Climate change
Resilience of the nuclear lifecycle

Presentation for NuLEAF RWPG July 2023

Alan McGoff – Policy Lead New Nuclear Build

New and Operational Nuclear Sites

Radioactive Substances and Industry Regulation

Environment Agency

Environment Agency strategy…

EA2025
A NATION RESILIENT
TO CLIMATE CHANGE

EA2025
HEALTHY AIR,
LAND AND WATER

EA2025
GREEN GROWTH AND
A SUSTAINABLE FUTURE

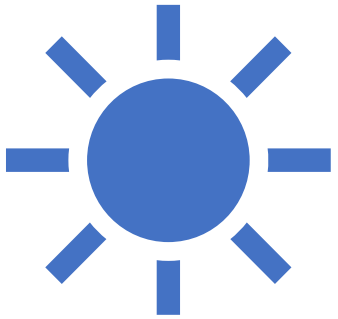
https://youtu.be/p7ahdhj-QzI

Environment
Agency


Adaptation


Mitigation

Examples of climate change impacts



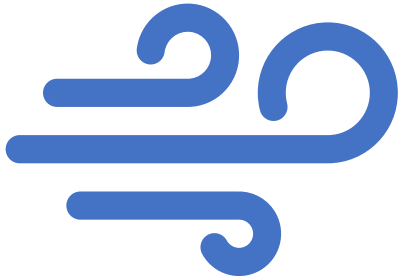
Winter/Summer daily maximum temperature

Daily extreme/average winter rainfall

Sea level rise

Drier summers

River flow



Increased maximum wind speed

- Multiple impacts across these topics
- Chronic and acute effects

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How can natural hazards impact businesses & environmental protection?
Possible failures / degradation

- **High temperature / Heat wave**
  - Insufficient process cooling, particularly where using ambient air as coolant;
  - Process equipment / instrumentation overheating and malfunctioning;
  - Increased fire risk / material decomposition / material auto-ignition;
  - Impact on workforce / reduced human performance;
  - Increased wildfire risk (either direct impact to establishment or indirect impacts – utilities/emergency response)
- **Prolonged dry weather / Drought**
  - Impact on cooling water or fire water availability;
  - Increased vulnerability of environmental receptors;
  - Subsidence / ground movement impacting on equipment supports and containment system integrity.

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How can natural hazards impact businesses & environmental protection?
Possible failures / degradation

- **Flooding**
  - Floating of vessels or impact damage to equipment causing loss of containment (potential multiple losses);
  - Loss of power / utilities / control and communication systems;
  - Compromising secondary/tertiary containment and drainage integrity/functionality;
  - Hampering emergency response due to unavailable resources or access/egress issues.
- **High winds / Storms**
  - Structural damage either directly or due to wind-blown debris;
  - Access restrictions hampering emergency response;
  - Wide area power / communications systems loss.
- **Sea level rise**
  - Increased risk of local sea/estuary defences failing and sites flooding;
  - Increased forces on jetties/coastal structures due to changes in marine/estuarine currents.

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How can natural hazards impact businesses & environmental protection?
Possible failures / degradation

- **Heavy Snowfall**
  - Access restrictions hampering process operation / maintenance;
  - Weight on structures causing structural collapse / loss of containment;
  - Loss of power / utilities / control and communication systems;
  - Compromising secondary/tertiary containment and drainage integrity/functionality;
  - Flooding impacts following thaw;
  - Hampering emergency response due to unavailable resources or access/egress issues.
- **Ice / prolonged cold**
  - Freezing of process pipework causing no /low flow and associated scenarios / causing potential pipework damage and loss of containment upon thaw;
  - Instrumentation faults and malfunctions leading to loss of process control;
  - Metal fatigue / other equipment damage causing failures and malfunctions;
  - Access issues or freezing of fire systems impacting emergency response.

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Is your business preparing for climate change?

Last year the EA published it's third adaptation report "Living Better with a Changing Climate"

- "business as usual" is not an option
- we are helping businesses prepare

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Policy and Planning

- **DESNZ radioactive substances and decommissioning policy consultation** –
- Sustainability hardwired

- **NPS - GDF**
- Applicants should use the latest set of UK Climate Projections available, at the time the Environmental Statement is prepared, to ensure that they have identified the climate risks and appropriate adaptation measures. This should cover the estimated lifetime of the new infrastructure up to and including the duration of the operational lifetime (see section 1.6)…..

- **NPS – NNB**
- EN1 (draft) Applicants should assess the impacts on and from their proposed energy project across a range of climate change scenarios…. Applicants should demonstrate that proposals have a high level of climate resilience built-in from the outset and should also demonstrate how proposals can be adapted over their predicted lifetimes to remain resilient to a credible maximum climate change scenario….. Where energy infrastructure has safety critical elements… the applicant should apply a credible maximum climate change scenario….

- **EIADR – Guidance 2023**
- A description of the project, including in particular: ….
- “the impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change;”

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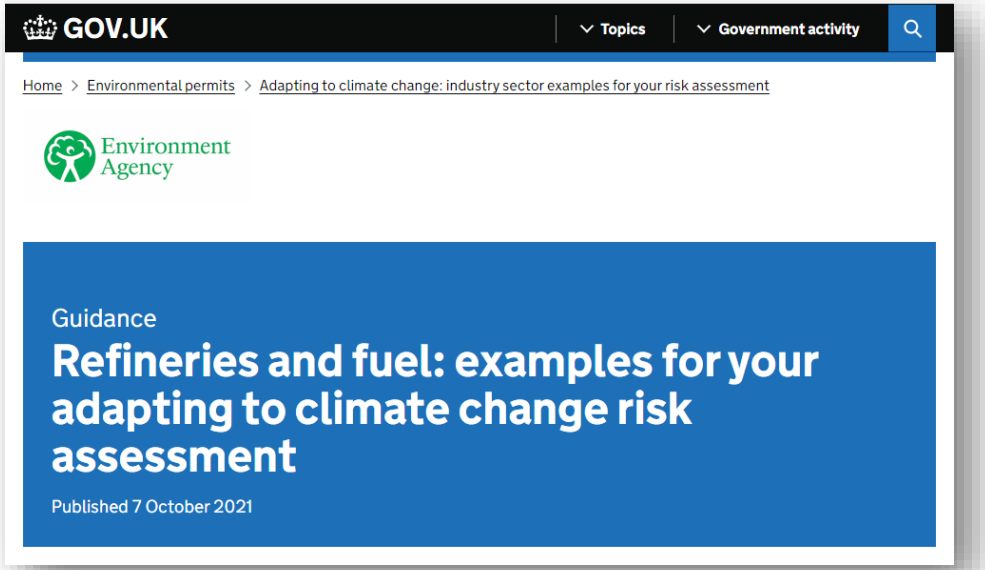
Permitting

- From 31 August 2022, EPR guidance on developing a management system has been updated to focus on an existing requirement to consider a changing climate



- Guidance is available on gov.uk

Develop a management system: environmental permits - GOV.UK (www.gov.uk)

Adapting to climate change: industry sector examples for your risk assessment

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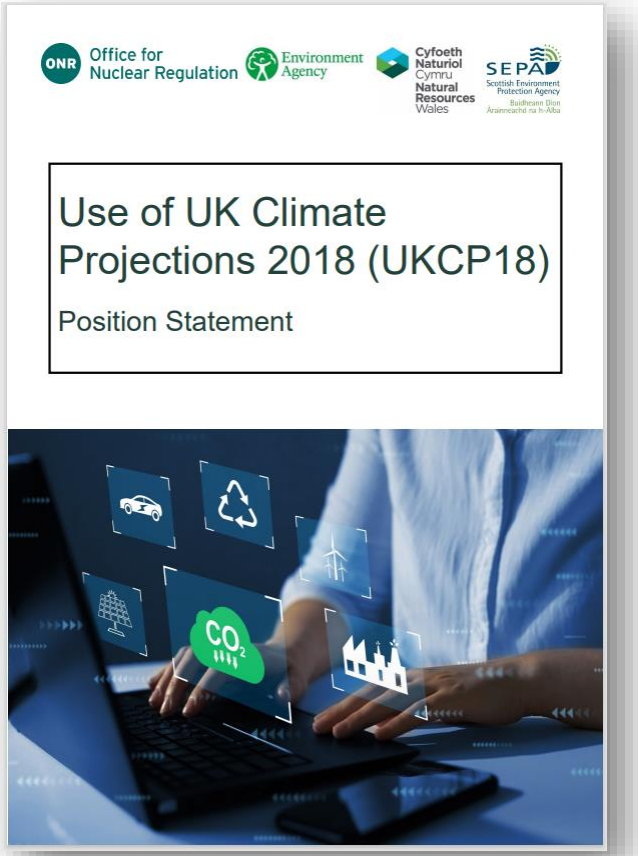
Identifying good/best practice - Guidance and Standards



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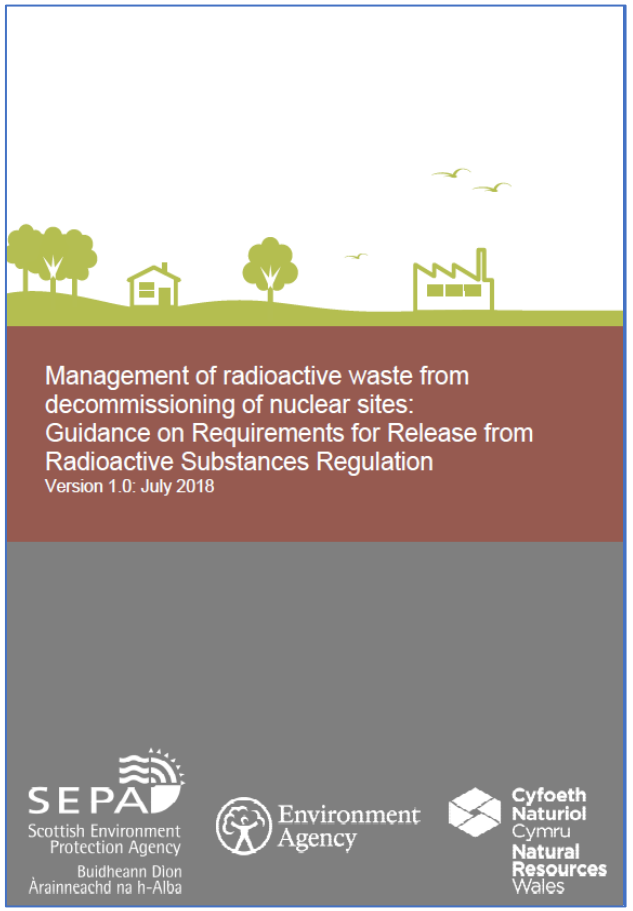
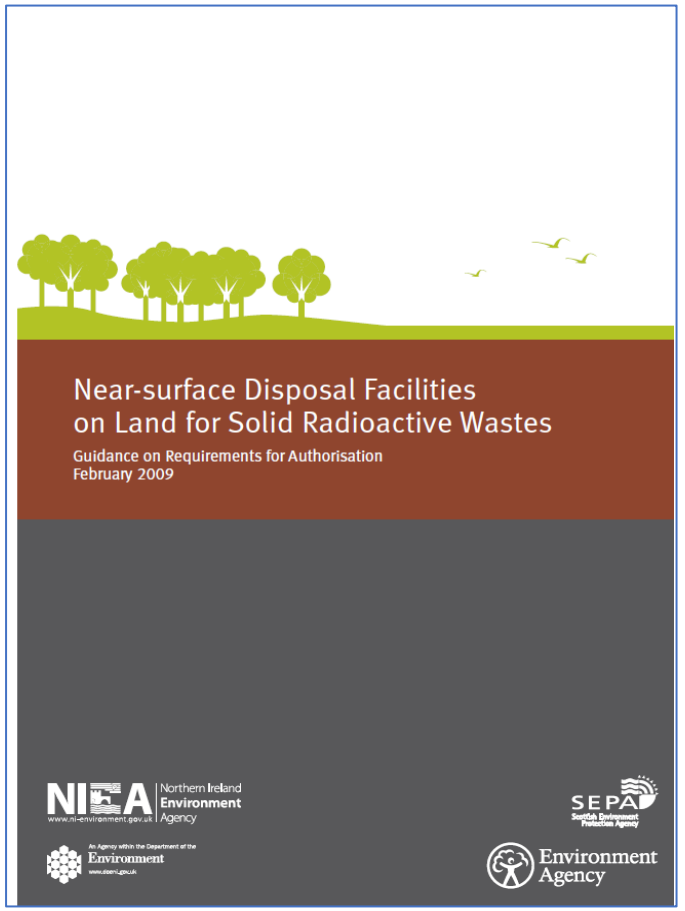
Decommissioning and clean-up, and waste management

Guidance on Requirements for Release (GRR) and Guidance on Requirements for Authorisation (GRA)





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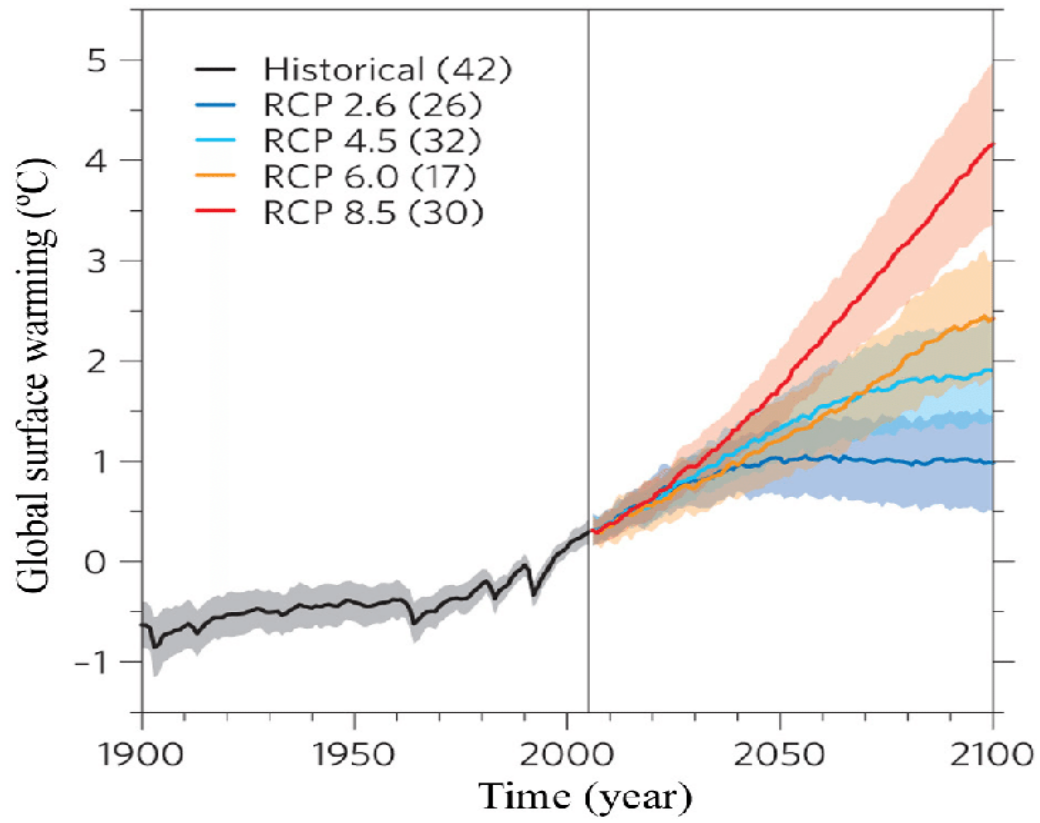
“Our thinking needs to change faster than the climate”

What is the ambition under the EPR regime?



Predicted Warming for different Representative Concentration Pathways (RCPs)

By 2026 operators will

- ✓ Assess the risks associated with a 4°C rise by 2100
- ✓ Plan to manage the risks associated with a 2°C rise by 2050, (~RCP 8.5)
- ✓ Avoid Lock-in during transition to Net Zero

- ✓ Approx 12,000 permitted sites (EA regulated)
- ✓ Approx 400-500 permitted sites (LA regulated)

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