

Incorporating innovation into system transformation

From emerging technology to safe, scalable deployment

Jonathan Thurlwell, Head of Emerging Technologies, Ofgem | 4 November 2026

Technology is central to the energy transition

Enabled by AI, agentic systems, autonomous technologies, robotics and drones



Plan

- Forecasting
- Network planning
- Digital twins



Build and maintain

- Automated inspection
- Predictive maintenance



Operate

- Optimisation
- Balancing
- Dispatch and flexibility

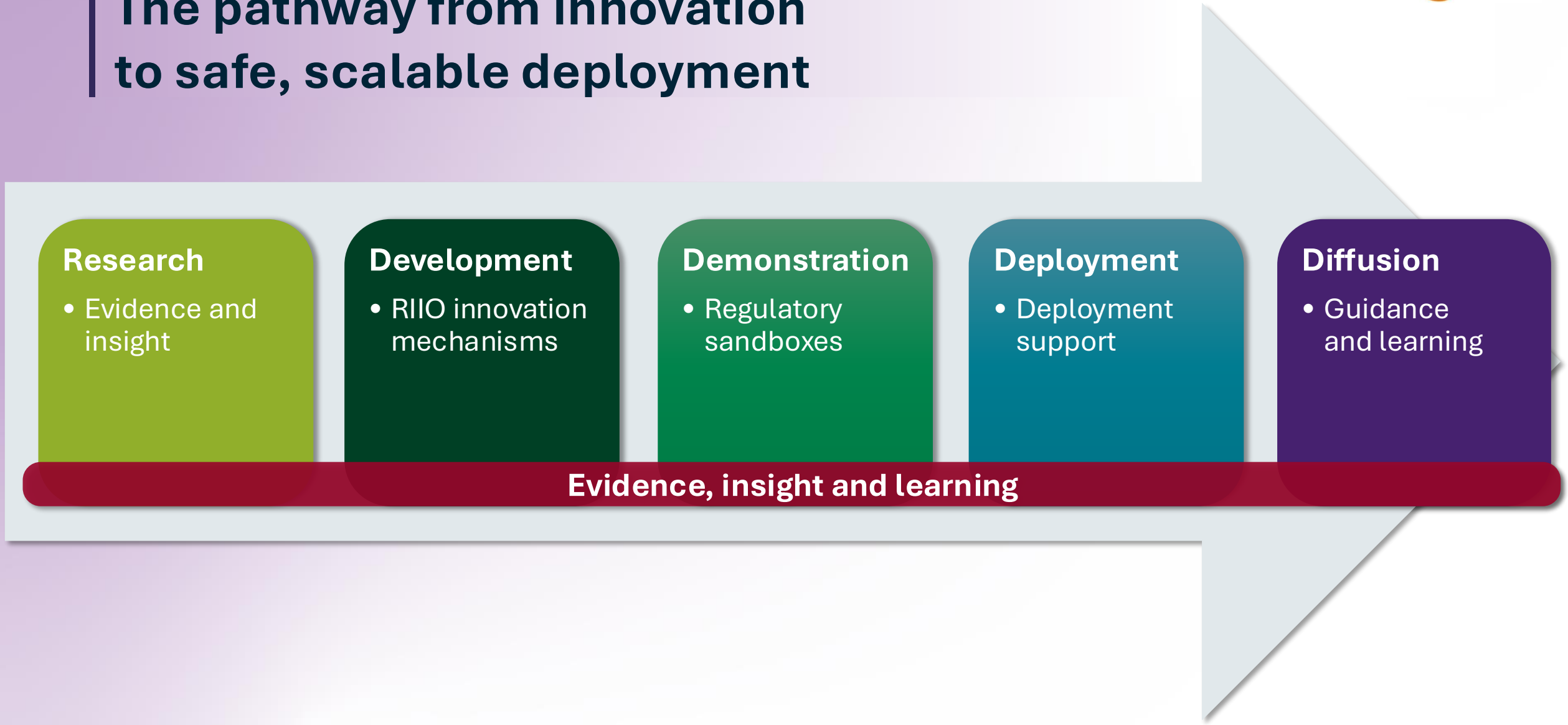


Serve consumers

- Customer service
- Switching
- Vulnerability identification

These technologies can improve utilisation, resilience and delivery, but also introduce new challenges and risks

The pathway from innovation to safe, scalable deployment



Ofgem's role: Enabling innovation through a wider ecosystem

Innovate UK

- Delivery of Strategic Innovation Fund and other programmes

Innovate UK Business Connect

- Cross-sector partnerships

Innovation Hub Ofgem

- Innovation sandboxes
- Fund / allowance decisions
- Regulatory change
- Policy and innovation coordination

DESNZ

- Set strategic policy direction

National Energy System Operator (NESO)

- Facilitating innovation across the whole energy system

Energy Systems Catapult

- Living lab and system-wide analysis

Energy Networks Association

- Electricity networks representation

Future Energy Networks

- Gas networks representation

Energy Innovation Centre (EIC)

- Supporting third parties to develop energy network expertise

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Ofgem helps set direction, creates routes to test and learn from evidence, and ensures regulatory barriers and risks are identified early

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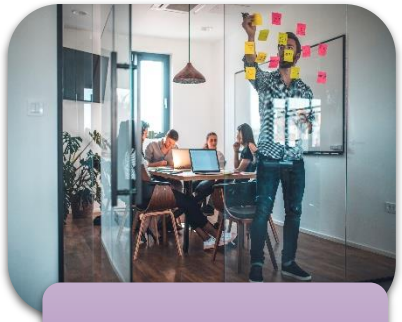
Ofgem's evolving regulatory approach to AI

Regulatory stance: Outcomes-focused → Principles-based → Proportionate and risk-based → Pro-innovation → Sector and innovator engagement

Key regulatory initiatives:



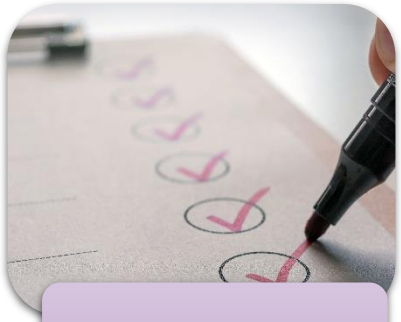
Ethical AI guidance



AI Reg Lab



AI technical sandbox



AI assurance



Risk monitoring and intelligence

Autumn 23 → Evidence → Strategy → Guidance → AI Reg Lab → AI Technical Sandbox → AI Assurance → **Autumn 26**

Our guidance and tools continue to evolve with the technology, evidence and AI uses in the energy sector

AI risk depends on capability and consequences of failure

AI system performance alone does not determine risk
Context, authority, dependency and consequences of failure also matter

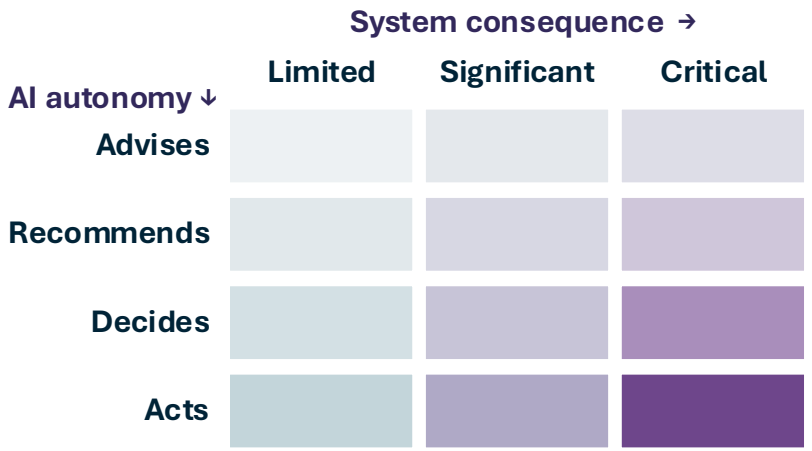
AI is only one component
Wider system determines the risk

Consider the whole socio-technical system:

- Processes
- People
- Data
- Controls
- Supply chain
- AI system
- Technology

System risk arises from interactions and dependencies

Risk increases with both dimensions



Regulator questions

1. What outcome is the AI supporting?
2. What can the AI influence or control?
3. How could failure propagate through the system?
4. What evidence, monitoring, fallback and recovery arrangements are required?

Safe experimentation, shared evidence and proportionate outcomes-based regulation can enable responsible AI to support energy system transformation

Any Questions?





EmergingTechnologies@ofgem.gov.uk