Climate change adaptation

How good are we?

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Presentation overview

- CDOIF success - Environmental risk tolerability
- Climate Change, Process Safety and Environmental Protection
  - CDOIF’s new guidelines and the urgency for action
- How ready are we for a changed and changing climate?
- Next steps for regulators and operators

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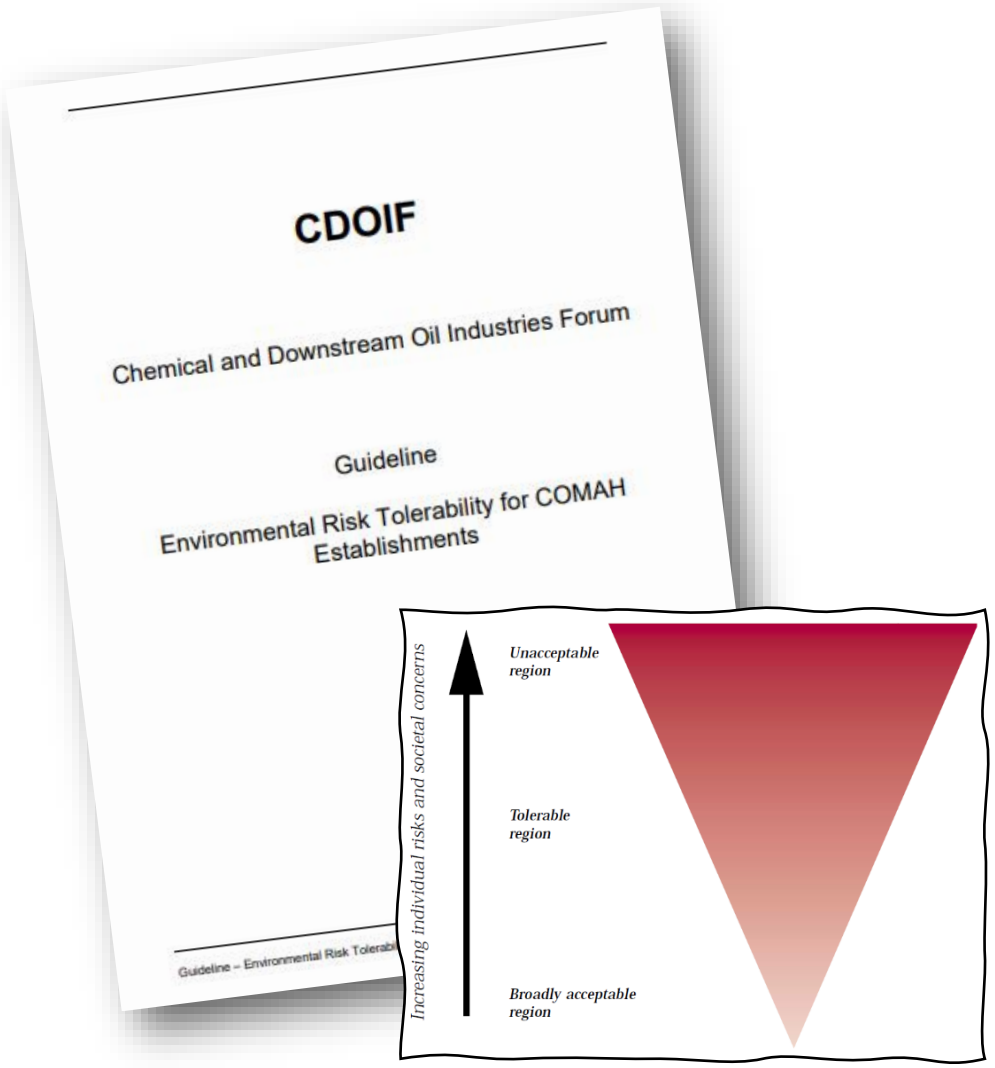
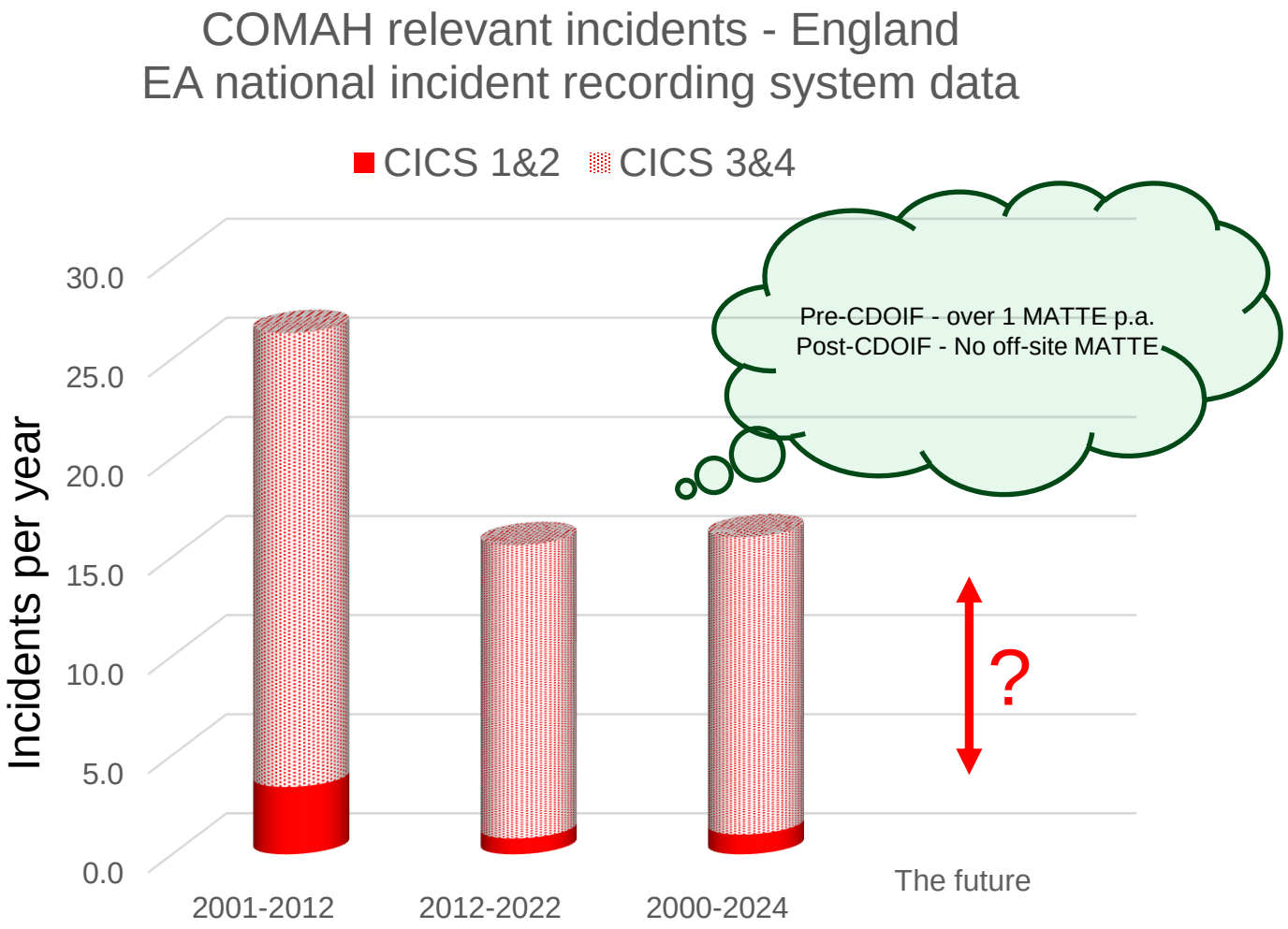
CDOIF Guideline – Environmental Risk Tolerability





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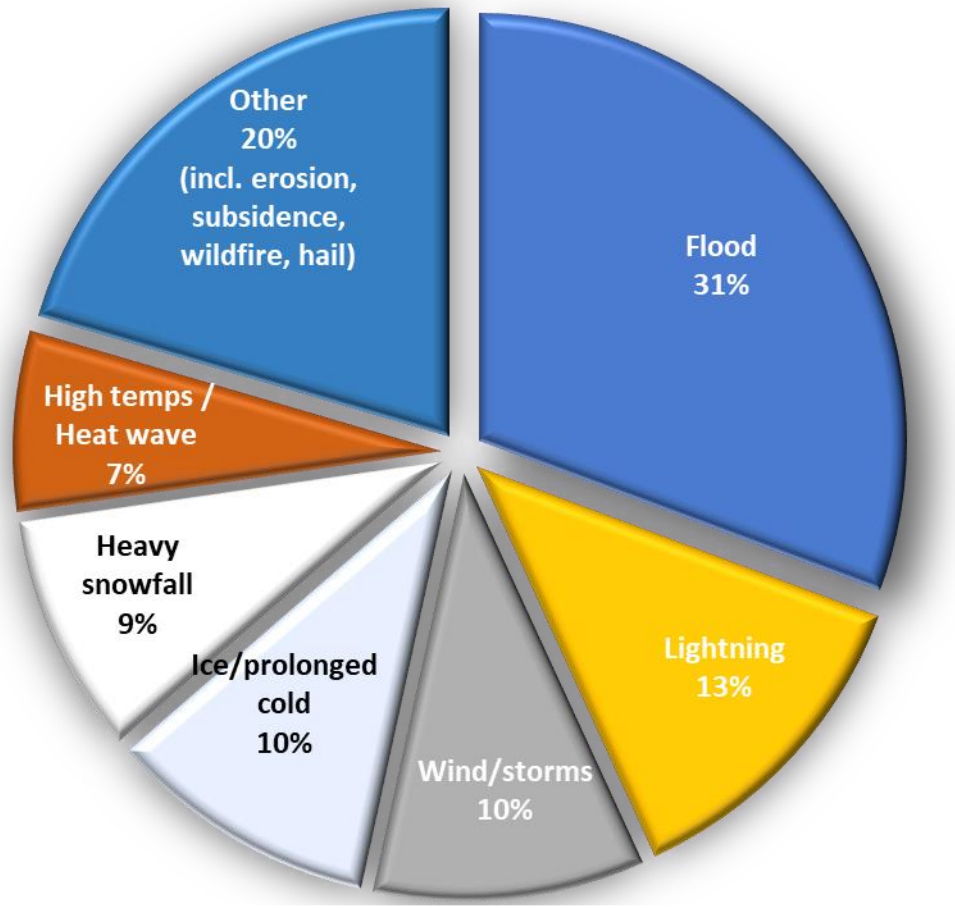
Climate Change & Natechs



Extreme weather threats to GB establishments
(Survey by CDOIF, 2021)

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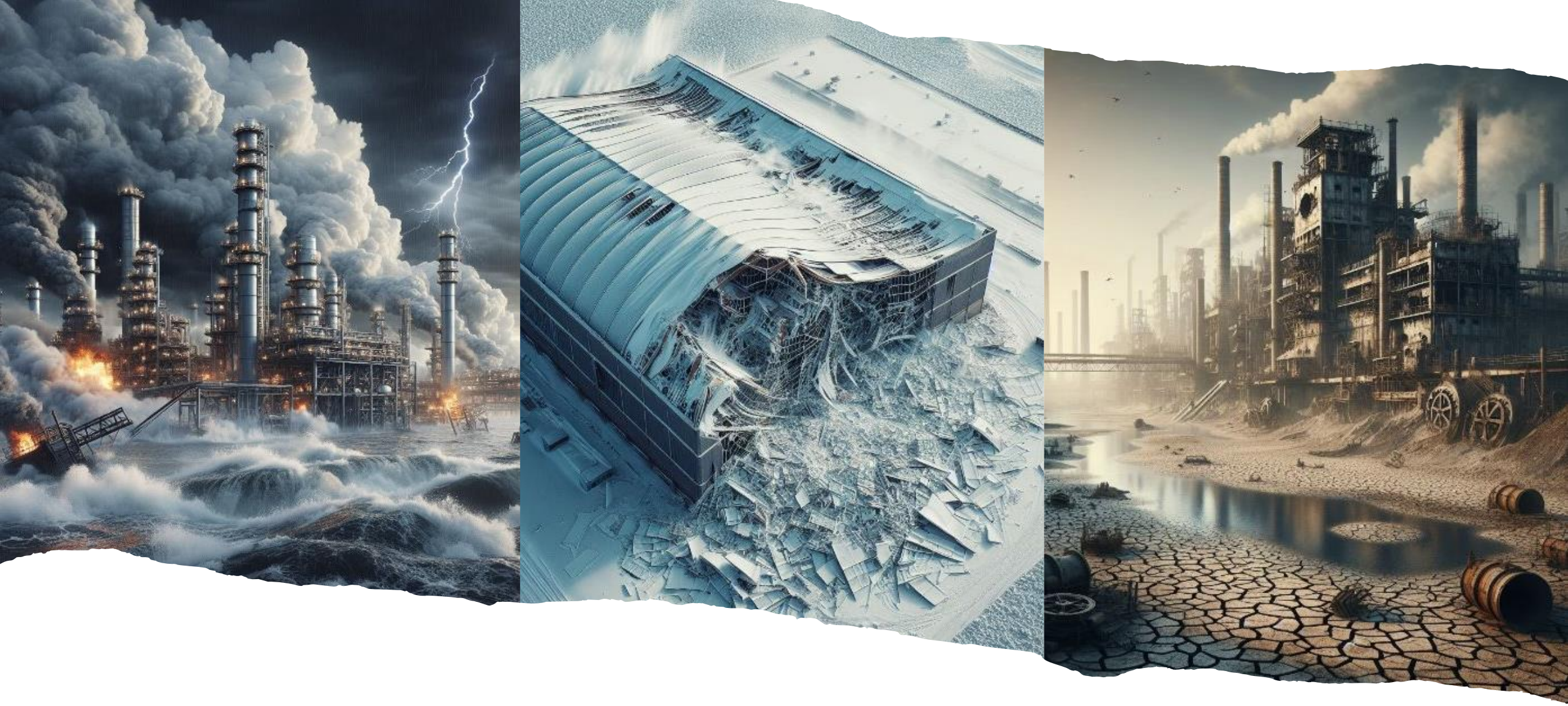

Our industrial future? (Bing AI generated)

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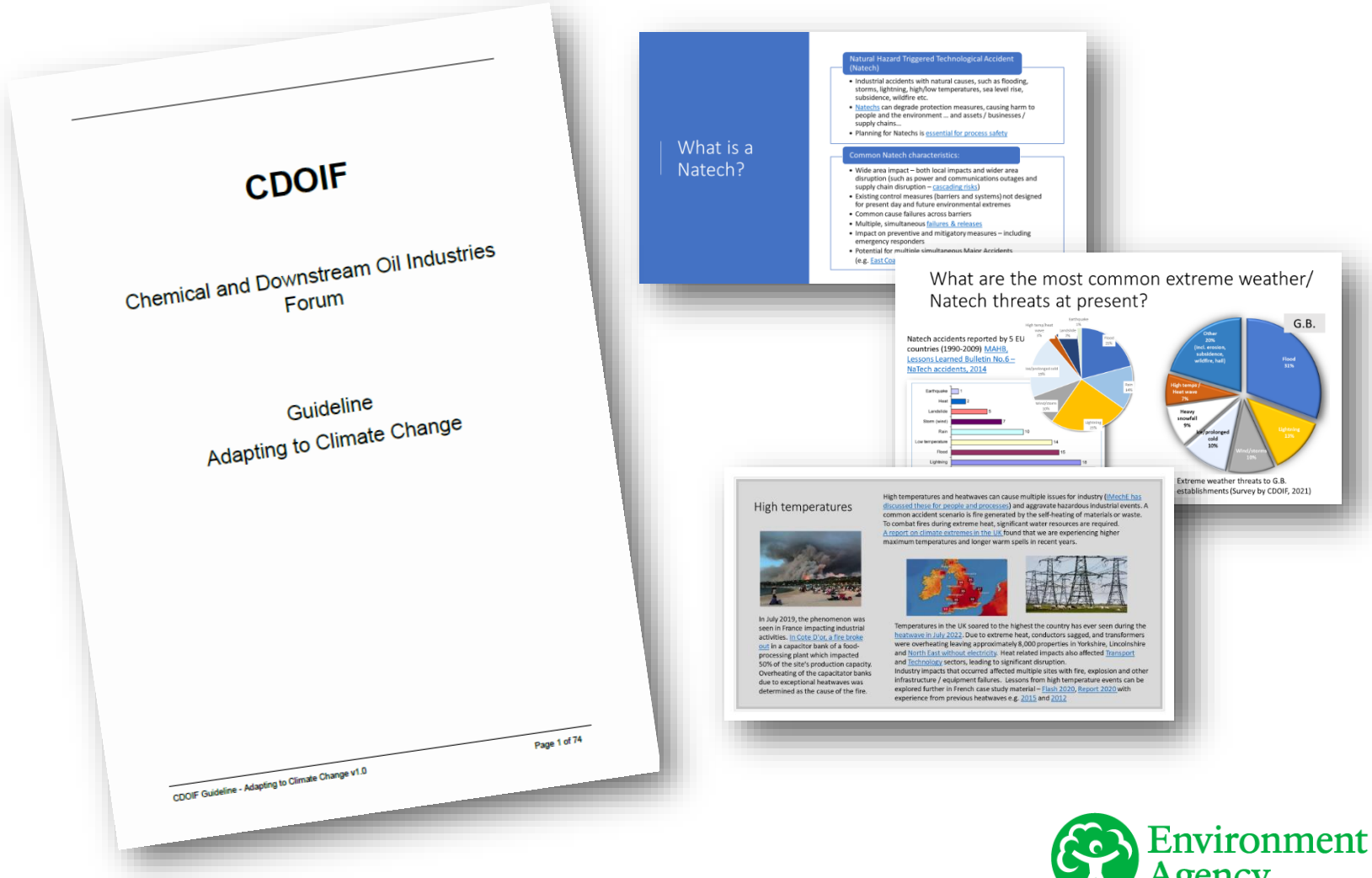
CDOIF – Adapting to Climate Change

- Guideline and overview slides now published on Process Safety Forum website

- [CDOIF – Process Safety Forum (p-s-f2.org.uk)]



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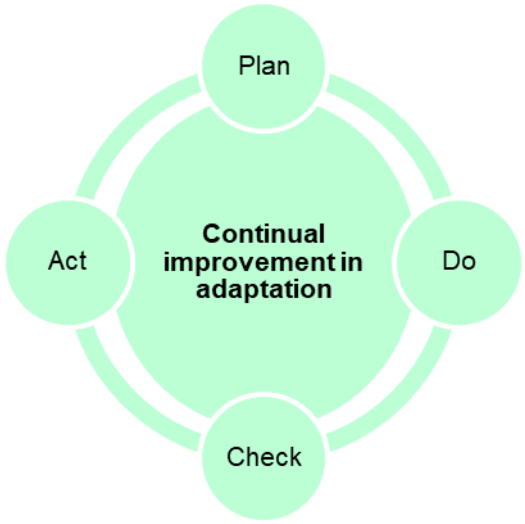
CDOIF – Embedding adaptation into SMS

Pre-planning & leadership
Policy, scope,
resources and competencies

Management System (MS) cycle of continuous improvement



Find potential impacts
- Major hazard identification & evaluation procedure* inclusive of Natechs
- Collate relevant data
- Identify Natechs and other climate change impacts relevant to COMAH

Risk Assessment Part A
- Gather specific relevant detailed data for Natechs
- Natech MAH risk analysis
- Risk evaluation

Risk Assessment Part B
- Sensitivity analysis
- Risk trending /attribution

Find control measures
- ALARP demonstration
- Identify and appraise necessary risk reduction measures

Adaptation plan (improvement plan)
- Plan & implement improvements
- Review and revise management system

Monitoring, record and review actions
- Monitor, record and review the adaptation plan
- Monitor, record and review climate relevant data
- Ensure top management oversight

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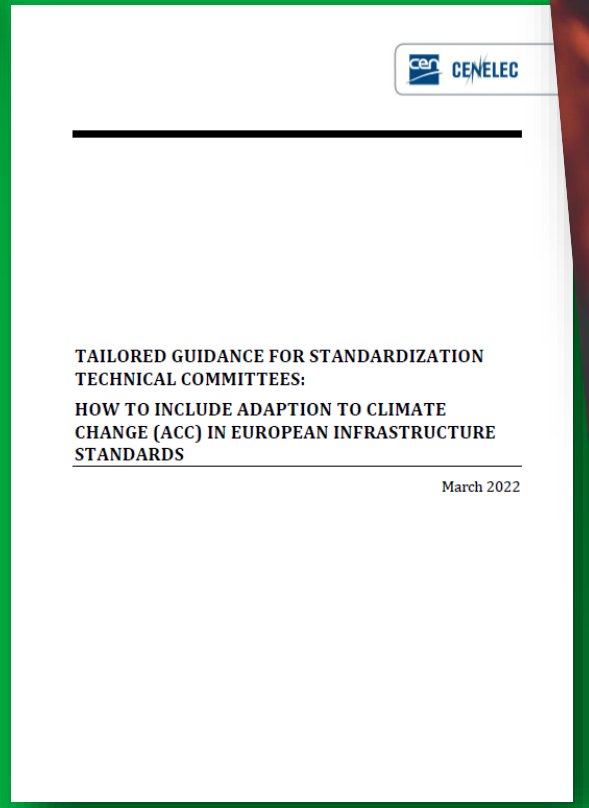
Signposted Guidance



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Extreme Weather Events in England (2020-2024)

2020

1. (3rd-16th Feb) Storm Ciara
2. (13rd-18th Feb) Storm Dennis
3. (Aug 2020) Heatwave
4. (16th Aug) Extreme Norfolk rainfall
5. (19th-20th Aug) Storms Ellen and (25th Aug) Francis
6. (2nd-4th Oct 2024) Storm Alex and heavy rain

2021

1. (18th-20th Jan) Storm Christoph
2. (Feb 2021) Winter Weather and Storm Darcy
3. (Mar and Apr) Extreme Temperature
4. (29th-30th Jul) Storm Evert
5. (Oct 2021) Heavy and persistent rain
6. (26th-27th Nov) Storm Arwen
7. (2021/2022) Mild New Year

2022

1. (29th-31st Jan) Storms Malik and Corrie
2. (16th-21st Feb) Storms Dudley, Eunice and Franklin
3. (16th-19th Jul) Heatwave
4. (8th-18th Dec) Low Temperatures

2023

1. (17th Feb) Storm Otto
2. (12th Apr) Storm Noa
3. (5th Aug) Storm Antoni
4. (18th-19th Aug) Storm Betty
5. (Sep 2023) Heatwave
6. (18th - 21st Oct) Storm Babet
7. (1st-2nd Nov) Storm Ciarán
8. (13th Nov) Storm Debi
9. (9th-10th Dec) Storms Elin and Fergus

2024

1. (2nd Jan) Storm Henk
2. (21st-24th Jan) Storms Isha and Jocelyn
3. (6th-7th April) Storm Kathleen
4. (9th April) Hampshire and Isle of Wight coastal flooding.
5. (21st- 23rd May) Exceptionally Wet Weather

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Key weather events and climate impacts (2020-2024)

Storms Ellen and Francis

Aug, 2020

Feb, 2021

Extreme Winter Cold

40-Degree Heatwave

Jul, 2022

2023

Multiple Storms - Direct and Cascading Impacts

Apr, 2024

Coastal Flooding

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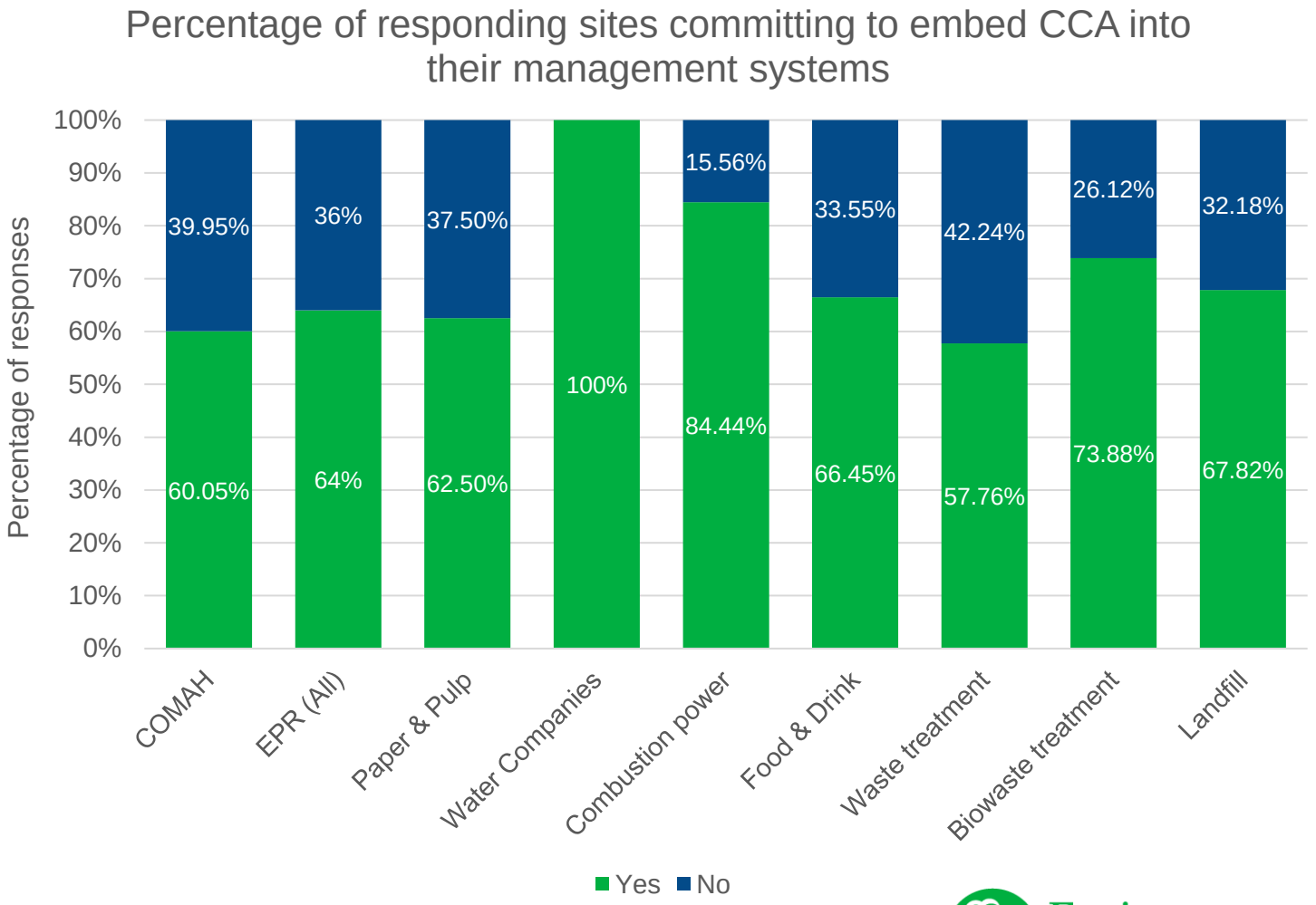
CA Questionnaire - overview & company commitments

- 418 responses (COMAH) 1289 responses (EPR)
- 73% response rate for COMAH sites (compared to ≈15% for EPR)
- 2/3 operators committing to embed climate change adaption into their management systems



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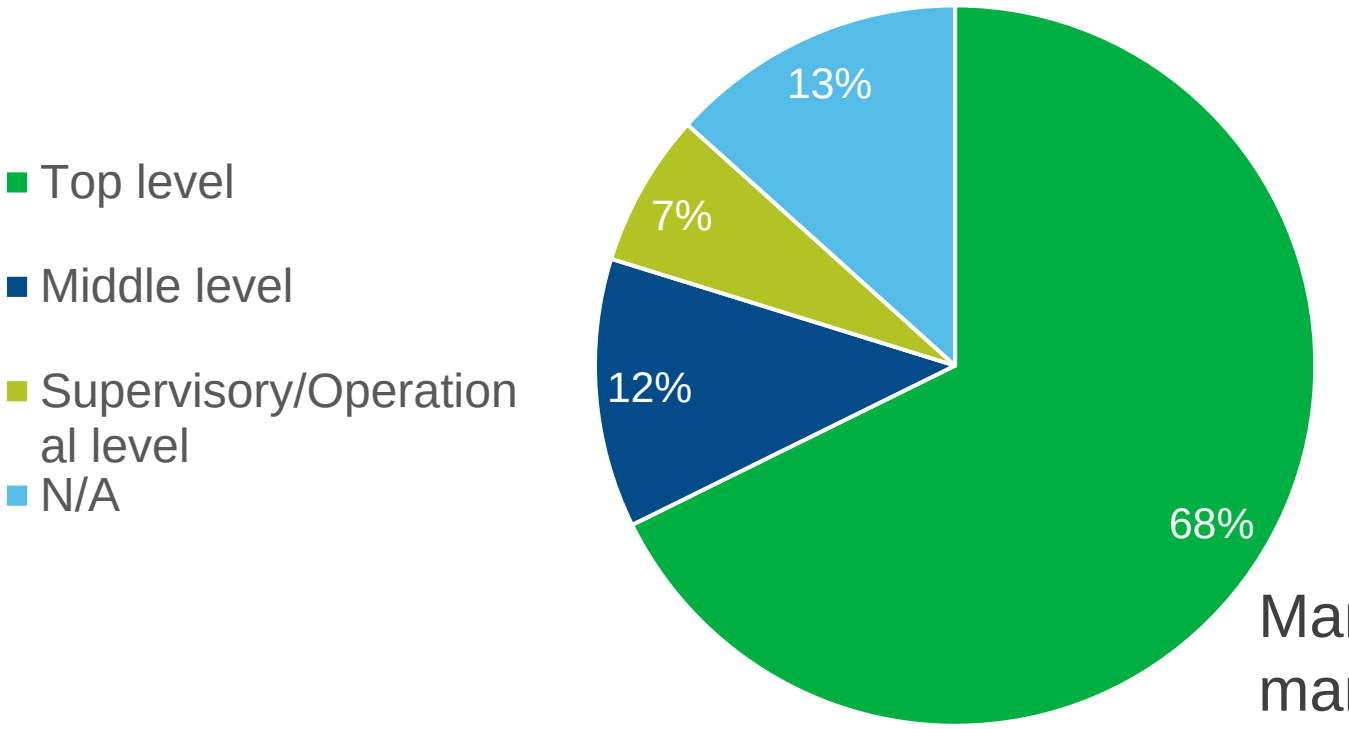
Level of management responsibility for Natech & adaptation management



Feb 2024 ISO amendments of management system standards require embedding of climate change, including top management oversight

Many operators have defined top management as responsible for ensuring compliance

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Benchmarking against standards & guidance, including Management System revisions and improvement plans

	EPR responses ISO 14090, ISO 14091 & BS 8631	COMAH responses ISO 14090, ISO 14091 & BS 8631
Total benchmarking & improving	340	96
Percentage of respondents	26.4%	23.05%
Total average	25%	

	EPR EMS guidance		EPR responses other guidance	COMAH responses other guidance
	EPR	COMAH		
Total benchmarking & improving	841	187	319	87
Percentage of respondents	65%	45%	25%	21%
Total average			23%	

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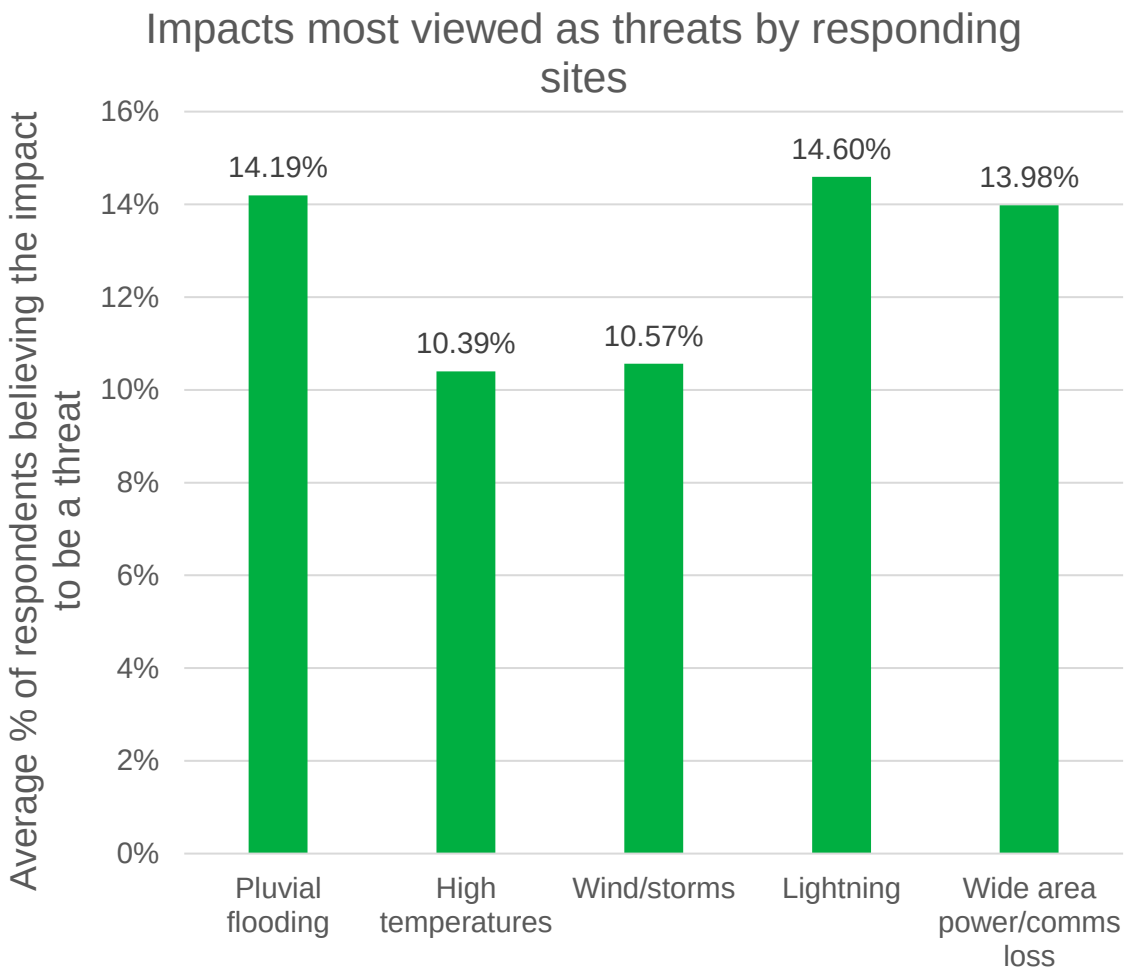
Key risk assessment findings – present day impacts

- Pluvial flooding and lightning – top impacts
- Consideration of cascading impacts encouraging

- ~70% of responding sites have currently assessed against the impacts

- Most common impacts yet to be currently assessed were:
  - Wildfire
  - High temperatures/heatwave
  - Increased sunlight (UV & heat)
  - Heavy snowfall
  - Hail
  - Climate impacts on the environment



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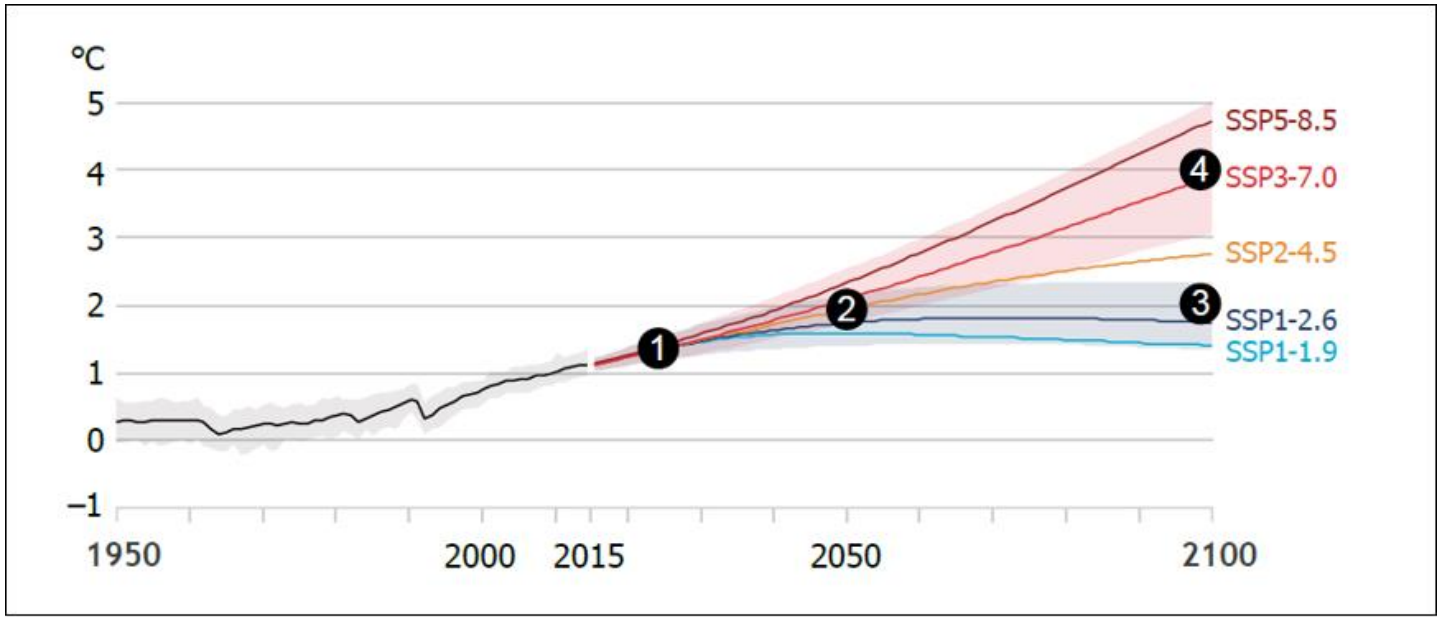
Key risk assessment findings – future risks

- Flooding impacts are the most common to include future scenarios in risk assessments
- Less than 50% of respondents replied to questions on future data inclusion within risk assessments
- On average only 16% of responding COMAH sites have included future scenarios within their RAs vs. 11% for EPR



1. Present day (The climate has already changed).
2. Mid-century (+2°C by 2050: medium-high emissions scenario).
3. Managed transition (+2°C by 2100: low-medium emissions scenario)
4. Runaway change (+4°C by 2100: medium-high emissions scenario).

https://www.gov.uk/government/publications/climate-impacts-tool

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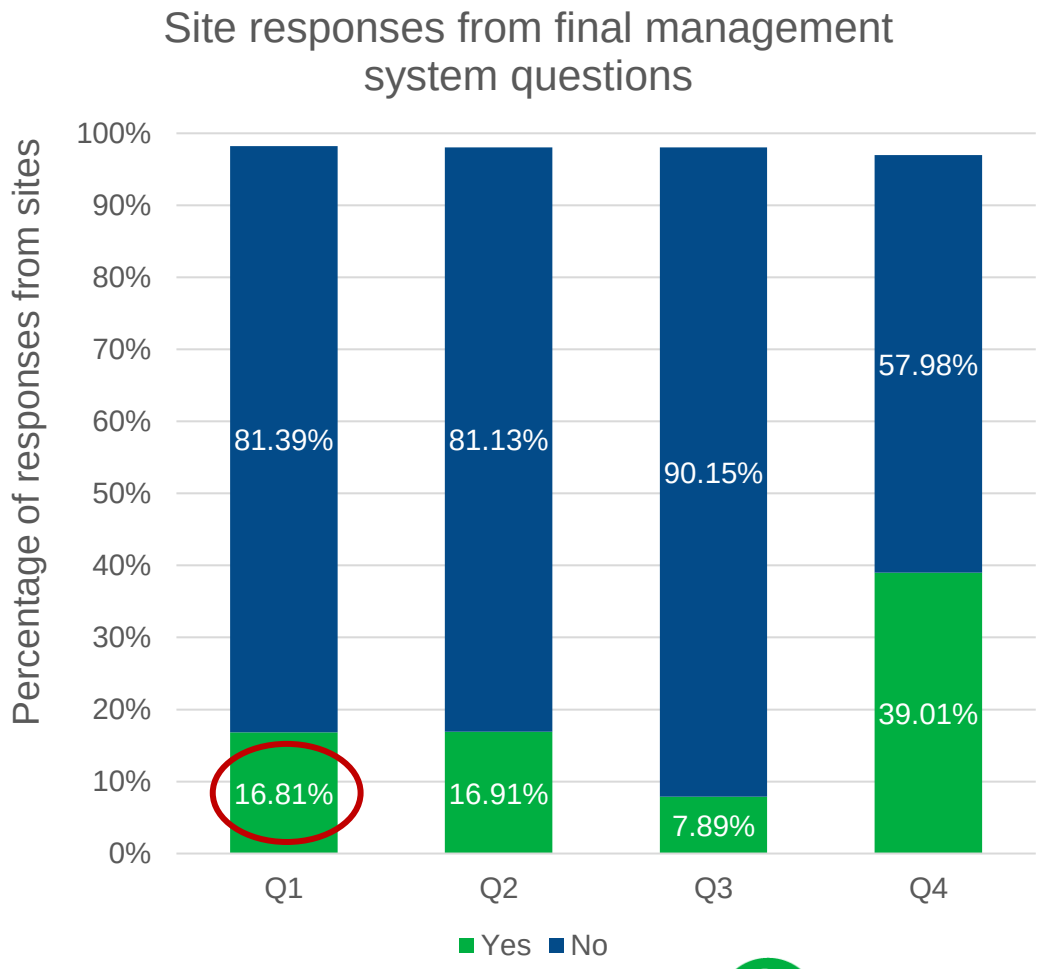
Average responses for management systems questions

1) Have you carried out a specific test/exercise of your emergency plans using a relevant incident or extreme weather scenario?
2) Do you keep records of local data associated with the risks identified? (e.g. extreme weather events / sea level data / loss of utilities or supply chain issues associated with climate impacts)
3) Have you developed any indicators specifically associated with monitoring climate change adaptation risks and the performance of the SMS in relation to these risks and the need to ensure compliance?
4) Do you have in place a system to log identified improvements (specifically relevant to climate change impacts), prioritise these and determine implementation timescales, assign an owner, track their implementation, and report progress to senior management?



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Questionnaire conclusions

- Majority of sites have top level management responsible for ensuring compliance
- Only 1 in 4 operators have utilised climate change standards/guidance
- Lack of awareness on the above has been acknowledged by sites
  - ✓ CDOIF guideline has answers, but skills and capacity building is an ongoing challenge
- Sites need to include more scenarios with future data within their risk assessments
- Few sites have the necessary climate change measures embedded throughout their management systems

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What the COMAH Competent Authority expects of operators, to manage risks of a changing climate

The operator of a COMAH establishment would be expected to:

- assess how Major Accident risks associated with extreme weather events and other climate change impacts will vary over the lifetime of their establishment; and
- plan how to respond to these changes, and implement modifications at an appropriate time, to manage both present and longer-term risk to ALARP levels.

EPR permitted sites need to embed adaptation into their management systems – guidance on gov.uk

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Ongoing COMAH regulatory activities

– subject to CASMG & CSF strategy discussions

2023/24/25

- Agencies led informing and enabling
- Evidence gathering
- Guidance and collaboration

2025/26

- Agencies led initial interventions
- High level MAPP & SMS – embedding & adaptation continual improvement
- Leadership, organisation & personnel, Natech ID, emergency response

Subsequently….

- Risk based, CA interventions
- All measures necessary, SMS deep dives

CA Delivery Guide - commitment to continual improvement

DG v.1 – enable early interventions on key issues (planned from Sept 2024). User needs and pilots, summer 2024

DG v.2 – consolidation of flood and Natech DGs + multi-disciplinary guidance (planned from Sept 2025 onwards)

DG v.3, 4…

Key messages

- The climate has changed and continues to change.

- Without adequate management, risks will increase (including safety and environmental).

- Regulators (and others) expect climate change adaptation to be embedded into management systems, to maintain control of compliance risks (accidents or other risks).

- This requires operators of high hazard sites to ensure:
  - Leadership, resource and competencies
  - Climate change risk assessment - assess for 4°C, plan for 2°C, and avoid lock-ins
  - Plan, monitor, record and review, with top management oversight…….
    ……delivering Continual Improvement

- International standards, guidance and case studies are available to support this work.
  - See CDOIF guidance at https://www.p-s-f2.org.uk/?page_id=669

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(Bing AI generated)

Climate change adaptation

Collaboration and continual improvement to deliver sustainable industries of the future

Many thanks to Solveig McLeod and Aiyasha Swarnn – EA interns supporting this work

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