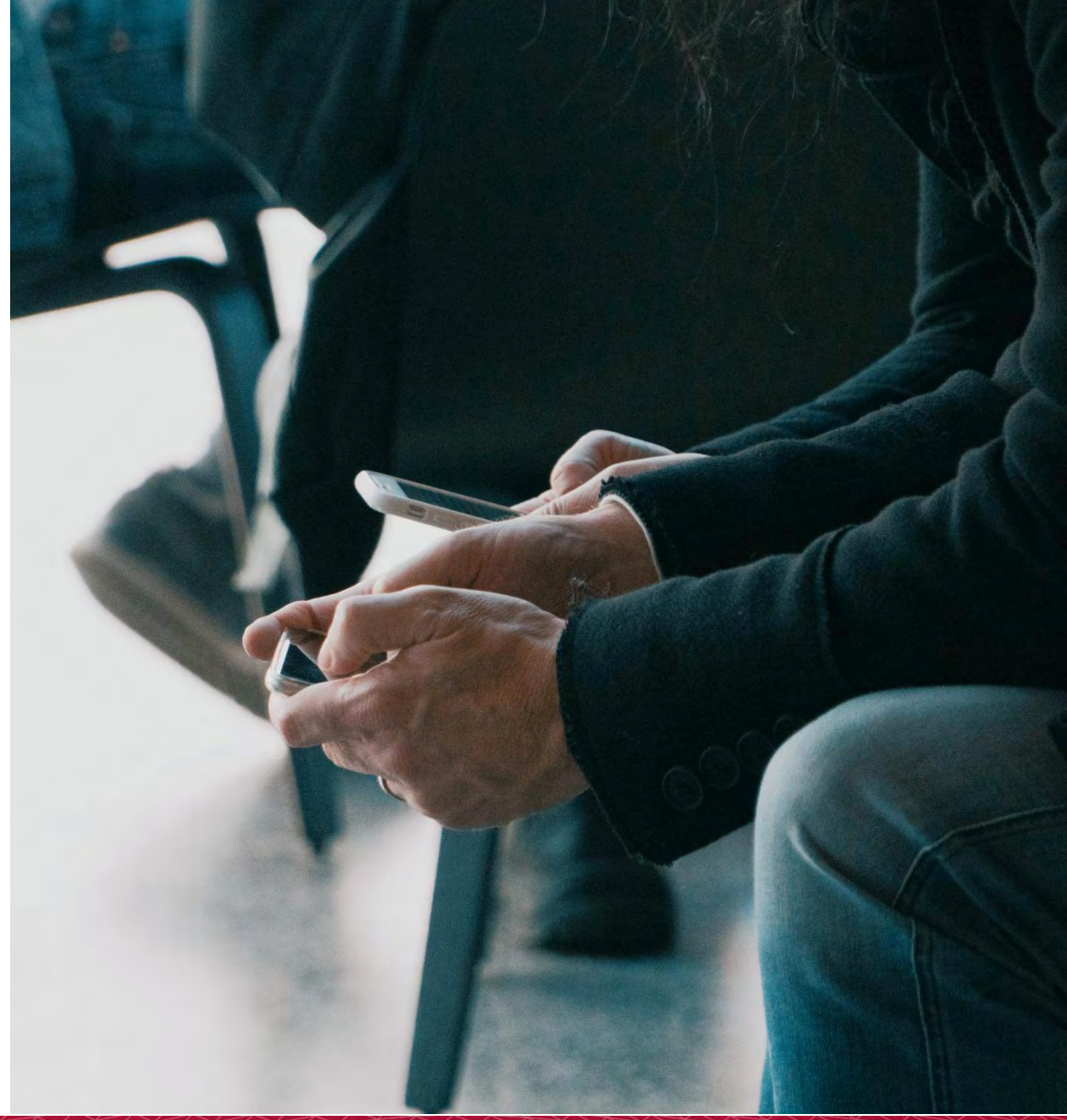
Northern Powergrid

Creating a sustainable energy future for the North

Welcome



Patrick Erwin
Policy and Markets Director

Creating a sustainable energy future for the North

The summit is our flagship annual stakeholder event and marks the start of our business planning cycle

It also kicks off our engagement programme for the next regulatory period (ED2) that runs from April 2023 to March 2028

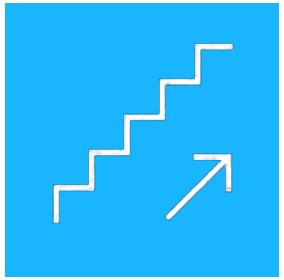
What does success look like?

- You leave with a good understanding our role as a key enabler of regional decarbonisation
- We leave with a good understanding of your needs and plans
- You are confident about our transition to Distribution System Operator plans for north Lincolnshire, the North East and Yorkshire
- You understand our wider business plans and know how you can contribute to help us produce the best possible plan for ED2

Safety and accessibility

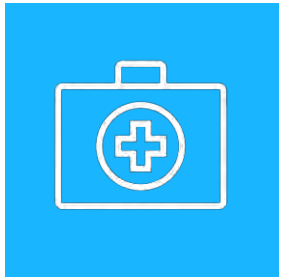
Fire

- No fire alarm test planned
- If alarm sounds:
  - Exit by the nearest door – follow routes identifiable by green and white signage
  - Head to fire assembly point – paved area in rear courtyard
  - Use green break glasses to assist emergency evacuation



Accessibility

- Lifts are available to all floors
- Disabled lift available to rear side of Cloth Hall Court
- Accessible doors situated off accessible lift, most doors not assisted



First Aid

- First Aid available at reception
- See First Aid notices for details of onsite first aiders

Wi-fi and conference app

Wi-fi access:

Network name: Visitor WiFi

Password: L66D5b79WC

Downloading conference App:

- Go to App Store or Google Play
- Search for **Northern Powergrid Summit 19**
- Install app and follow log-in instructions
- Get help and advice on app installation at registration desk
- Conference app also available for general use on iPads throughout conference and afternoon workshops

Agenda – morning

Sessions	Lead	Timings
Welcome address and scene setting	Patrick Erwin	10:00 – 10:05
Northern Powergrid Keynote address	Phil Jones	10:05 – 10:30
Guest keynote A climate for change	Dr Gabrielle Walker	10:30 – 10:55
Q & A session	Phil Jones Dr Gabrielle Walker	10:55 – 11:15
Morning break Exhibition of innovation and decarbonisation projects		11:15 – 11:45
Expert panel Perspectives on decarbonisation priorities across the region	Carol Botten	11:45 – 12:30
Lunch Exhibition of innovation and decarbonisation projects		12:30 – 13:15

Agenda – afternoon

Sessions	Lead	Timings
Lunch Exhibition of innovation and decarbonisation projects		12:30 – 13:15
Introduction Afternoon workshops	Patrick Erwin	13:15 – 13:30
Afternoon workshops Round 1		13:30 – 14:30
Afternoon workshops Round 2		14:30 – 15:30
Summary Learning and next steps	Patrick Erwin	14:30 – 16:00
Summit close		16:00

Afternoon workshops

Round 1 – 13:30 – 14:30	Round 2 – 14:30 – 15:30
Balancing competing priorities: Getting flexibility right in the energy landscape	Cotton Room First floor
Zero carbon transport: How to start your journey	Denim Room Second floor
Overnight decarbonisation: Quick wins for you and your organisation	Merchants Hall Ground floor
Zero carbon: A socially inclusive transition	Tweed Suite Second floor
Forecasting the impact of net zero: Supporting regional decarbonisation with future energy scenarios	Wool Room Second floor
Planning for our region: Exploring energy priorities across the North	Corduroy Room Fourth floor

Guest speakers

Dr Gabrielle Walker
Strategist, author and academic

Carol Botten
VONNE

Adam Scorer
National Energy Action

Andrew Brooks
Lincolnshire County Council

Tom Knowland
Leeds City Council

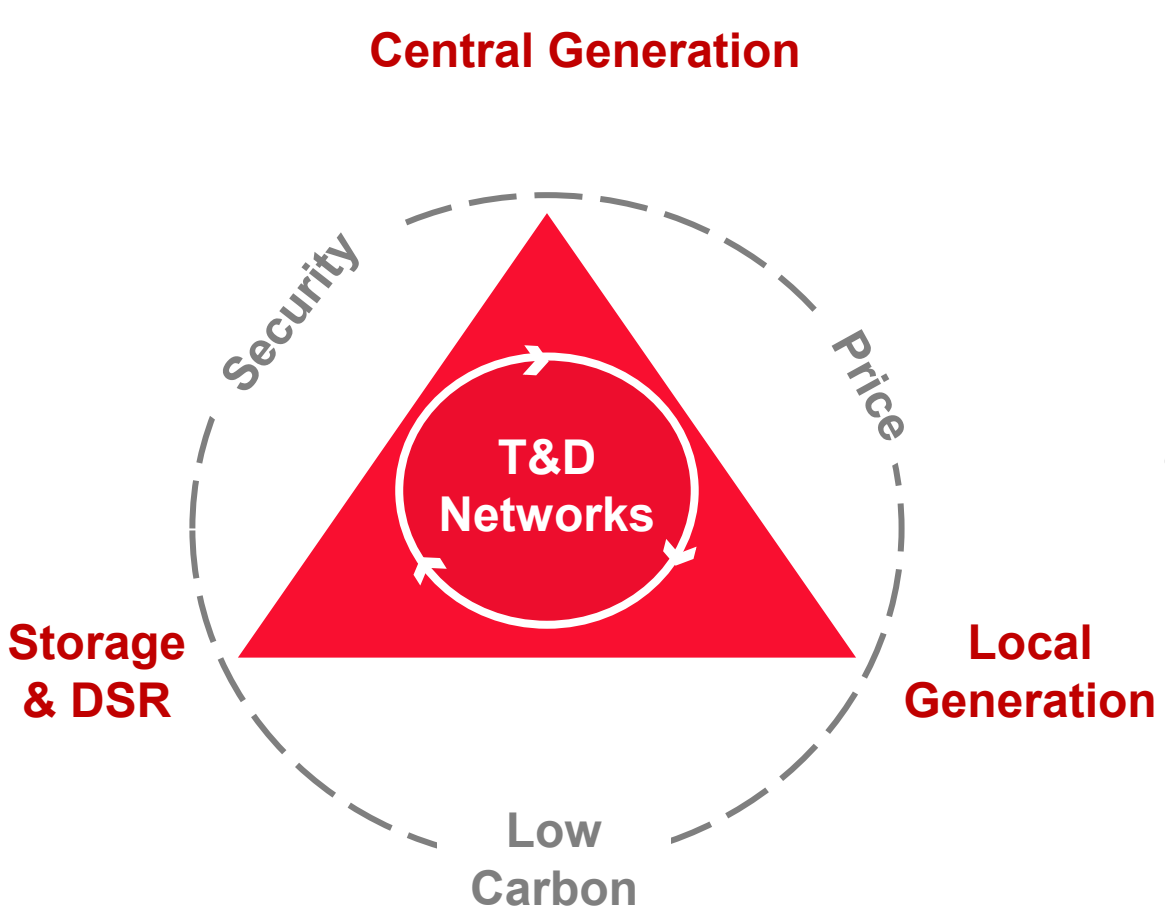
Hannah Richmond
CBI

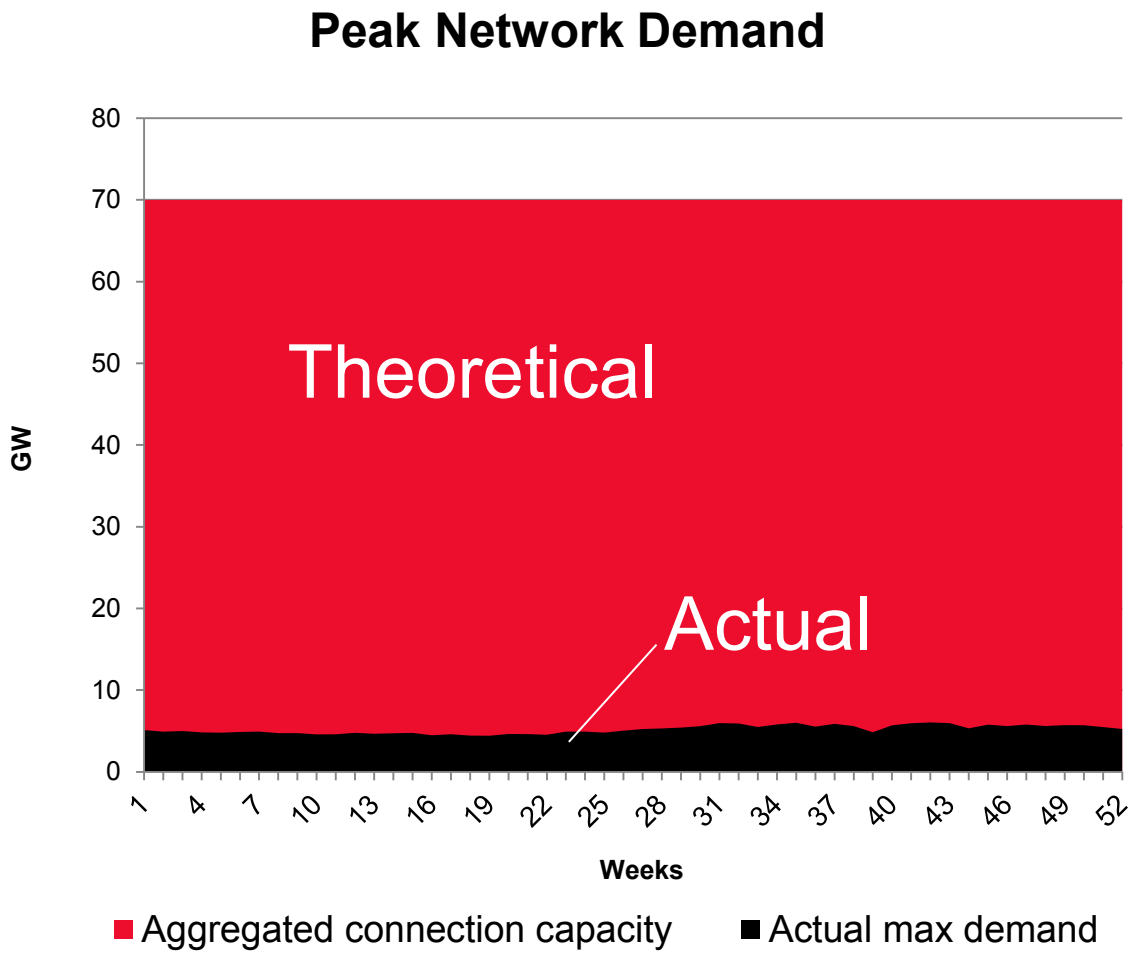
Moira Nicolson
Ofgem

Northern Powergrid
Keynote address

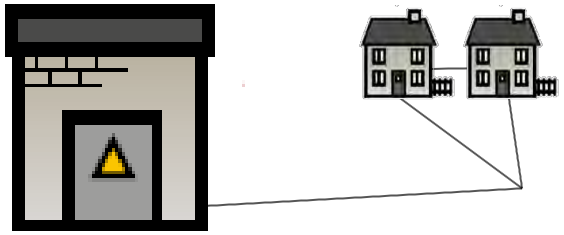
Phil Jones
Chief Executive Officer – Northern Powergrid

Networks are set to take centre stage





Activating the Smartgrid

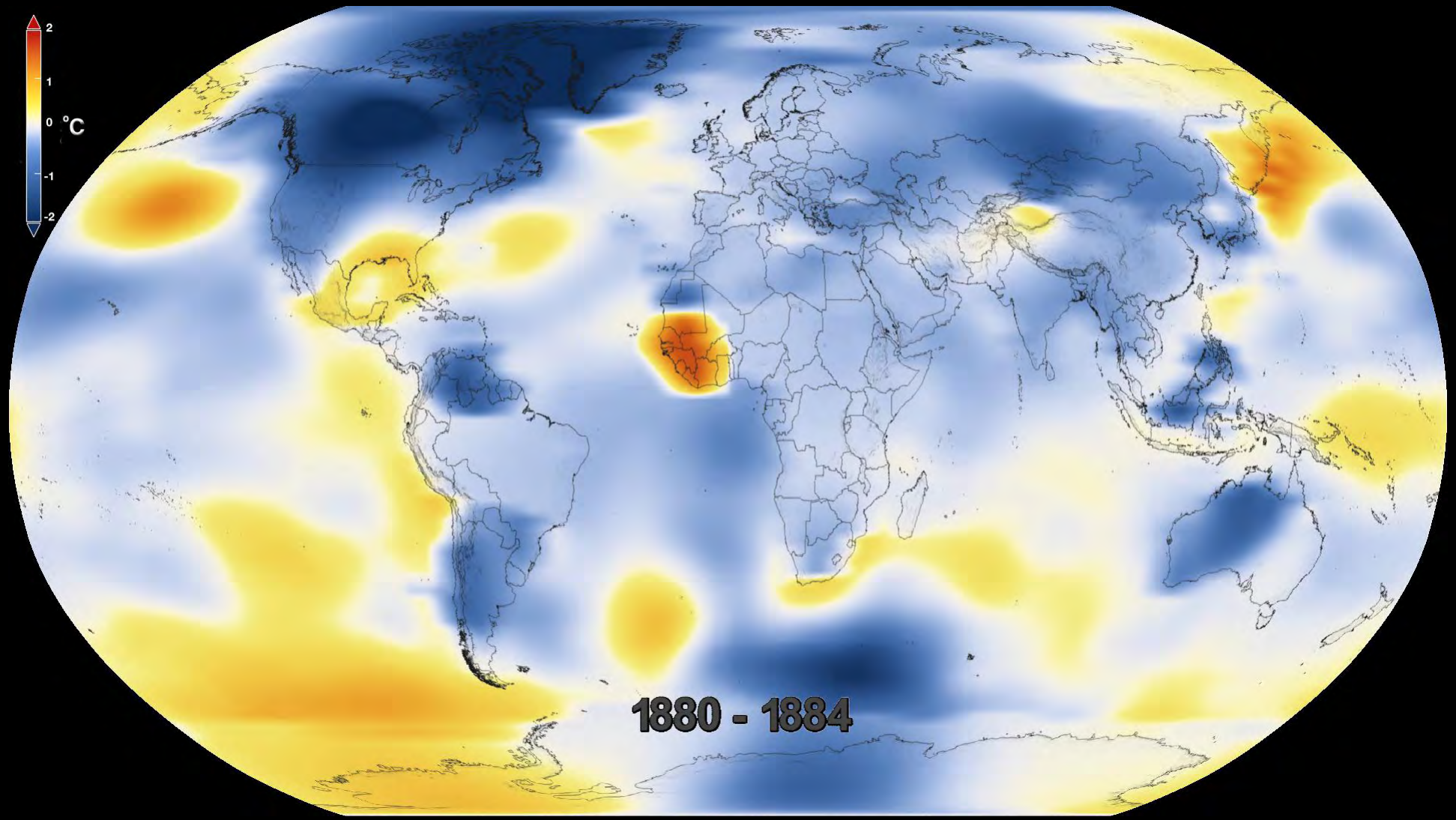


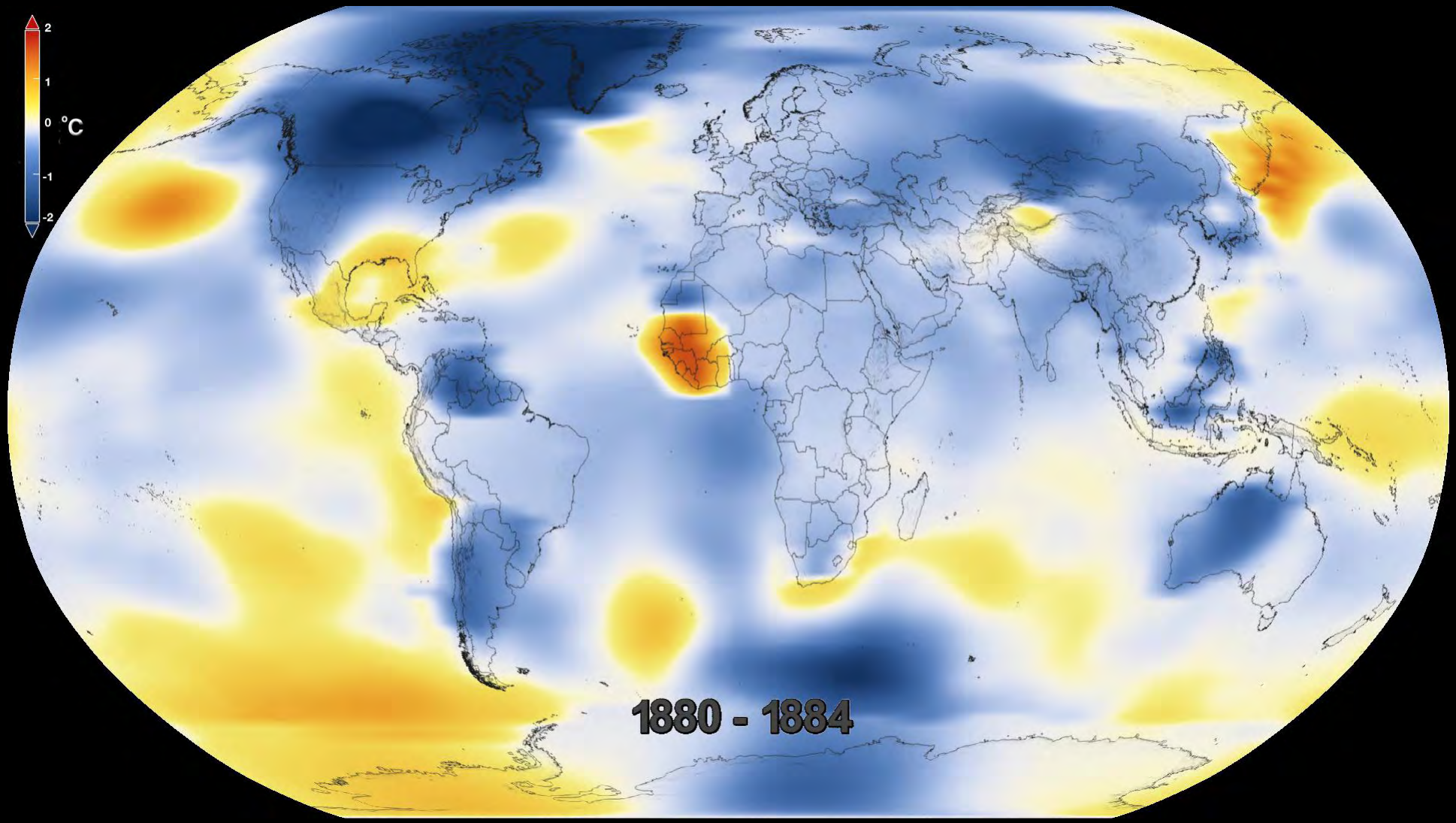
	Primary (town) networks	Local (street) networks
1960s	✓ Locally managed circuit breakers	✓ Dumb, 'fit and forget' passive assets
1970s	✓ Post-fault circuit re-closing	-
1980s	✓ Remote operation of circuit breakers ✓ Monitoring one-way power flow ✓ Low bandwidth communications	-
1990s	✓ Equipment rationalisation driven by electronics	✓ Temporary LV fault management devices
2000s	✓ Remote reconfiguration post-fault	✓ Low bandwidth HV remote control
2015 - 2023 (ED1)	✓ **Self-healing networks** ✓ **Real-time capacity management** ✓ **Two-way power flow monitoring** ✓ **Advanced substation control devices** ✓ **Wideband flexible communications (IP-based)**	✓ **Time of use demand data** ✓ **Remote monitoring of LV circuit power flow** ✓ **Automated control of voltage** ✓ **Fault prediction and smart "fuses"** ✓ **Wideband communications** ✓ **Harvesting network data from existing HV devices**

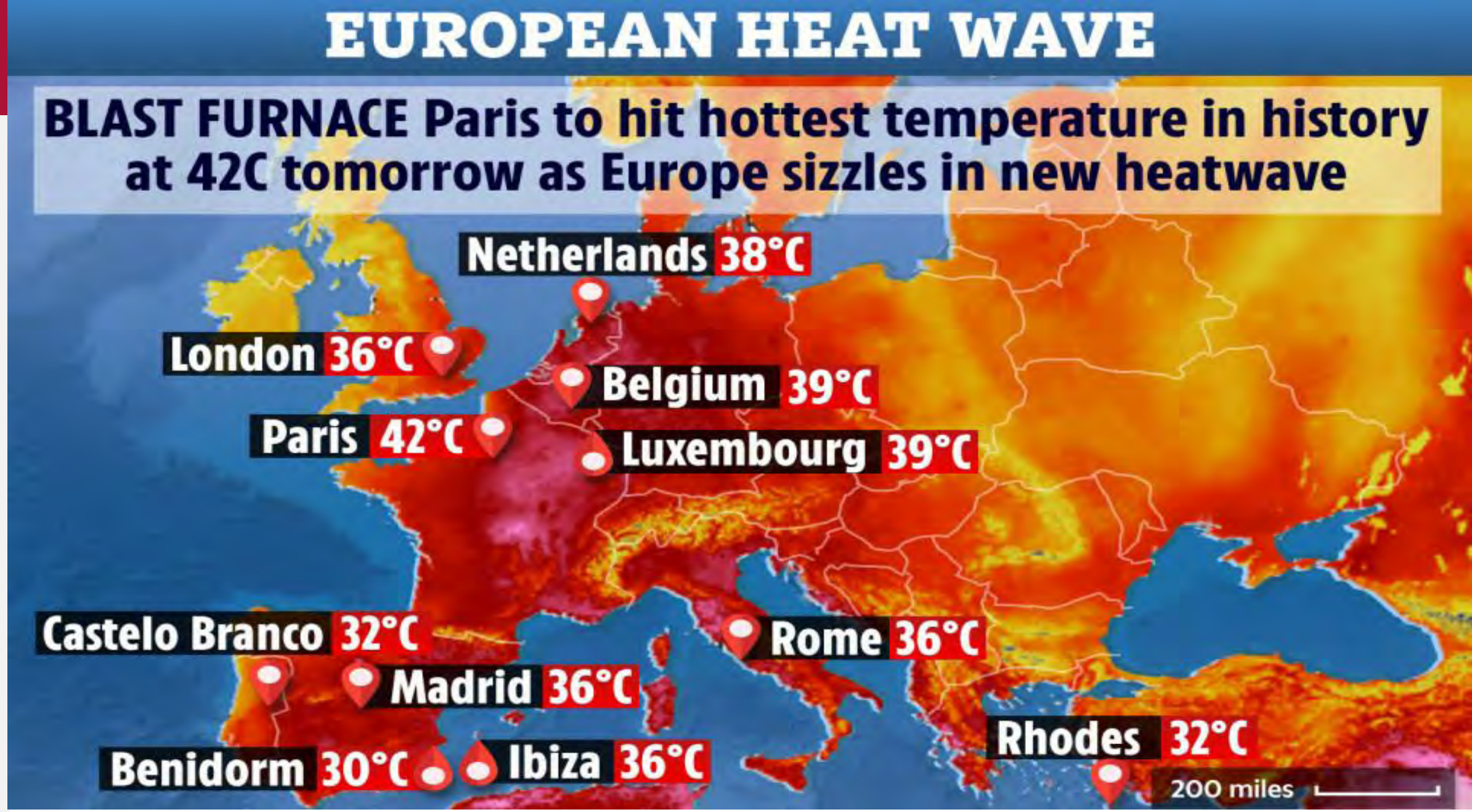
!!! INCREASING CYBER RISK !!!

Guest keynote
A climate for change

Dr Gabrielle Walker
Strategist, author and academic

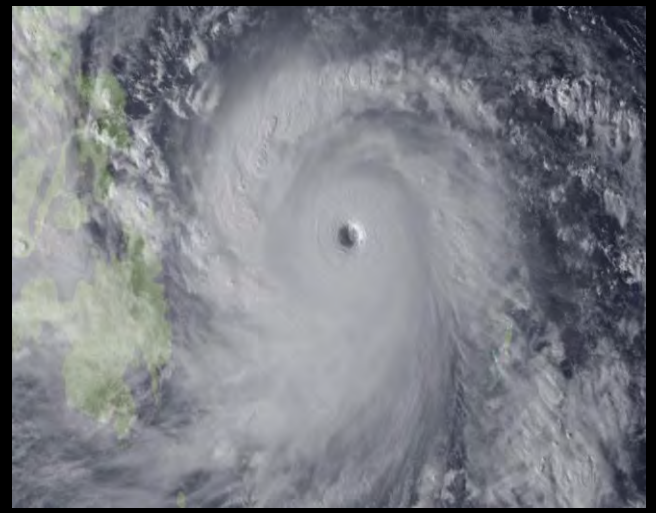

2
1
0
°C
-1
-2
1880 - 1884


2
1
0
°C
-1
-2
1880 - 1884

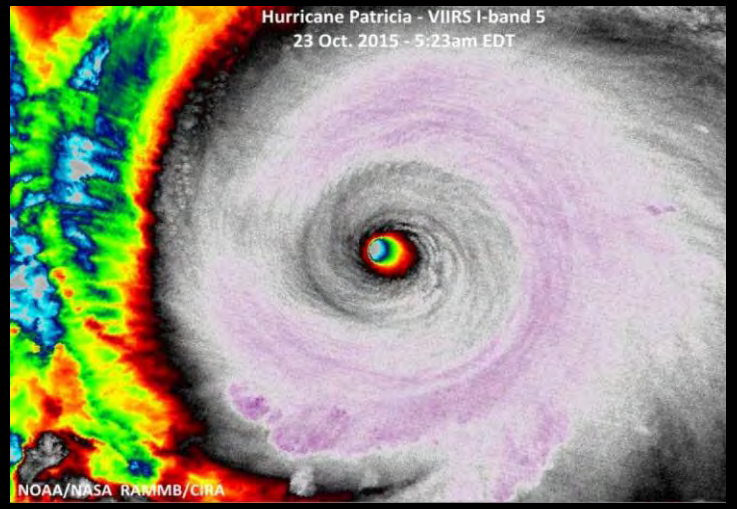

EUROPEAN HEAT WAVE
BLAST FURNACE Paris to hit hottest temperature in history at 42C tomorrow as Europe sizzles in new heatwave
Netherlands 38°C
London 36°C
Belgium 39°C
Paris 42°C
Luxembourg 39°C
Castelo Branco 32°C
Rome 36°C
Madrid 36°C
Rhodes 32°C
Benidorm 30°C
Ibiza 36°C
200 miles


NIKE
ANDOLAS

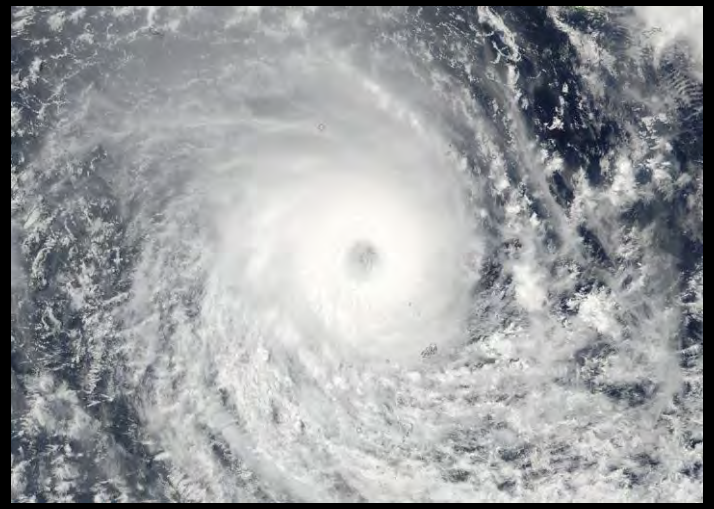

Florida
Grand Bahama
Great Abaco



Typhoon Haiyan, Philippines 2013
Strongest tropical storm ever recorded in Eastern Hemisphere



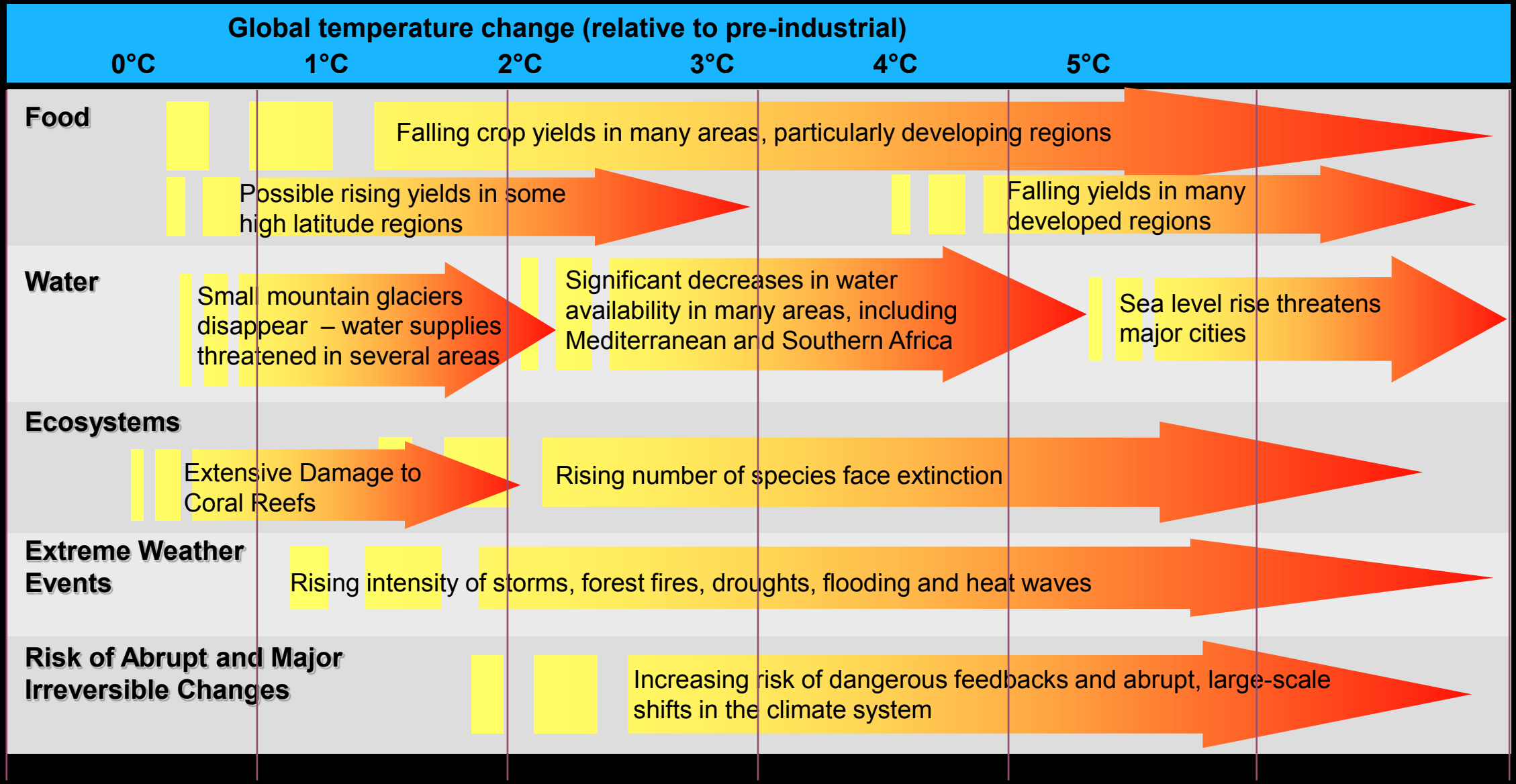
Hurricane Patricia, Mexico 2015
Strongest tropical storm ever recorded in Western Hemisphere



Cyclone Winston, Fiji 2016
Strongest tropical storm ever recorded in Southern Hemisphere


CREDIT LYONNAIS
CREDIT
LYONNAIS
le TOUR de France 2005
Discovery
CHANNEL
Giro

Projected impacts of climate change



- **4˚C warming** gives losses to assets of **$4.2 trillion** in present value terms
- Equivalent to total value of all the world's listed oil and gas companies

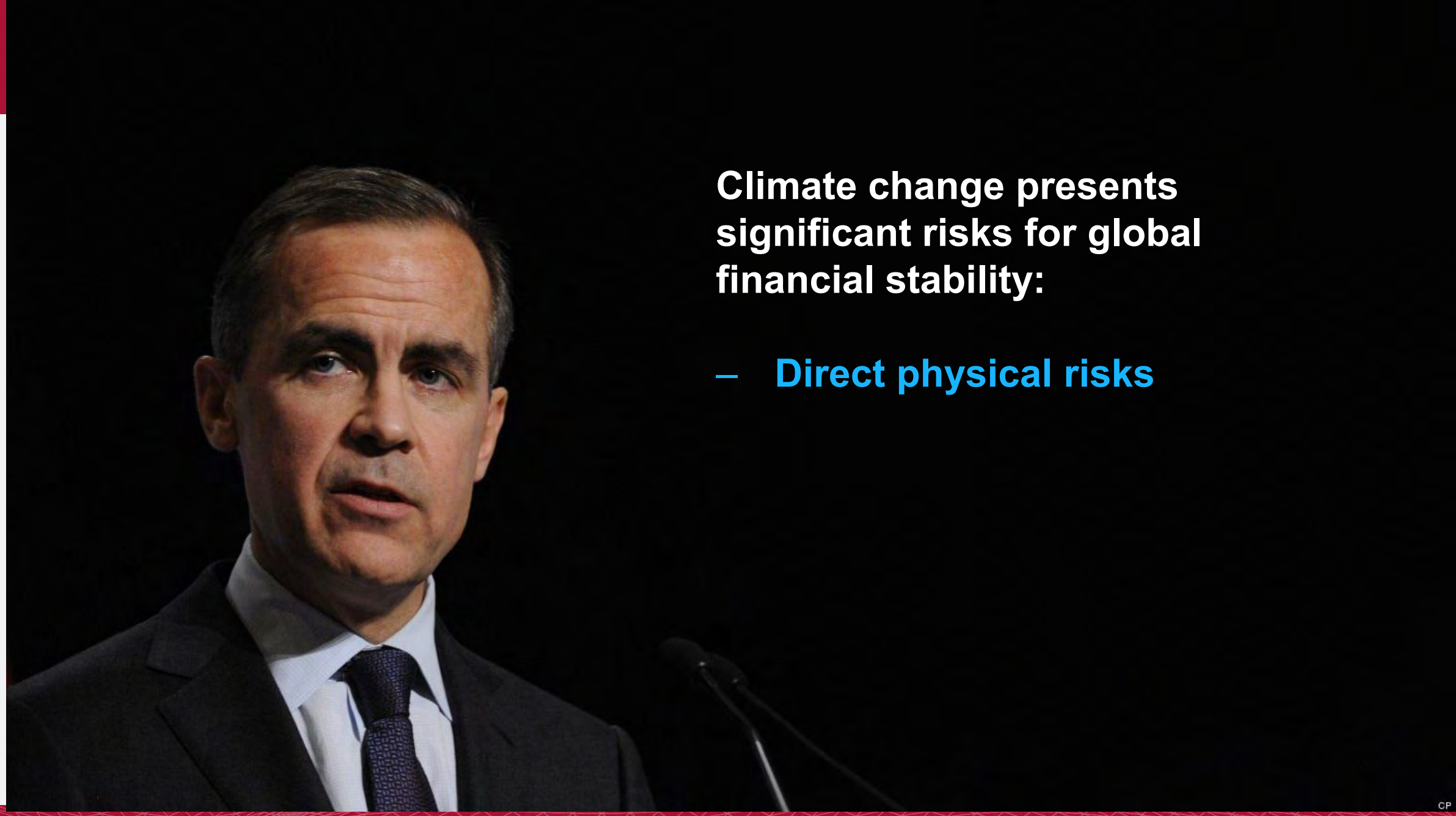
"We are following a 6 degree trajectory every year in a very loyal way. Even schoolchildren know this will have catastrophic implications for all of us"

Fatih Birol
Chief Executive, IEA

Climate change presents significant risks for global financial stability:

- Direct physical risks
- Liability risks
- Risks from transition costs

CP



Climate change presents significant risks for global financial stability:

– **Direct physical risks**

Climate change presents significant risks for global financial stability:

- Direct physical risks
- **Liability risks**


MoMA

Climate change presents significant risks for global financial stability:

- Direct physical risks
- Liability risks
- **Risks from transition costs**

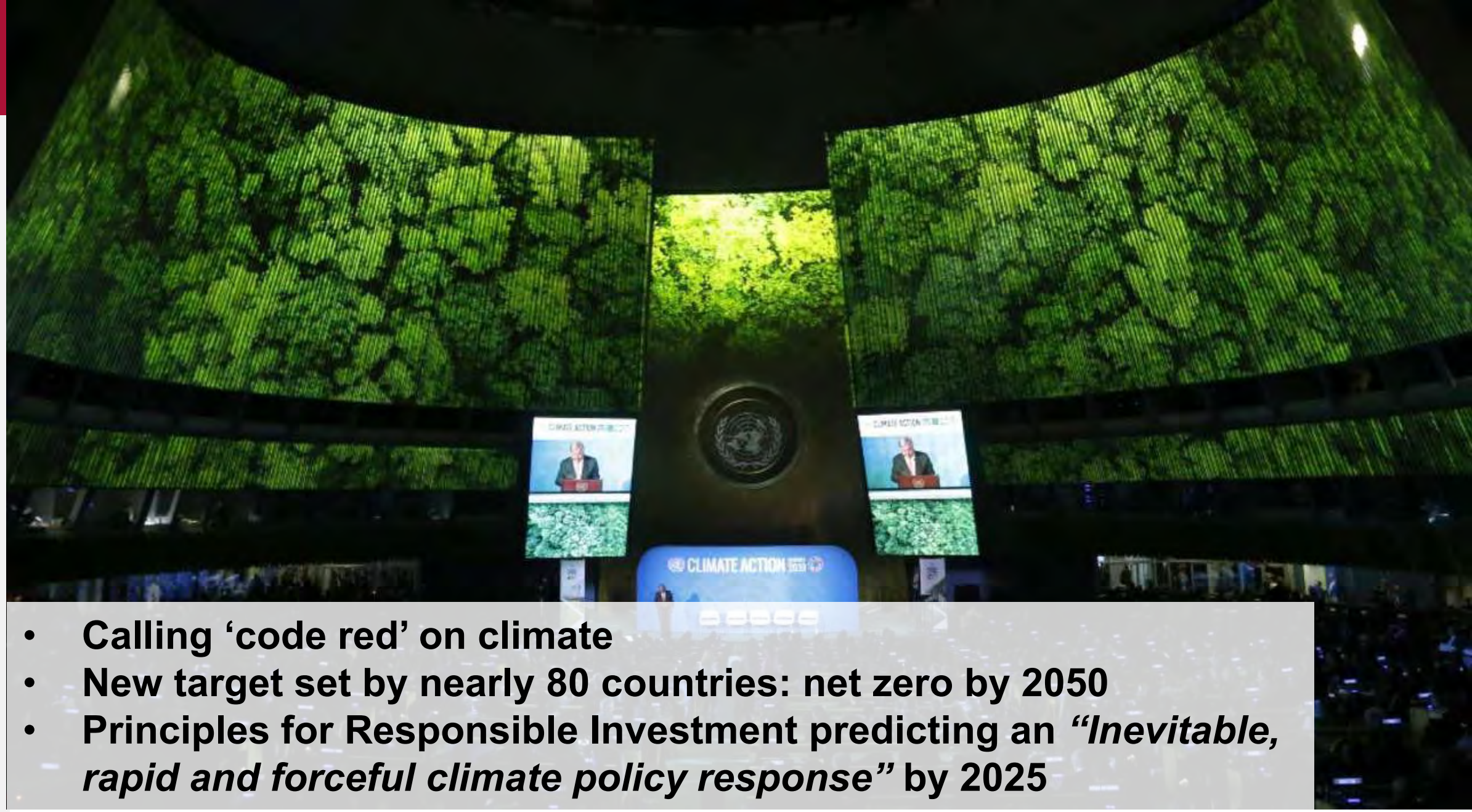

HITACHI

June 2019: Companies with a combined market capitalization of more than $9.3 trillion supporting TCFD recommendations on climate-related financial disclosure


A global approach to
sustainable
finance
#SustainableFinanceEU
European
Commission


SKOLSTREJK
FÖR
KLIMATET

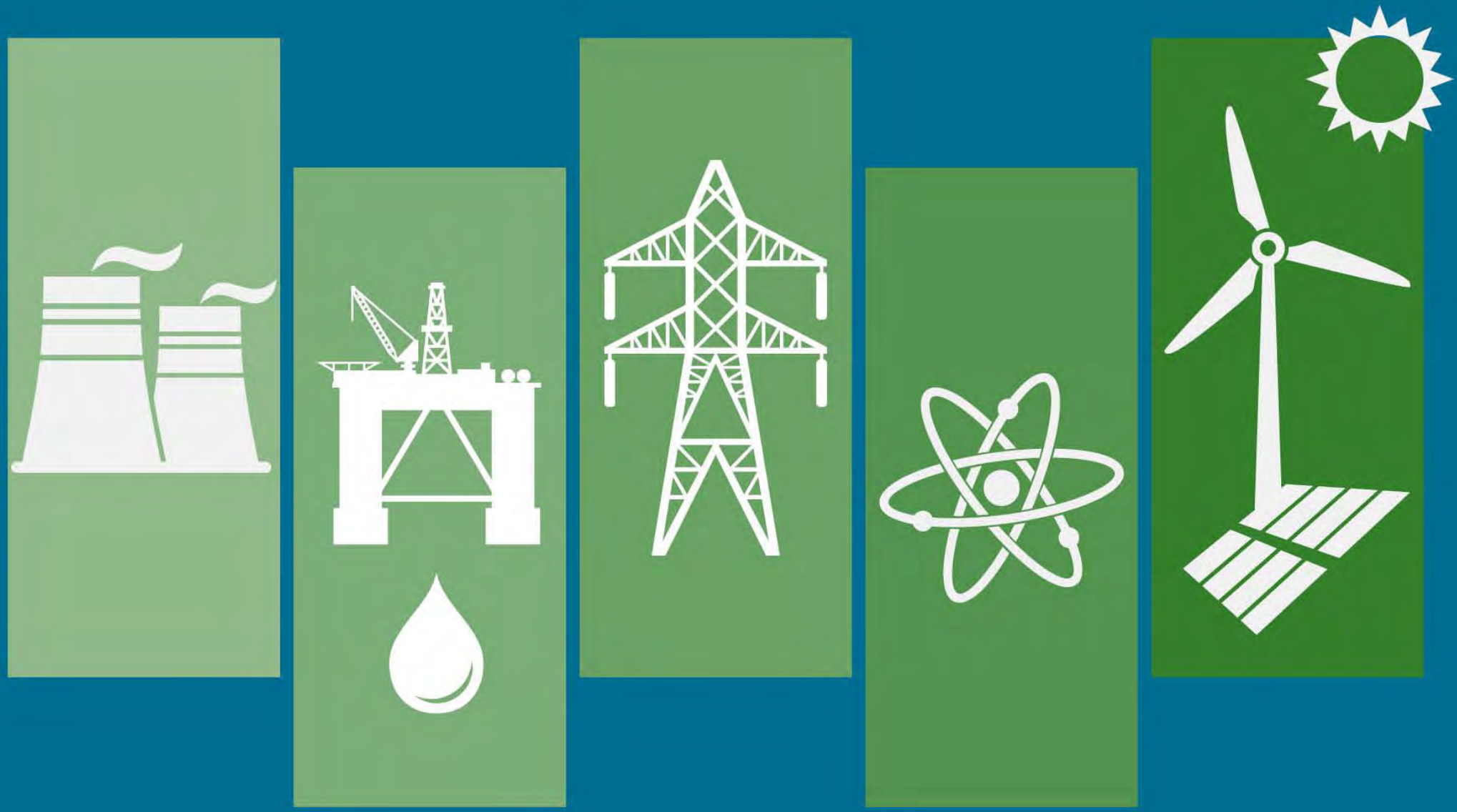

THIS IS AN EMERGENCY

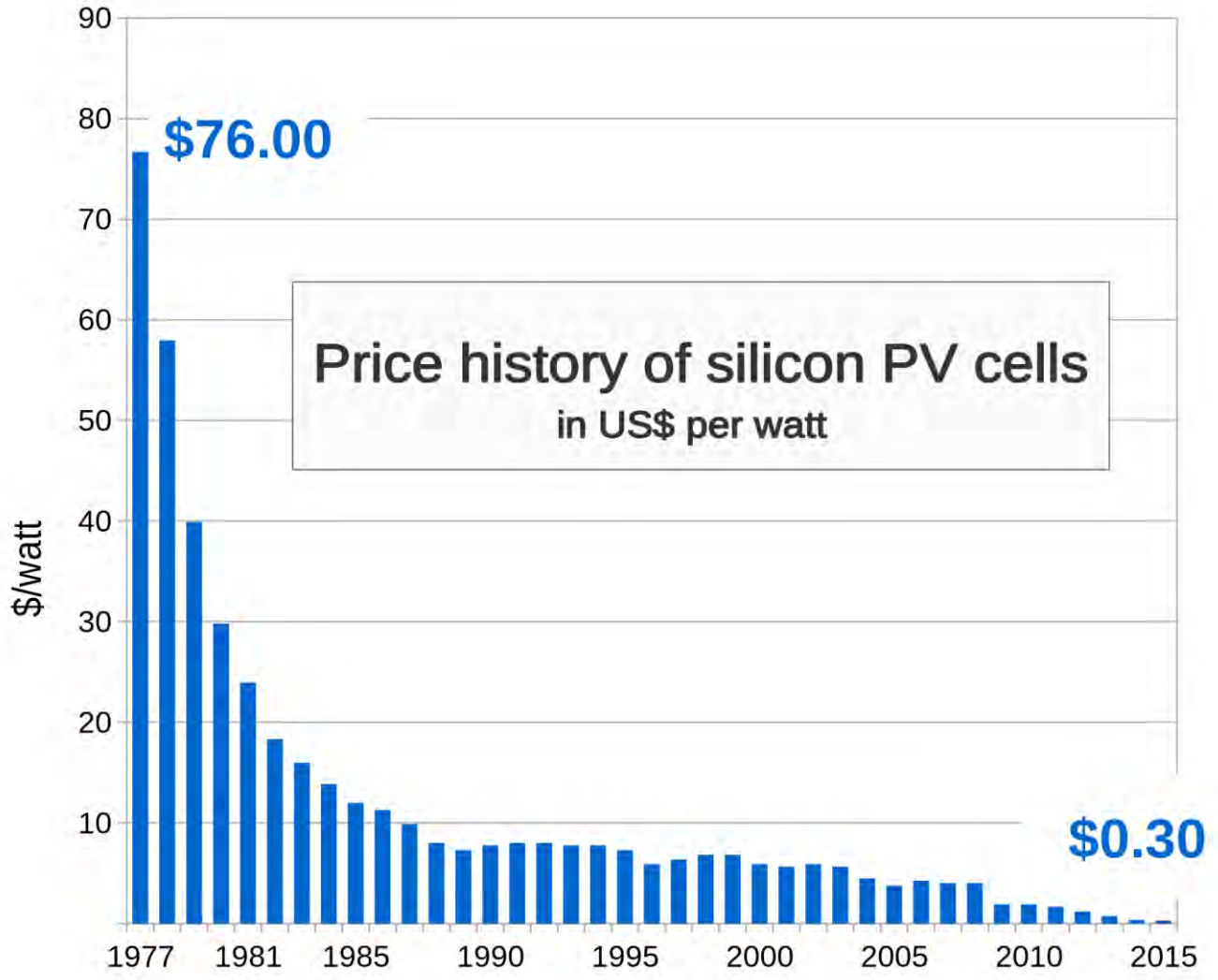


- **Calling ‘code red’ on climate**
- **New target set by nearly 80 countries: net zero by 2050**
- **Principles for Responsible Investment predicting an *“Inevitable, rapid and forceful climate policy response”* by 2025**

"Carbon emissions have to decline by 45% from 2010 levels over the next decade in order to reach net zero by 2050. This requires a massive reallocation of capital.

If some companies and industries fail to adjust to this new world, they will fail to exist."





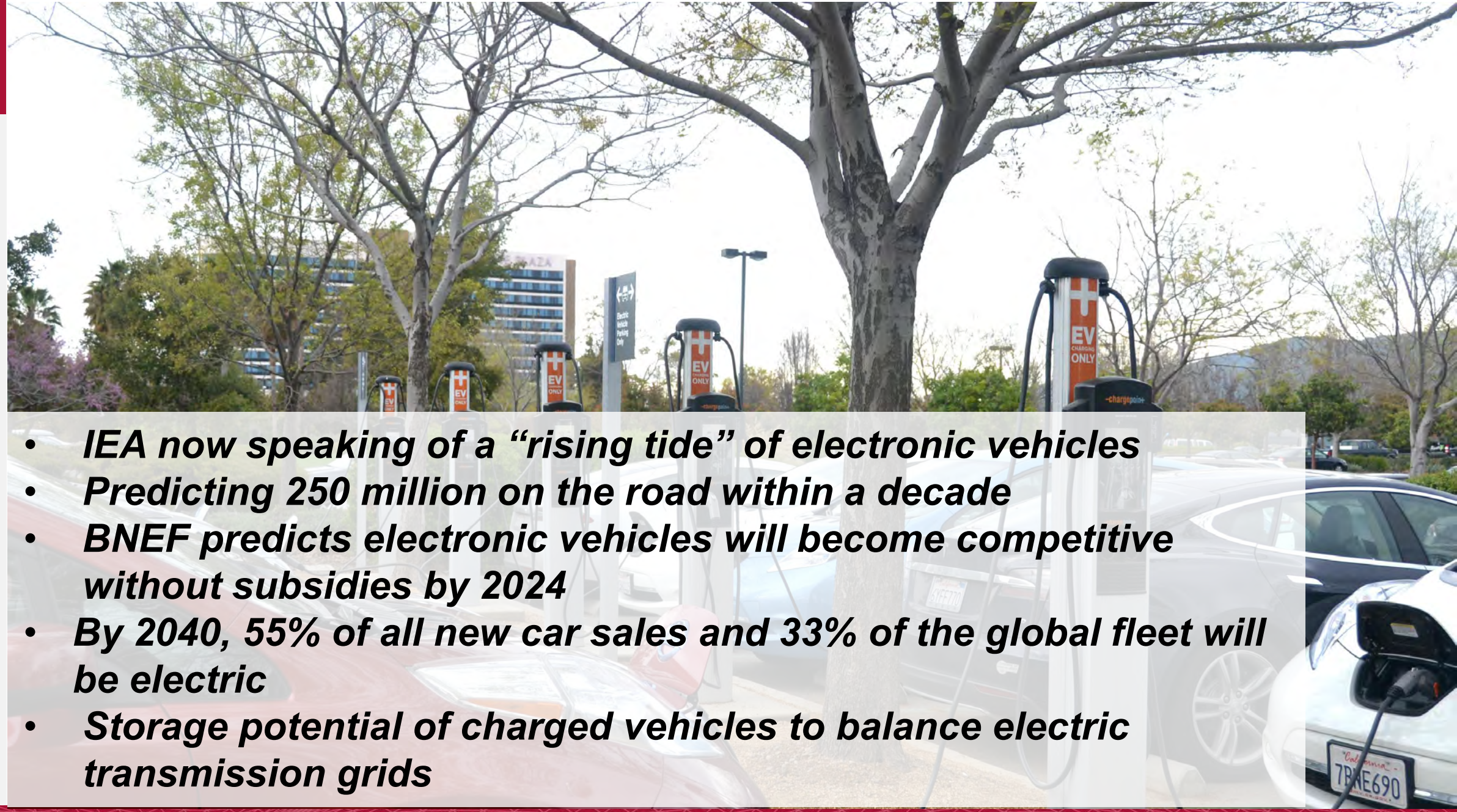
Source: Bloomberg New Energy Finance & pv.energytrend.com

"I am convinced that we are entering a new era, in which companies will increasingly be judged by their overall impact on society and the environment. Companies that refuse to assume these responsibilities are doomed."

'Strategic Epiphany'

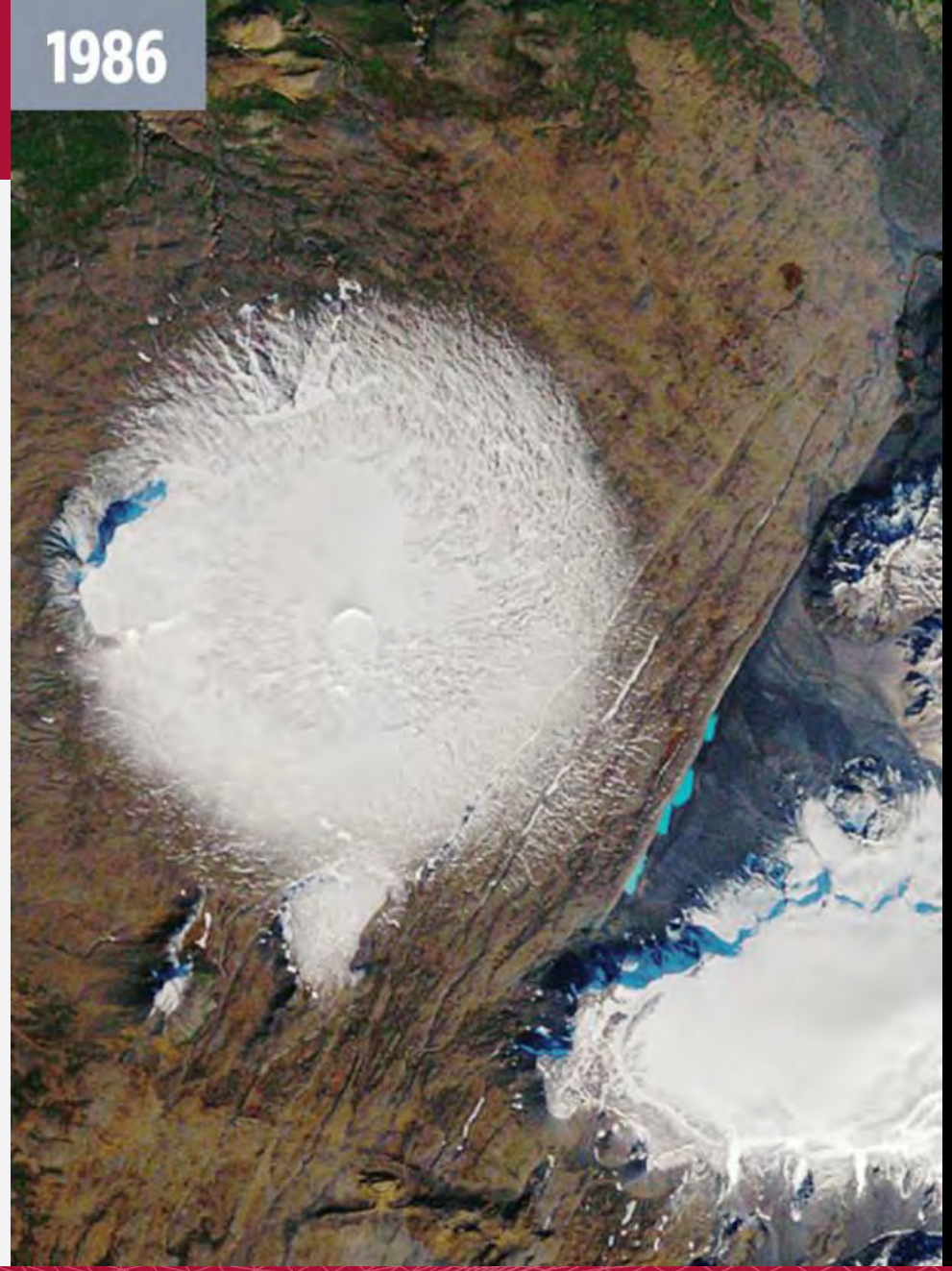
- In past two years Since 2016 Engie has sold off or closed down nearly $15 billion of fossil fuel related assets
- Reinvesting in low-carbon activities, which now provide 90% of revenue
- Focus on energy efficiency, renewables, hydrogen and electric vehicles
- District heating and cooling systems
- Share price up more than 17%

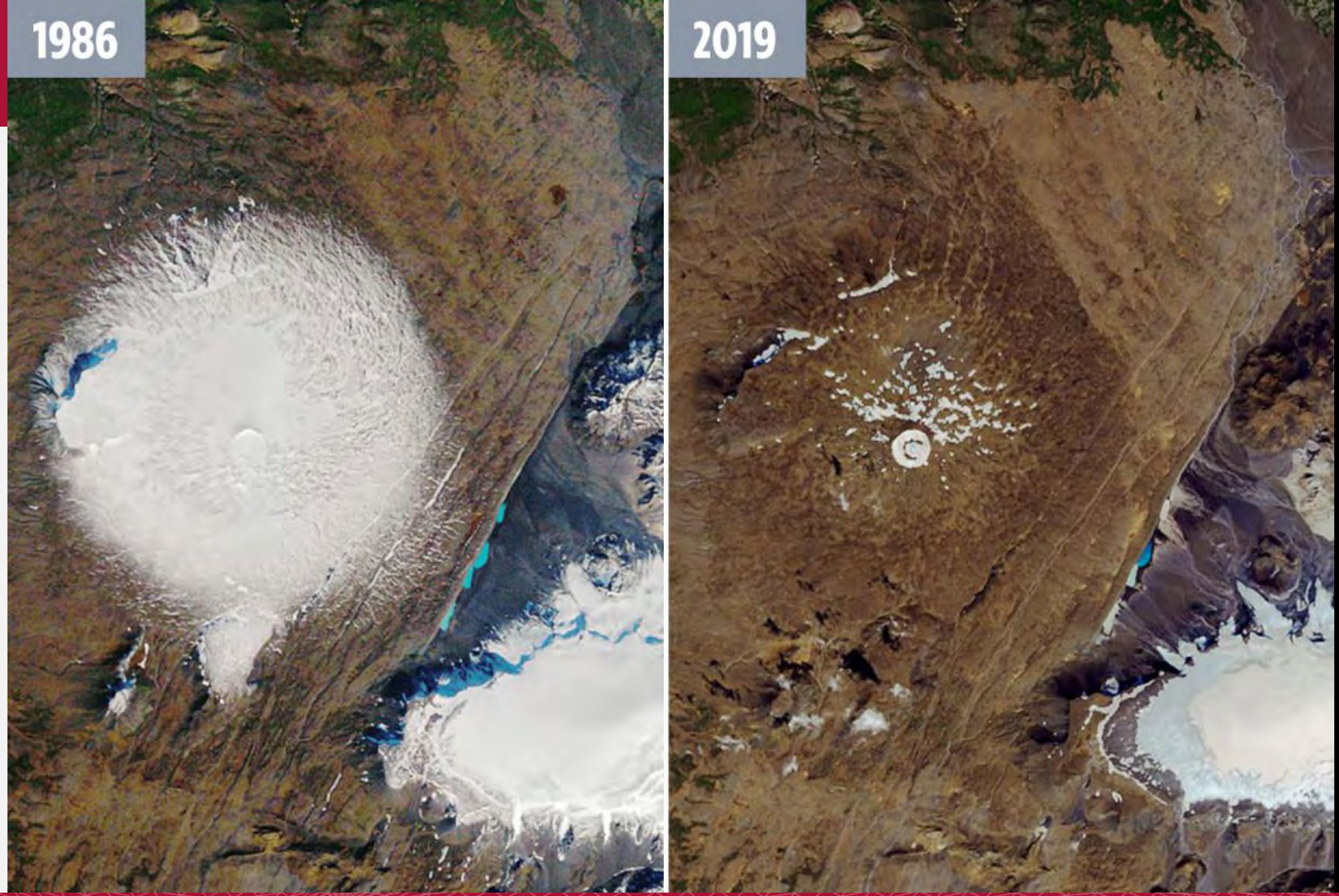

ID.3



- *IEA now speaking of a "rising tide" of electronic vehicles*
- *Predicting 250 million on the road within a decade*
- *BNEF predicts electronic vehicles will become competitive without subsidies by 2024*
- *By 2040, 55% of all new car sales and 33% of the global fleet will be electric*
- *Storage potential of charged vehicles to balance electric transmission grids*

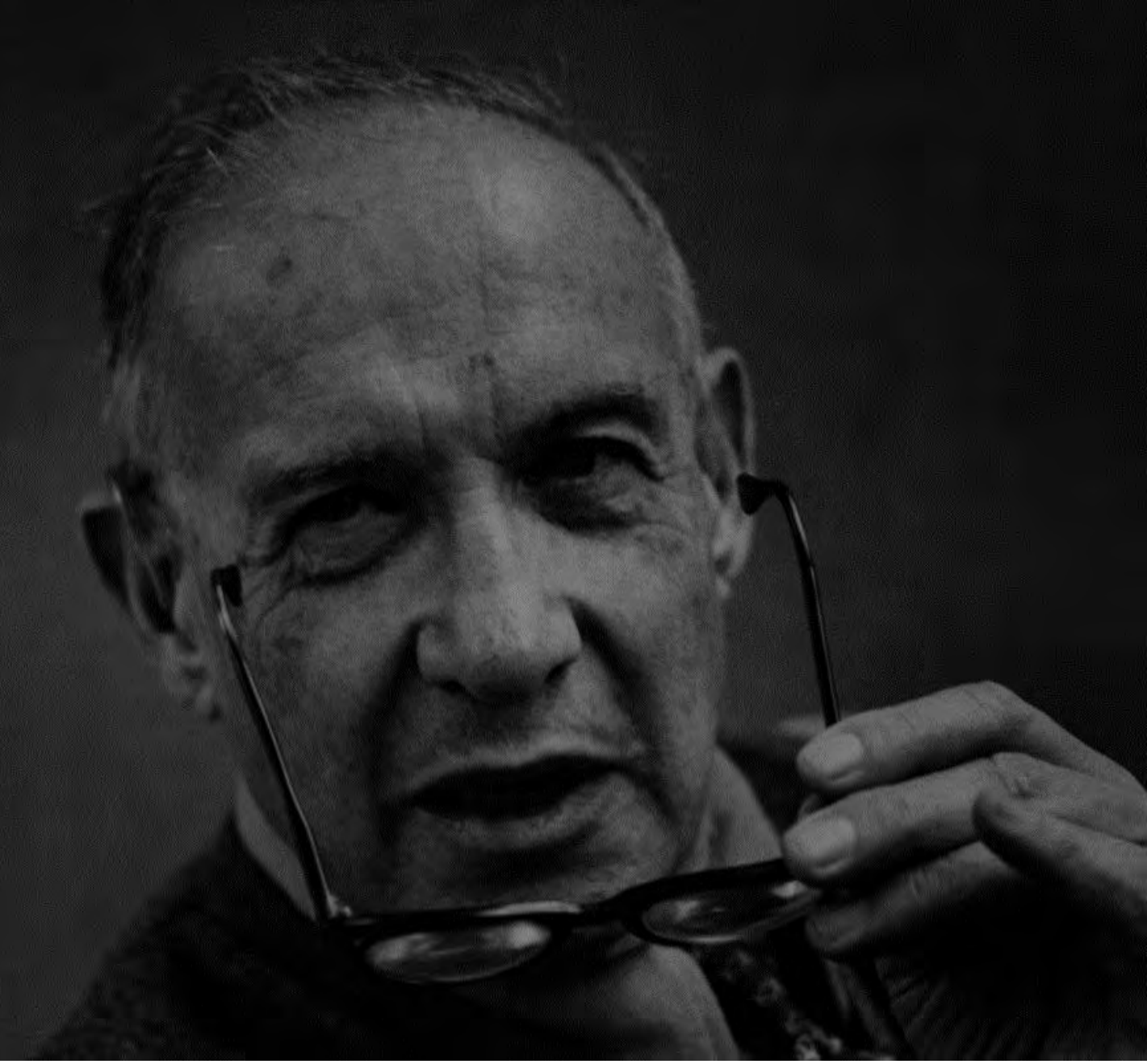

S TA 5131E

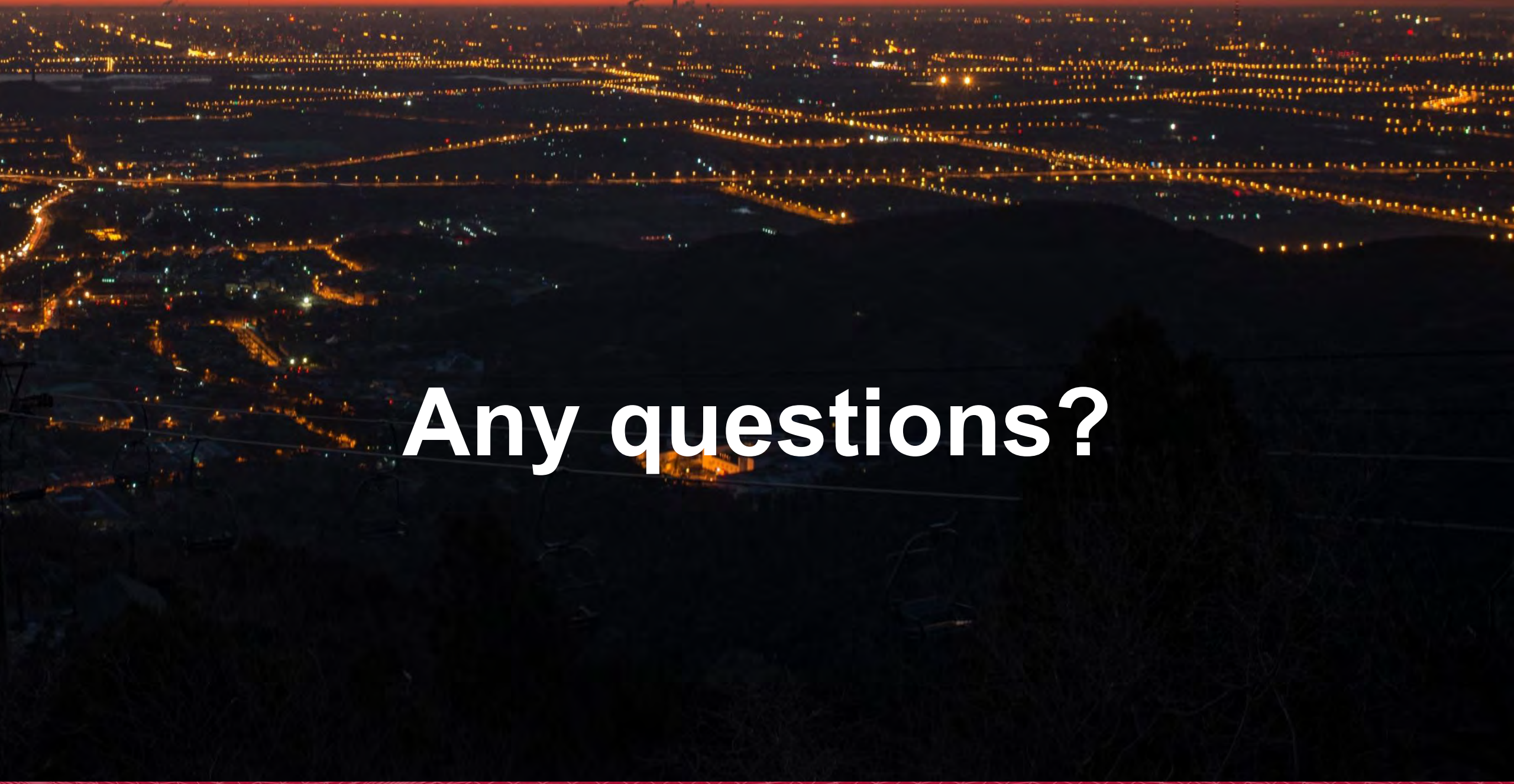

1986


1986
2019


Bréf til framtíðarinnar
Ok er fyrsti nafnkunni jökullinn til að missa titil sinn.
Á næstu 200 árum er talið að allir jöklar landsins fari sömu leið.
Þetta minnismerki er til vitnis um að við vitum
hvað er að gerast og hvað þarf að gera.
Aðeins þú veist hvort við gerðum eitthvað.
A letter to the future
Ok is the first Icelandic glacier to lose its status as a glacier.
In the next 200 years all our glaciers are expected to follow the same path.
This monument is to acknowledge that we know
what is happening and what needs to be done.
Only you know if we did it.
Ágúst 2019
415ppm CO_2

"Every single social and global issue of our day is a business opportunity in disguise."
Peter Drucker



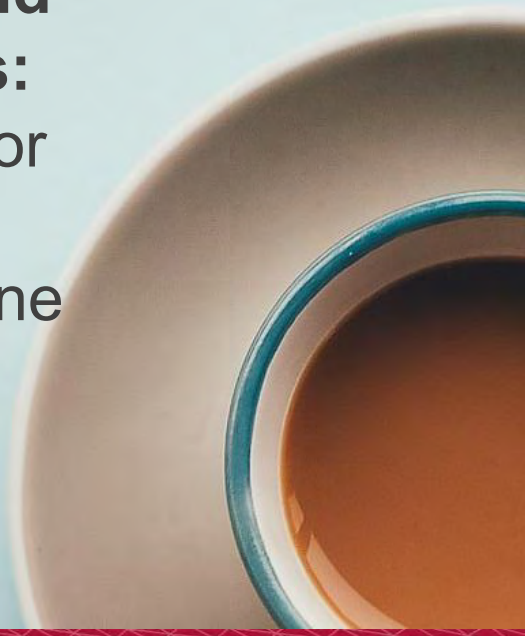

Any questions?

Morning Break

Refreshments available:
Merchants Hall, ground floor

Northern Powergrid exhibition | Innovation and Decarbonisation projects:
Merchants Hall, ground floor

Please return to Herringbone Suite by **11:45**



Expert panel

Perspectives on decarbonisation: Priorities across the region

Carol Botten
Chief Executive Officer – VONNE

Perspectives on decarbonisation

What are the challenges and opportunities of energy decarbonisation?

What practical advice can you and your organisation offer in tackling energy decarbonisation?

Hannah Richmond – Senior Policy Advisor

Tom Knowland – Head of Sustainable Energy & Climate Change

LEEDS CARBON BUDGET

53m Tonnes CO2e

Big Leeds Climate Conversation

Moira Nicolson - Senior Behavioural Insights Manager

ofgem

Making a positive difference
for energy consumers

Adam Scorer – Chief Executive

Action for Warm Homes

Andrew Brooks – Commissioning Manager

- **Energy is taken for granted, but the energy transition will change the way we all engage**
- Consumers will go from being on the edge of the system, to being at its heart

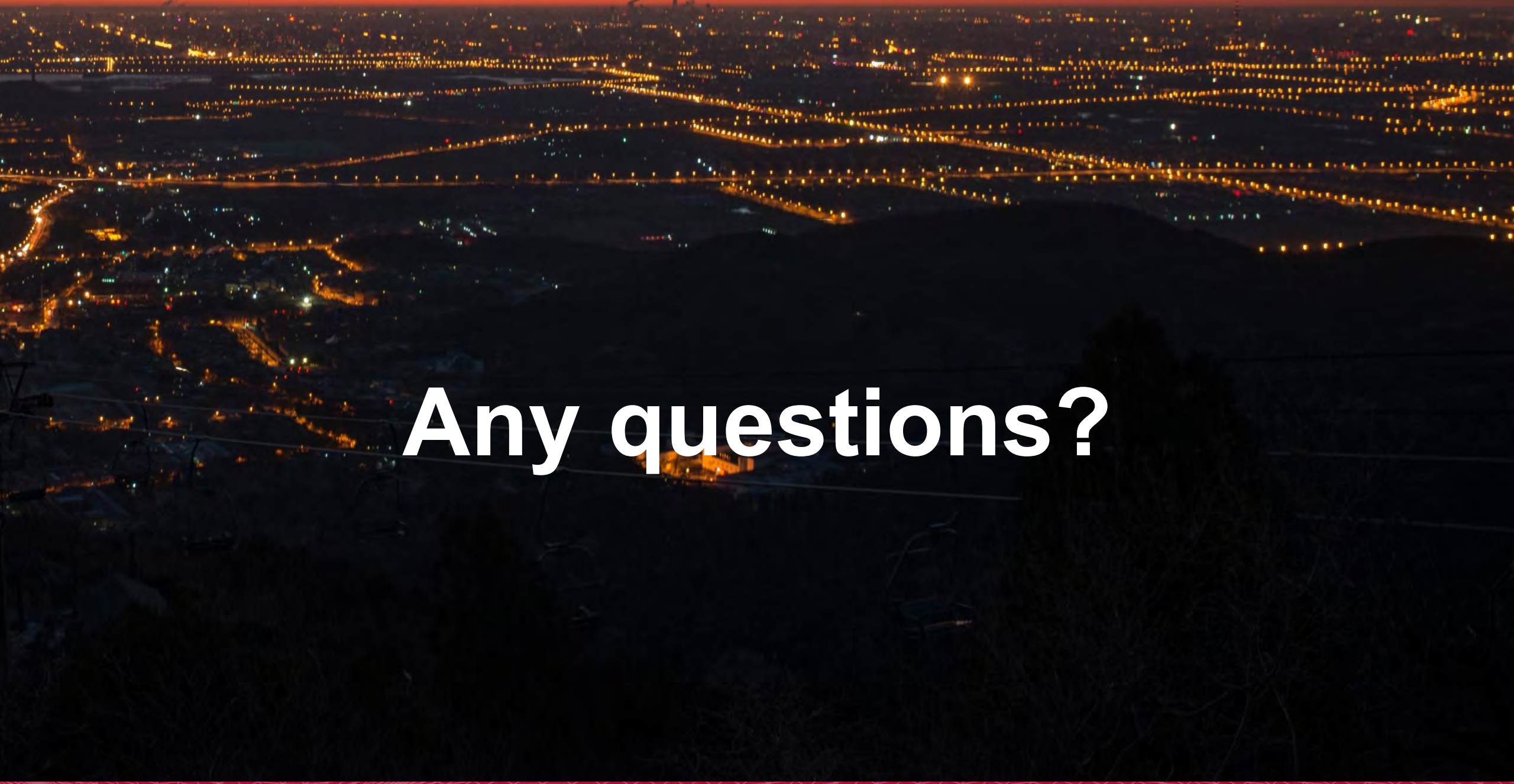
Greater Lincolnshire is taking a lead on:

- Improving energy IQ and business leadership
- Making place important to the solutions, with a future generational focus
- Creating the right environment, always with an eye to current and future energy market structures, plus commercial and technical constraints
- Consideration of the ‘touch points’ to other important sectors, infrastructure and services

Lincolnshire COUNTY COUNCIL

Mark Drye – Director of Asset Management

NORTHERN POWERGRID


Any questions?

Lunch Break

Lunch available:
Merchants Hall, ground floor

Northern Powergrid exhibition | Innovation and Decarbonisation projects:
Merchants Hall, ground floor

Please return to Herringbone Suite by **13:15**

Introducing our afternoon workshops

Patrick Erwin
Policy and Markets Director – Northern Powergrid

Afternoon workshops

Round 1 – 13:30 – 14:30	Round 2 – 14:30 – 15:30
Balancing competing priorities: Getting flexibility right in the energy landscape	Cotton Room First floor
Zero carbon transport: How to start your journey	Denim Room Second floor
Overnight decarbonisation: Quick wins for you and your organisation	Merchants Hall Ground floor
Zero carbon: A socially inclusive transition	Tweed Suite Second floor
Forecasting the impact of net zero: Supporting regional decarbonisation with future energy scenarios	Wool Room Second floor
Planning for our region: Exploring energy priorities across the North	Corduroy Room Fourth floor

Summary

Patrick Erwin
Policy and Markets Director – Northern Powergrid

Afternoon workshops – feedback

Balancing competing priorities:
Getting flexibility right in the energy landscape

Zero carbon transport:
How to start your journey

Overnight decarbonisation:
Quick wins for you and your organisation

Zero carbon:
A socially inclusive transition

Forecasting the impact of net zero:
Supporting regional decarbonisation with future energy scenarios

Planning for our region:
Exploring energy priorities across the North

Did we meet our objectives?

Today's ambitions:

- You leave with a good understanding our role as a key enabler of regional decarbonisation
- We leave with a good understanding of your needs and plans
- You are confident about our transition to Distribution System Operator plans for north Lincolnshire, the North East and Yorkshire
- You understand our wider business plans and know how you can contribute to help us produce the best possible plan for ED2

Next steps

- One-page take away from the day
- Answers to any outstanding questions
- Detailed report with actions and commitments
- Post-summit webinar
- DSO webinar

Thank you

Northern Powergrid

Planning for our region – exploring energy priorities across the North

Welcome

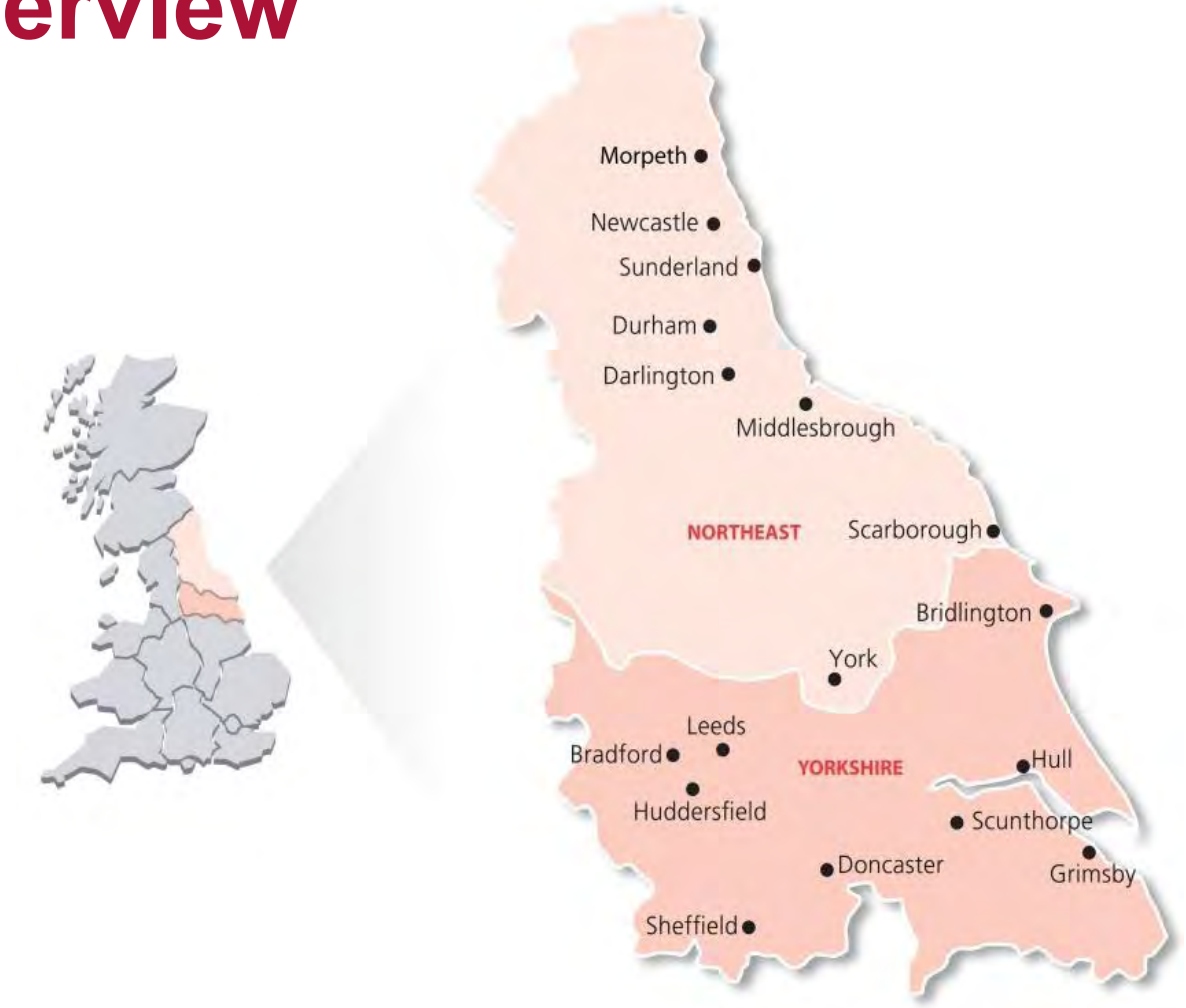
Andy Bilclough
Director of Field Operations

Siobhan Barton
Head of Stakeholder Relations

Northern Powergrid Overview

Our customers and other stakeholders:

- We serve **8 million people** (3.9 million homes and businesses) across Yorkshire, North Lincolnshire and the North East of England
- We cover **3 of the UK's top 10 largest** cities
- We cover affluent areas and a disproportionate number of deprived communities
- Some large areas include rural communities and farmland
- **Four National Parks** in the area we serve



Northern Powergrid Overview

Our network:

- Dominated by **overhead lines in rural areas** and **underground cable in urban areas**
- Our main ports of Hull and Teesside have **high densities of high-voltage equipment**, reflecting their industrial heritage
- We are well-served by **National Grid Interconnection points**, a legacy of the coal industry and the number of power stations built here
- Yorkshire and the North East are exposed to some of England's most severe weather conditions
- Our region includes challenges with the four National Parks being some of the most scenic but most inhospitable landscapes in the UK

The changing profile of our region

Our customers and other stakeholders:

- North East and Yorkshire **below national average economic growth**
- Relative income deprivation – driver of health and social wellbeing, regions generally having **below average life expectancies and poorer health outcomes**
- Over **300,000** of customers live rurally – **8.4%** of UK total rural customers
- Areas of high deprivation in region, often linked to reduced access to education and life skills
- **13%** of North East and Yorkshire population in fuel poverty, compared to **11%** nationally
- **400,000 homes** in York, North Yorkshire and East Riding Local Enterprise Partnership regions estimated to be rated at EPC level C or below
- Challenges of heavy industry – e.g. industrial cluster in Humber Local Enterprise Partnership region: **6 firms responsible for 90% of emissions**

The changing profile of our region

Current and future challenges:

- Decarbonisation represents economic ***opportunity*** for North East and Yorkshire: potential creation of **46,000 low carbon jobs** by 2030…
- …but corresponding economic ***threat*** with potential loss of **28,000 jobs in coal, oil and gas** industries by the same date
- Projected to be approximately **46,000** fewer people in 16-64 labour force age groups by 2030
- 65+ population age groups will have grown by 25%, an additional **414,000 people by 2030** compared to 2018
- Humber Local Enterprise Partnership region is set to be on track for **10GwH wind farm capacity** by 2020
- York, North Yorkshire and East Riding Local Enterprise Partnership looking to install **30,000 heat pumps** for off-grid homes, posing a network capacity challenge in these areas

Table discussion:

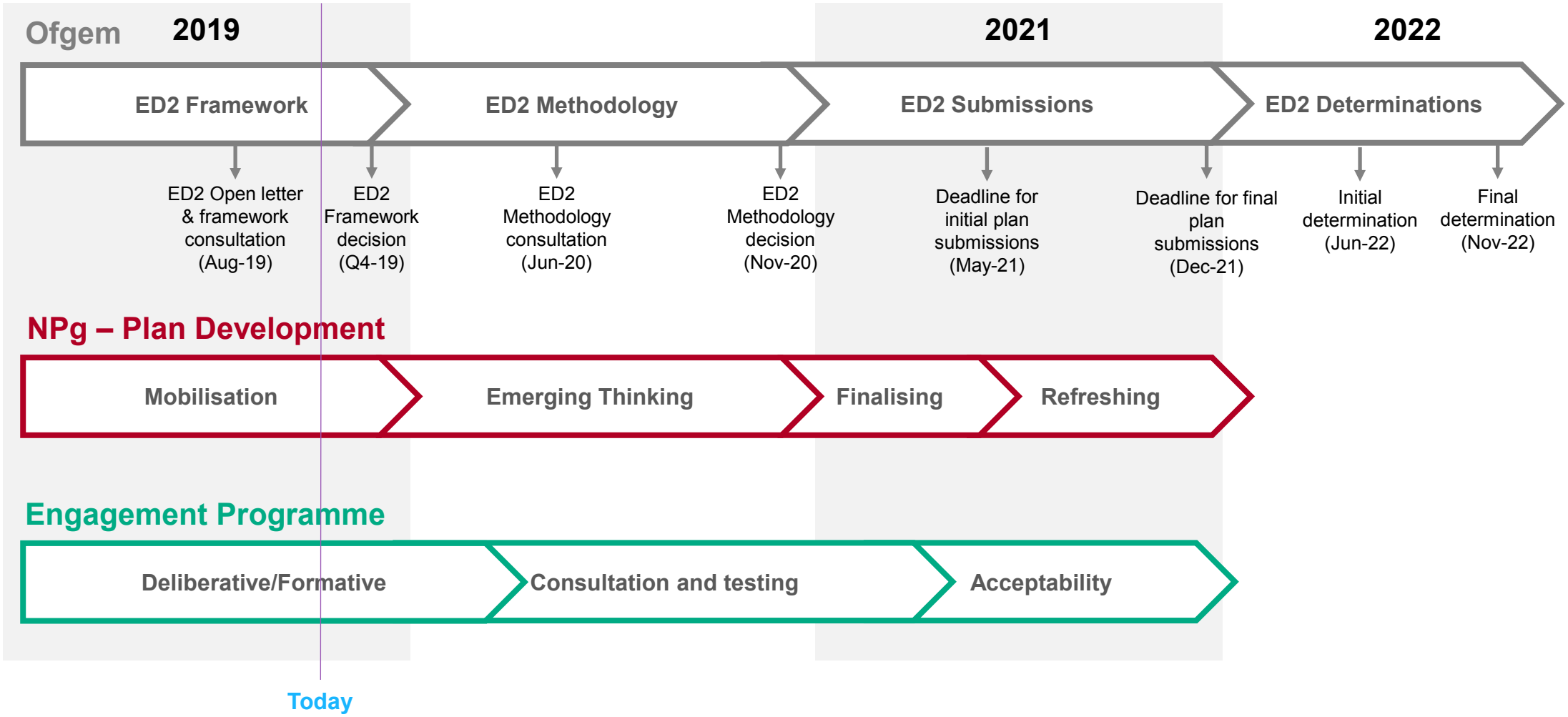
What are the challenges and opportunities for us all as a region?

What is unique about the North East and Yorkshire?

What are the major changes you expect to see in the region by 2023 when our new business plan will start?

What are the factors informing your organisations' strategic planning for 2023-28? What are you working towards or responding to?

Business plan development timeline



Engagement will drive the content of our business plan

We are committed to engaging with and listening to our customers and wider stakeholders, ensuring our plans and services reflect our community's current and future needs

Our stakeholder engagement will be:

Led by and focused on what our **customers and stakeholders most value**

Inclusive and representative of the diverse communities we live in and serve – ensuring no-one is left behind

Early, open and deliberative – allowing not just for opinions on formed plans and optionality but true **co-creation**

Open, transparent and robust – leading to **meaningful** outcomes

Conducted with **integrity** – through educating and communicating with our stakeholders to enable them to give informed views

Informed by **continual learning and best practice**

Our business plan needs to reflect our stakeholder needs, a straw man for discussion…

Our ED2 Business Plan

Maintain a safe and resilient network

- Provide a safe and reliable network
- Protect the network from external threats

"We're addressing cyber and climate-driven threats to the network that delivers your energy, what other protection do we need?"

Our business plan needs to reflect our stakeholder needs, a straw man for discussion…

Our ED2 Business Plan

Meet the needs of consumers and network users

- Proactively provide great customer service
- Make it easy to use, assess and connect to our network
- Keep bills low (be affordable)
- Be a force for good in our communities
- Be trustworthy and transparent

"How do we balance providing a reliable service with cost and environmental impact?"

"What new technologies could we be using to improve customer service?"

Our business plan needs to reflect our stakeholder needs, a straw man for discussion…

Our ED2 Business Plan

Maintain an environmentally sustainable network

- Protect the environment
- Enable the transition to a low-carbon future

"How can we best support the region achieving net zero carbon emissions?"

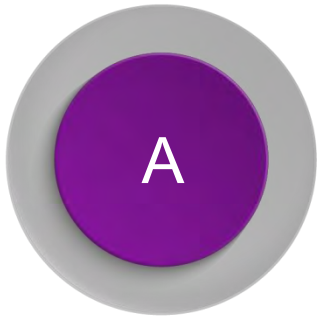
"What do we prioritise - impact on environment, visual impact or emissions?"

Table discussion:

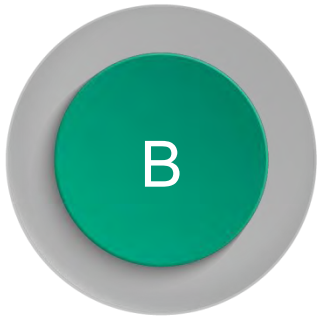
- Do these topics reflect the challenges and opportunities that face us as a region?
- What do we need to say to really reflect us as a region?
- What would tell you that this was our plan and not a distribution network operator somewhere else in the country?

What would you be most interested in discussing with us?

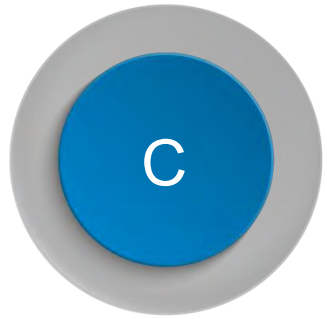
Our ED2 Business Plan



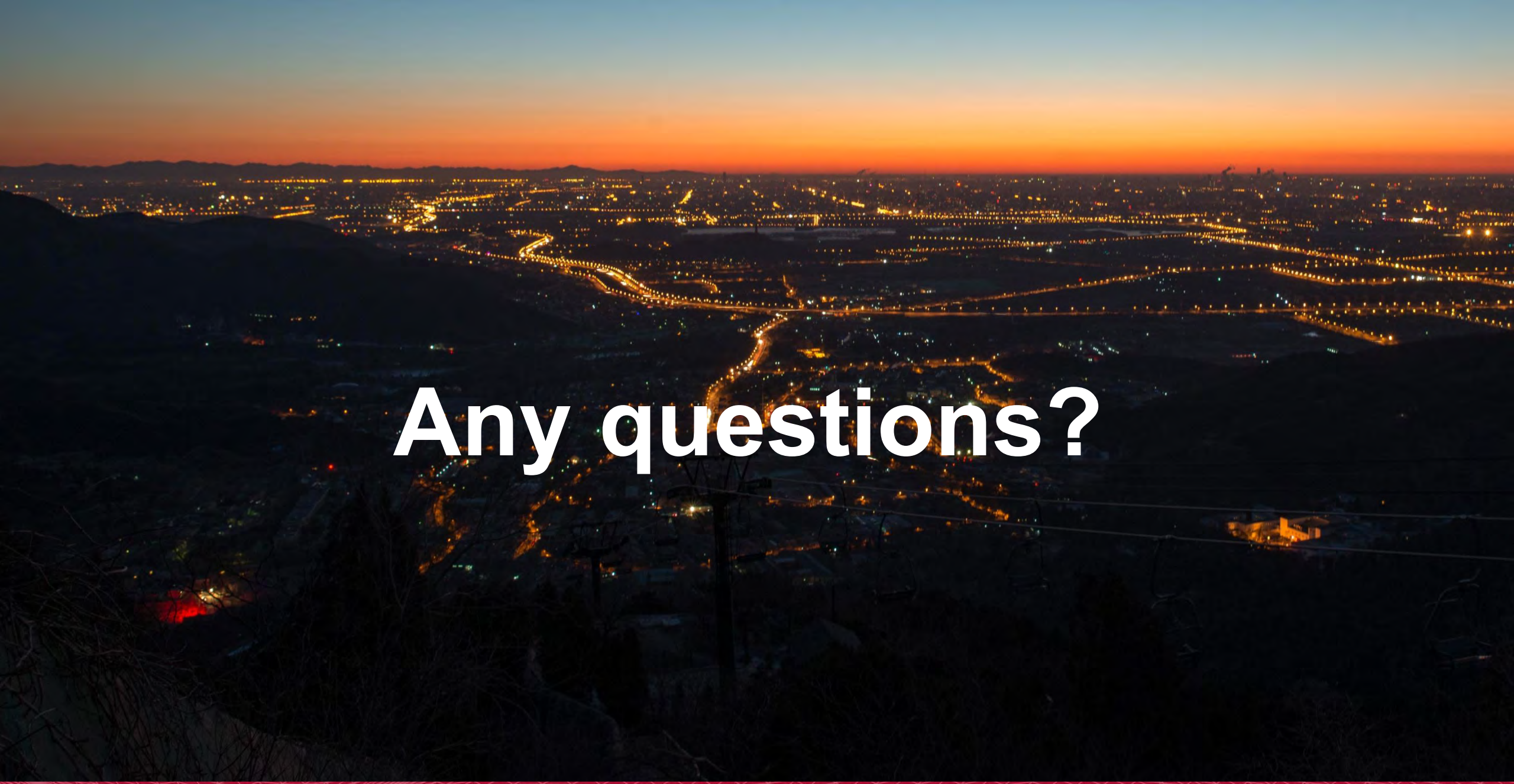
Maintain a safe and resilient network



Meet the needs of consumers and network users



Maintain an environmentally sustainable network


Any questions?

Thank you

Northern Powergrid

Getting flexibility right in the energy landscape

Welcome

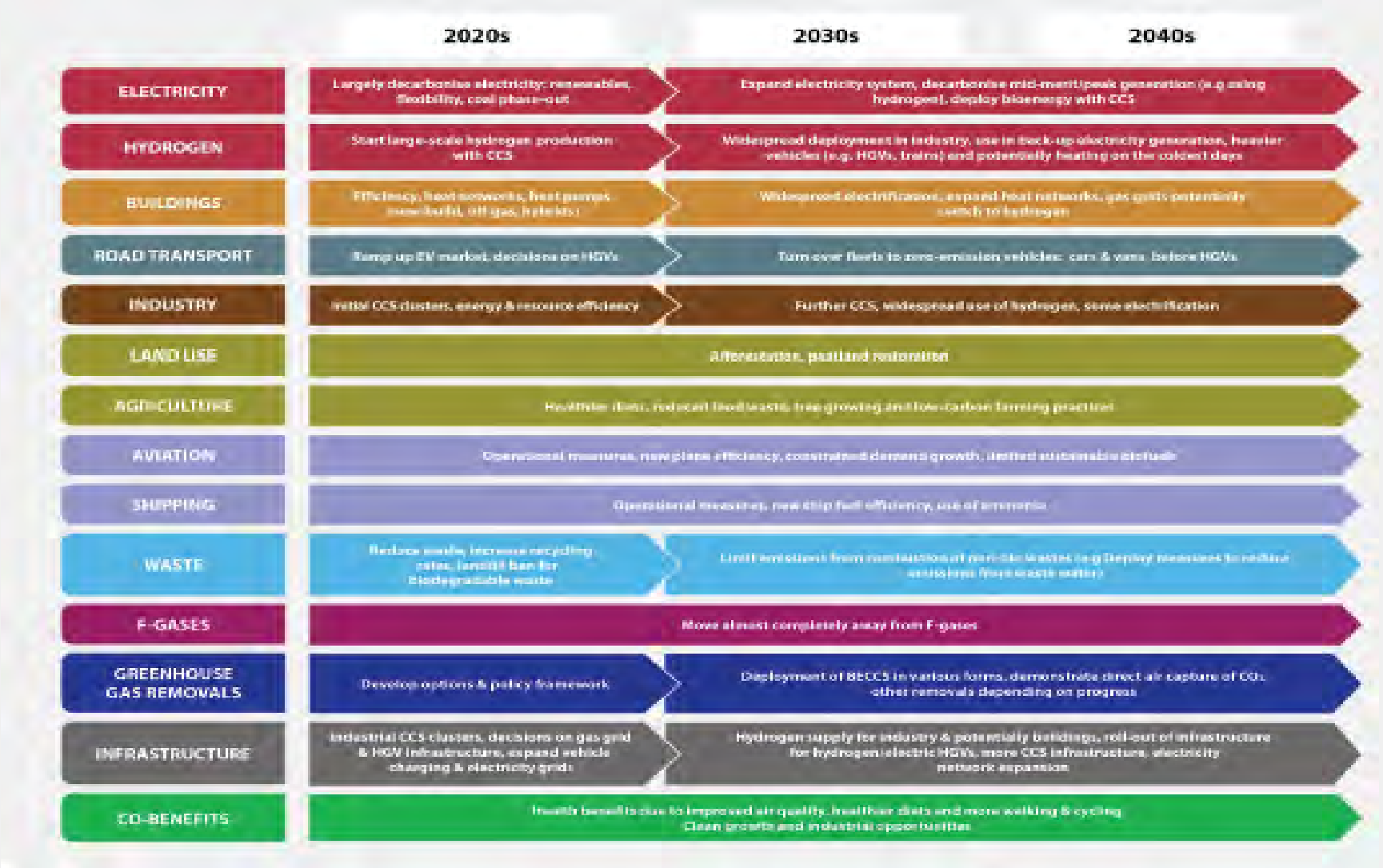
Jim Cardwell
Head of Policy Development – Northern Powergrid

Andrew McKenna
Commercial Manager, Flexibility – Northern Powergrid

Net zero – a ‘war footing’ arguably required

- The national net zero by 2050 binding target is a step change moment – policies are required to meet the challenge
- This has been reinforced by the accompanying declaration of climate change emergencies at a local level
- These local targets are more aggressive
  - For example, Leeds City Region has declared net zero by 2038 latest
  - Local stakeholders seeking assistance to create plans that meet this target

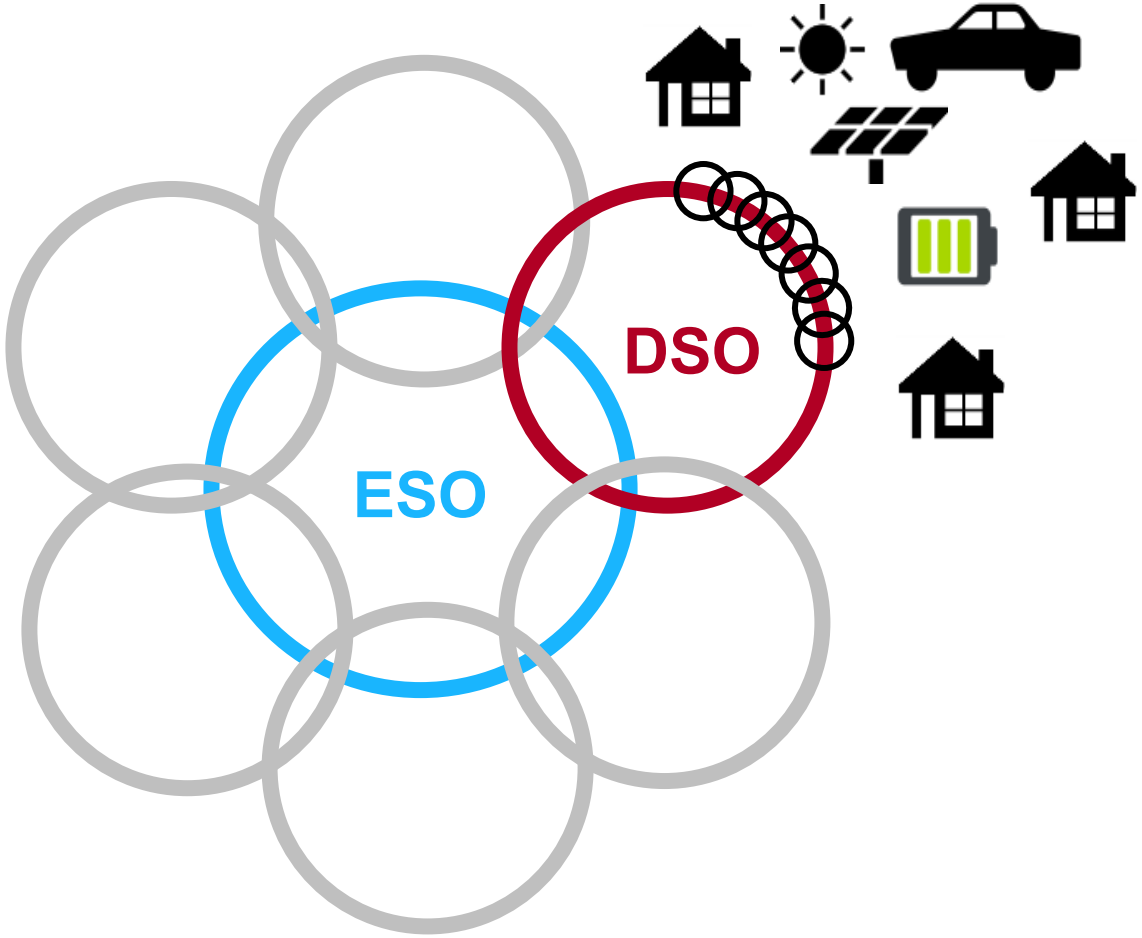
‘A major ramp-up in policy effort is now required’



Net Zero – The UK’s contribution to stopping global warming, Committee on Climate Change, p.24

Our vision for the transition from network to system optimisation

- **Local platform for energy system** and resource optimisation to connect and utilise more low carbon
- A **clearly accountable local body**
- **Universal secure service to all customers** and competitive market players
- The new role of distribution system operator (DSO) is required
  - To coordinate between buyers and sellers of flexibility
  - To provide visibility and transparency for new flexibility markets

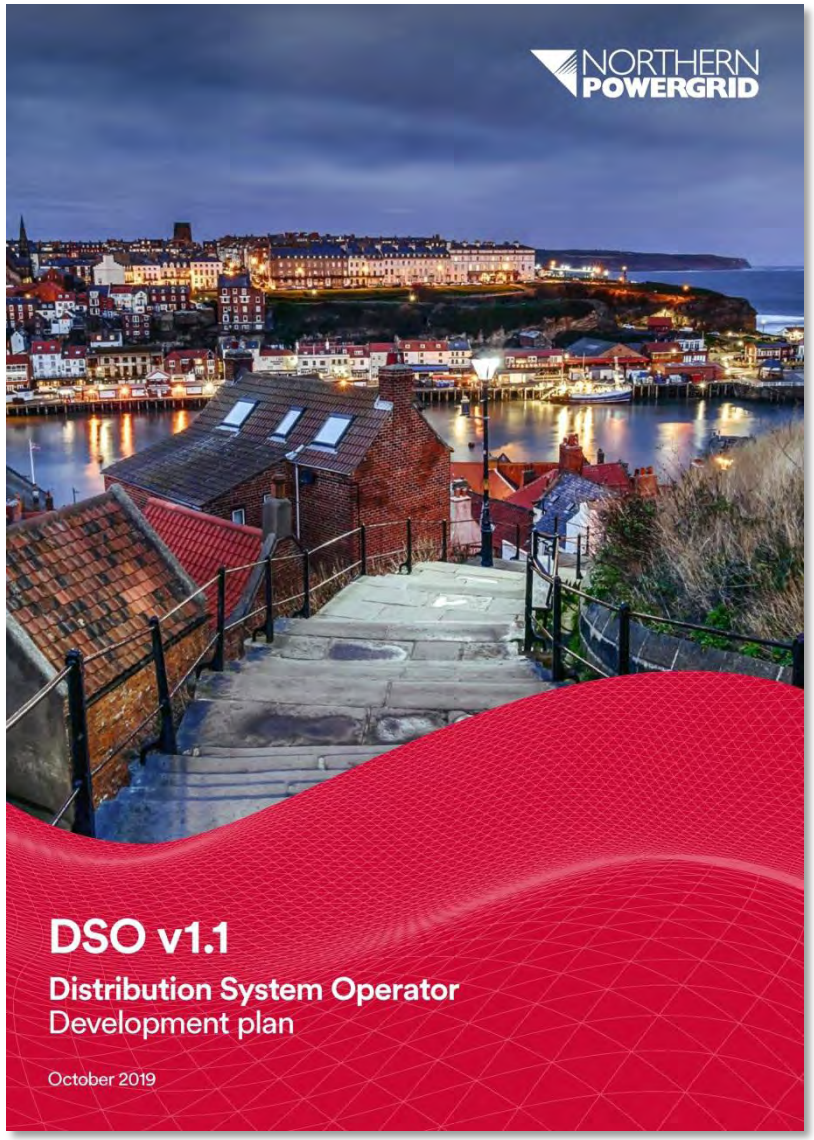


Transitioning to DSO – setting out our plans in DSO v1.1 October 2019

Our DSO development plan

- Customer and commercial development
- Technical development
- Data and systems development

Link to document:
https://www.northernpowergrid.com/asset/0/document/5139.pdf



Northern Powergrid:

Deploying flexibility services

Andrew McKenna
Commerical Manager, Flexibility – Northern Powergrid

Networks at the forefront of the change

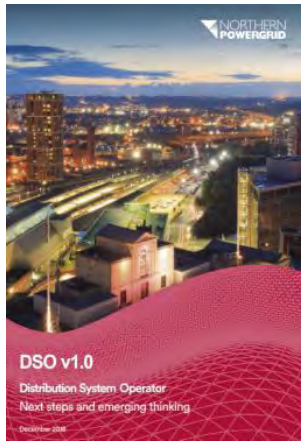
Q3 - 17

Q4 - 18

Q3 - 19

Q3 - 17

Q4 - 18



Q3 - 19

Q4 - 19

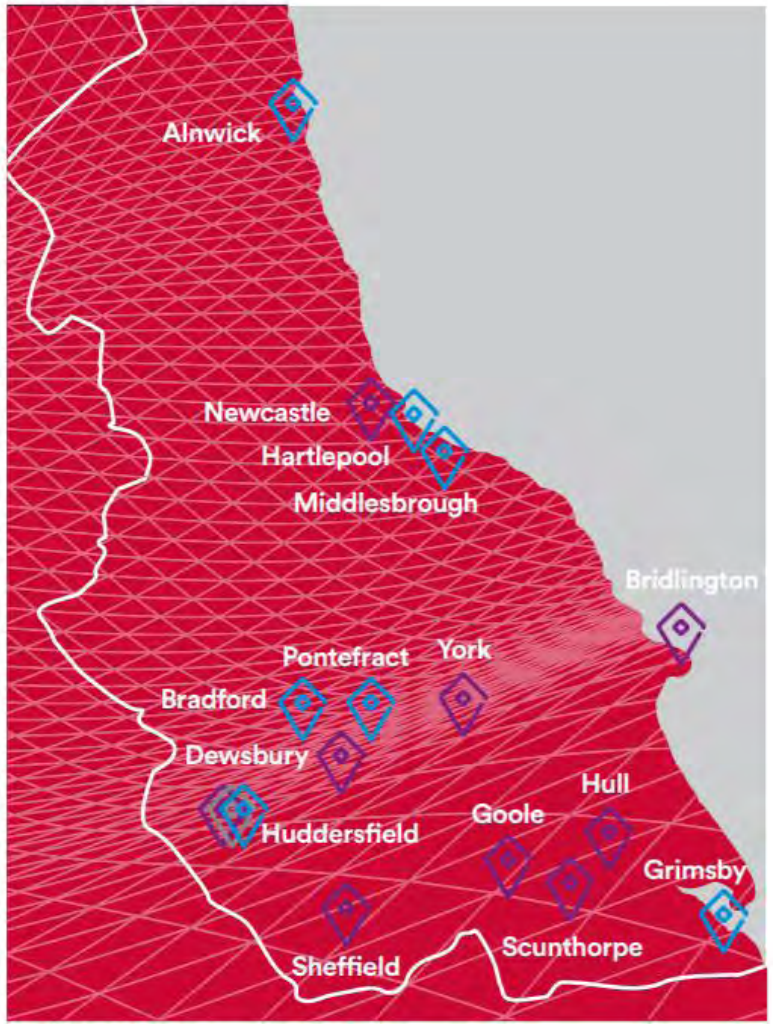
How are we deploying customer flexibility?

- We have committed to test the flexibility market prior to any significant network reinforcement
- We have identified essential planned maintenance projects taking place in 2020 that could benefit from customer flexibility
- We have recently launched customer flexibility as an additional means of restoration to our control room

Delivering customer flexibility in 2020

- First DNO to procure flexibility through e Auction
- Up to 100MWs of ‘Restore’ flexibility across seven locations on our network
  - Alnwick
  - Hartlepool
  - Middlesbrough
  - Pontefract
  - Grimsby
  - Bradford
  - Huddersfield

- www.northernpowergrid.com/DSO



Transition to deep and flexibility markets in 2030 – a view of the future

	Short term	Medium term	Long term
	2019-20	**2020-23**	**2023-30**
Types of customers	I+C Customers Aggregated loads	I+C Customers Aggregated loads SMEs	I+C Customers Aggregated loads SMEs Domestic (including Evs)
Voltage level	EHV	EHV HV LV	EHV HV LV Domestic +EVs
Use case	Peak load	Peak load Construction risk Restoration Reactive power	Peak load Construction risk Restoration Ancillary services
Service contracts	Bilateral contracts	Bilateral contracts Flexibility & Energy short term exchange	Bilateral contracts Flexibility & Energy short term exchange Multilateral contracts (between DSOs)
Data for competitive markets	Heat maps	DFES + enhanced forecasting	DFES Automated data share

Cross industry collaboration - delivering the best solution for our customers

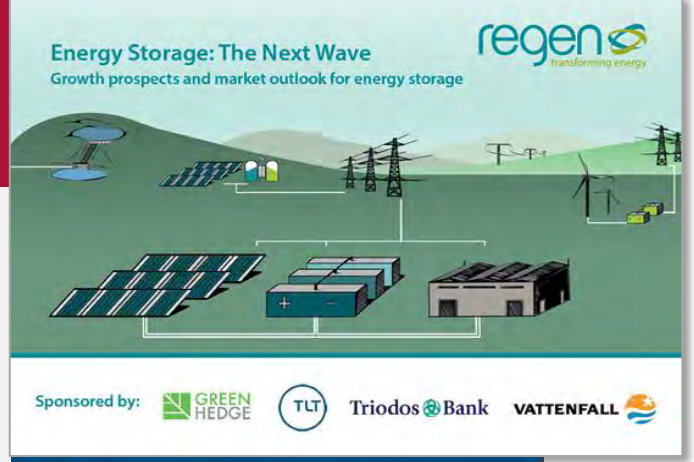
Open Networks Project -

Our six steps for delivering flexibility services:

1. Champion a level playing field
2. Ensure visibility and accessibility
3. Conduct procurement in an open and transparent manner
4. Provide clarity on the dispatch of services
5. Provide regular, consistent and transparent reporting
6. Work together towards whole energy system outcomes

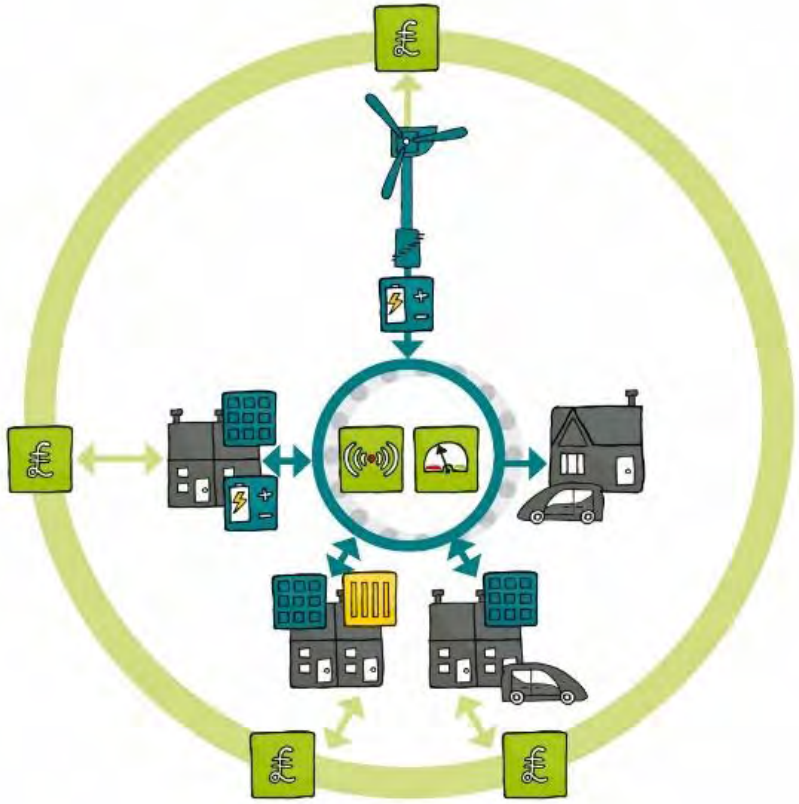
Making flexibility markets more accessible

Jodie Giles
Senior Project Manager - Regen


Energy Storage: The Next Wave
Growth prospects and market outlook for energy storage
regen
transforming energy
Sponsored by:
GREEN HEDGE
TLT
Triodos Bank
VATTENFALL

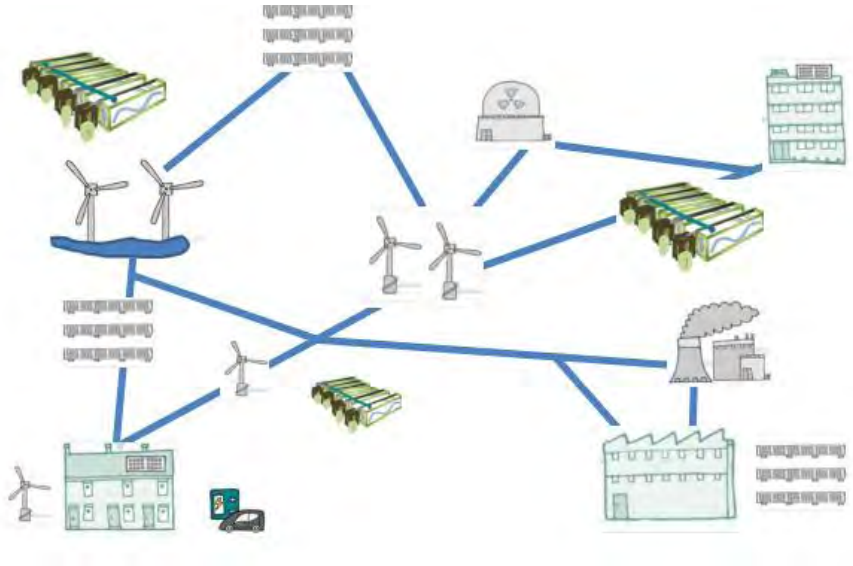

Local supply: Options for selling your energy locally
3rd Edition
regen
transforming energy
Sponsored by:
Stephens
Carbon Co-op


Electricity Network Innovation Guide For Communities 2018
ena
energy networks association
regen




Local flexibility markets
What are they and how can community energy organisations get involved?
Procurers
TSO
Providers
Large energy users
DSO
Platform
Aggregators
Electricity Suppliers
Energy storage operators
Generation asset owners
Community and domestic flexibility

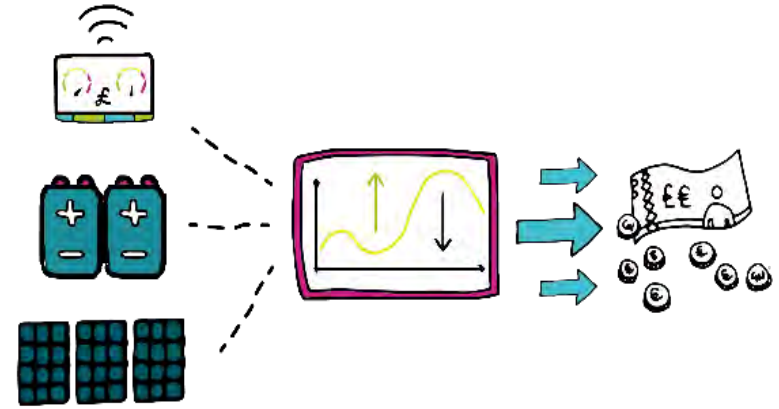
Context



Committee on Climate Change says we'll have to:

- **Quadruple low-carbon supply by 2050**
- **Upgrade the network**

"Many networks will need to be upgraded in a timely manner and future-proofed to limit costs and enable rapid uptake of electric vehicles and heat pumps"



- **Be more flexible**

"the UK could save £17-40 bn across the electricity system from now to 2050"

CCC report: Net Zero - The UK's contribution to stopping global warming

National perspectives

Friends Provident Foundation

[Power to Participate project]

Community energy organisations want:

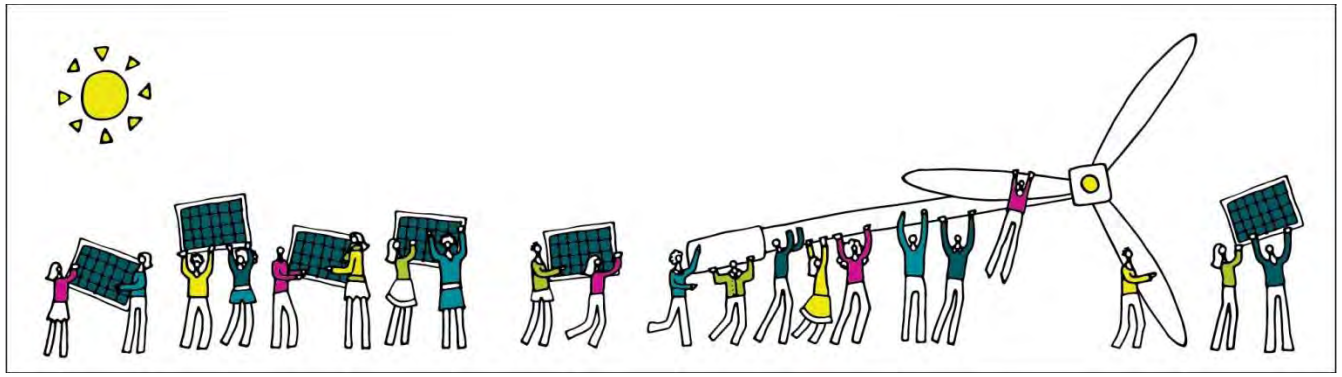
- **support with energy efficiency to reduce demand**
- **low carbon sources of flexibility to be prioritised**
- **flexibility to enable more renewables to connect to the network**

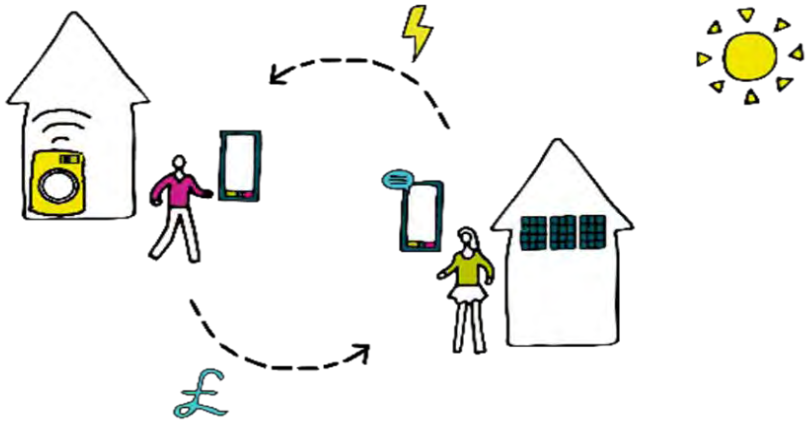
Main barriers for new entrants to local flexibility markets:

1. The value is too low
2. It's not clear how flexibility enables more low carbon connections
3. Contract lengths are too short
4. The revenues stack is too complex

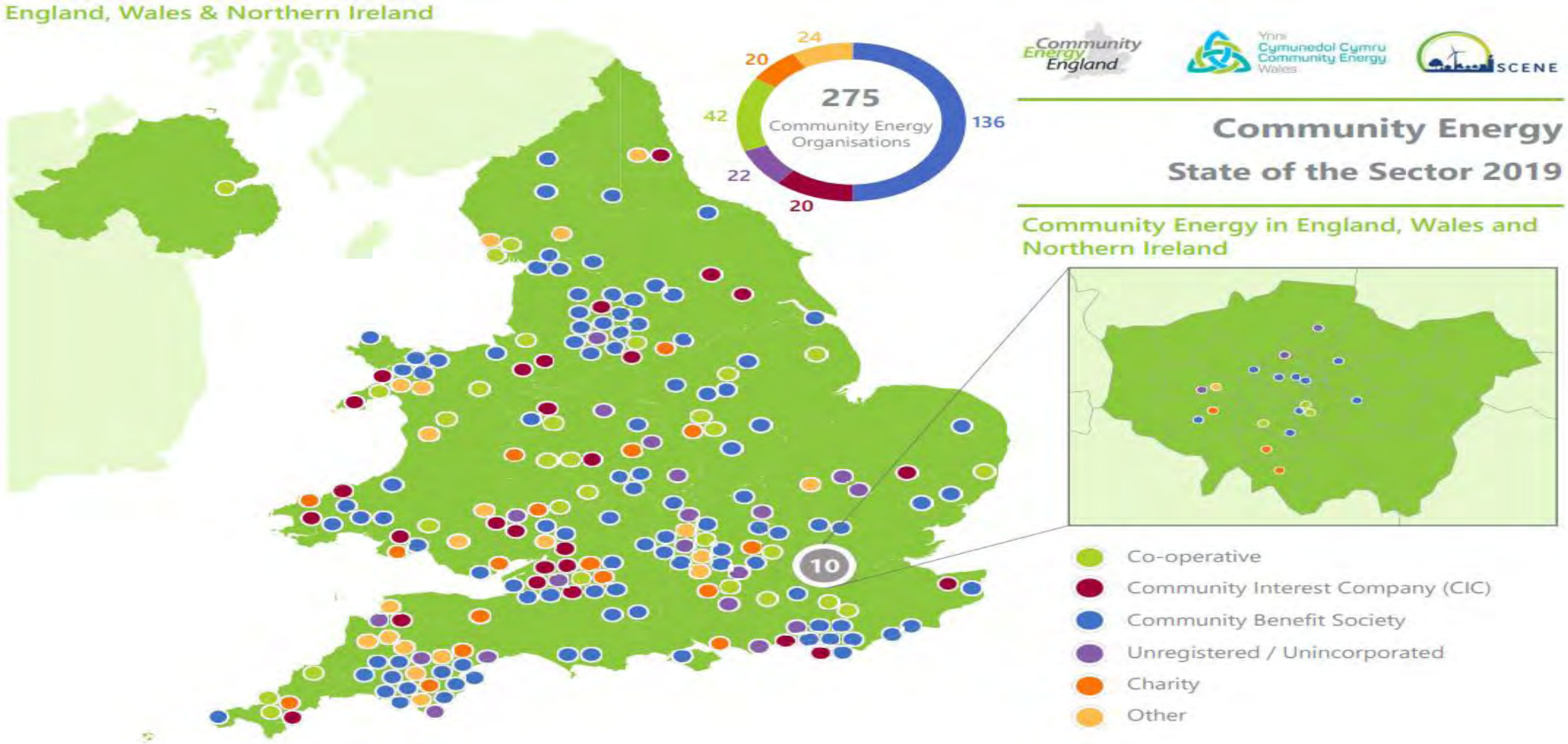
Getting new flexibility markets right

- Explain how flexibility services unlock progress to a low carbon system
- Prioritise low carbon generation – get off the technology agnostic fence
- Provide a genuine ‘level playing field’ – this means supporting the least able to engage more
- Address practical barriers – signposting periods, contract lengths, entry thresholds, technical language etc.



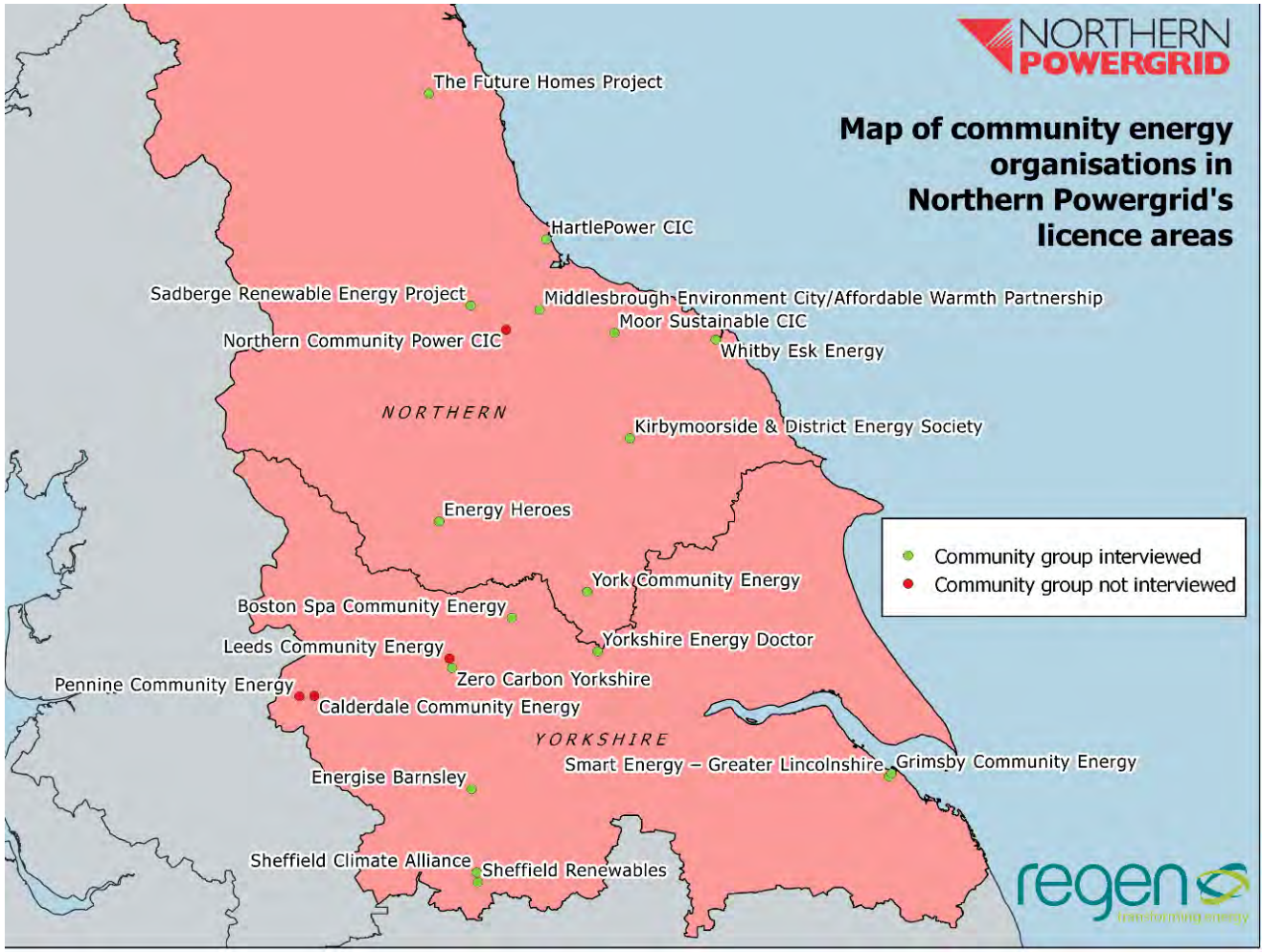


Community Energy nationally



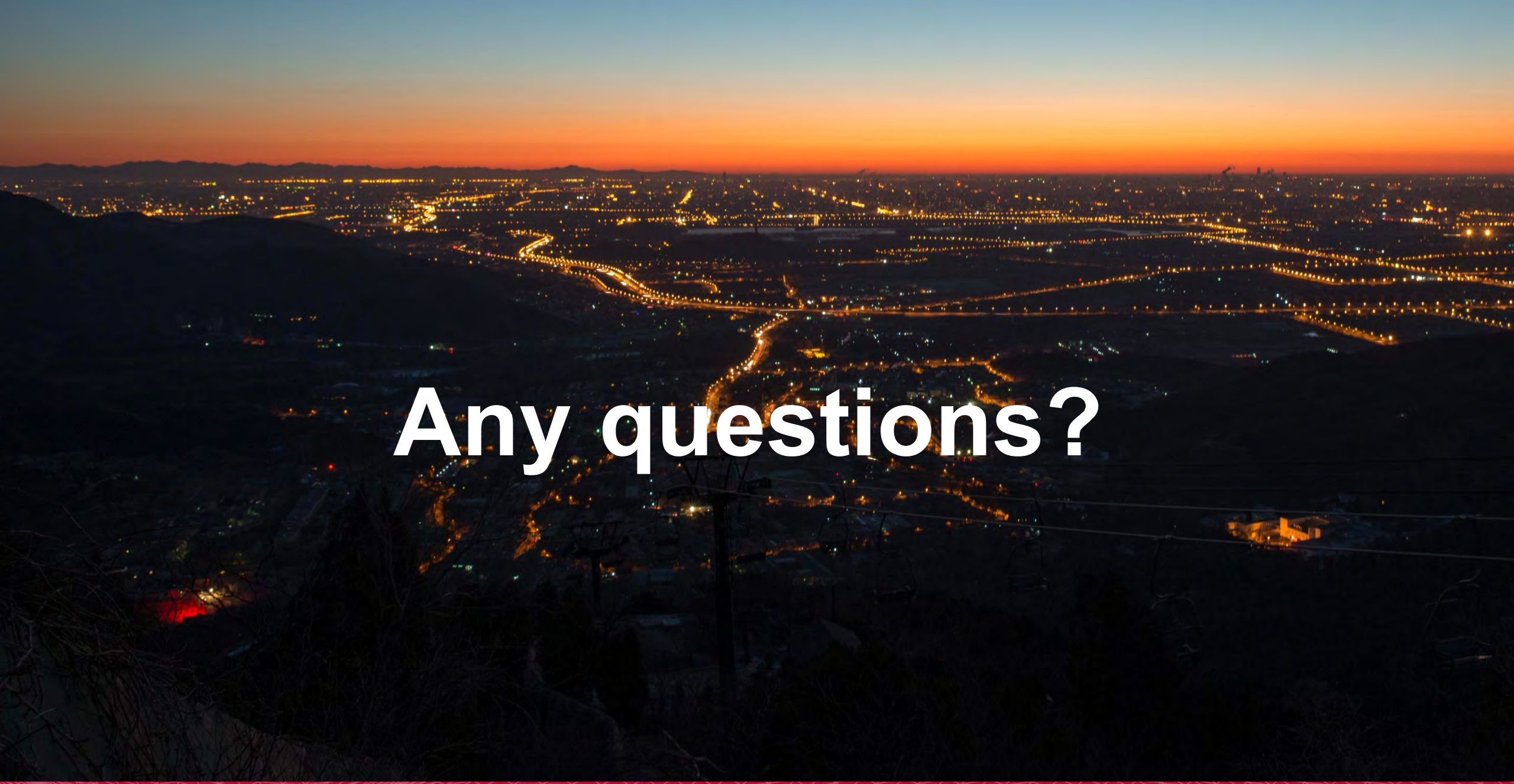
Community Energy in the NPg region

- **Listening**
- **Transparency**
- **Better communications** targeted biannual newsletter, a point of contact, more face to face engagement
- **Technical support**
- **Financial support**
- **Innovation projects with communities**
- **Enhanced and free connection service**
- **Support people in fuel poverty**
- **Advocate and help communities have a voice**



Thank you


The Element in the Room
I want to go renewable so my streets are less canoeable


Any questions?

Thank you

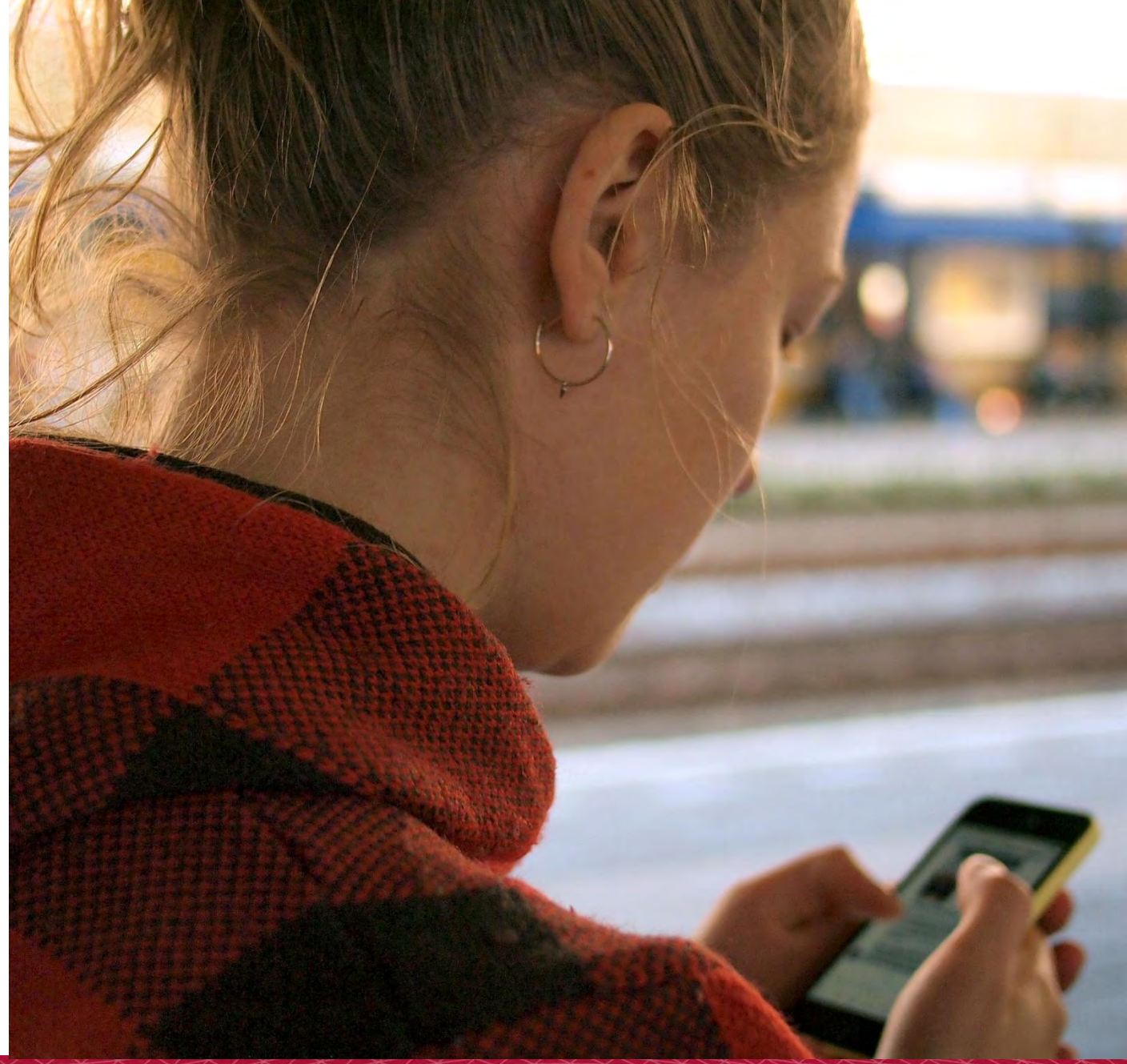
Workshop

A socially inclusive transition to zero carbon

Welcome

Anne-Claire Leydier
Energy Transition Manager –
Northern Powergrid

Michelle Cummings
Social Responsibility Manager –
Northern Powergrid



Our consumer vulnerability strategy

Our customer-focused strategy identifies three roles for the electricity network:

Customers who need extra support when accessing and receiving our services or as a result of a power loss or interruption.	→	To provide **support tailored to their needs during a power cut** and when accessing our wider services, for example connection.
Customers experiencing vulnerabilities which Northern Powergrid has a legitimate role in addressing, reducing or supporting.	→	To develop innovative ways to support our customers and communities with an aim of **reducing vulnerability in the future.**
Customers who are less able to represent themselves or their interests in energy matters.	→	**To give our customers a voice** – acting as an advocate when discussing industry policy and to share best practice.

The drivers of change

Democratisation

Decarbonisation

Decentralisation

Digitisation

A new smart, flexible and fair energy system

Our proposition

Feedback and discussion

Sue Ferns
Prospect

Adam Scorer
NEA

Carol Botten
VONNE

Joshua Emden
IPPR

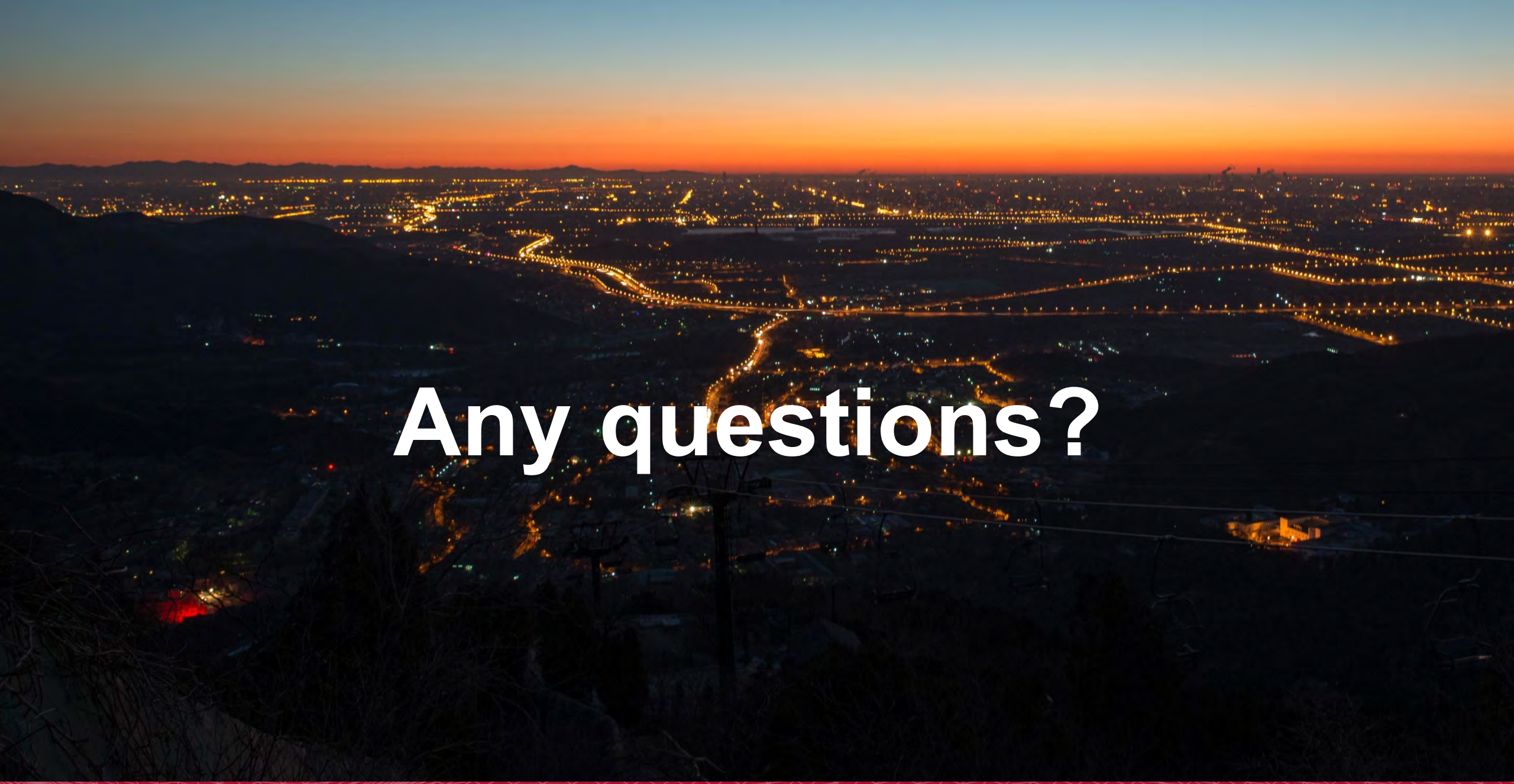
Feedback and discussion

What are the risks and opportunities for energy customers because of the "4Ds", thinking specifically about vulnerable members of society?

How do we minimise the risks and maximise the opportunities?

- As a network?
- As your organisation?
- As a community?

What can we do together to share the best possible energy system by 2035?


Any questions?

Thank you

Workshop

Zero carbon transport: How to start your journey

Welcome

Geoff Earl
Director of Safety,
Health and Environment

Phil Jagger
Design Team Manager

Enabling the decarbonisation of transport

- Andy Wilson – **Rotherham Metropolitan Borough Council**
- Dr Sara Walker – **Decarbon8 and Newcastle University**
- Matt Sandell – **GRIDSERVE**
- Moira Nicolson – **Ofgem**
- Phil Jagger – **Northern Powergrid**

‘Road to Zero’ strategy

2017: UK Government announced **Road to Zero Strategy** to decarbonise transport sector

Three key targets over three decades:

2030

By 2030 – at least 50% of new cars and 40% of new vans to be ultra low emission

2040

By 2040 – ban on new petrol and diesel car sales

2050

By 2050 – almost all cars on road to be zero emission

What does this mean for us?

The start of our decarbonisation journey…

…began with our **industrial and grey fleets**, involving **1,460 vehicles**

Pool car fleet:
Have 5 EVs in current fleet

Will increase to 10 by 2020

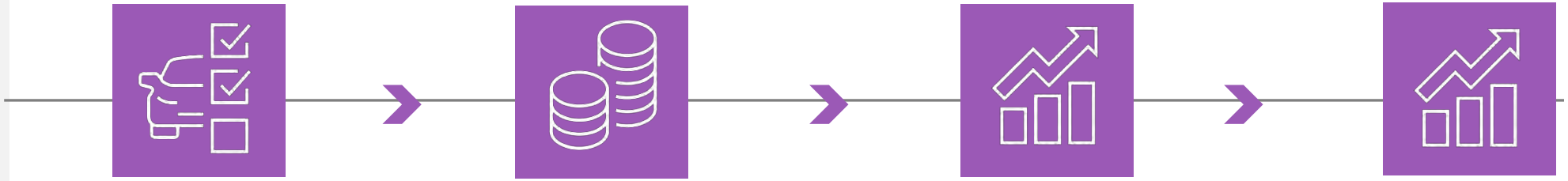
100% EV by 2021

'Silent Power' innovation project:
3 clean, silent mobile electrical energy storage systems to restore supplies to customers in event of network fault / maintain supplies during planned power cut

Annual fleet renewal programme:
additional EVs of car-derived van class, arriving 2020

Fleet management company:
due to issue new tender imminently, to include grey fleet provision of EVs and alternative-fuelled vehicles

Continued…



Vehicle trials:
new Ford Transit Custom Hybrid early 2020, others as they become available from manufacturers

Business plan:
gradual progression to alternative-fuelled fleet over next regulatory period

Additional charging points:
for operational depots, encouraging our people to use alternative-fuelled rather than fossil-fuelled vehicles

Euro 6 engines:
complete within 2 years

Future challenges for Northern Powergrid

Ensuring **supply and demand of automotive manufacturers** – will there be enough vehicles?

ED1: remaining within our agreed allowances while progressing changes to EVs with increased capital and operational spend

ED2: securing stakeholder agreement for higher costs to finalise changeover

Communicating with union representatives to allow for discussions for potential home charging points to be installed

Reaching agreements with others on T&Cs for utilising our home charging points

Establishing charging facilities within our substations to ensure more robust network

Educating our workforce to motivate and build confidence – e.g. using alternative-fuelled vehicles

Providing alternative-fuelled specialist plant replacing, for example, Mercedes Benz Unimogs for off-road overhead line commitments

Potential challenges facing the automotive industry

We're not the only ones who will face challenges as attitudes to EVs change in the future:

- Will gap emerge between manufacturer capacity projections and customer demands?
- Will pricing structure become on par with internal combustion engine counterparts?
- Will charging infrastructure be able to cope with number of vehicles wanting to utilise it?
- Will predictions for faster charging capability be achievable?
- Will industry be able to give redundant battery packs 'second life' for energy storage when finally removed from vehicles?
- What skills will workforce need to maintain vehicles and can these gaps be filled?

Decarbonising transport

Practical experiences

Rotherham Borough Council

Andy Wilson

Energy Efficiency Officer

Decarbon8

Dr Sara Walker

Reader in Energy and Director of Energy@NCL

AVOID, SHIFT, REDUCE

Newcastle University

GRIDSERVE Electric Forecourt® (actual design)

Matt Sandell
Public Sector Partnerships Director

Ofgem

Moira Nicolson

Senior Behavioural Insights Manager

What's the end goal?

Education/awareness ≠ behaviour change

Exploit the window of opportunity

ofgem

Making a positive difference
for energy consumers

Northern Powergrid:

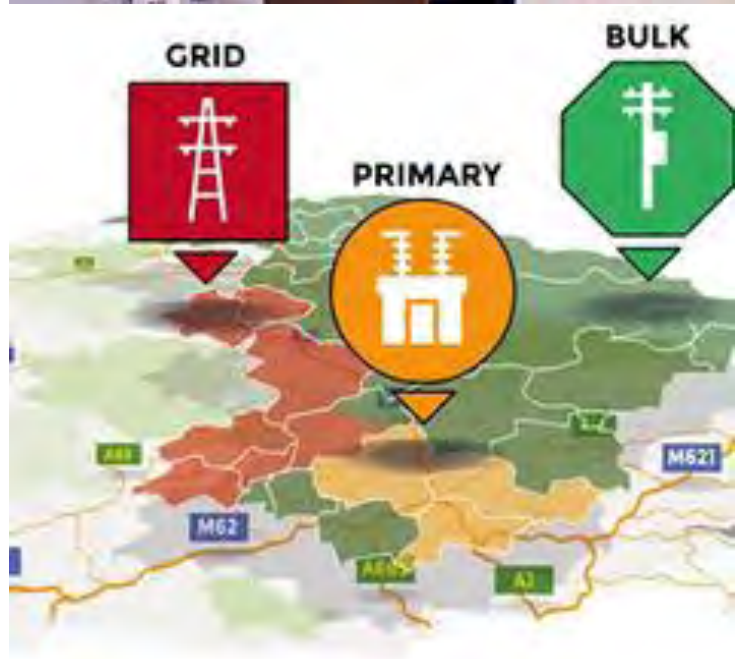
What are we doing to help the decarbonisation of transport?

Phil Jagger
Design Team Manager

We have a key role in enabling regional transport electrification

We are doing this in a number of ways:

- ✓ Upfront conversations
- ✓ Stakeholder engagement
- ✓ Monthly ‘connections surgeries’
- ✓ Meeting with local authorities and local enterprise partnerships to discuss future infrastructure plans
- ✓ Innovation projects
- ✓ Working with industry, research partners and policy makers
- ✓ Developing and sharing technical guidance and new tools



Helping you plan your charging infrastructure

You may want to consider:

- ✓ What is the minimum requirement to fulfil your needs?
- ✓ Available (existing) connection at your premises
- ✓ Whether charging can be matched or offset by other LCTs
- ✓ Battery degradation/heating
- ✓ Flexible/smart charging arrangements

	Slow	Fast	Rapid
Power rating	3.5-7kW	7-22kW	43kW+
Electrical supply type	AC	AC and DC	DC
Time to charge (empty to full)	6-11h	2-6h	48-56min or less
Time to charge (typical daily use of 10kWh)*	1.5-3h	0.5-1.5h	less than 15min
Range added in 15min*	3-7 miles	7-23 miles	45-53+ miles

Charger types – illustrative example
* Based on assumed battery capacity of 40kWh

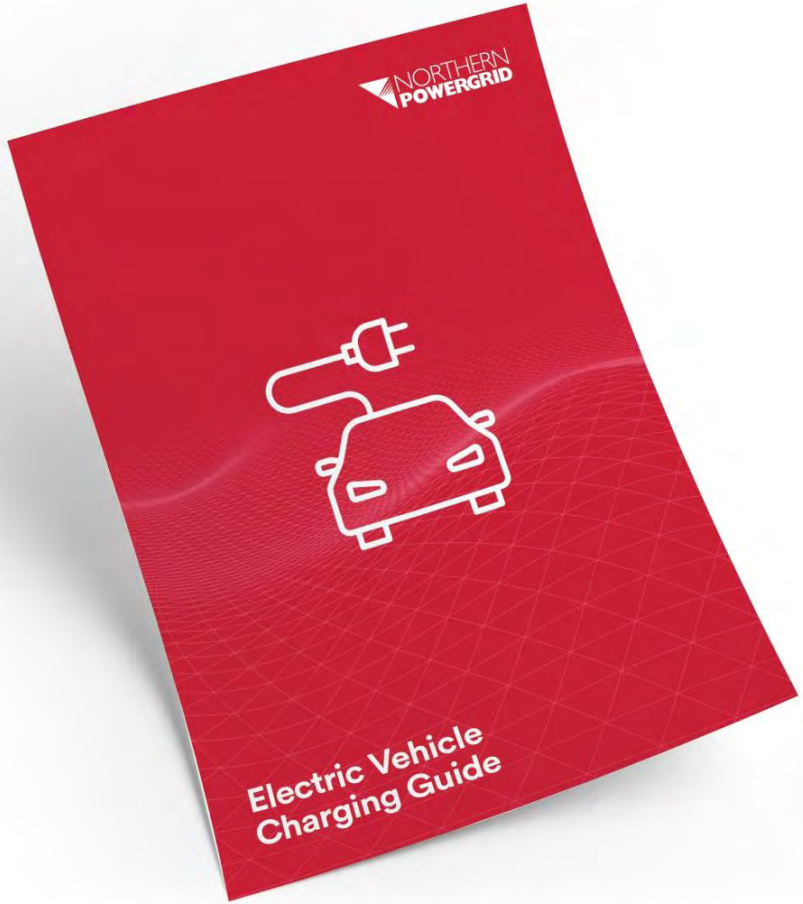
We are listening to our stakeholders

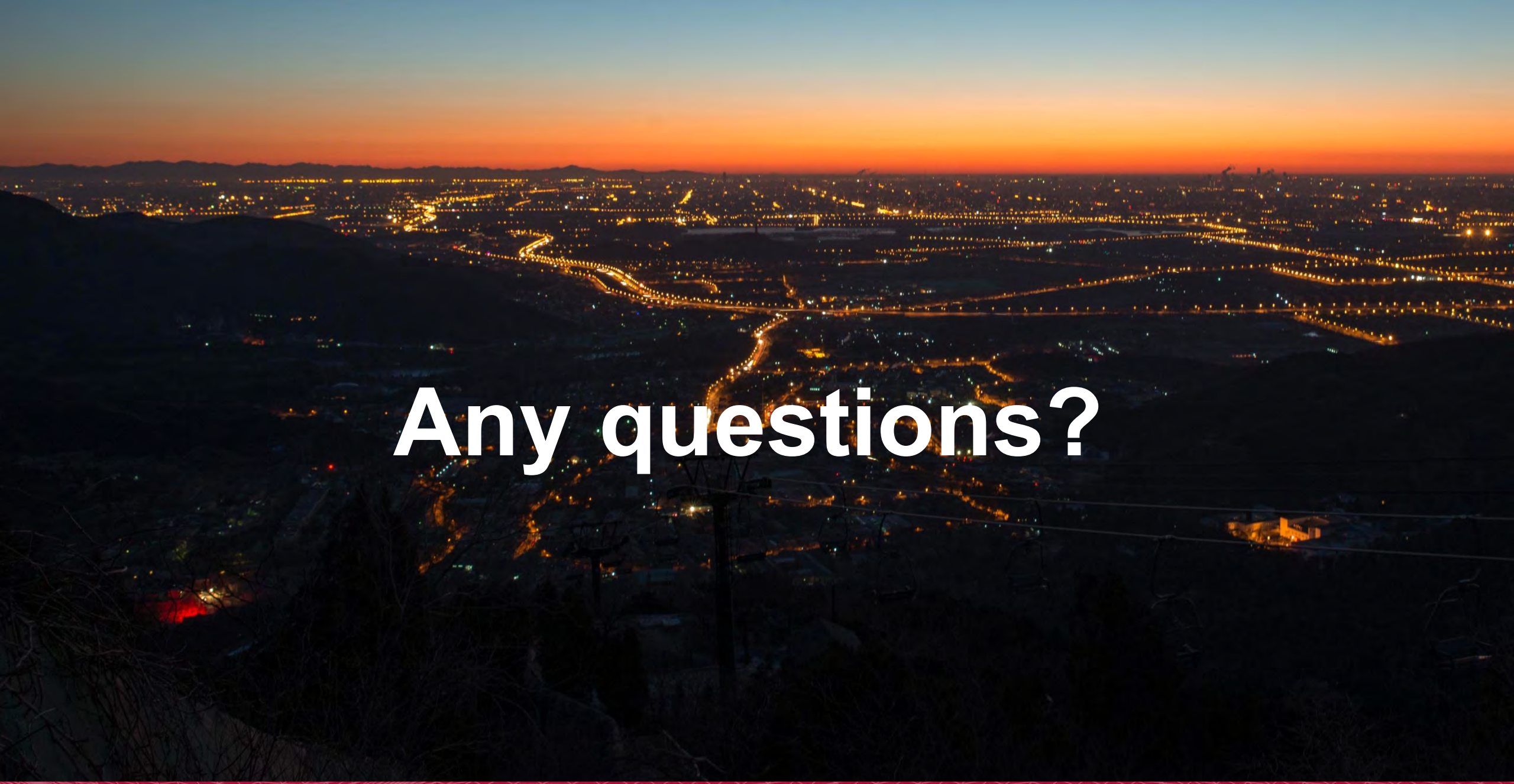
Drafting an Electric Vehicle Charging Guide around:

- Home charging
- Destination charging
- On-street charging
- Charging hubs

- Reviewing our online applications process and information available

- Providing new online mapping and budgeting tools for electric vehicle charger connections




Any questions?

Thank you

Forecasting the impact of net zero

Establishing planning scenarios to facilitate regional decarbonisation aspirations

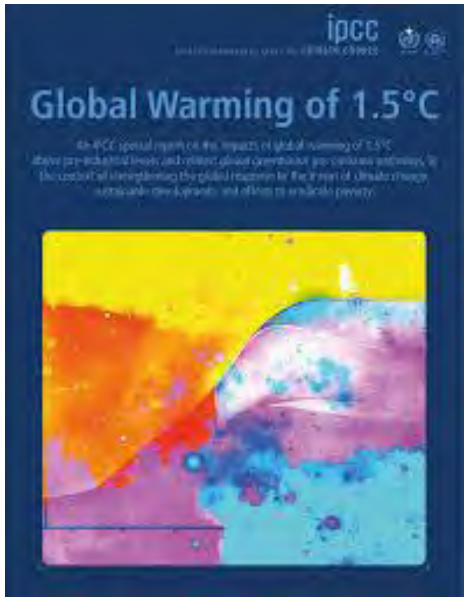
Welcome

Mark Drye
Director of Asset Management

Andrew Spencer
System Planning Manager

Climate Emergency in the UK has significantly tightened decarbonisation targets

- For global warming to be limited to 1.5 °C CO2 emissions would need to reduce to net zero by 2050 EPCC Global Warming Report 2018
- A year of civil protest ensued
- UK government first to declare climate emergency and target net zero by 2050
- 33 local authorities in our region:
  - 27 have declared climate emergency
  - 7 are introducing clean air zones
  - 19 are aspiring to adopt net zero targets ahead of 2050



Electricity networks are key to the decarbonisation of heat, transport and generation

- Coal fired power stations are closing.
- Significant generation is now connected to our distribution networks; 4.4GW of export capacity; 64% renewable.
- The switch to non-fossil fuel alternatives for transport & heating is running at a slower pace; 18,000 EVs and 27,500 heat pumps.
- Forecasting is scenario-based to manage uncertainty.
- EVs could have the biggest potential impact on peak demand depending on charging incentives on offer.
- We are engaging local stakeholders to develop our regional forecasts.

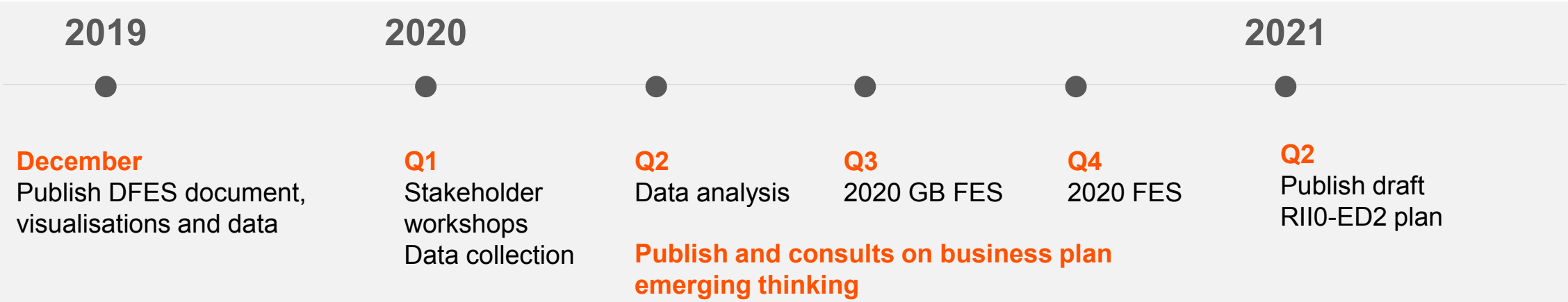
The purpose of this workshop

To consult on our proposal and to receive feedback on:

- Data presentation
- Engagement method
- Feedback questions
- Feedback mechanisms and timeline

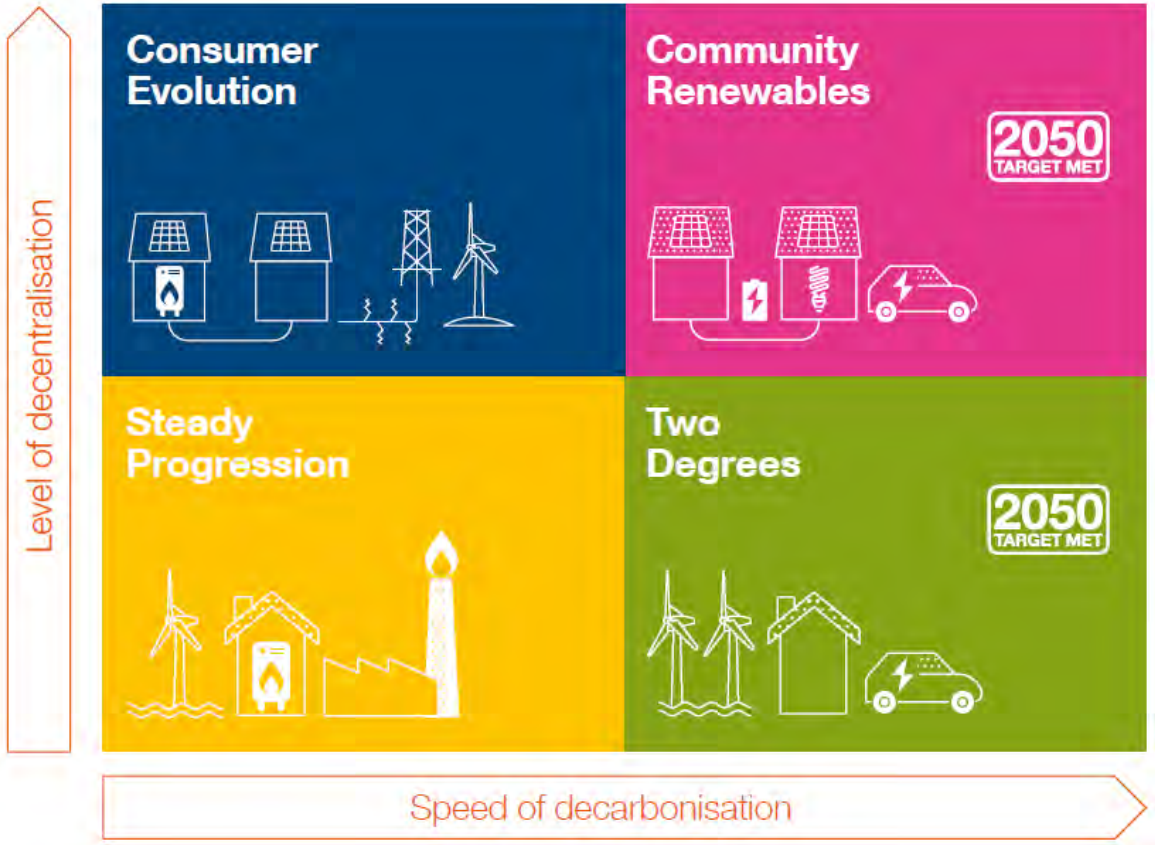
We will:

- Demonstrate DFES data and visualisations
- Allow you to explore DFES visualisation
- Seek initial views on current forecast parameter
- Seek views on what we are proposing



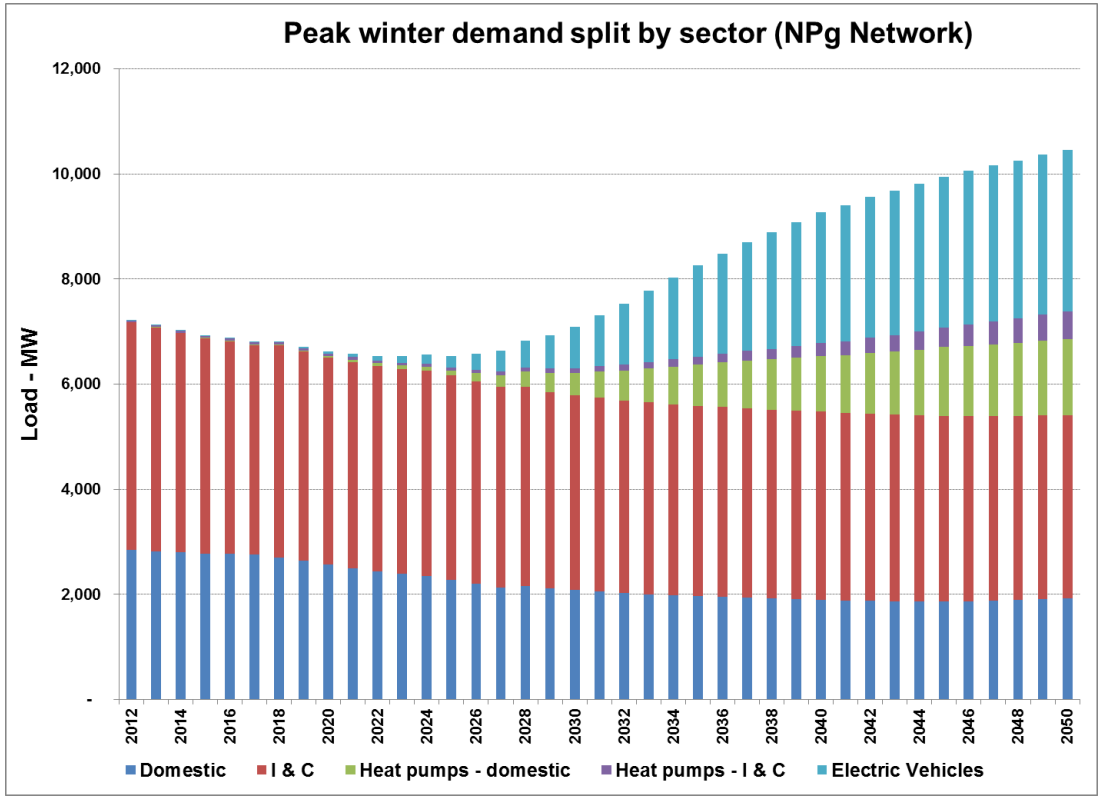
Our scenario-based forecasts are based on the GB FES

- Only two current GB FES scenarios achieve 80% reduction by 2050
- Mirrored in our 2019 DFES
- Our consultation with you will inform next iteration of GB FES 2019 and our 2020 DFES
- Both will incorporate scenarios to achieve net zero



Mix of demand will evolve

- Underlying residential, industrial and commercial demand will continue to reduce with ongoing energy efficiency initiatives
- Low carbon technologies will introduce new demand as heat and transport is decarbonised:
  - Electric vehicles
  - Residential heat pumps
  - I&C heat pumps
- Different scenarios reflect different growth assumptions



Introducing the Northern Powergrid DFES

Our 2019 DFES consists of:

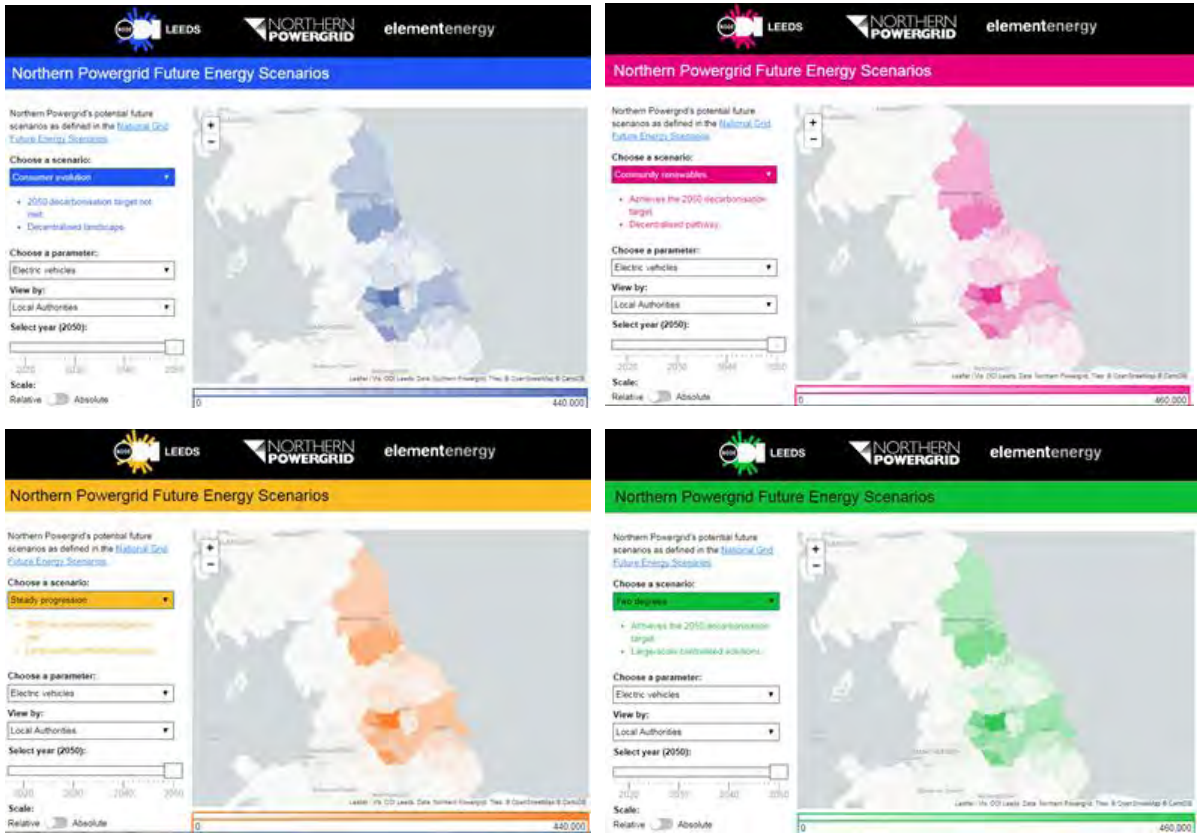
- Summary and orientation document
- Visualisation tool
- Downloadable data files and charts
- Feedback templates

Key parameters include:

- Electric vehicles (No)
- Heat pumps (No)
- DG and storage (MW)
- Energy and peak demand (GWh and MW)

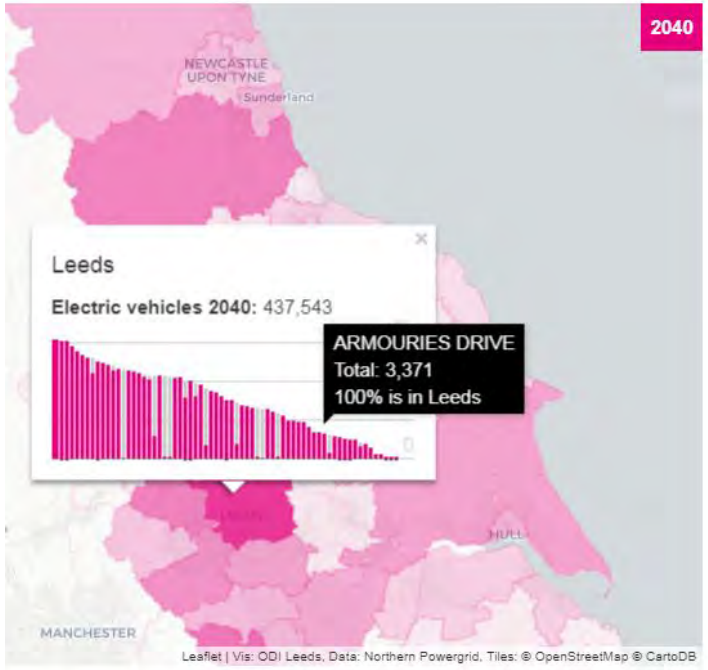
Forecasts for every major substation

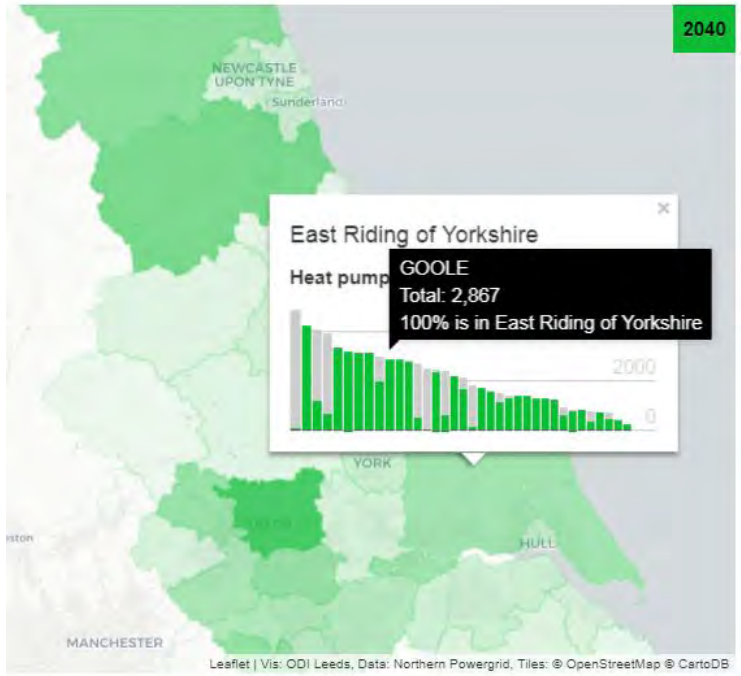
A regional view by local authority area

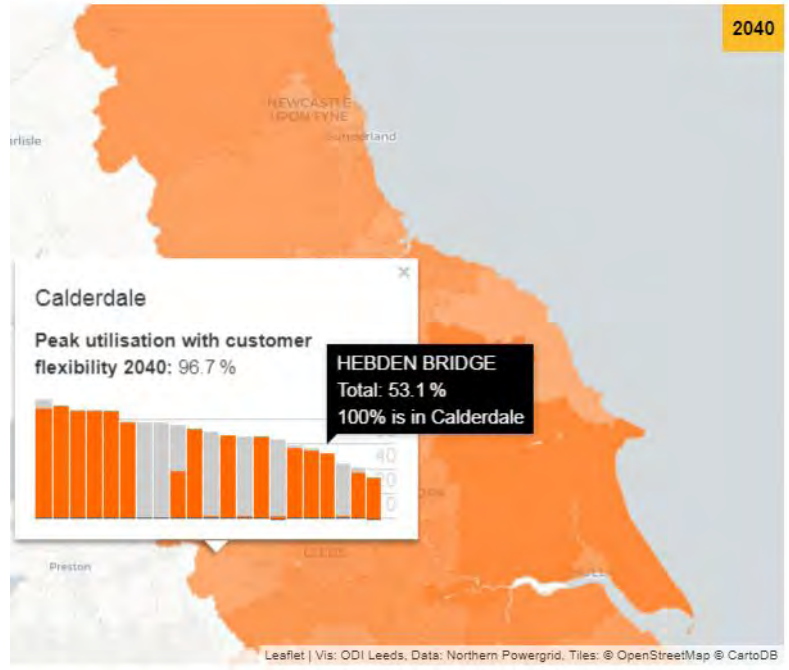


Exploring the DFES visualisation

Can be found at: https://odileeds.github.io/northern-powergrid/







Zooming in for a substation view

Northern Powergrid's potential future scenarios as defined in the National Grid Future Energy Scenarios.

Choose a scenario:

Consumer evolution

- 2050 decarbonisation target not met.
- Decentralised landscape.

Choose a parameter:

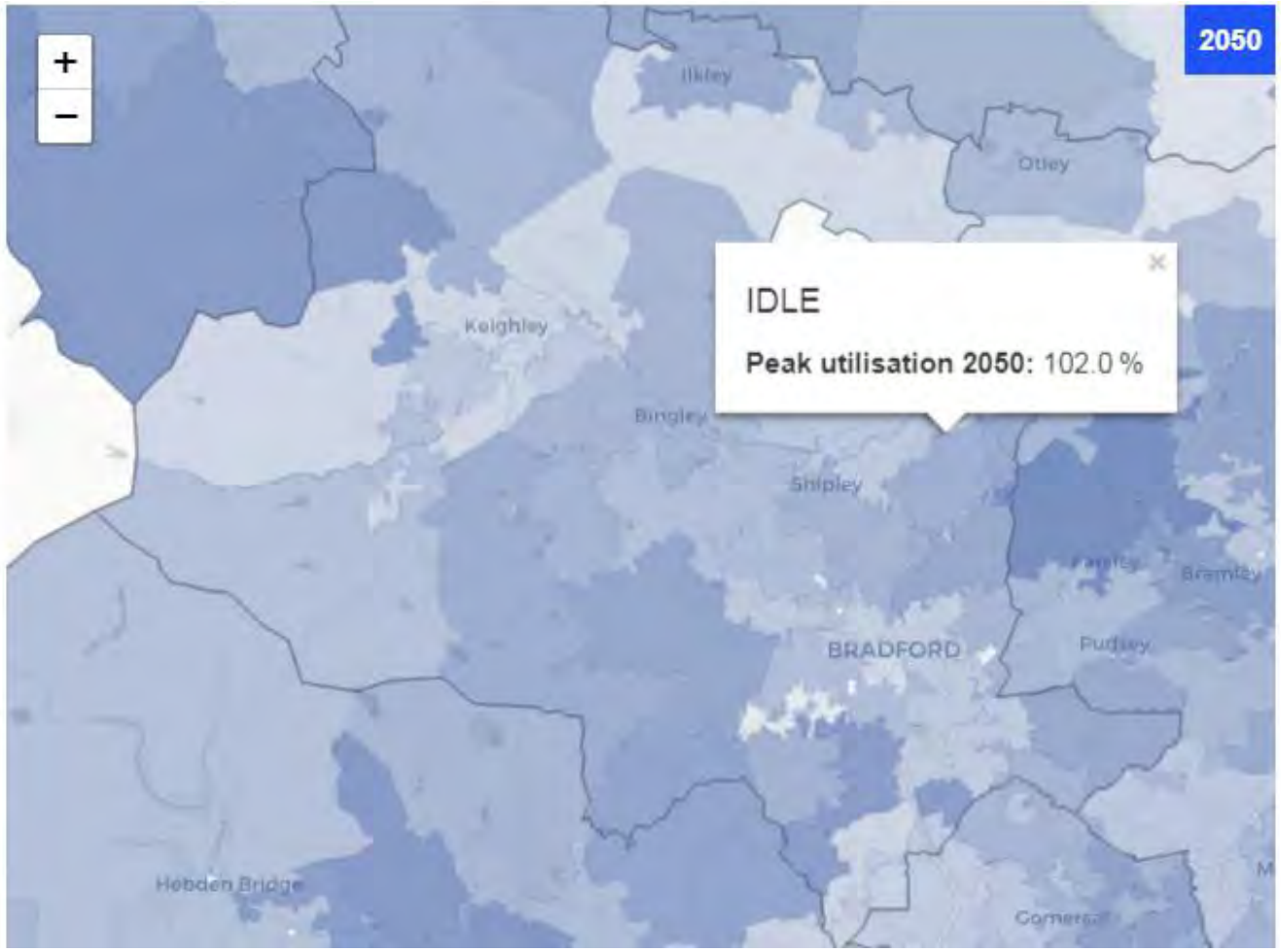
Peak utilisation

View by:

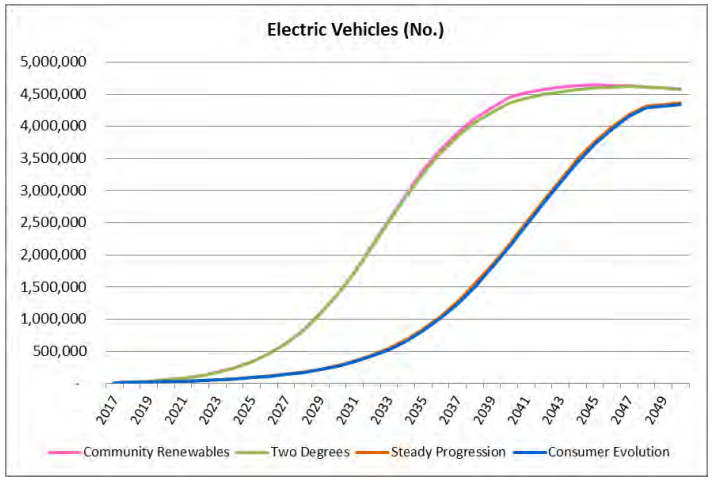
Primary Supply (with Local Authorities)

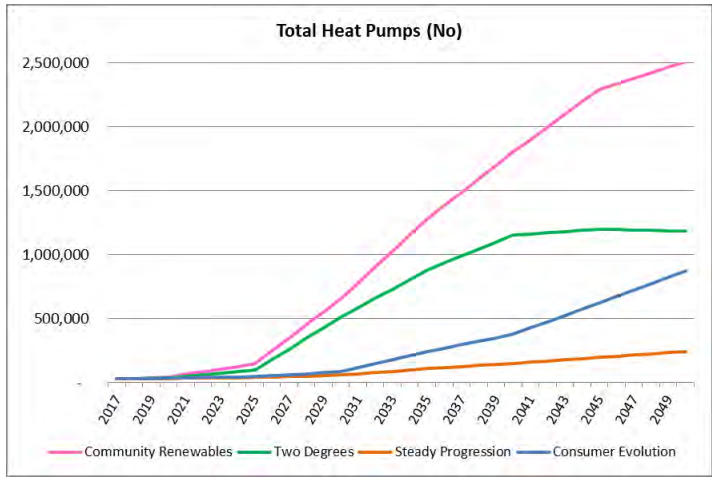
Select year (2050):

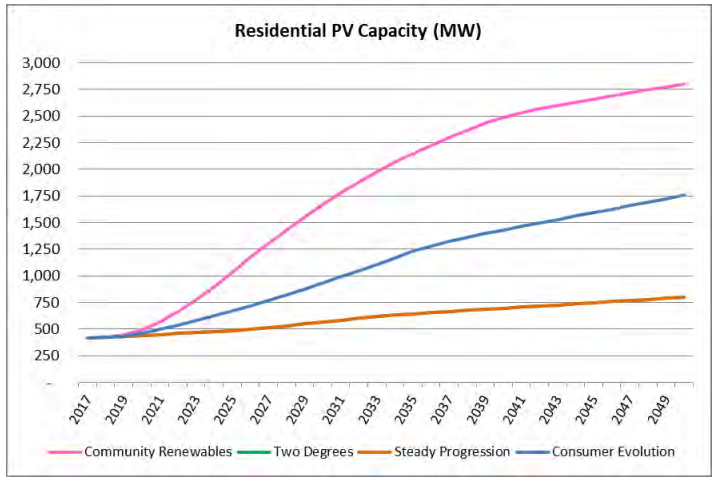
2020 2030 2040 2050

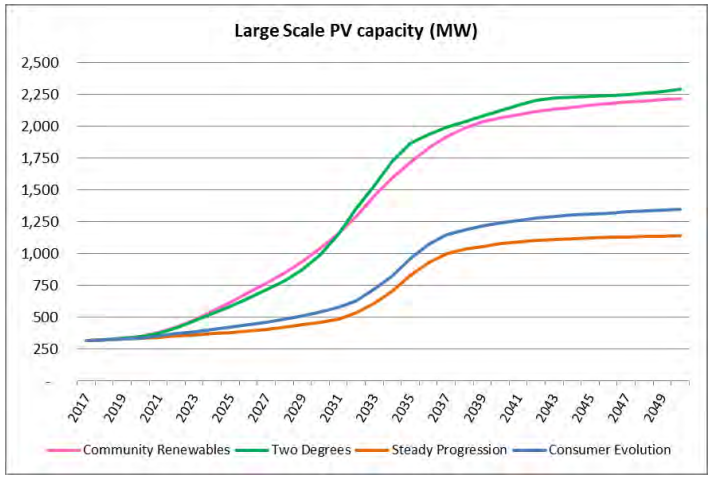


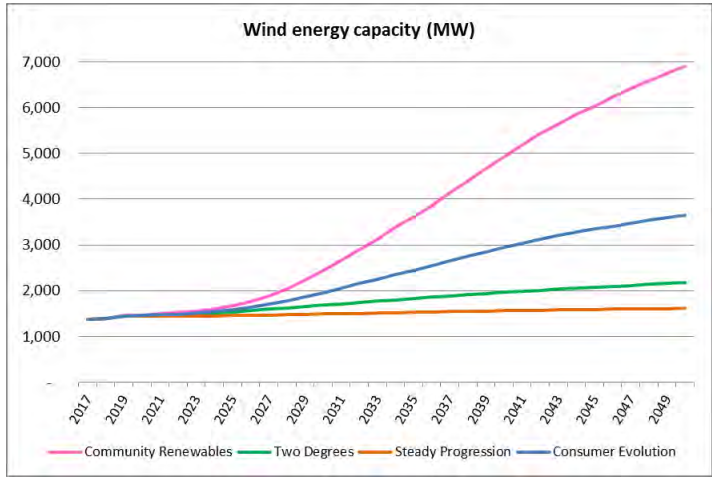
Data files provide underlying data and charts

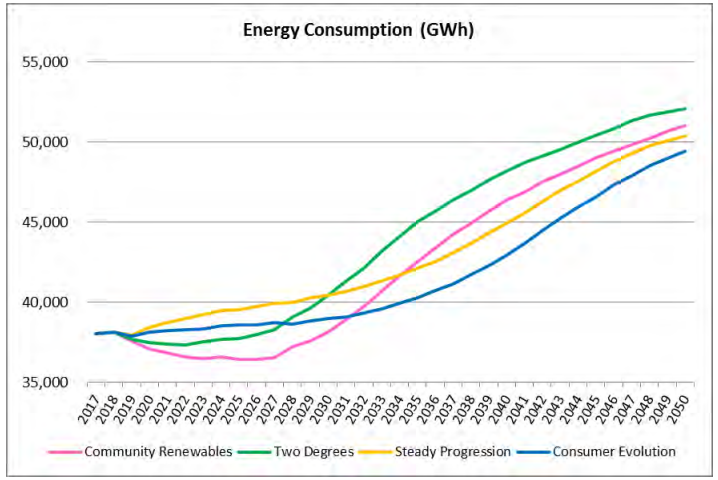




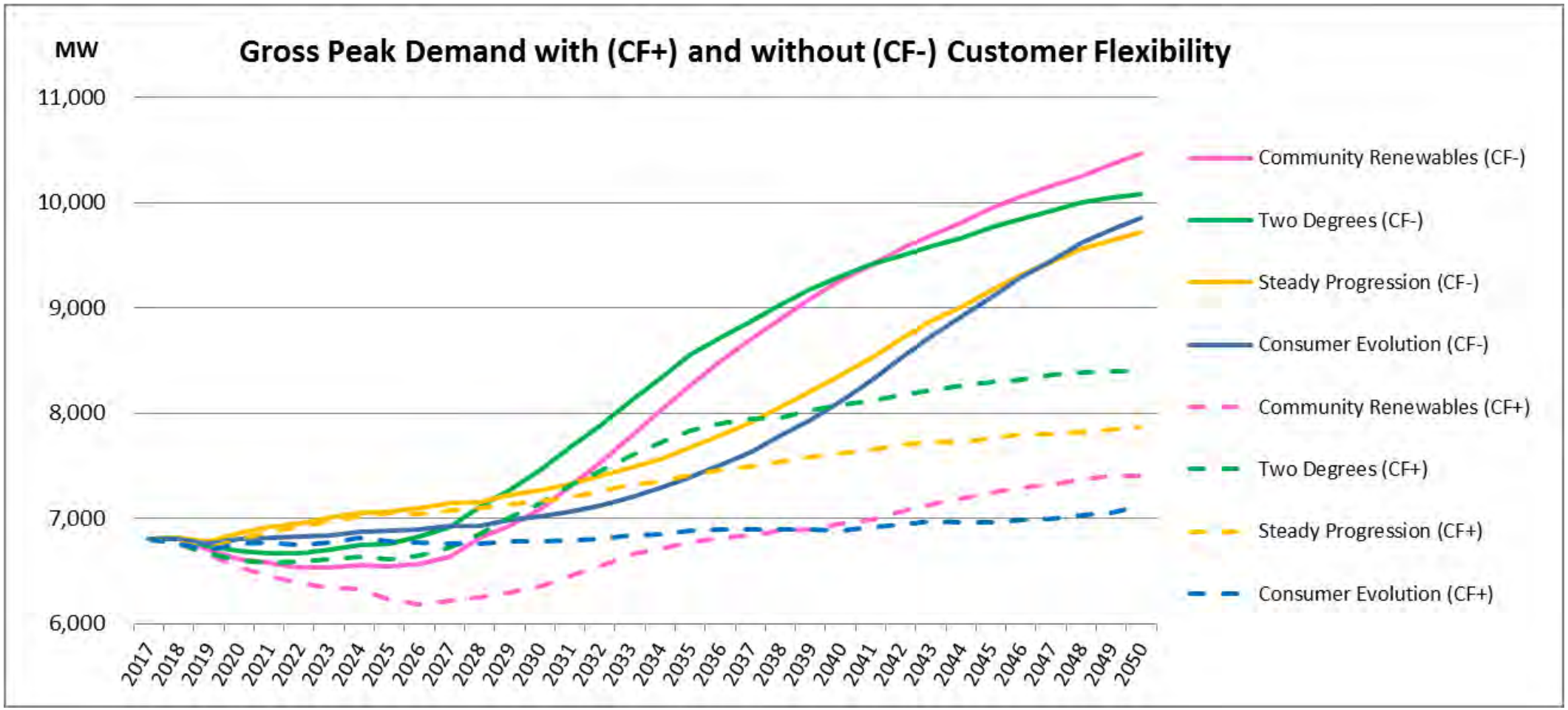








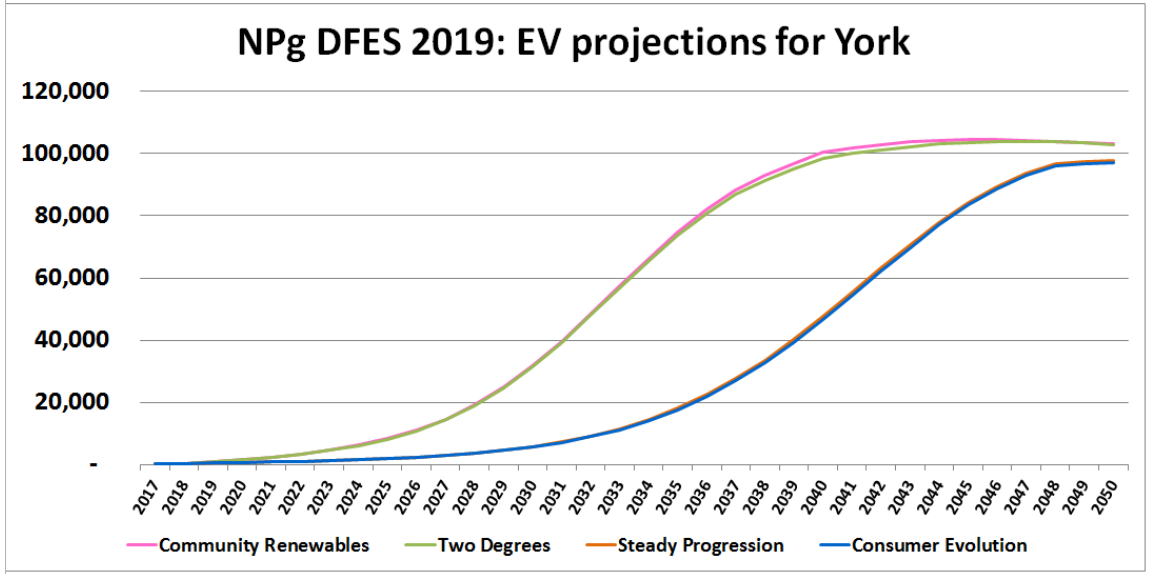
Data files will provide all underlying data and charts



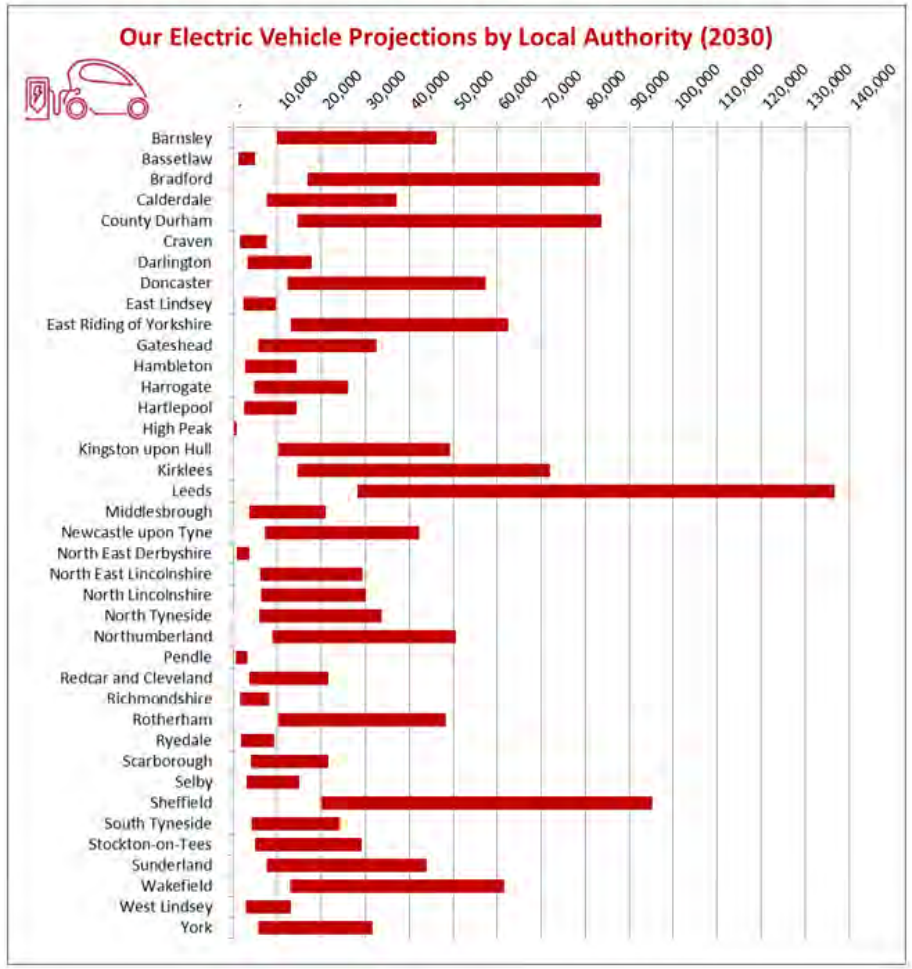
All projections provided at substation level and regional level

Select Your Local Authority

York



NPg DFES 2019: EV projections for York	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Community Renewables	274	399	909	1,531	2,325	3,319	4,586	6,185	8,274	11,019	14,583
Two Degrees	274	399	900	1,516	2,301	3,292	4,545	6,129	8,198	10,917	14,452
Steady Progression	274	399	557	706	878	1,065	1,289	1,572	1,930	2,383	2,956
Consumer Evolution	274	399	557	703	873	1,057	1,278	1,557	1,909	2,352	2,909

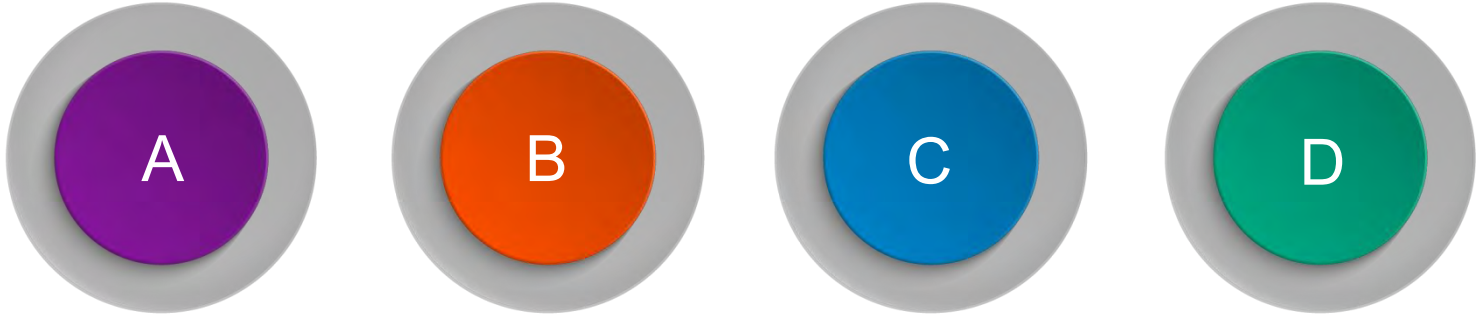


Seeking your views – interactive session

Please explore the 'tool and answer' questions on one of the LCTs categories:

1. At Northern Powergrid level
2. At local authority level

Please vote now to chose one from each of the following two options



A	B	C	D
Number of electric vehicles in 2030	Number of electric vehicles in 2040	Number of heat pumps in 2030	Number of heat pumps in 2040

The results will be presented here

Workshop final votes (to be taken at session end):

a) Do you feel engaged with our proposal for providing our forecasts?

b) What engagement process would be best for you to provide your views?

Electric vehicles in 2030

Whole of Northern Powergrid region

Possible answers

a) Community Renewables / Two Degrees

b) Steady Progression / Consumer Evolution

c) Higher

d) Lower

e) No idea

Scenario	2030	Multiplier
Community Renewables	1,393,292	77x
Two Degrees	1,381,697	
Steady Progression	278,425	15x
Consumer Evolution	272,232	

Background data

- Northern Powergrid serves **3.9 million** homes and businesses
- Approximately **8 million** people and **4 million** cars
- **18,000** electric vehicles in 2019

The results of the electric vehicles scenario poll will be presented here

Electric vehicles in 2030

Your chosen local authority area

Possible answers

a) Community Renewables / Two Degrees

b) Steady Progression / Consumer Evolution

c) Higher

d) Lower

e) No idea

Scenario	2030	Multiplier
Community Renewables	1,393,292	77x
Two Degrees	1,381,697	
Steady Progression	278,425	15x
Consumer Evolution	272,232	

Background data

- Northern Powergrid serves **3.9 million** homes and businesses
- Approximately **8 million** people and **4 million** cars
- **18,000** electric vehicles in 2019.

After using the feedback mechanism, click here to present the results of the electric vehicles visualisation poll.

Electric vehicles in 2040

Whole of Northern Powergrid region

Possible answers

a) Community Renewables / Two Degrees
b) Steady Progression / Consumer Evolution
c) Higher
d) Lower
e) No idea

Scenario	2040	Multiplier
Community Renewables	4,452,122	245x
Two Degrees	4,367,503	
Steady Progression	2,162,869	120x
Consumer Evolution	2,121,728	

Background data

- Northern Powergrid serves **3.9 million** homes and businesses
- Approximately **8 million** people and **4 million** cars
- **18,000** electric vehicles in 2019

The results of the electric vehicles scenario poll will be presented here

Electric vehicles in 2040

Your chosen local authority area

Possible answers

a) Community Renewables / Two Degrees
b) Steady Progression / Consumer Evolution
c) Higher
d) Lower
e) No idea

Scenario	2040	Multiplier
Community Renewables	4,452,122	245x
Two Degrees	4,367,503	
Steady Progression	2,162,869	120x
Consumer Evolution	2,121,728	

Background data

- Northern Powergrid serves **3.9 million** homes and businesses
- Approximately **8 million** people and **4 million** cars
- **18,000** electric vehicles in 2019.

After using the feedback mechanism, click here to present the results of the electric vehicles visualisation poll.

Heat pumps in 2030

Whole of Northern Powergrid region

Possible answers

a) Community Renewables / Two Degrees
b) Steady Progression / Consumer Evolution
c) Higher
d) Lower
e) No idea

Scenario	2030	Multiplier
Community Renewables	656,075	24x
Two Degrees	508,741	18x
Steady Progression	56,549	2x
Consumer Evolution	84,205	3x

Background data

- Northern Powergrid serves **3.9 million** homes and businesses
- **27,500** heat pumps in 2019

The results of the heat pumps scenario poll will be presented here

Heat pumps in 2030

Your chosen local authority area

Possible answers

a) Community Renewables / Two Degrees
b) Steady Progression / Consumer Evolution
c) Higher
d) Lower
e) No idea

Scenario	2030	Multiplier
Community Renewables	656,075	24x
Two Degrees	508,741	18x
Steady Progression	56,549	2x
Consumer Evolution	84,205	3x

Background data

- Northern Powergrid serves **3.9 million** homes and businesses
- **27,500** heat pumps in 2019

After using the feedback mechanism, click here to present the results of the heat pumps visualisation poll.

Heat pumps in 2040

Whole of Northern Powergrid region

Possible answers

a) Community Renewables / Two Degrees
b) Steady Progression / Consumer Evolution
c) Higher
d) Lower
e) No idea

Scenario	2040	Multiplier
Community Renewables	1,800,442	65x
Two Degrees	1,153,212	42x
Steady Progression	149,843	5x
Consumer Evolution	376,831	14x

Background data

– Northern Powergrid serves **3.9 million** homes and businesses
– **27,500** heat pumps in 2019

The results of the heat pumps scenario poll will be presented here

Heat pumps in 2040

Your chosen local authority area

Possible answers

a) Community Renewables / Two Degrees
b) Steady Progression / Consumer Evolution
c) Higher
d) Lower
e) No idea

Scenario	2040	Multiplier
Community Renewables	1,800,442	65x
Two Degrees	1,153,212	42x
Steady Progression	149,843	5x
Consumer Evolution	376,831	14x

Background data

- Northern Powergrid serves **3.9 million** homes and businesses
- **27,500** heat pumps in 2019

After using the feedback mechanism, click here to present the results of the heat pumps visualisation poll.

Questions, feedback mechanisms and timescales

Views on technology growth in your region

a) Electric vehicles
b) Heat pumps
c) Solar PV
d) Other DG
e) Energy consumption

Qualitative feedback

Word document

Initiatives for decarbonisation in your region

Qualitative view, relative to DFES numbers

Quantitative feedback

Excel spreadsheet

Your forecast for parameters

2019

December
Publish DFES document, visualisations and data

2020

Q1
Stakeholder workshops
Data collection

Q2
Data analysis

Q3
2020 GB FES

Q4
2020 FES

Stakeholder Workshops

2021

Q1

Q2
Publish draft RII0-ED2 plan

Publish and consults on business plan emerging thinking

Initial stakeholder views

Andrew Brooks
- Commissioning Manager

Lincolnshire COUNTY COUNCIL
Working for a better future

Martin Budd
- Environment & Climate Change Strategic Advisor

Hull City Council

Your views and feedback

Do you feel engaged with our proposal for providing our forecasts?

a) Yes: we will be able to provide some ***qualitative*** feedback

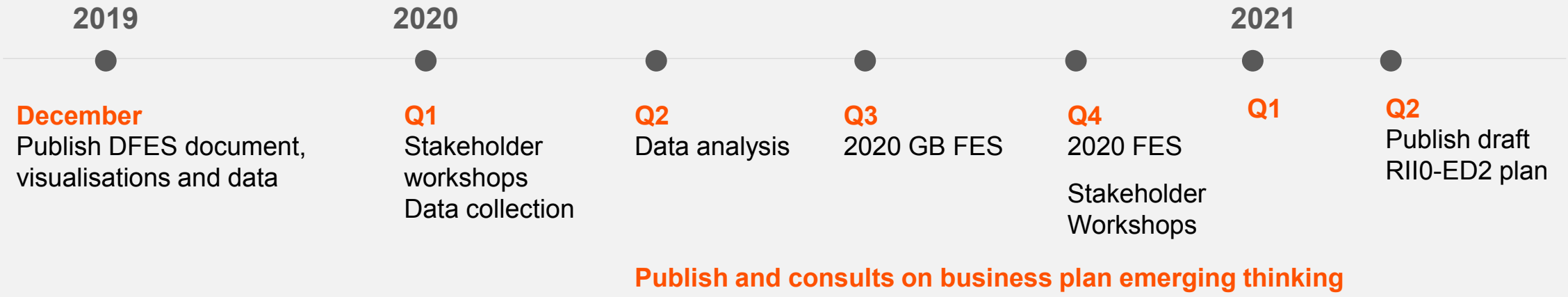
b) Yes: we will be able to provide some ***qualitative*** and ***quantitative*** feedback

c) No: we do not have forecasts for any of the parameters

Your views on the engagement process

What engagement process would be best for you to provide your views?

a) Interactive workshop for a group of ***mixed*** stakeholders
b) Interactive workshop for a group of ***similar*** stakeholders
c) Interactive workshop specifically for ***your organisation only***
d) Just emailing back feedback forms is sufficient



Session closure and final poll

We would appreciate session feedback via the app questions

If you have any follow-on suggestions on the DFES process, please feel free to contact us via our System Planning Mailbox:

Npg.system.planning@northernpowergrid.com

Andrew Spencer
Andrew.spencer@northernpowergrid.com

Thank you