



Infrastructure Adaptation and Policy



richard.dawson@newcastle.ac.uk @profrichdawson richard-dawson-newcastle

The UK Climate Change Act

- The Committee on Climate Change (the CCC) is an independent, statutory body established under the Climate Change Act 2008.
- <u>Advise</u> the UK Government and Devolved Administrations on emissions targets; and,
- <u>*Report to*</u> Parliament on progress made in reducing greenhouse gas emissions and preparing for climate change.



Climate Change Act 2008

2008 CHAPTER 27

An Act to set a target for the year 2050 for the reduction of targeted greenhouse gas emissions; to provide for a system of carbon budgeting; to establish a Committee on Climate Change; to confer powers to establish trading schemes for the purpose of limiting greenhouse gas emissions or encouraging activities that reduce such emissions or remove greenhouse gas from the atmosphere; to make provision about adaptation to climate change; to confer powers to make schemes for providing financial incentives to produce less domestic waste and to recycle more of what is produced; to make provision about the collection of household waste; to confer powers to make provision about charging for single use carrier bags; to amend the provisions of the Energy Act 2004 about renewable transport fuel obligations; to make provision about carbon emissions reduction targets; to make other provision about climate change; and for connected purposes. 9 [26th November 2008]

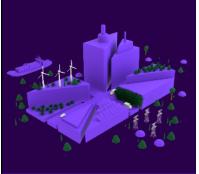
- Strategic priorities
 - Provide independent advice on setting and meeting carbon budgets and preparing for climate change
 - Monitor progress in reducing emissions and achieving carbon budgets and targets
 - Conduct independent analysis into climate change science, economics and policy
 - Engage with a wide range of organisations and individuals to share evidence and analysis

https://www.theccc.org.uk/wp-content/uploads/2013/03/CCCFramework-Document.pdf

June 2021

Independent Assessment of UK Climate Risk

Advice to Government For the UK's third Climeter Obergy Risk Association (CORA3)



Climate Change Committee

What's at risk?

UK Climate Change Risk
 Assessment

- Climate changes, actual and projected
- Changes in vulnerability and exposure (demographics, economic growth etc)
- Combined impact on the magnitude of long-term risks
- Consequences of incremental climate change and increasing weather extremes

Department for Environment Food & Rural Affairs

The National Adaptation Programme and the Third Strategy for Climate Adaptation Reporting

Making the country resilient to a changing climate

July 2018



What action is being taken?

 UK National Adaptation Programme

• Direction of travel under existing policy and practice

- Barriers and incentives
- Specific adaptation policies and programmes
- Monitoring and evaluation of key policies

Progress in preparing for climate change

2017 Report to Parliament

What progress is being made?

Progress in preparing for climate change

Progress in adapting to

climate change 2021 Report to Parliament

019 Report to Parliament

June 2021

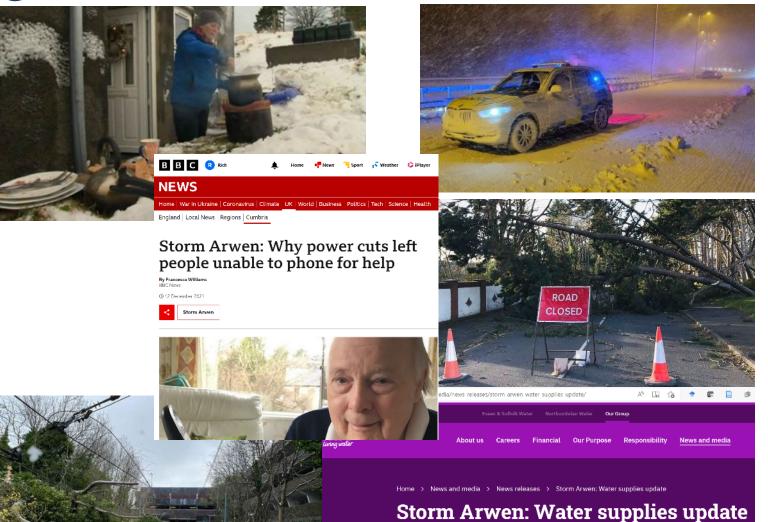
- CCC statutory progress
 report
- National indicators of vulnerability
- Is there scope for additional policy 'win-wins', low regret actions?
- Do decisions with long-term consequences account for the future climate?
- Are we preparing now for options with long lead times?

Infrastructure Action • Adaptation

Reporting Power

Interdependence

- Exposed by extreme weather
- Electrification and Digitisation changing risk pathways
- Lack of accountability to identify, track and mitigate them
- Requires coordination, data-sharing, common resilience standards, assessment in ARPs



01.12.2021

Northumbrian Water is continuing to work hard in the aftermath of Storm Arwen.

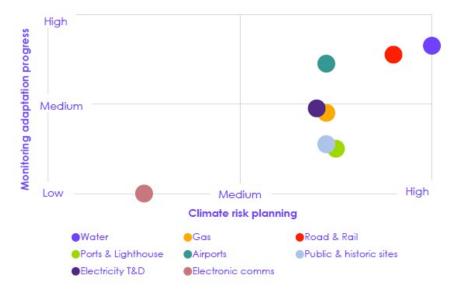
Resilience and regulation

- Need outcome-based resilience standards for all sectors
- From now until 2029: new price controls for electricity, gas, water (twice), Network Rail
- Ofwat's resilience duty has been central to resilience planning in the water sector similar duties needed for Ofgem, Ofcom and the Office of Rail and Road



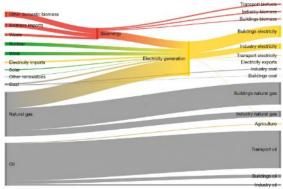
Better and comprehensive ARPs

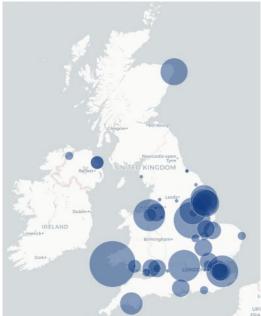
- Adjust timing to feed into CCRA 4 / NAP 4
- Mandatory to ensure complete national picture
- Interdependencies
- Link actions to risk reduction
- Key sectors needing improvement:
 - ICT
 - Ports
 - Energy (gas, generation)





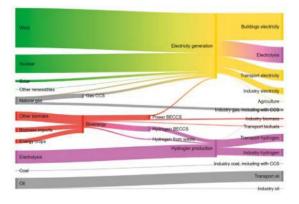
Transition to Net Zero is fundamentally rewiring system architecture

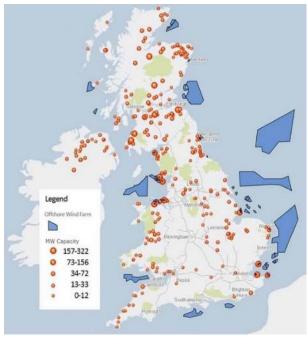




Gas power stations Source: www.carbonbrief.org







Wind generation Source: Renewable Energy Hub

Net zero infrastructure must be resilient







Ę

Monitoring progress

A resilient and net zero electricity supply



Reliable energy supply in a Net Zero economy

Required Outcomes	Reduced vulnerability of energy assets to extreme weather - Asset-level flood resilience - Condition of electricity poles , gas pipes and other power system infrastructure - Heat protection / operating thresholds of substations, oables, overhead lines and other power system infrastructure - Ground conditions (subsidence, landslides and erosion) - Abstraction restrictions imposed on generators			System level security of supply • Generation capacity, flexibility and redundancy • Generation mix and location • Water needs for Net Zero compatible generation				Interdependencies known and managed Interdependency rists (e.g. transport, water, digital) included in alimate risk assessments and adaptation action plans for all major electricity and gas producers and transmission & distribution system infrastructure operators	
Enablers	Governance		Data				Funding & investment		
	Co-ordination of resilience responsibilities across Gov departments		Centralised reporting on weather- related outages Data on consideration of climate risk				£ spent (and forecast) on system resilience (e.g. fload protection, pole management, wanagement) Consideration of adaptation needs		
	Climate resilience incorporated into relevant Net Zero policies		 Data on consideration of climate risk adaptation in major infrastructure project approvals 						
	Clear governance arrangements and responsibilities for climate resilience across the sector		 Data provision to local resilience groups on interdependencies 				in investment decisions (e.g. UK Infrastructure Bank)		
Policies and plans	Legislation and regulation	Standards	m resilience standards erators and transmission wition nies covering all CCRA r alimate resilience being to major infrastructure		 Planning Clear resilier outcomes in adaptation with monitor place Operator-lev for climate re 				
	 Climate resilience remit for Regulators 								
	Climate resilience as a	& distribu						adaptation activities by all major electricity and	
	statutory consideration for planning authorities	risks					Ŭ	gas producers,	
	decisions on infrastructure							transmission system infrastructure operators and regulators	
ontextu al factors	Hazard		Exposure			Vulnerability			
	 Observed and projected changes in: summer temperatures and extreme 		Age and condition of power infrastructure			Percentage share of electrical energy from VRE Proportion of austamers			
	heat events								
	 winter and summer rainfall and intensit of rainfall events –flooding and drough 		y				 dependent solely on electricity Consumer bill considerations impacting 		
Conte	 wind strength & regimes, storminess 		assets/number of connections				ability to invest in new infrastructure and resilience activities		

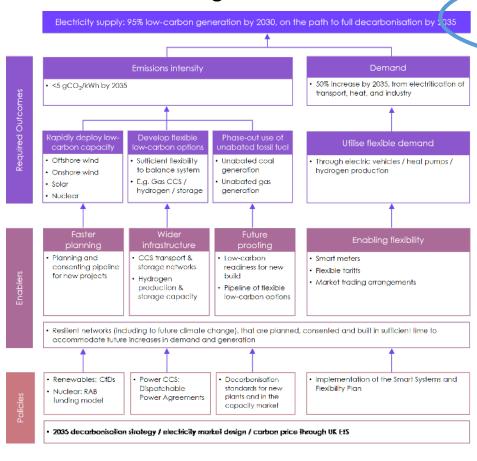
sea level rise , storm surges, coastal

erosion

and resilience activities

communities

Proportion of power users in remote



Summary

- Adaptation not yet at the scale needed to prepare fully for climate risks facing UK infrastructure, or more broadly for cities, communities, the economy and ecosystems
- Key priorities for policy are:
 - Translate present high-level objectives into delivery plans and monitor progress of delivery
 - Align adaptation and resilience timeframes with regulatory cycles
 - Develop and operationalise common resilience standards
 - Enable coordination between sectors
 - Embed net zero and climate adaptation in infrastructure planning
- Imminent opportunities
 - Upcoming regulatory cycles
 - 3rd National Adaptation Programme (NAP3)
 - Clarify important delivery milestones for the National Resilience Framework





Infrastructure Adaptation and Policy



CCC Adaptation Monitoring Framework Assessing the effectiveness of adaptation action across the UK

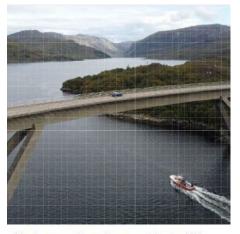
0

Climate Change

June 2021

Independent Assessment of **UK Climate Risk** Advice to Government For the UK's third Climate Change Risk Assessment (CCRA3)





Understanding climate risks to UK infrastructure Evaluation of the third round of the Adaptation Reporting Power - July 2022

Climate Change Committee



Delivering a reliable decarbonised power system March 2023

Climate Change Committee



richard.dawson@newcastle.ac.uk 🗳

The

@profrichdawson 🤟

richard-dawson-newcastle

