore power for customers

North Yorkshire - £3.3m investment programme to improve and modernise the network across Skelton, Saltburn and Marske.

Calderdale – Upgrading flood defences in the Upper Calder Valley, including in Hebden Bridge, with relocation of the main substation to a protected location, in partnership with Calderdale Council.

Grimsby – Planned investment of £XXm in Grimsby will improve the network in the town and fortify power supplies to the economically important Grimsby Docks

Investment in the network – the numbers 2017/2018

We're in the process of a major overhaul of the network – the largest coordinated change to our network assets since the 1970s.

Asset area	Asset investment	Spend(£)
Voltage control and monitoring	• Replacement of 1,356 transformer automatic voltage control relays • Installation of control equipment at 47 HV voltage regulators • Functionality for ANM & DSO services for improved visibility & alternative settings	£34m
Primary substation RTUs	• Upgrade or replacement of 850 RTUs • Platform for local substation control & IP capable	£17.6m
Telecoms (secondary)	• Replacement of existing UHF radio system, operating over 9,500 sites • Providing communications for grid edge control & monitoring	£13.8m
Telecoms (primary)	• IP based network replacement providing more bandwidth and resilience across 850 sites	£9.9m
Control and OT systems	• Rollout of standard ANM systems, first one at Driffield in 2019 with forecast of two per year after that • New databases for monitoring data and platform for data analytics	£4.3m
Distribution monitoring	• Harvesting of data from 2,000 pole mounted reclosers • Retrofitting of LV board monitors to 1,300 GM distribution subs	£3.2m
		£83m

Investment that protects the Environment

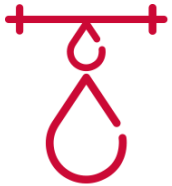
Our commitments

Protecting the environment is one of our key business priorities, and we set ourselves ambitious environmental targets in our last business plan, with ambitions to make significant improvements across all the main areas against which we measure our environmental impact. We also set ourselves specific targets to:

Our Achievements

34%

reduction in Business Carbon Footprint (RIIO-ED1 to date).



44%

reduction in oil/fluid leakage (RIIO-ED1 to date).

13.8km

of overhead line undergrounded across National parks in 2017-18.

2,477MWh

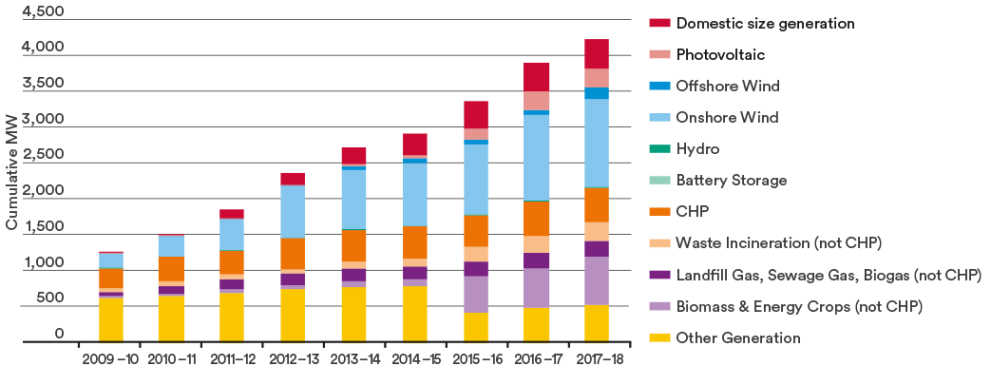
saved through use of larger electricity cables.

Planning for the Future – Responding to change

We are in the midst of unprecedented change in the UK's energy system. Our distribution network was designed to deliver electricity from a few large power stations to homes and businesses and built to cope with historical patterns of demand. We now need to play a more active role in order to continue to deliver a safe, reliable and affordable service to the eight million people in our region.

- Local generation is growing rapidly
- Clean technologies are growing rapidly
- Consumer demand patterns are changing
- Digitalisation enables smarter ways of running the system
- Growing awareness of sustainability

Figure 1: Generation connected to our network



268GW

Low carbon and decentralised generation capacity could increase from 103GW today to between **189GW and 268GW by 2050;**

65%

Up to 65% of generation could be local by 2050;

60%

Gas is likely to remain the dominant form of heating until 2030, but **up to 60%** of homes could be using electric heat pumps by 2050.

11m

There could be **11 million** electric vehicles on UK roads by 2030 and 36 million by 2040;

Keeping our promises
Improving Customer Service

Neil Applebee

Director of People and Customer Services

Our vision is to be the best energy company in **serving our customers** while delivering a sustainable energy solution

Culture

Personal Responsibility to our CUSTOMERS

Core Principle – Customer Service

CUSTOMER SERVICE


TEAM
POWERGRID

Tiered Service Delivery Model

Click Call Face

Tier -1

... proactive communication

Tiered Service Delivery Model

Click Call Face

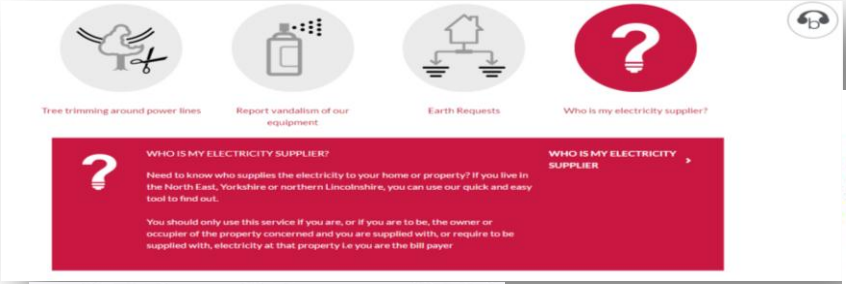
Tier 0

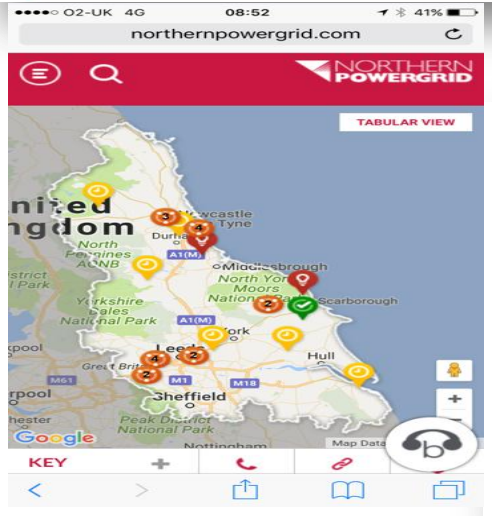
… not a new concept …

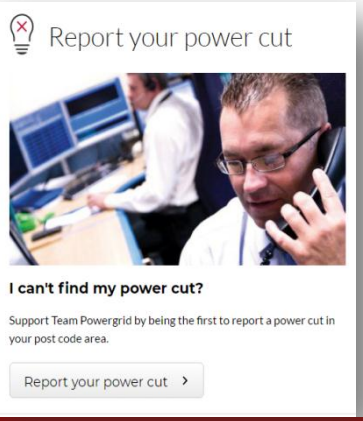
self service

Tiered Service Delivery Model

Click Call Face







Knowledgebase

Tier 0

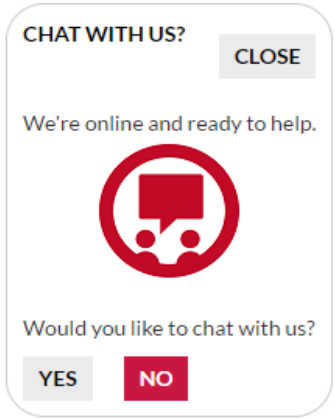
Using technology to empower our customers …

Tiered Service Delivery Model

Click Call Face

Tier 1

... we are here to help when our customers need us...



Tiered Service Delivery Model

Click Call Face

Tier 2

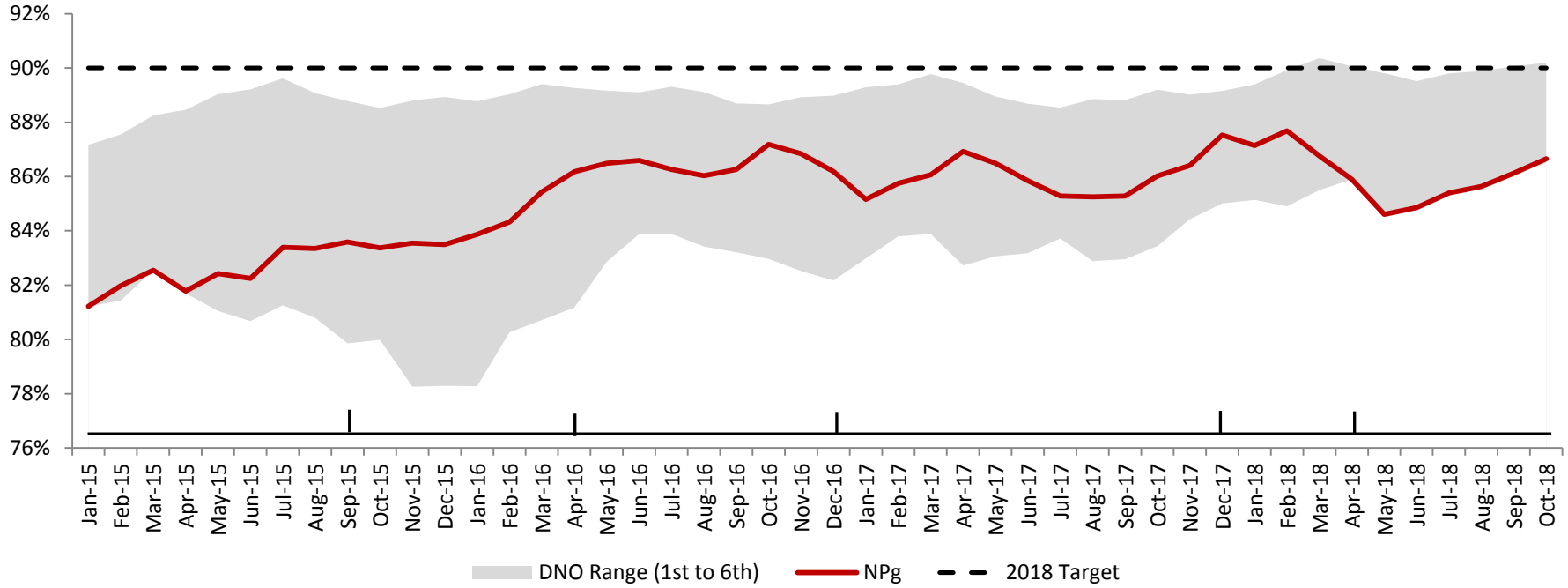
... Polite, friendly & helpful colleagues…

Rank 21st in UK

ICMI TOP 50 COMPANIES FOR CUSTOMER SERVICE

So how satisfied are our customers?

Customer Satisfaction Performance - Rolling Quarter



Make Every Contact Count

With a culture where every member of **Team Powergrid** takes personal responsibility for our customers,

every time we **talk** to you,

every time we **listen** to you,

and every time we **solve** your problems,

we will do our very best to **help** you and provide **a positive experience**.

NORTHERN POWERGRID

WE'LL KEEP OUR PROMISES

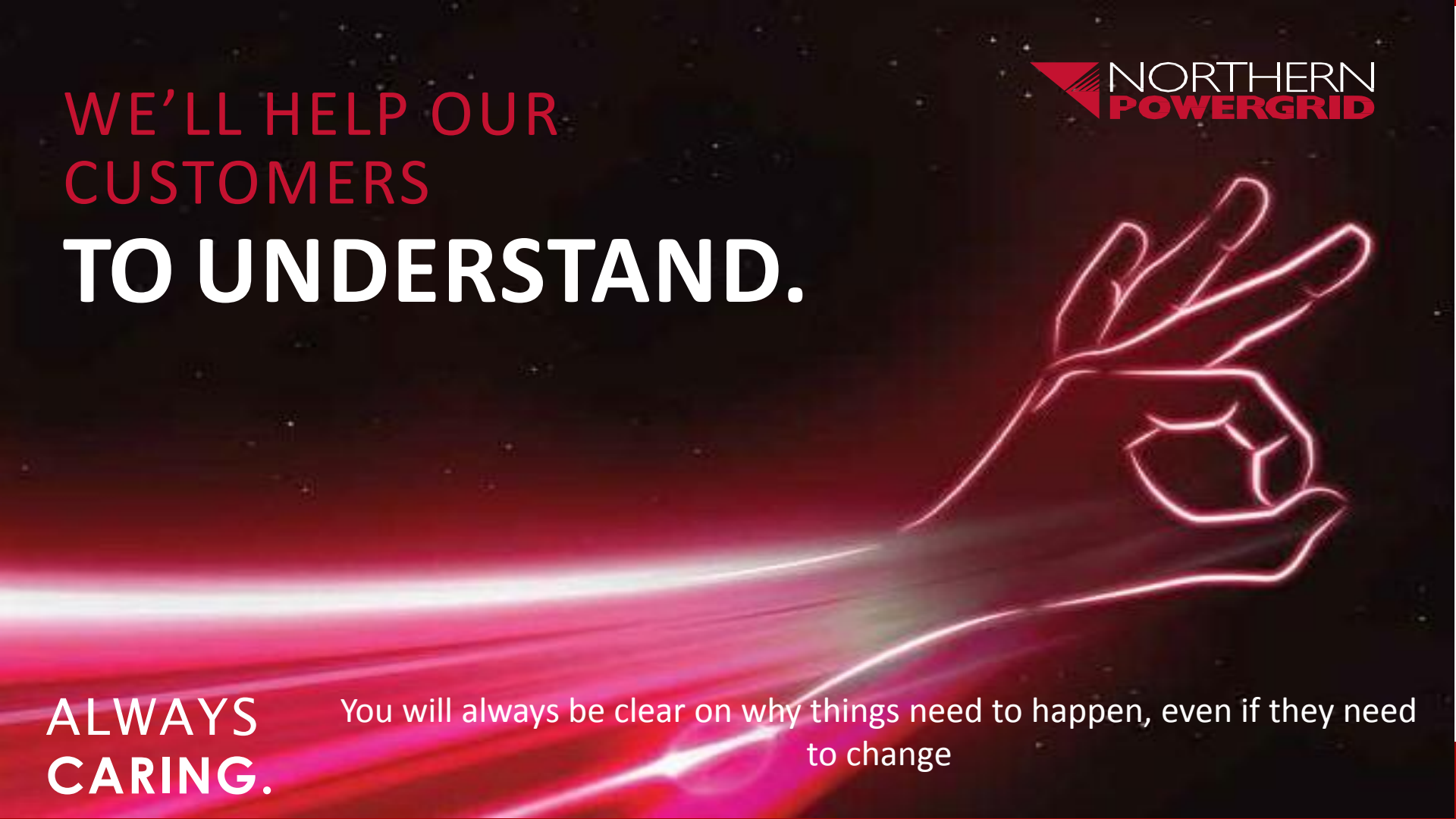
TO OUR CUSTOMERS.

ALWAYS **TRUSTED.**

You can always trust us to do our very best for you

NORTHERN POWERGRID

WE'LL HELP OUR CUSTOMERS TO UNDERSTAND.



ALWAYS CARING.

You will always be clear on why things need to happen, even if they need to change

NORTHERN POWERGRID

WE'LL KEEP OUR

CUSTOMERS INFORMED.

ALWAYS

INFORMED.

You will always know what is happening and when

WE'LL PROVIDE OUR CUSTOMERS

WITH A PERSONAL SERVICE.

ALWAYS VALUED.

You will always receive a service that is appropriate to your specific needs

Priority Services Register - Animation

https://youtu.be/AN9quUUSo4g

The future is here now…

…Proactive digital customer communications

The future is here now…

…Customer Relationship Management

The future is not far away…

…On site digital quote, payment & appointment booking

Our goal

No.1 in customer satisfaction

Striving for #10outof10

Our vision is to be the best energy company in **serving our customers** while delivering a sustainable energy solution

Ukrainian Power Plant Attack

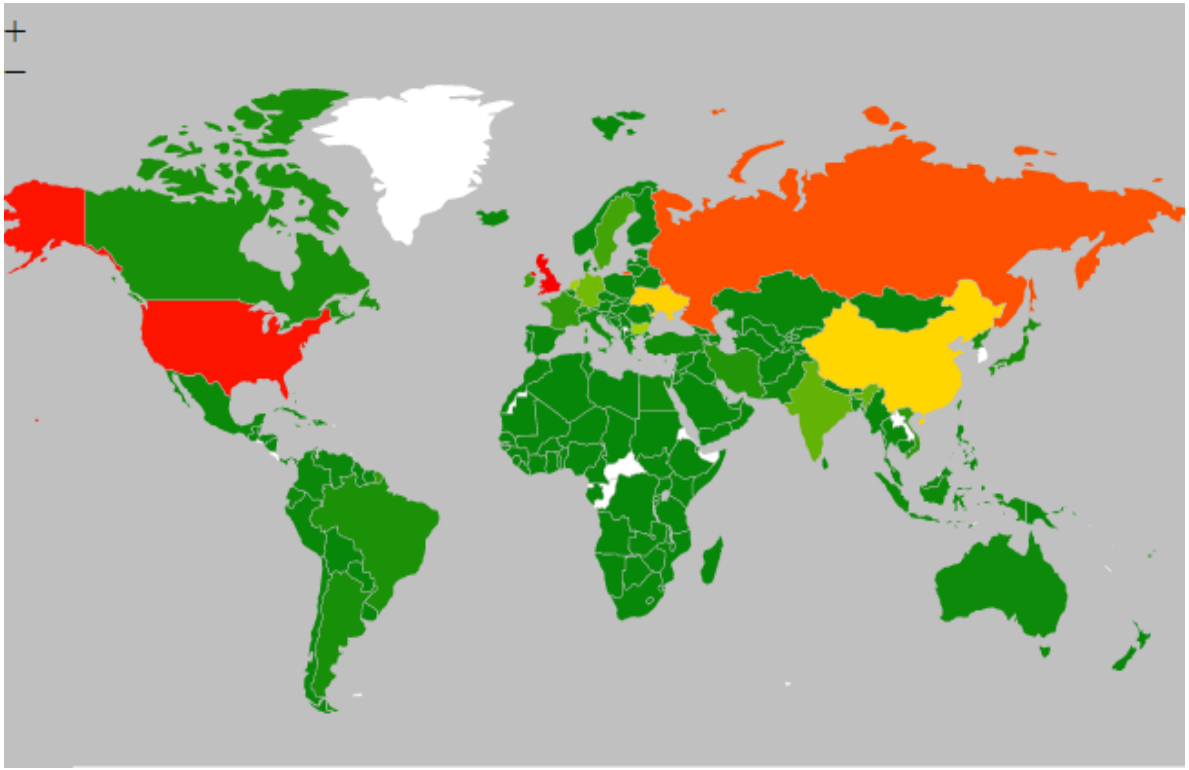
https://vimeo.com/254707611/9077654150

Keeping our promises
Cyber Security



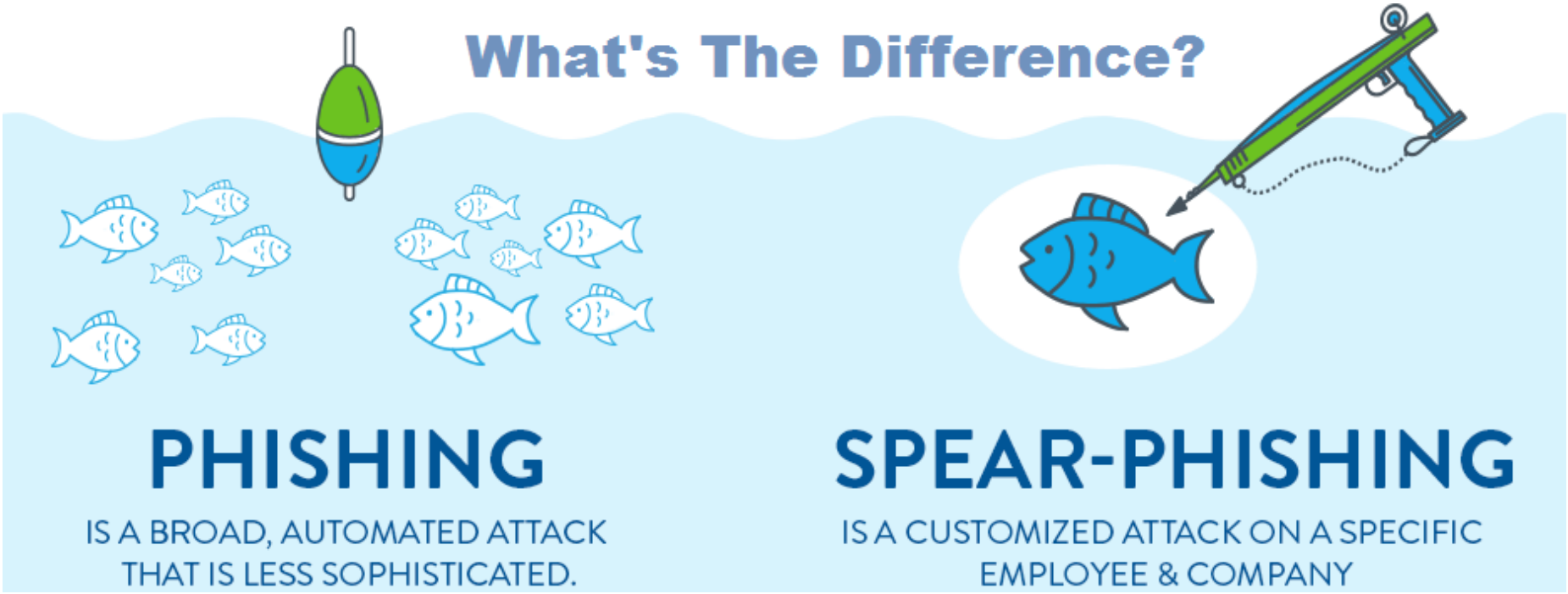

Tom Fielden
Finance Director

Our experience of cyber attack sources: top 5

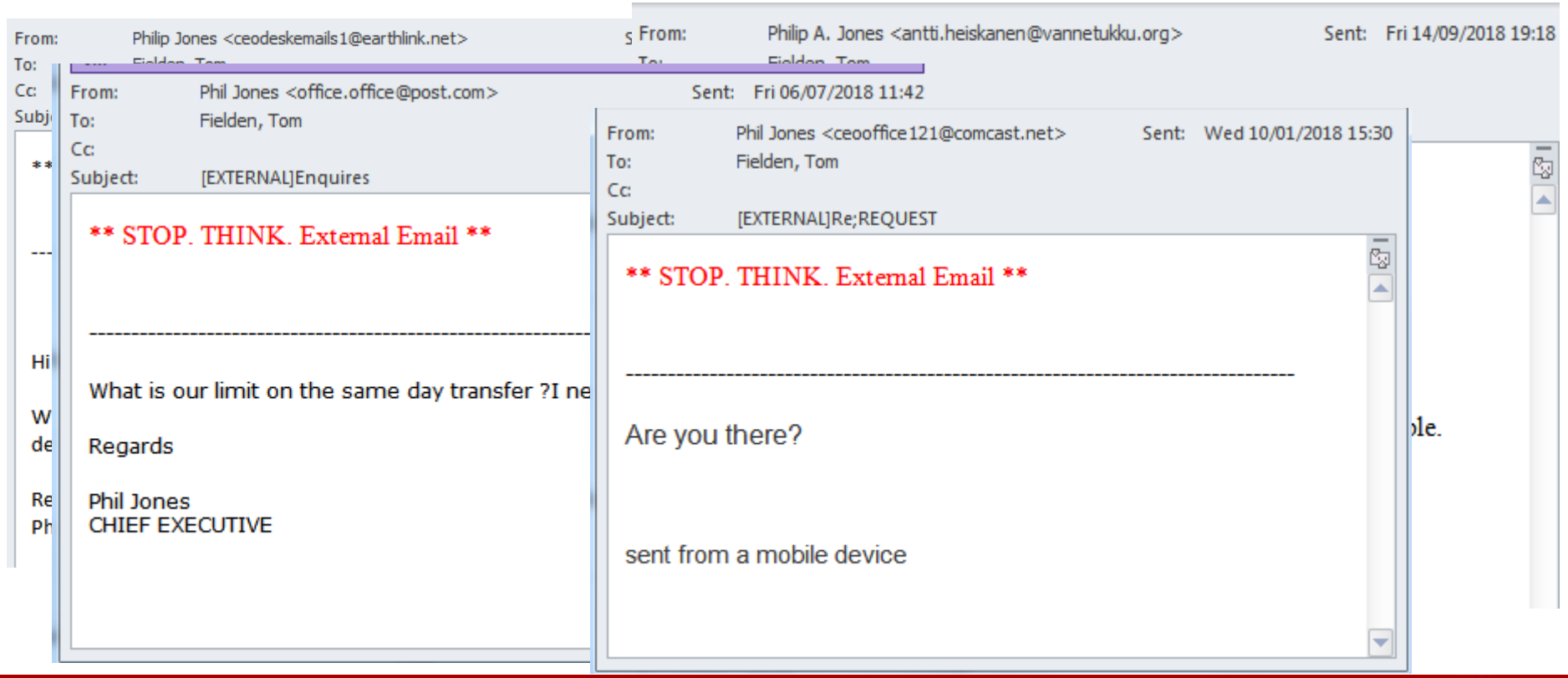


1. UK: 1,627,851
2. USA: 723,346
3. Russia: 637,354
4. Ukraine: 253,558
5. China: 247,808

Attack Modes



Spear Phishing IRL



NORTHERN POWERGRID

LET'S KEEP THE MONSTERS OUT

Be cyber smart and read our new phishing policy

Tackling cyber security together is key.

We've launched a new policy to protect our business, employees and customers from phishing attacks. It sets out what Northern Powergrid is doing to keep the cyber monsters out and your responsibilities in supporting this.

See The Grid or your line manager for a copy.

STOP & THINK. BEFORE YOU LINK.
Be Cyber Smart

We have been working to improve security

- System protections (firewalls, etc.)
- Rigorous processes
- 24x7 monitoring
- Physical security
- Agency support
- Training our people (phishing) 135,000 emails YTD
- Manual work-arounds (Plan B)

National Cyber Security Centre
a part of GCHQ

Conclusions

- Cyber threats are here to stay
- Threat types evolve all the time
- The response much develop with the threat

Keeping our promises
Innovation to drive long-term customer benefit

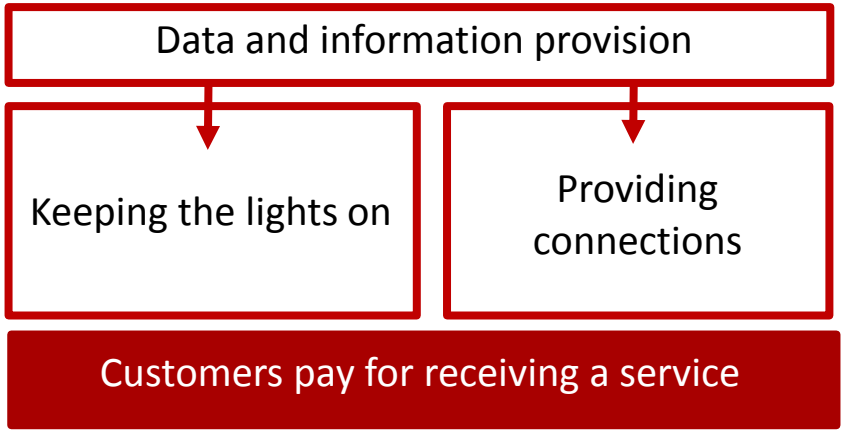



Jim Cardwell
Head of Policy Development

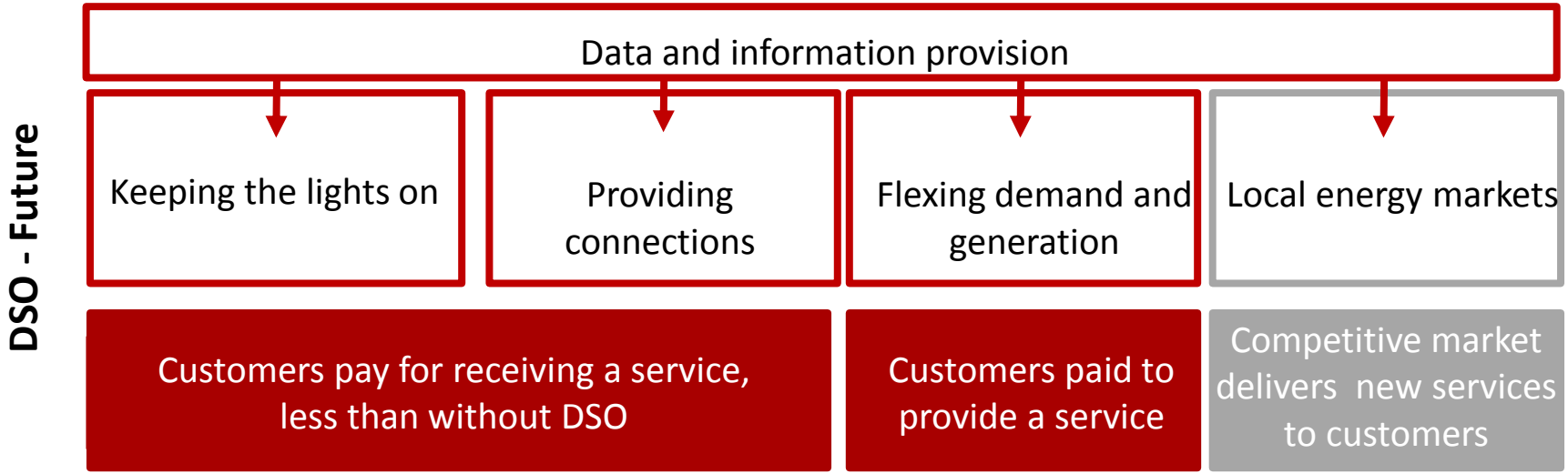
An evolving world

What DSO means for our customers

DNO - Today

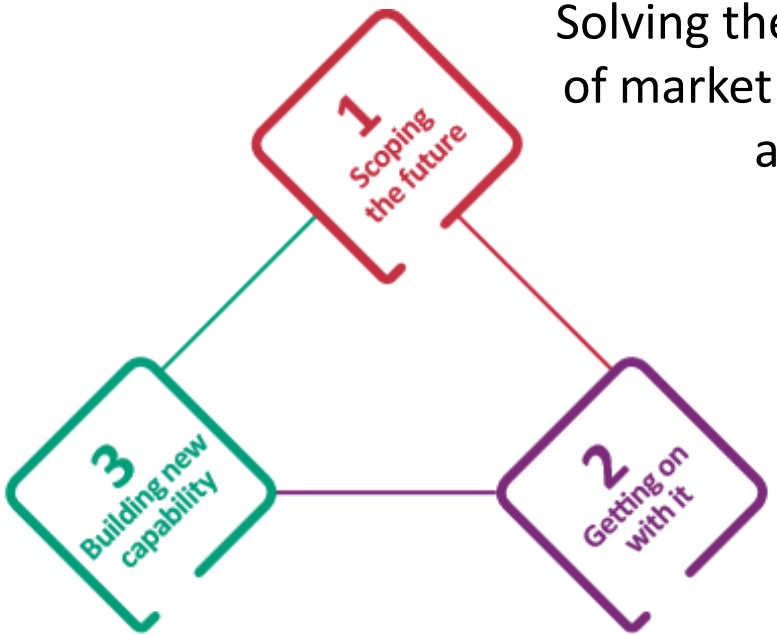


What DSO means for our customers



Our approach to being the DSO

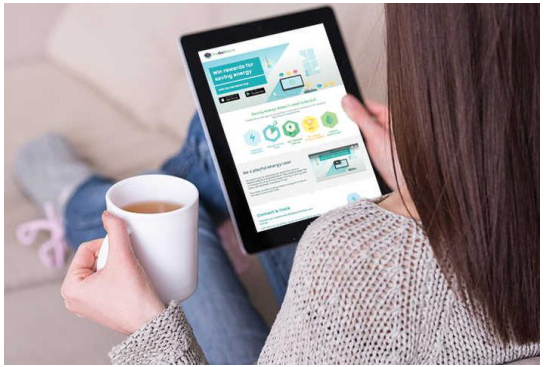
Solving the big open questions of market design and industry architecture



Low regrets steps to implement, demonstrate and learn

Providing new infrastructure and processes

Exploring the future: our innovation portfolio



Future services: our guiding principles

1. Led by our customers' needs

2. Promotes sustainability by being efficient, fair and inclusive, and better for the environment

3. Requires a right-sized regulated business supporting competitive markets for flexibility

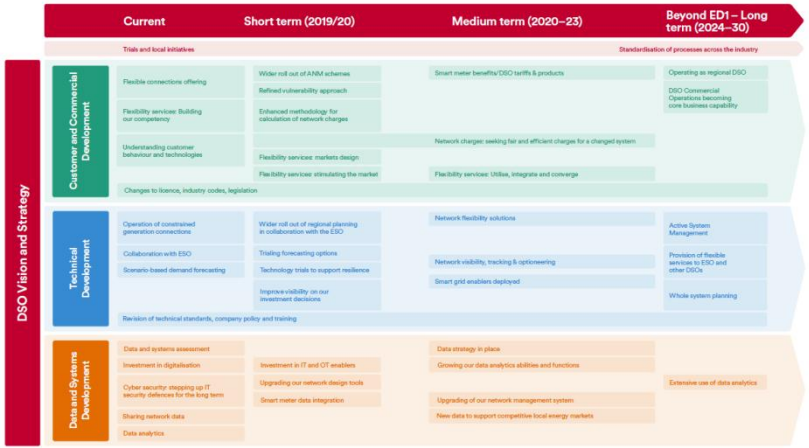
4. Changes to duties that optimise the system as the volume of distributed energy resources increase

DSO V1.0: implementing first phase of customer flexibility

2019-2023
Capacity required for flexibility
up to **14 sites, 16MW**

2023-30
Capacity required for flexibility
Up to ca. 40MW

Our emerging thinking: potential pathways to 2030



- ***Customer and commercial development*** – developing deep and liquid flexibility markets through co-ordinated actions with customers and the sector

- ***Technical development*** – cost effective deployment of well-targeted and well-timed investment smart grids

- ***Data and systems development*** – embracing the opportunities to revolutionise our service delivery

Engagement objectives:

Provide clear information

Ensure opportunity to inform our thinking

Seek challenge

Dialogue welcomed

- ✓ Today – stakeholder validation of our DSO V1.0 thinking
- ✓ Events - **23 January 2019**, DSO event, London
- ✓ Newsletter
- ✓ Email: yourpowergrid@northernowergrid.com

Northern Powergrid Stakeholder Summit – 7 December 2018

DRAFT DISTRIBUTION SYSTEM OPERATOR (DSO) V1.0 DOCUMENT

STAKEHOLDER VALIDATION STAGE

The attached document is a pre-design and well-developed draft of our DSO v1.0 next steps and emerging thinking document. We are seeking and welcome your comments today.

We are planning to complete and sign this off with our executive team next week following the Stakeholder Summit. Our expectation coming in to today is that we will publish prior to Christmas such that all stakeholders, not just those present, may engage with its content prior to further events scheduled for Q1 2019. However, this plan is not set in stone and depends on what you say today.

We hope that we will bring to life some of the content in the discussions today. We would also welcome any comments on Slido or even annotated on this front sheet (or document pages) and placed in the drop box before you leave.

Thank you

NAME

COMMENTS

Is there a particular aspect of DSO that you would like us to explore in a focused engagement session?

Executive Panel Q&A

- **Tom Fielden,** Finance Director
- **Neil Applebee,** Director of People & Customer Service
- **Mark Drye,** Director of Asset Management
- **Geoff Earl,** Director of Safety, Health & Environment
- **Nick Gill,** Operations Director
- **Patrick Erwin,** Policy & Markets Director
- **Rt Hon Lord John Hutton**

The changing energy landscape: What does this mean for our region, partners and stakeholders?

- **Martin Budd,** Hull City Council
- **Francisco Sierra,** Nissan Europe
- **Josh Emden,** IPPR
- **Adam Scorer,** National Energy Action
- **Patrick Erwin,** Northern Powergrid
- **Chair - Carol Botten,** Voluntary Organisations' Network North East

The changing energy landscape – what does this mean for our region, partners and stakeholders?

Carol Botten
Chief Executive,
Voluntary
Organisations'
Network North East

Patrick Erwin
Policy & Markets Director

Adam Scorer
Chief Executive,
National Energy Action

Francisco Sierra
Managing Director of Energy Service, Nissan Europe

Joshua Emden
Research Fellow,
IPPR North

Martin Budd
Environment and Climate Change Strategic Advisor, Hull City Council

Martin Budd
Hull City Council

City Challenges

- Network resilience:
  - heat decarbonisation
  - electric vehicle infrastructure
- Climate adaptation resilience
- Substation space for regeneration
- Role of planning- V2G/EV spaces
- Location of EV energy hubs

Corporate Challenges

- How do we pay for EV infrastructure
- Future proof EV infrastructure
- Time of Use tariffs
- EV fleet and grid balancing

Stakeholder Summit: Unlocking the Energy Future for the North

7 December 2018

THE **ELECTRIC VEHICLE** COULD BE PART OF THE PROBLEM OR THE SOLUTION

Forbes

Oct 6, 2017, 02:39pm

How Electric Cars Could Help The Power Grid Become More Efficient, Less Expensive

A recent analysis from Bloomberg New Energy Finance suggested that electric vehicles could account for half of all new cars sold by 2040. While electric vehicles consume electricity, they can also export power to the grid as mobile energy storage units. An increase in electric vehicle adoption may mean more flexibility for the grid to respond to supply and demand.

The Telegraph HOME | NEWS

Business

Business

Electric car owners could be forced to pay more for peak time charging

Follow

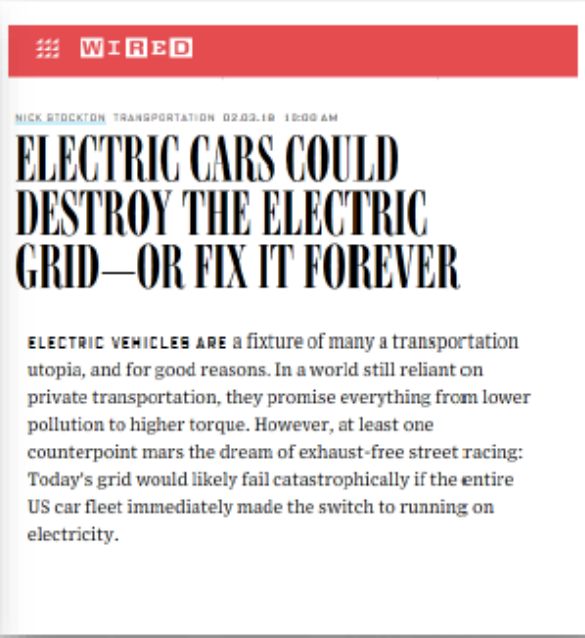
By Jack Terrance

23 JULY 2018 • 3:21PM

Electric car owners who continue to charge their vehicles during the evening peak could be forced to pay more in a bid to encourage off-peak consumption, under new plans put forward by the energy watchdog.

Ofgem said that incentivising drivers to charge their cars in the middle of the night or at other times of low demand could boost the number of vehicles the grid is currently capable of supporting by at least 60pc.

It wants to see so-called "flexible charging" systems that would allow cars to automatically draw power from the grid at times of excess capacity rather than immediately after being plugged in.



WIRED

NICK STOCKTON TRANSPORTATION 02.03.18 10:00 AM

ELECTRIC CARS COULD DESTROY THE ELECTRIC GRID—OR FIX IT FOREVER

ELECTRIC VEHICLES ARE a fixture of many a transportation utopia, and for good reasons. In a world still reliant on private transportation, they promise everything from lower pollution to higher torque. However, at least one counterpoint mars the dream of exhaust-free street racing: Today's grid would likely fail catastrophically if the entire US car fleet immediately made the switch to running on electricity.

ELECTRIC VEHICLE USED BATTERIES WILL DISRUPT STATIONARY STORAGE

pv magazine

Second-life EV battery market to grow to $4.2 billion by 2025

Circular Energy Storage, a London-based research and consulting group, reports a strong business case for reconstituted electric vehicle batteries for energy storage applications. As the EV and static storage system markets grow rapidly, synergies could be a useful tool for continued cost optimization.

AUGUST 3, 2018 MARIAN WILLUHN

Bloomberg Opinion

View

China's Giving Batteries a Second Life

It's a simple idea. But it may have profound consequences.

China is hoping to become the Detroit of the battery-powered electric-vehicle industry. Sales of EVs are expected to reach 1 million this year alone, and the government has big plans for expansion. But this welcome trend comes with a perplexing side effect: China is now using up more lithium-ion batteries than anywhere else in the world. What to do with them?

Throwing those batteries away could be environmentally hazardous. Recycling them, meanwhile, turns out not to be very profitable. The solution China has hit on is simple – but may have profound consequences for the environment.

the japan times

Retired electric vehicle batteries find a second life chilling beer and grilling sausages

MELBOURNE/TOKYO – The first batches of batteries from electric and hybrid vehicles are hitting retirement age, yet they aren't bound for landfills. Instead, they'll spend their golden years chilling beer at convenience stores in Japan, powering car-charging stations in California and storing energy for homes and grids in Europe.

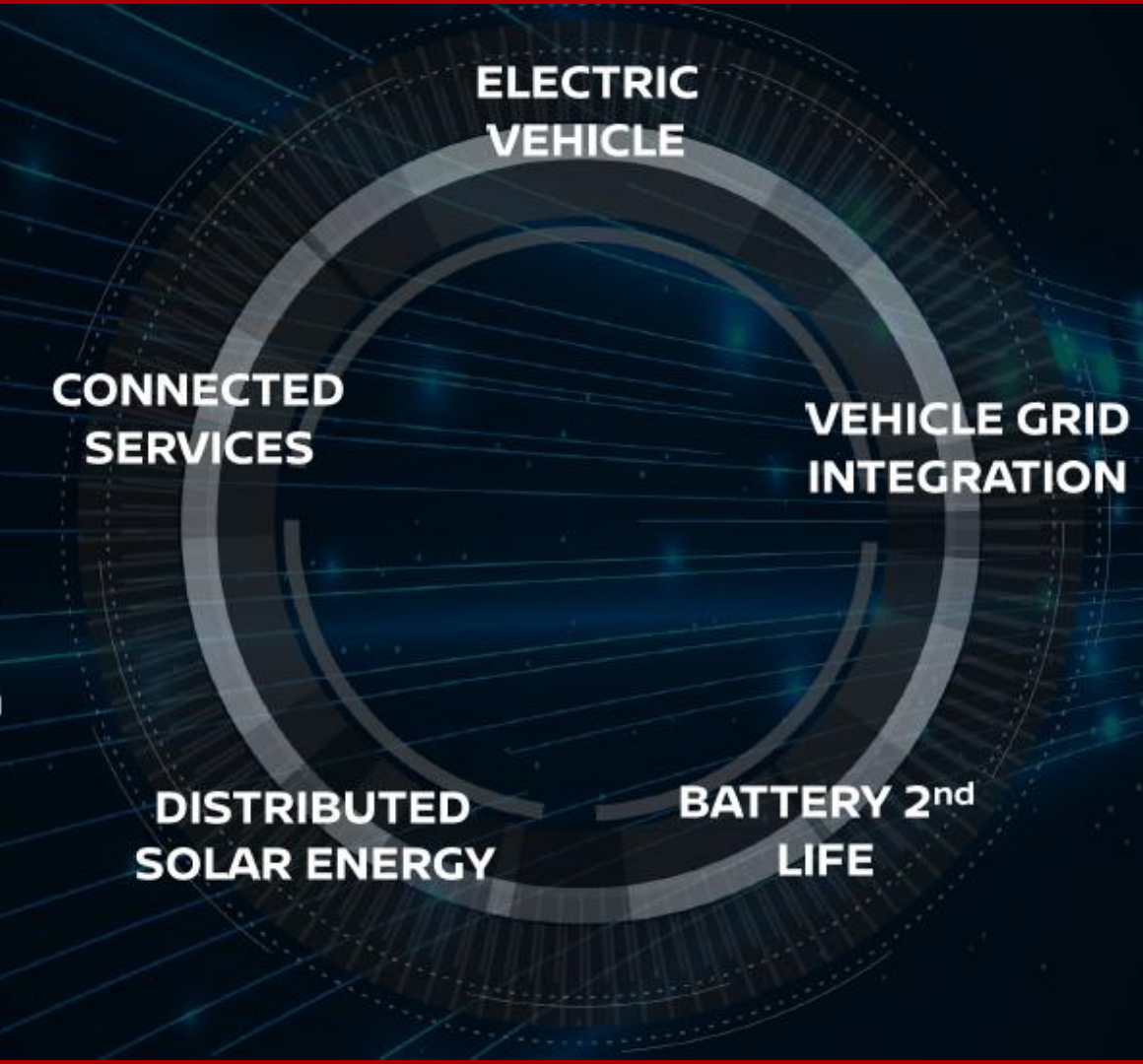
Lithium-ion car and bus batteries can collect and discharge electricity for another seven to 10 years after being taken off the roads and stripped from chassis — a shelf life with significant ramifications for global carmakers, electricity providers and suppliers of raw materials.


The Reality of the
NISSAN Electric Eco-System
TRANSFORM THE
WAY WE
DRIVE
TRASFORM THE
WAY WE
LIVE

TRANSFORM THE WAY WE LIVE

Being the leader of electric mobility means **accepting the responsibility to go beyond the car.**

We need to understand our role in the lives of our customers and in **making a Better World.**




NISSAN
Innovation that excites
NISSAN INTELLIGENT MOBILITY
HOW DO WE MAKE
PROGRESS?

INTEGRATION OF VEHICLES IN THE GRID

INTEGRATION OF VEHICLES IN THE GRID

DISTRIBUTED SOLAR AND CIRCULAR ECONOMY


NISSAN
Innovation that excites
NISSAN INTELLIGENT MOBILITY
THANKS
FRANCISCO CARRANZA
Managing Director Nissan Energy

Adam Scorer

National Energy Action

Skills and workforce transition in the North of England

Joshua Emden
j.emden@ippr.org

The Progressive Policy Think Tank

Context

- Decarbonising the UK's economy is an urgent necessity if we are to tackle the threat of climate change and stand a chance of limiting global warming to 1.5C

- This is particular relevant for the North of England where the energy sector is one of its "prime capabilities"

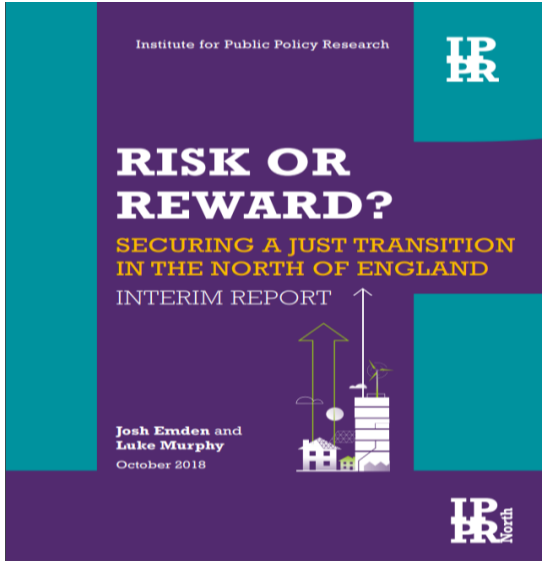
- However, decarbonisation, automation and disruptive technologies are all fundamentally changing the shape of the workforce in the North's energy sector

- To ensure that the North continues to be a leader in the energy sector, a just transition strategy is needed to support workers at risk of losing their jobs whilst providing the skills of the future

Key findings of our interim report (1)

- Decarbonisation could lead to the creation of 46,000 jobs in the power sector alone by 2030 but also lead to approximately 28,000 jobs being lost in the North of England

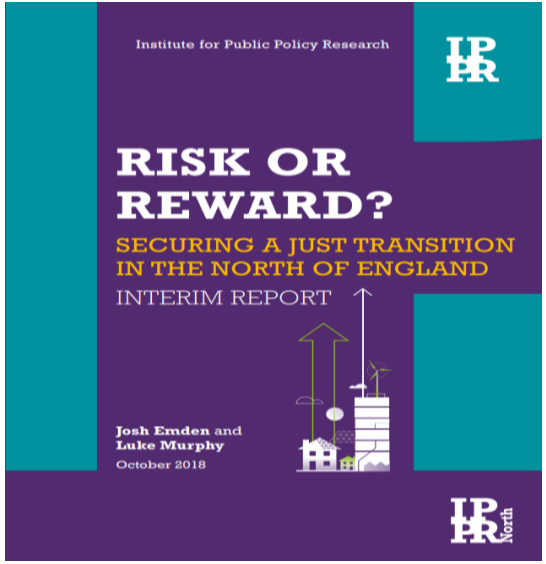
- Workforce transition from carbon-based generation to low-carbon energy is possible. However, there is no government plan either in the Industrial Strategy or Clean Growth Strategy to support these workers



Key findings of our interim report (2)

- Government plans for the low carbon energy sector are also not ambitious enough which further limits transition opportunities

- The skills system is ill-equipped to either retrain workers in carbon-based energy sectors or provide graduates with the right kinds of skills to make them employable



Key findings of our interim report (3)

1. **Greater long-term policy certainty** for the low carbon energy sector to ensure the growth opportunities are realised in the first place.

2. **Embedding just transition** into decarbonisation, including i**nvolving trade unions as critical social partners** and to ensure that workers in carbon-based generation are given the opportunity to find new high quality, well paid employment in the low carbon energy sector and beyond.

3. **Reforming an ill-equipped skills system**, both in terms of adult training and retraining for those working in carbon-based generation but also skills and appropriate apprenticeships for graduates.

4. **Providing certainty on Brexit**, particularly, though by no means exclusively, on Euratom as well as any restrictions on freedom movement.

Key takeaways

- Long-term policy certainty is crucial in helping businesses to make plans for the future of their workforce

- The language of just transition must be embedded at every level of government. It must also be made clear that high quality jobs are entirely compatible with policy objectives to increase productivity

- There is a huge opportunity for a just transition in the low carbon sector given that the demand for skills is likely to grow.

- However, this can only be achieved by providing incentives for proper re-training of existing workers and for taking on and training new graduates and apprentices

Next steps – research timelines

- Thursday 29th November: Manchester
- Thursday 29th November: Leeds
- Friday 30th November: Durham

- **w/c 17th December: Dissemination of survey on job quality, reasons for hard-to-fill vacancies and future skills.**

- **Please email if you would like to receive the survey to fill in or to pass it on**

- First draft: January 2019
- Final report publication: Early March 2019


TIME FOR QUESTIONS
12
1
2
3

Summary and next steps

Siobhan Barton
Head of Stakeholder Relations

Active Engagement

Annual stakeholder report

Emerging thinking:
Distribution System Operator (DSO)

Sli.do

Feedback forms

Filming (vox pops)

On-going
engagement plan

Workshops 3 - 4pm

Workshops	Lead
Workshop 1 - ***Herringbone Suite, Floor 1*** **Supporting our region's growth and decarbonisation: investing in a smart, sustainable network**	Mark Drye Mark Nicholson Issy Middleton Jim Cardwell Andrew McKenna
Workshop 2 - ***Denim Room, Floor 2*** **Electric Vehicle's: Charging ahead**	Nick Gill Geoff Earl Francisco Sierra (Nissan) Iain Miller Phil Jagger
Workshop 3 - ***Tailors Suite, Floor 1*** **Skills: developing the northern energy economy's future workforce**	Tom Fielden Andy Bilclough Glen Hodges Josh Emden (IPPR)
Workshop 4 - ***Cotton Room, Floor 1*** **A socially inclusive transition to a smart energy future: what could this mean for Northern Powergrid and our customers**	Siobhan Barton Anne-Claire Leydier Patrick Erwin Adam Scorer (NEA)