AI in Fire Engineering: A Practitioner-Led View from the SFPE UK Chapter

Gabriel Risco & Dr. Simón Santamaria

Technology is the answer.

Technology is the answer. But what was the question?

Cedric Price, 1966

Image credit: wwww.politico.eu

NEWS > TECHNOLOGY

Pope Leo launches AI commission

The Vatican said the pontiff was motivated by the increase in usage of AI, "its potential effects on human beings and on humanity as a whole [and] the church's concern for the dignity of every human being."

COPY LINK

Contents

Who we are

Gabriel Risco

- Vice-President of the SFPE UK Chapter
- Associate Director at Ashton Fire
- Chartered Engineer
- Member of the MAAP and Ethics panels at the Institution of Fire Engineers

Dr. Simón Santamaria

- President of the SFPE UK Chapter
- Director at Stantec
- Chartered Engineer
- Member of BSI technical committees and New London Architecture committee on competency

Who we are

The SFPE UK Chapter is dedicated to fostering collaboration among fire safety professionals, enabling knowledge sharing and driving advancement in the industry. We provide valuable insight from both technical and regulatory perspectives, helping to shape best practices and state-of-the-art solutions.

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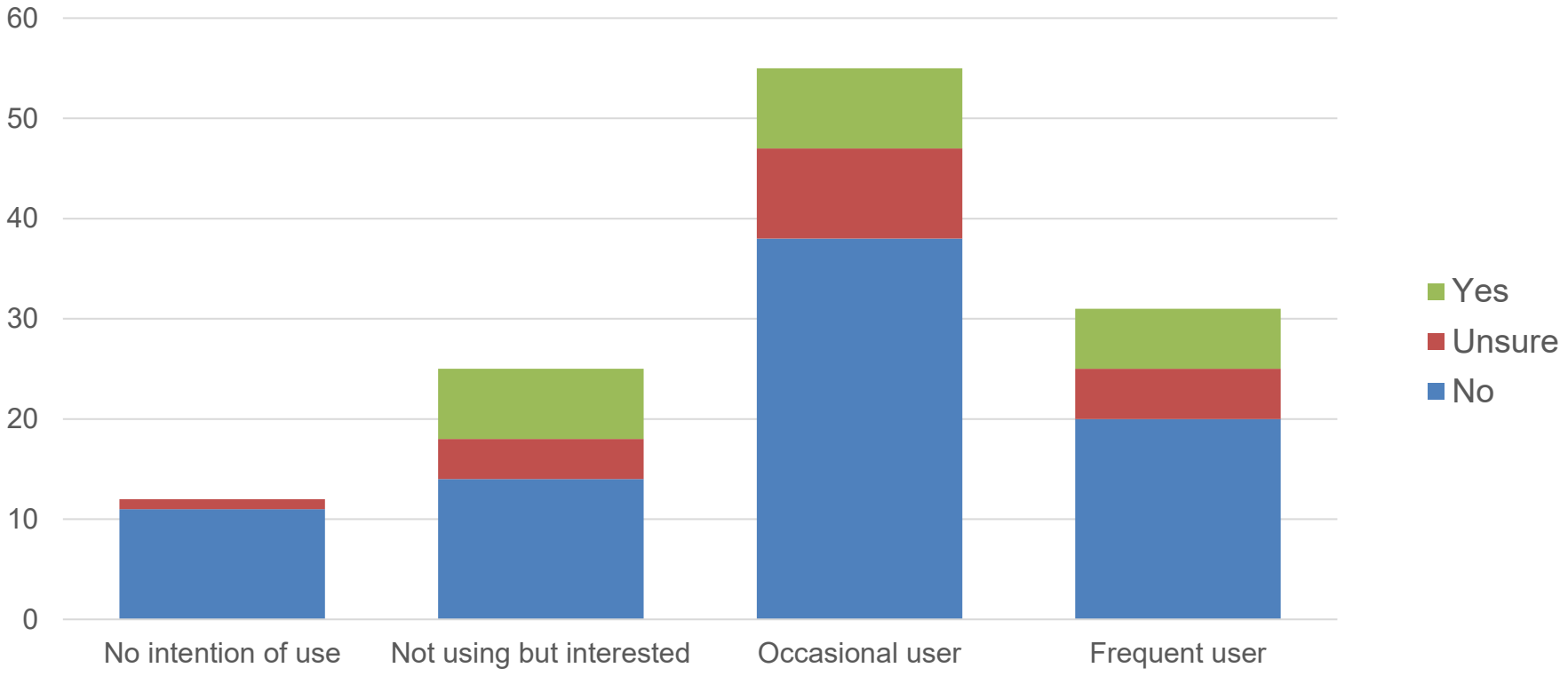
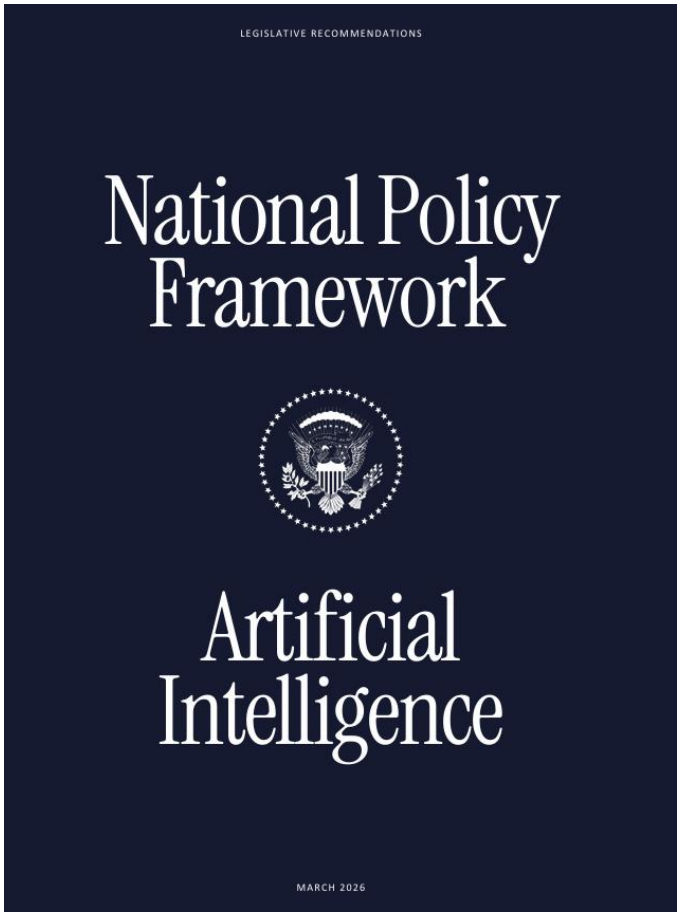
Our Sponsors

AI Use vs AI Policy Awareness



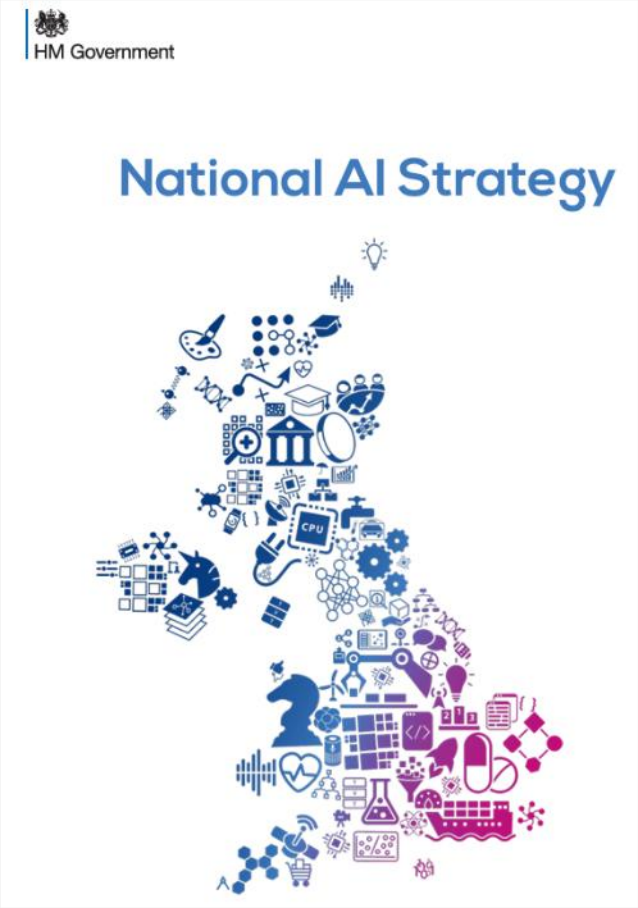
Our use of AI to talk about AI

Which guidance?



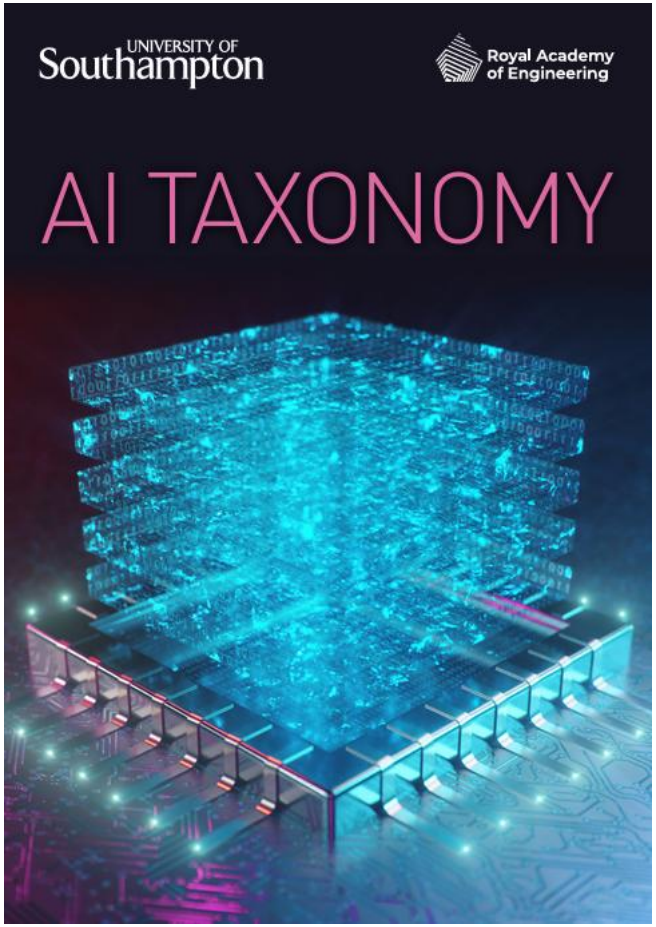
1. Single National Framework
2. Light-Touch Regulation
3. Targeted Safeguards
4. Infrastructure & Energy
5. Competitiveness & Workforce

Which guidance?



1. 10-year ambition
2. Build capability, scale adoption, and establish effective governance
3. Emphasis on real-world use across sectors and regions
4. Enable innovation while *protecting the public*

Which guidance?



1. Common language
2. AI as a layered system
3. Interdependencies matter: Decisions at one layer affect performance and behaviour
4. Support better design and policy

Which guidance?

1. AI is transforming fire engineering
2. Data is becoming a critical asset
3. Transparency and trust are key challenges
4. Ethics and governance are not yet

The scale of the challenge

ARTIFICIAL INTELLIGENCE

The most-cited computer scientist alive says AI could make humanity extinct within a decade

May 16, 2026 - 9:32 am

Our Approach

01
Who Responded
Role, sector and experience level to contextualise every response

02
AI Adoption & Tools
Familiarity, frequency of use, and types of tools (LLMs, data analysis, coding, image generation)

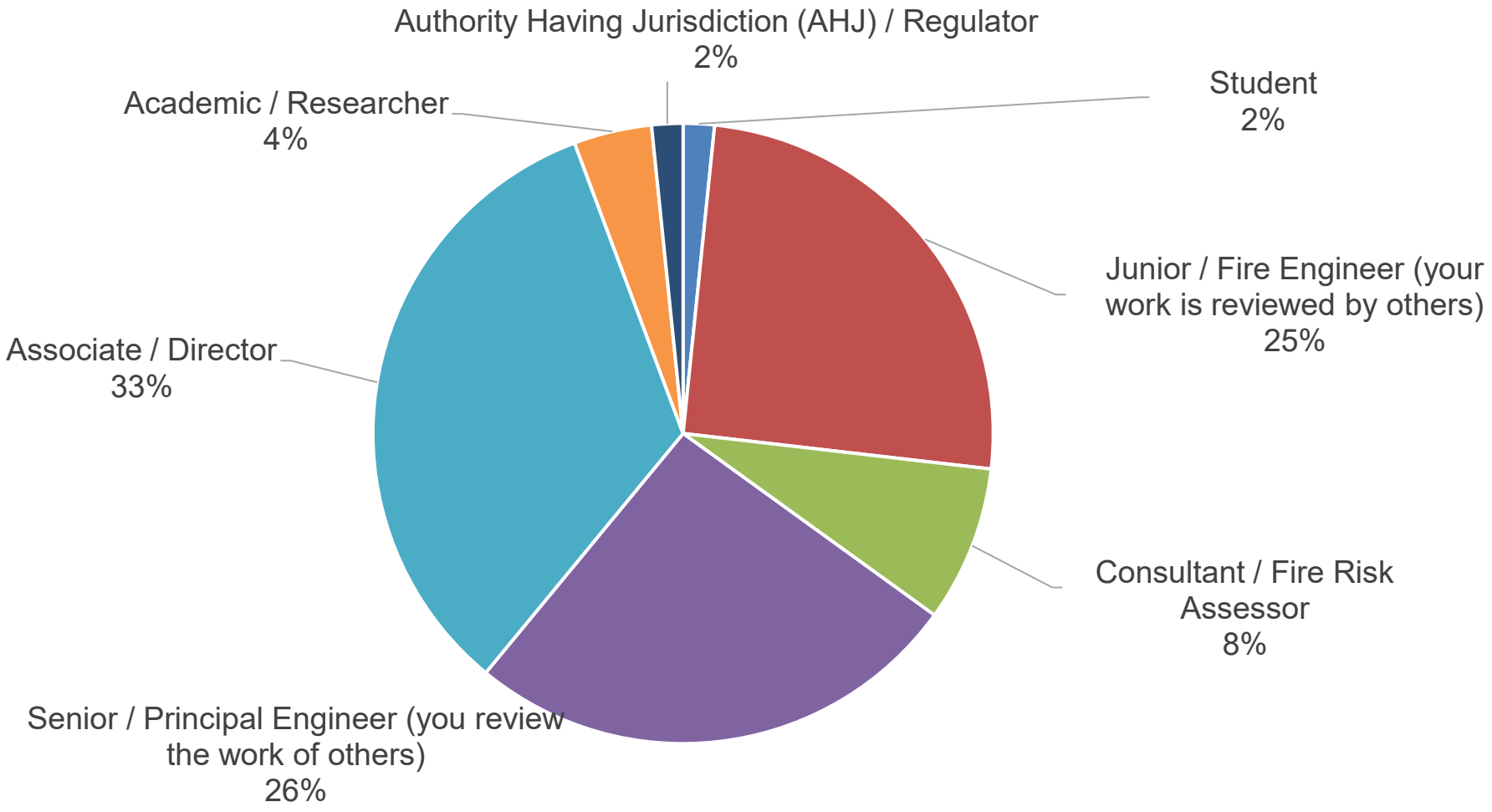
03
Use Cases & Value
Where AI is applied, perceived effectiveness, and measurable time savings in practice

04
Risk & Responsibility
Accuracy, hallucinations, liability, over-reliance, and boundaries where AI should not be used

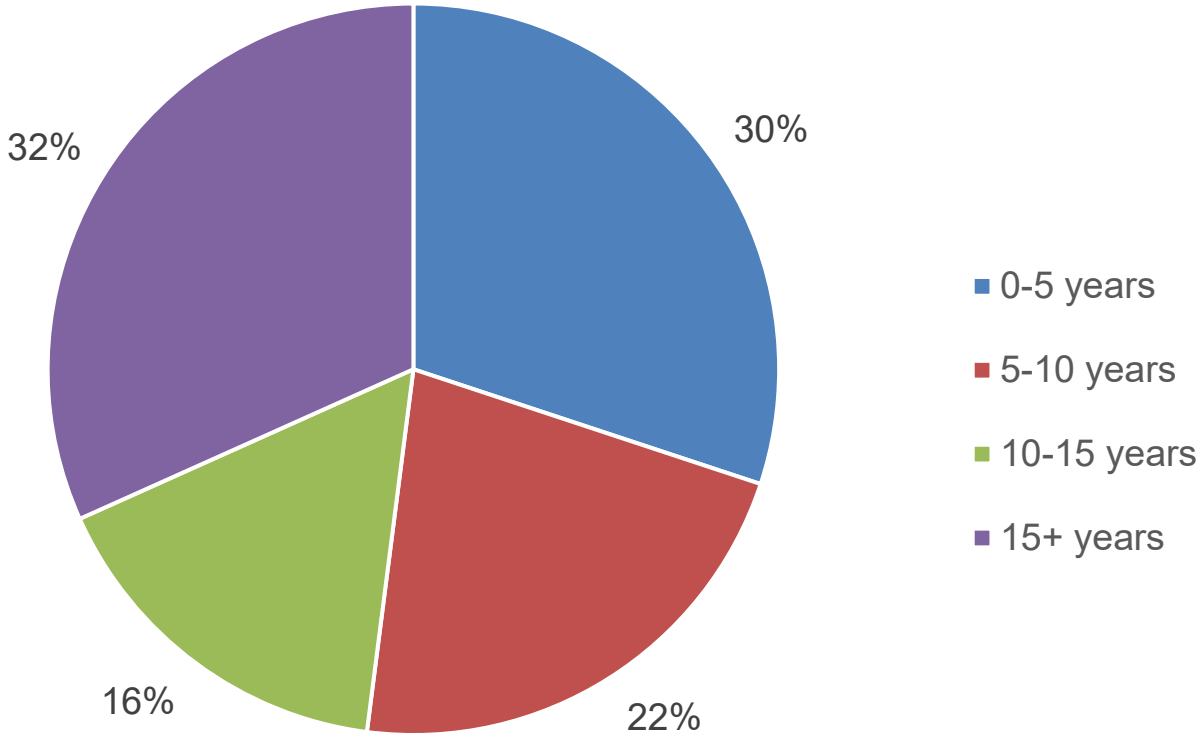
05
Future & Governance
Long-term impact on the profession, skills needed, regulatory expectations, and form of guidance

Incoming charts … (bar charts, pie charts)

Role


Authority Having Jurisdiction (AHJ) / Regulator
2%
Student
2%
Academic / Researcher
4%
Junior / Fire Engineer (your work is reviewed by others)
25%
Associate / Director
33%
Consultant / Fire Risk Assessor
8%
Senior / Principal Engineer (you review the work of others)
26%

Experience



Survey overview

Top 3 Benefits

Where AI is considered most valuable

Administrative and efficiency

Guidance searching and summarising

Support tool with human oversight

Top 3 Concerns

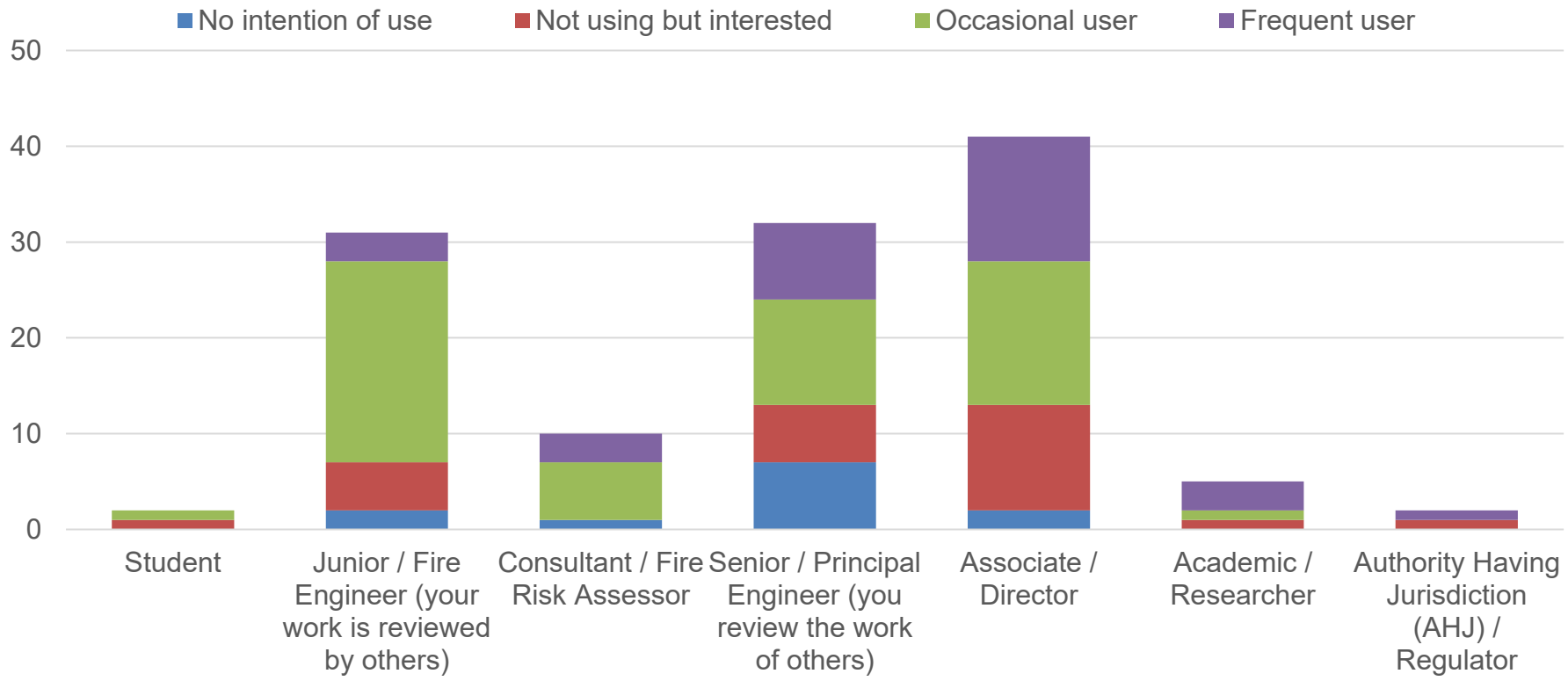
Key risks identified by respondents

Over-reliance on AI / loss of competency

Incorrect or inaccurate outputs

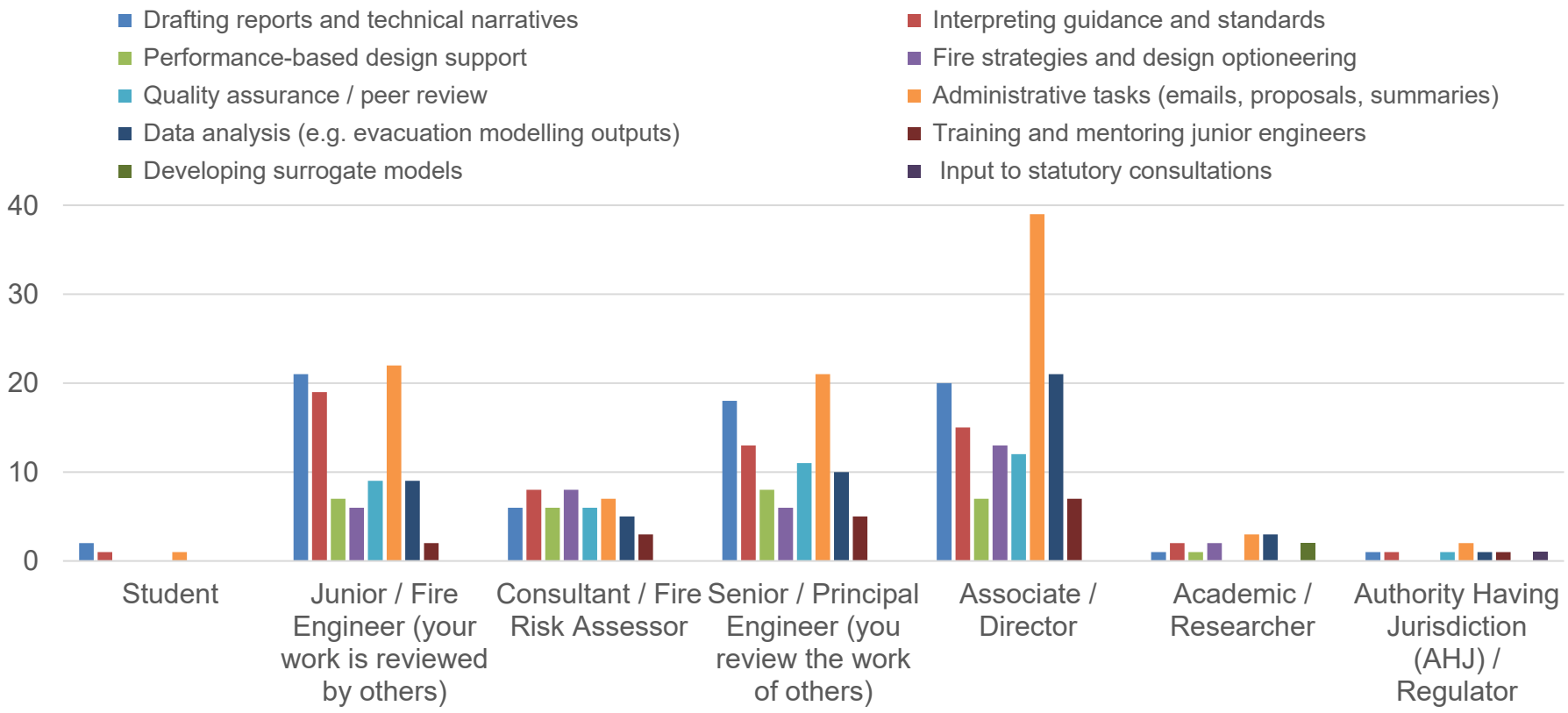
Misinterpretation of regulations

Periodic Use



Commonly used tools

Potential


Drafting reports and technical narratives
Interpreting guidance and standards
Performance-based design support
Fire strategies and design optioneering
Quality assurance / peer review
Administrative tasks (emails, proposals, summaries)
Data analysis (e.g. evacuation modelling outputs)
Training and mentoring junior engineers
Developing surrogate models
Input to statutory consultations
40
30
20
10
0
Student
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Consultant / Fire Risk Assessor
Senior / Principal Engineer (you review the work of others)
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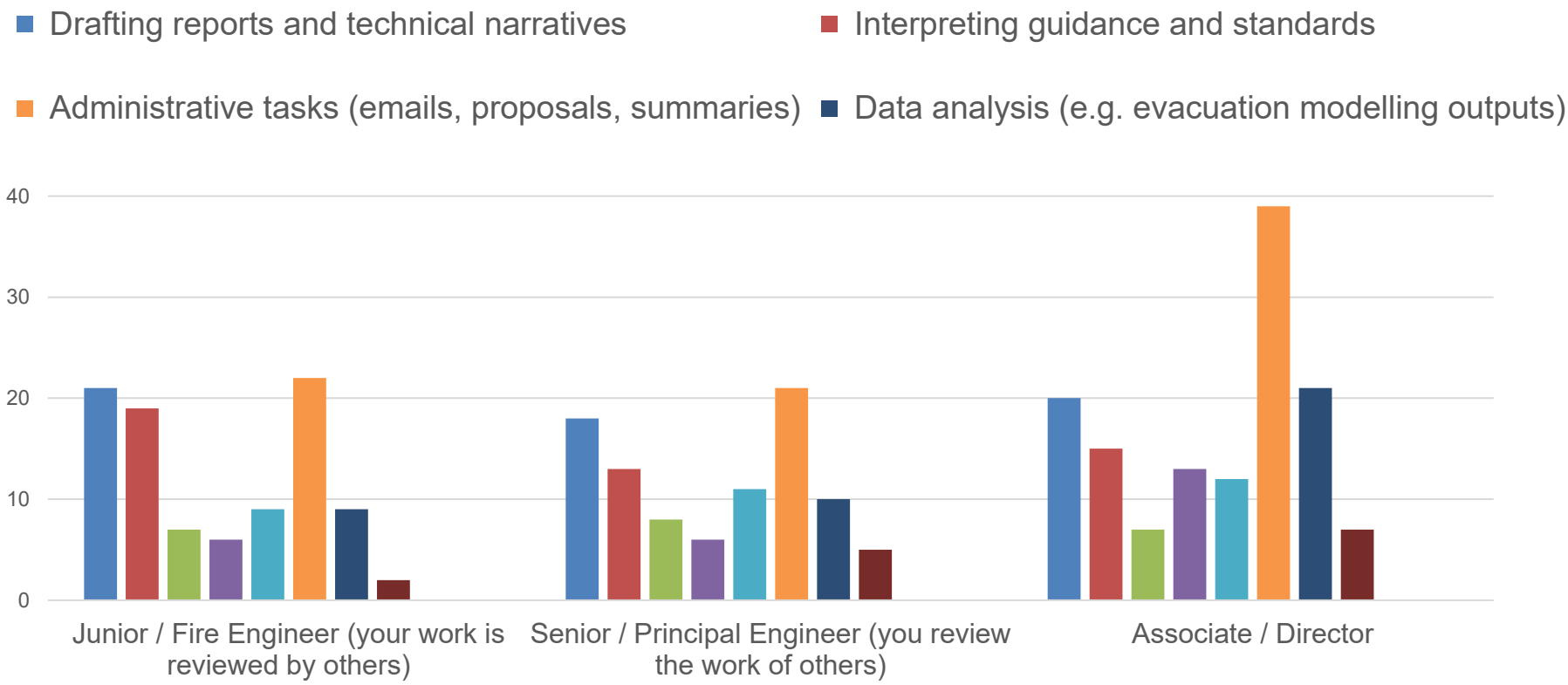
Potential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0
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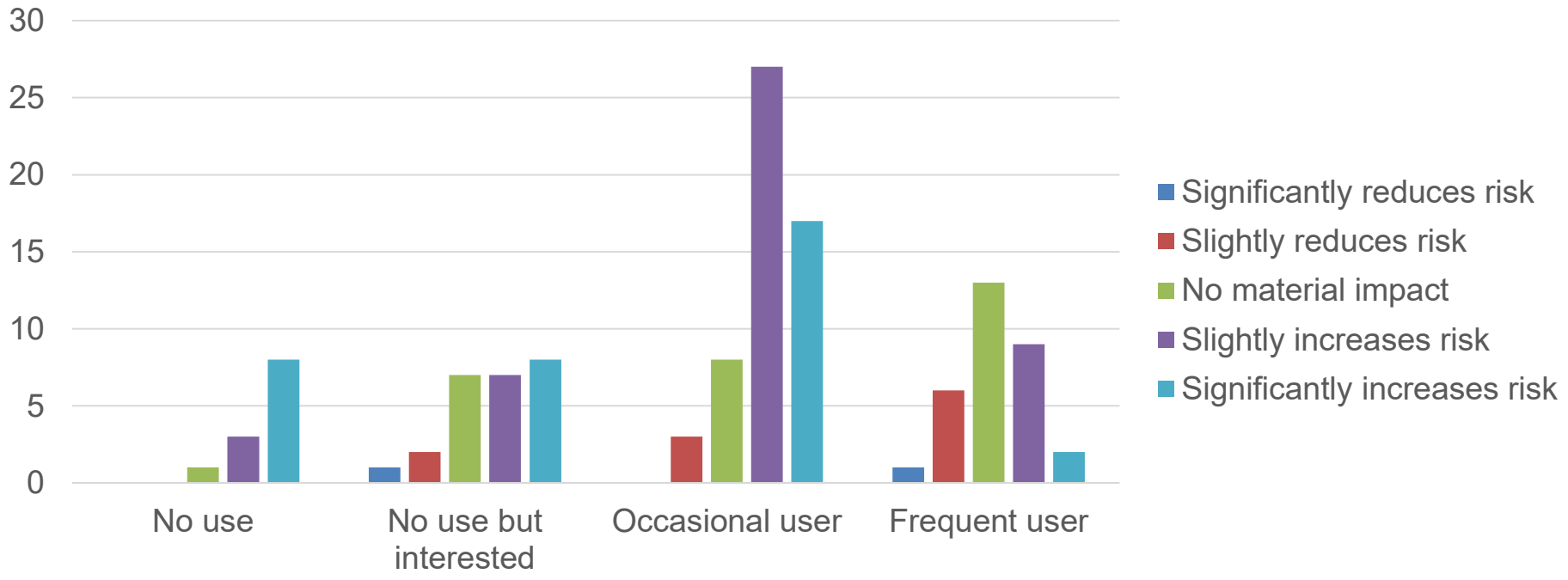
Associate / Director

Professional risk



Perceived risk

Risk theme	No use	No use but interested	Occasional user	Frequent user
Hallucinations / inaccuracy				
Over-reliance				
AI replacing judgement				
Blind trust in outputs (blackbox)				
Competency erosion				
Ethical concerns				
Lack of liability/accountability				
Regulatory concerns				
Job displacement				
Confidentiality and data loss risk				
Magnifiying bias				

Benefits and opportunities

Non Users

Rejection

Generally rejected AI. Limited use only for very low-risk, non-technical tasks with strict QA.

Interested Non Users

Curiosity

Cautious about technical reliability. See potential for admin tasks, drafting documents, training and mentoring.

Occasional Users

Practical adoption

Drafting text, interpreting guidance with verification, a search tool. Open to advanced design applications with caution.

Frequent Users

Operational integration

Using AI operationally, not experimentally. Administrative automation, modelling, guidance interpretation, QA support.

Professional implications

100%

Engineer oversight required

All respondents believe AI outputs must be checked by a qualified engineer. 78% want all output reviewed, 22% technical work only.

55%

Expect regulatory change

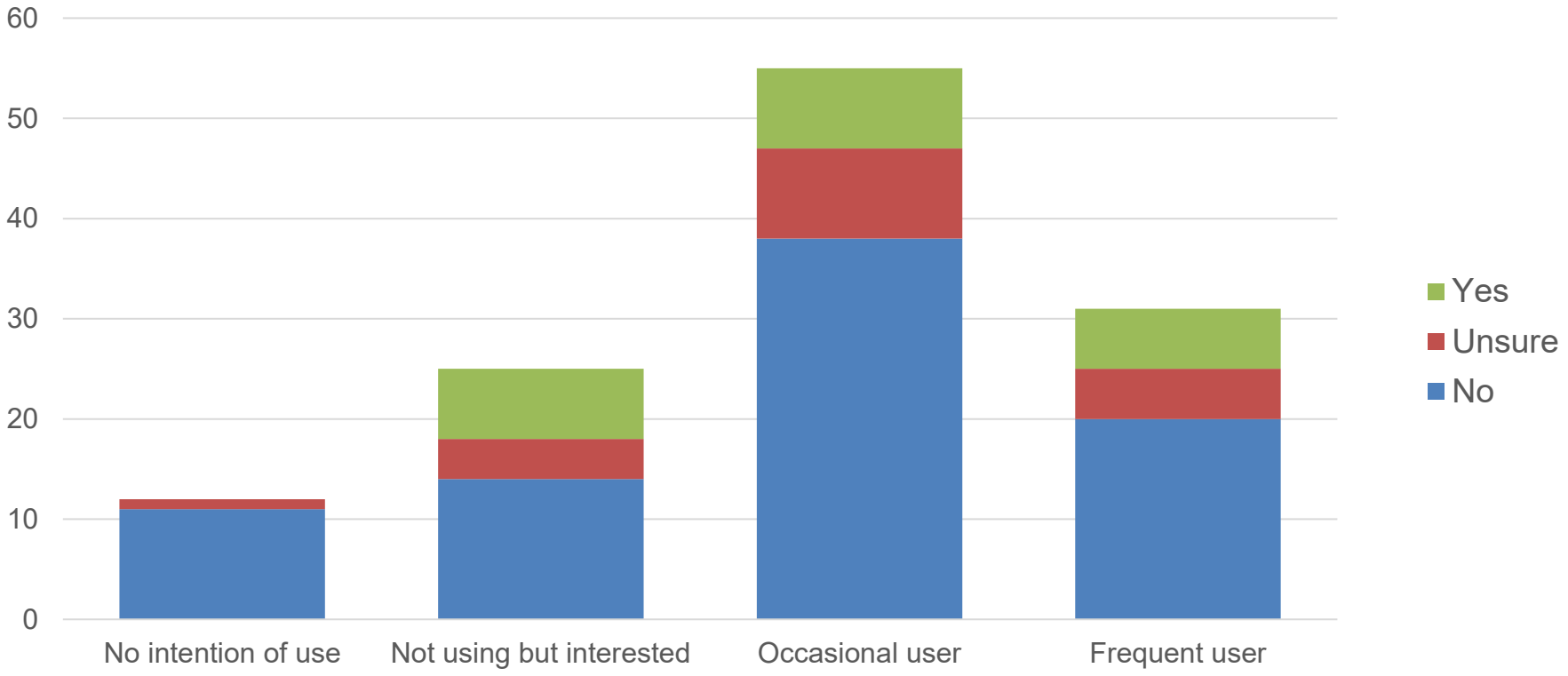
Over half believe AI will shift regulator expectations. 18% are unsure, while 27% see no change ahead.

<3 h

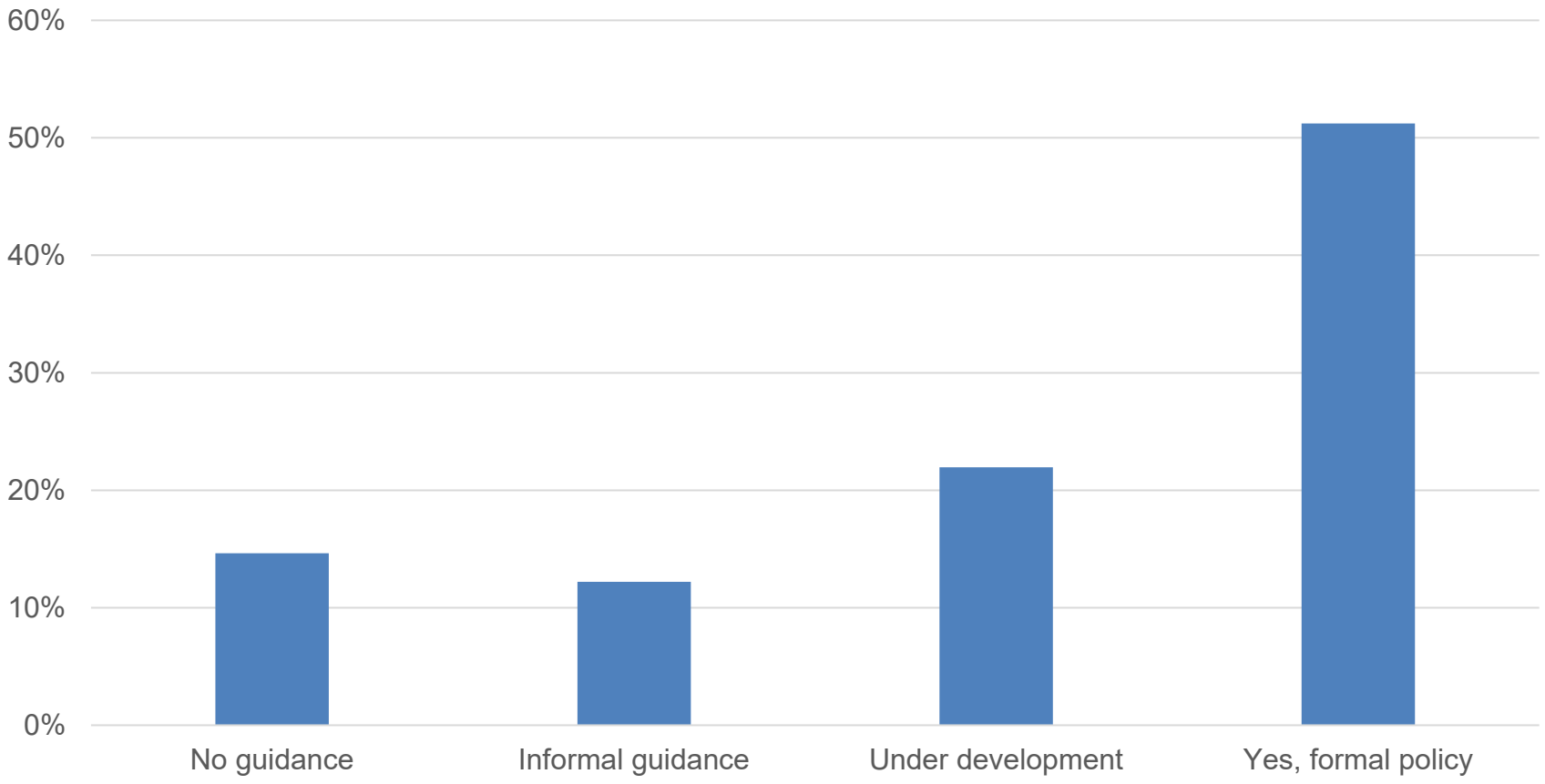
Saved per week on average

Most find AI somewhat effective with modest time savings. A few report 5+ hours saved weekly through deeper integration.

AI Use vs AI Policy Awareness



Training and guidance



Conclusions

AI is already reshaping fire engineering

1. AI adoption is already widespread

2. Human judgement and ethics are fundamental

3. AI will become standard engineering practice

4. Governance and misuse remain major concerns

5. Professional guidance is urgently needed

Conclusions

The challenge is no longer whether AI will be used, but how responsibly it will be integrated.