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The Wider Role of Nuclear in the Energy System – Engagement and Education Activities to Enable

Mr. Robert Alford

8 July 2026

Australian Government | ANSTO
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United Kingdom National Nuclear Laboratory

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Technical Difficulties	Search the Zoom Webinars Support https://support.zoom.com/hc/en/article?id=zm_kb&sysparm_article=KB0064143
To ask a question	Select the “Q&A” pane on your screen and type in your question
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Click the Q&A buton in the zoom menu.

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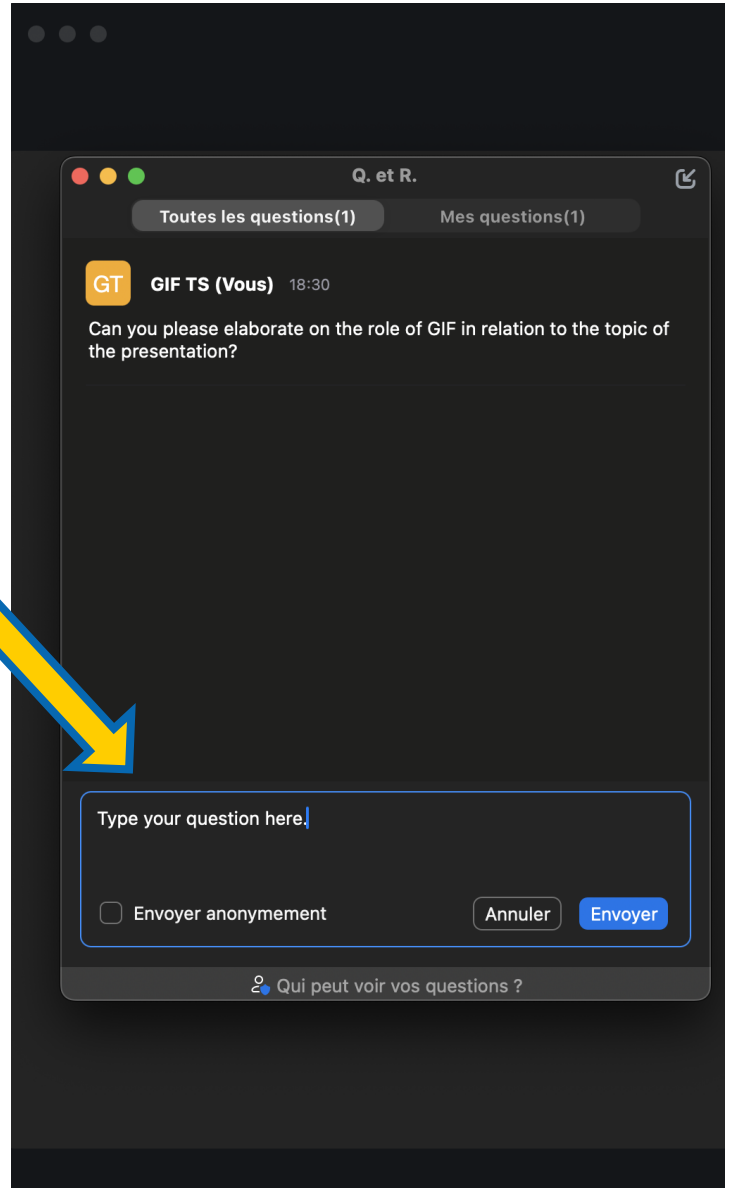

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United Kingdom National Nuclear Laboratory

Meet the Presenter

Mr. Robert Alford is the Delivery and Engagement Lead for Nuclear Energy Application projects at United Kingdom National Nuclear Laboratory. His career to date spans a wide range of roles across the nuclear sector, including work in waste management, operational support for existing reactors and, more recently, within UK Government.

His expertise centres on the role of nuclear energy in enabling decarbonisation beyond electricity generation. His work explores opportunities such as direct heat use, nuclear-enabled hydrogen production, and the synthesis of liquid fuels such as sustainable aviation fuel, critical pathways for reducing emissions in hard-to-abate sectors such as industry and transport.

Robert also contributes to several international initiatives. He chairs the Hydrogen Energy Association's Nuclear Enabled Hydrogen working group and represents the UK Government on committees within the Generation IV International Forum and the Nuclear Energy Agency. His impact on the sector has been widely recognised; in 2022, he became the youngest Fellow of the Nuclear Institute, the professional body for the UK nuclear industry.

The Wider Role of Nuclear in the Energy System - Engagement & Education Activities to Enable

Robert Alford
Delivery and Engagement Lead Nuclear Energy Applications
Linked In: https://www.linkedin.com/in/robertalford1/

70 Years Since Nuclear Cogeneration

- In 1956, Calder Hall in the UK made history as the world's first commercial-scale nuclear power station
- Pioneering not just clean electricity, but also steam for industrial reprocessing & heating of buildings
- A bold demonstration of what nuclear energy could be long before climate targets or net-zero commitments
- Yet decades later, this broader vision of nuclear cogeneration remains largely unrealised
- Technology exists today, but lacks a compelling reason for change

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We Need Energy

- Energy enriches our lives
  - Hot water and heat for our homes
  - Energy to enable transportation by road, rail, sea and air
  - Fuel for industrial processes
  - Electricity to empower our lives
- These are essential in a thriving society
- But the energy system we rely on is facing an overhaul as we work to decrease our carbon emissions and support Net Zero legal commitments

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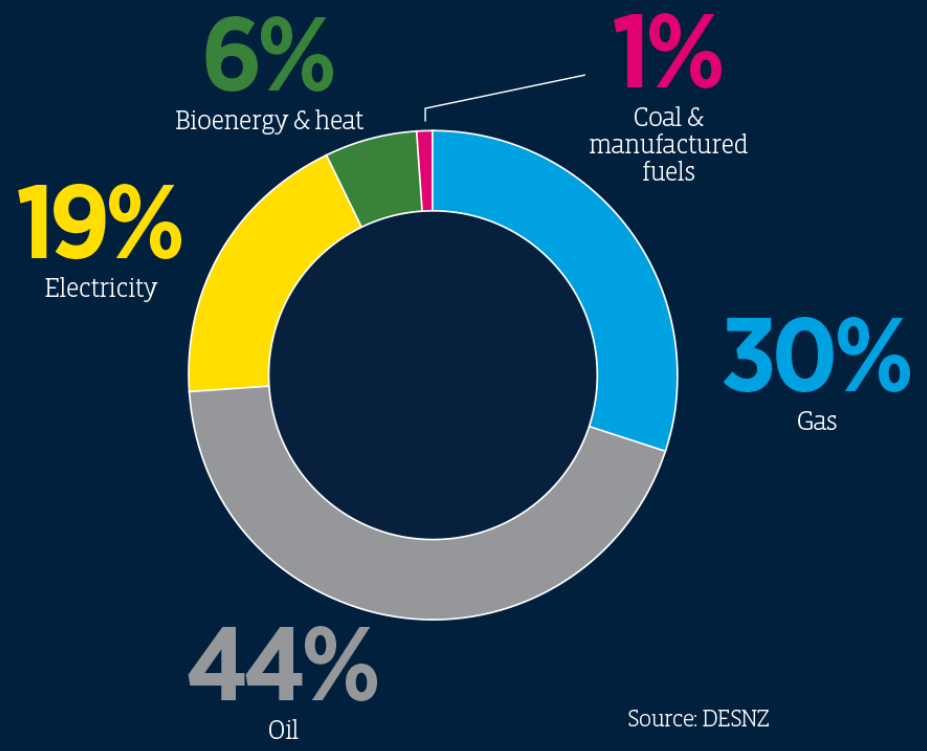
Electricity Cannot Do Everything

- Not everything is suitable for electrification including:
  - heavy transport (e.g. aviation and shipping)
  - heavy industry
  - heating older buildings including many homes
- It's essential to secure different ways of delivering non-fossil fuel energy, to reduce harmful emissions whilst retaining energy security



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What Are The Options and Applications?

Hydrogen

Synthetic fuel

Heat for industry

Heat for buildings

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Considerations to Enable These Options

- The technology already exists, but meaningful progress requires a compelling reason to change
- A critical balance is required between low-carbon transition, energy security, and affordability, especially in uncertain and challenging times
- Change will only happen when the “cost” of change is less than the “cost” of staying the same
- Policy support alone is not enough, without public understanding and engagement, change will not be delivered

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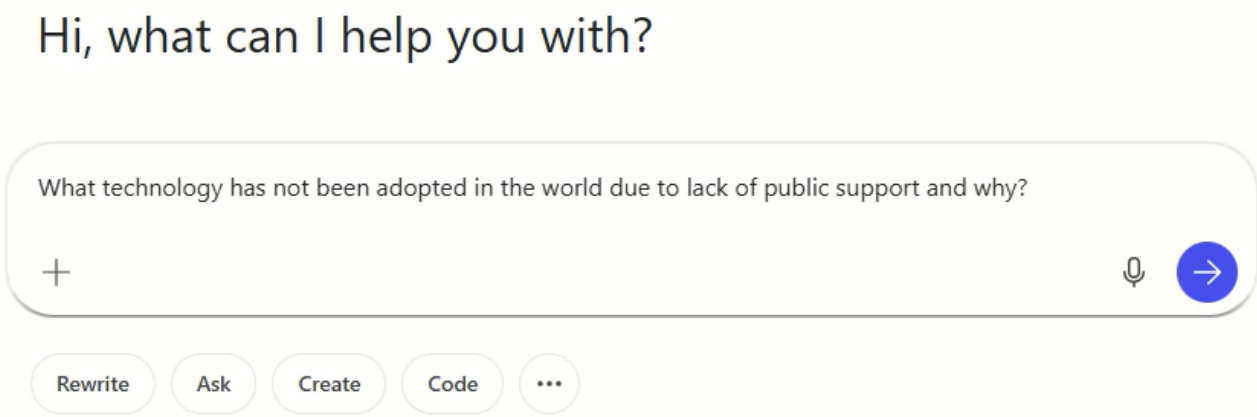
Rapid Adoption of Technology Does Exist

What can I help you with?

Message Copilot

Rewrite Ask Create Code ...

Let’s Ask AI the Question?



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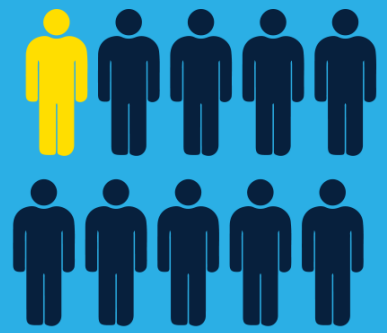
What do People Know and Think About Nuclear?

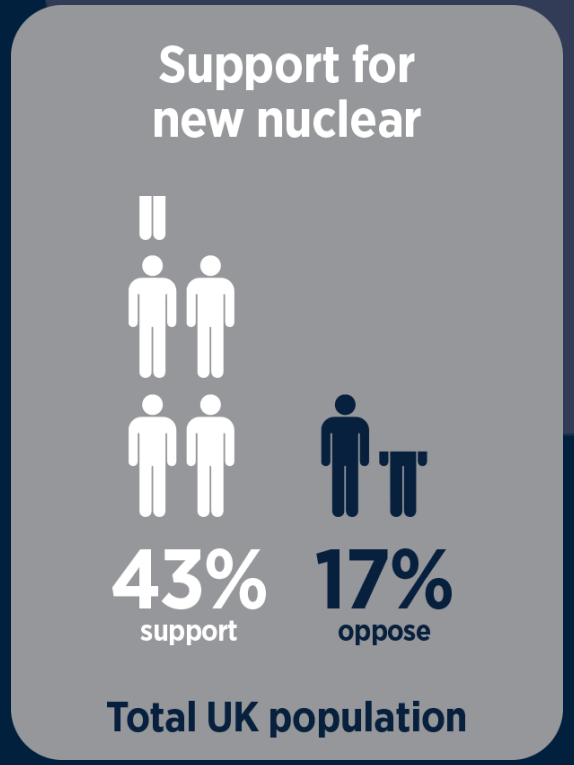


1 in 10 (11%)

of the UK population report not knowing anything about nuclear energy

78% of respondents in Anglesey reported a lot or some knowledge about nuclear energy

Anglesey is where the new Rolls-Royce SMR plants are to be built



What about the other 40% the “unsure”?

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Example Engagement & Education Activities

Online Influencers

I_sodope (Isabelle Boemeke)

https://www.instagram.com/reel/DLpuCDyxmKS

https://www.instagram.com/reel/DTdnE3vklsM/

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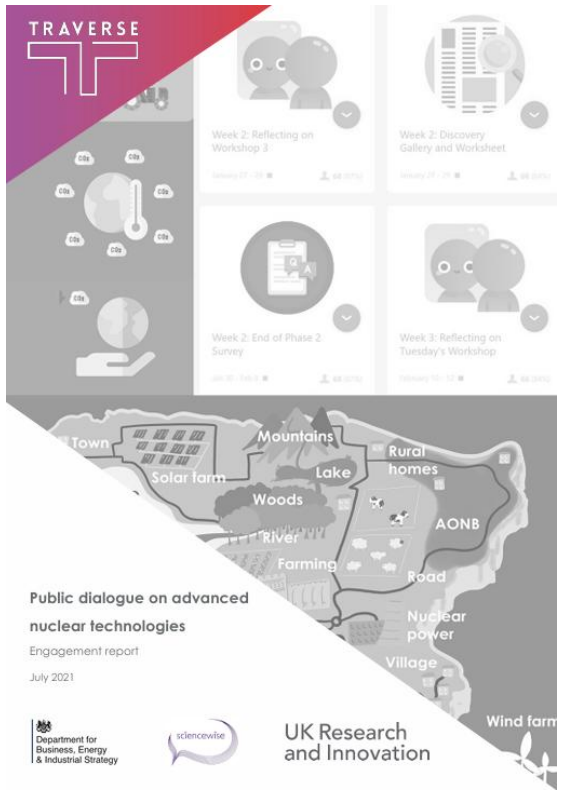
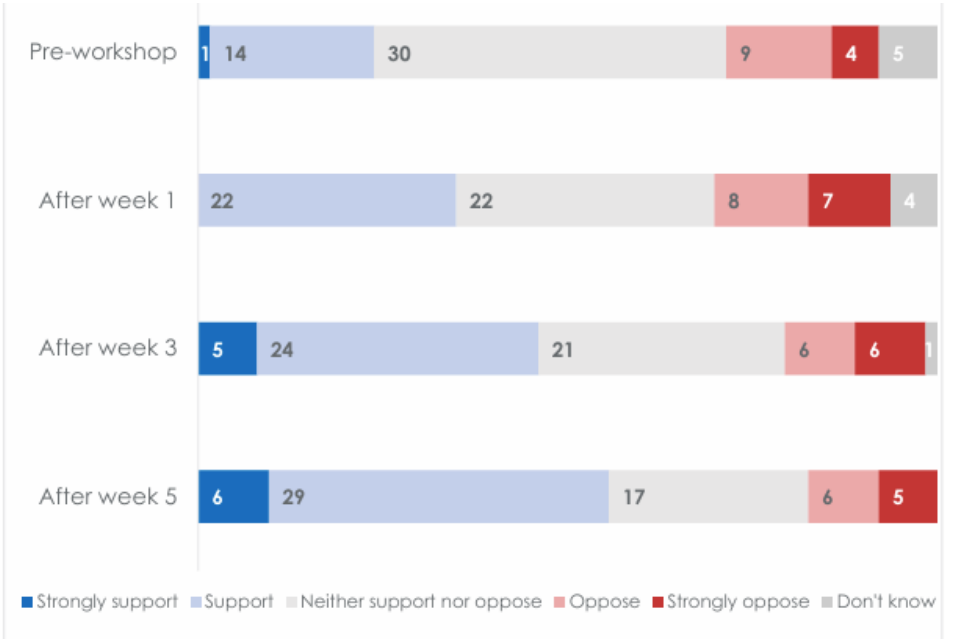
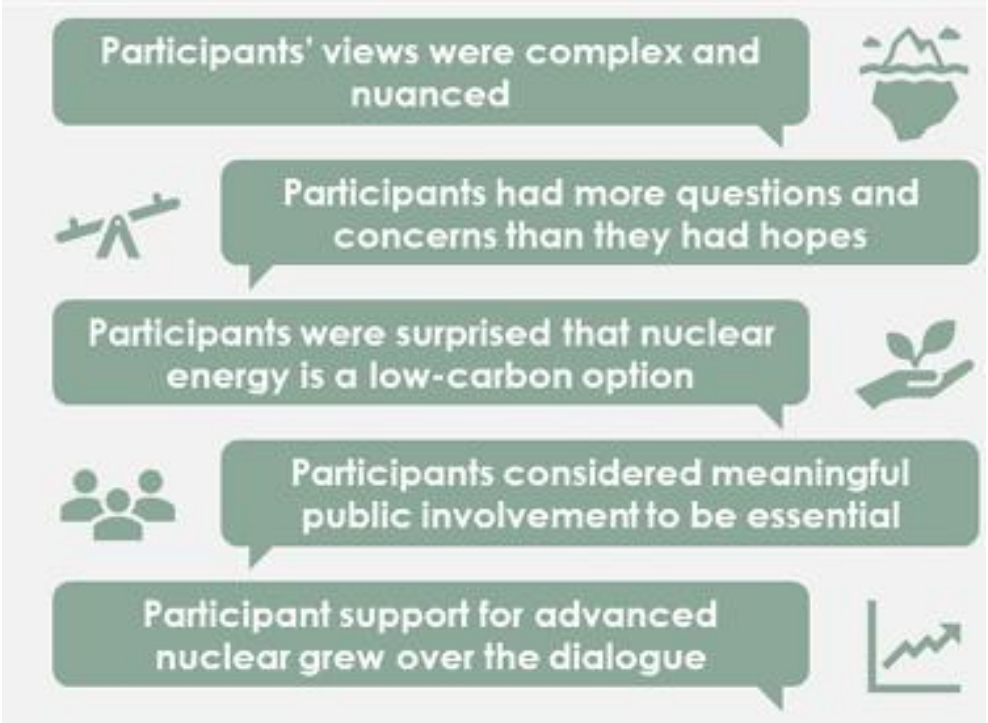
Public Dialogues



https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1013681/advanced-nuclear-technologies-engagement-report.pdf





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Broadcasting: Radio & Television

World Service · 09 Sep 2024 · 26 mins

The Life Scientific: Fiona Rayment

Discovery >

▶ Play + Bookmark Subscribe

"Nuclear part of the toolbox"

"It is not just about baseload electricity it is also about decarbonising the total energy mix in the UK and internationally. We want it to be clean using renewables, using nuclear or fossil fuel with carbon abatement"

"People need to really make sure they have the right information in terms of what their concerns are and to find out about it. When we think about nuclear power and the waste that is created, not a lot of people know that only 6% of that waste is radioactive the rest is not"

Dame Fiona Rayment DBE and Professor Jim Al-Khalili

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https://www.bbc.co.uk/sounds/play/w3ct5rn3

Targeted Education Outreach

Megawatt combines an award-winning card game, a rich library of resources, and expert workshop facilitators to deliver engaging learning experiences about energy.

An award-winning card game

Race to build the world's most resilient energy grid with Megawatt! Balance power generation and environmental impact while navigating challenges like environmental and political events.

A library of teaching resources

A collection of lesson plans, posters, presentations and worksheets designed for both primary and secondary schools. Curriculum-aligned, project-based learning activities accredited by the Association for Science Education.

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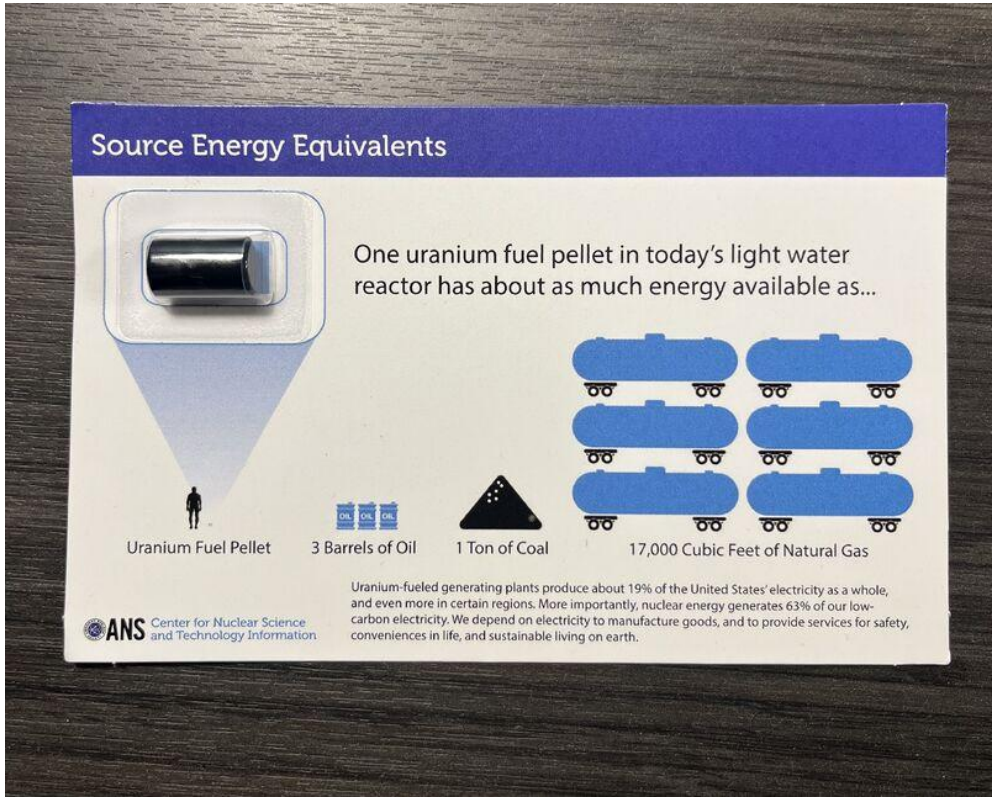
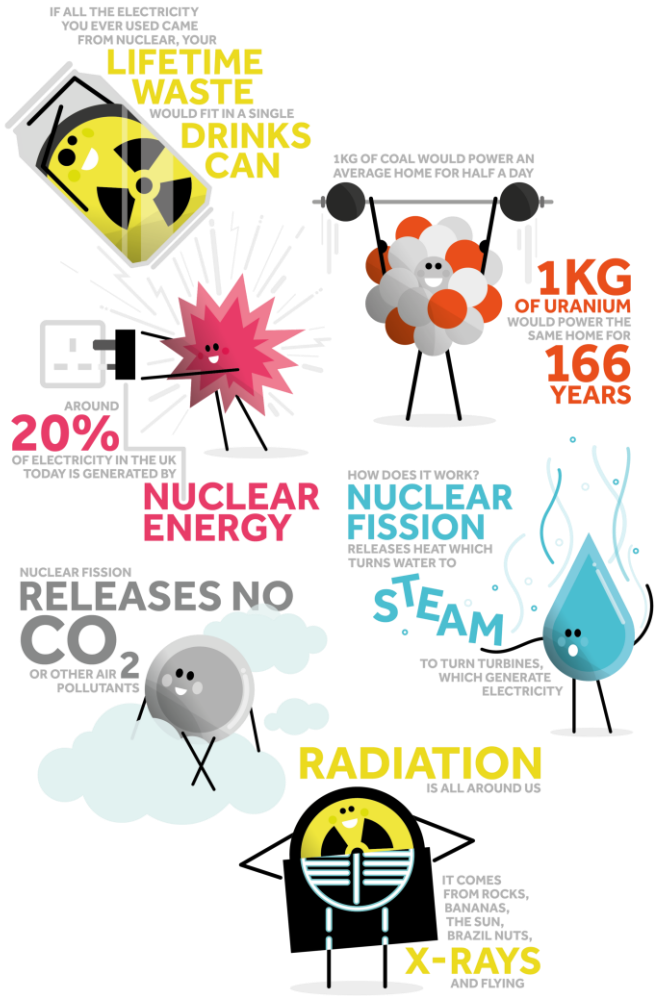
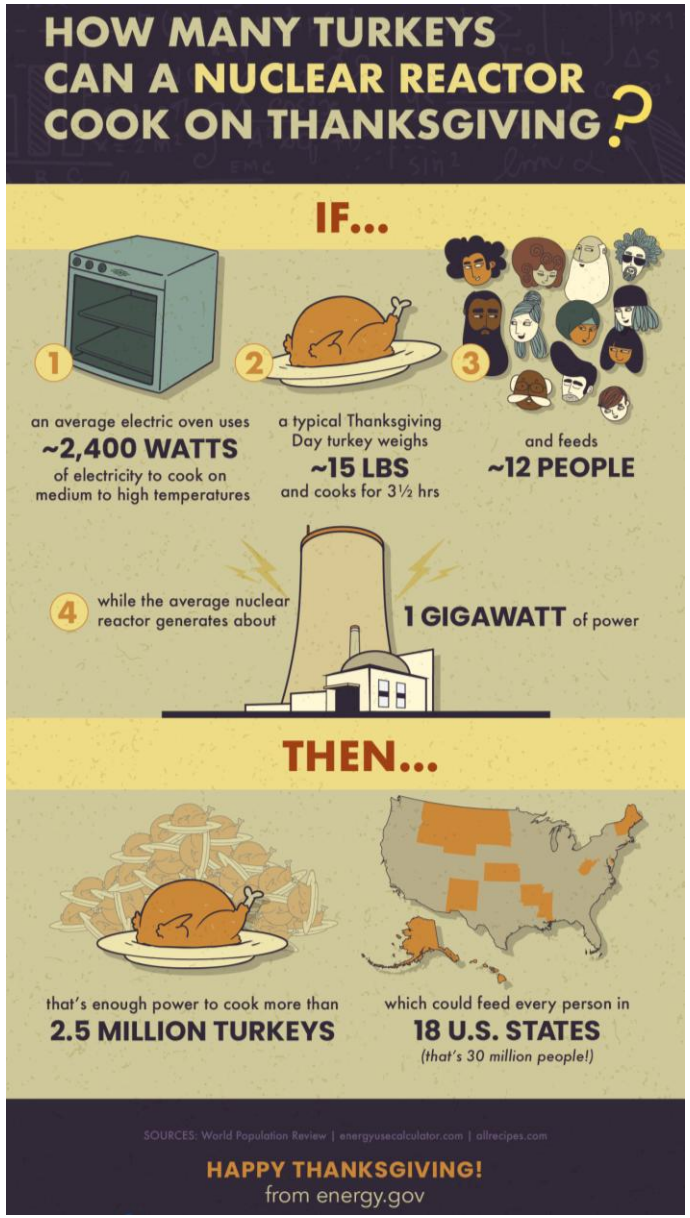
Relatable Science Demonstrations



Memorable Infographics





Dalton Nuclear Institute: https://www.talknuclear.info/

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Nuclear Energy Graphics Resources | Department of Energy

Interactive Engagement Tools

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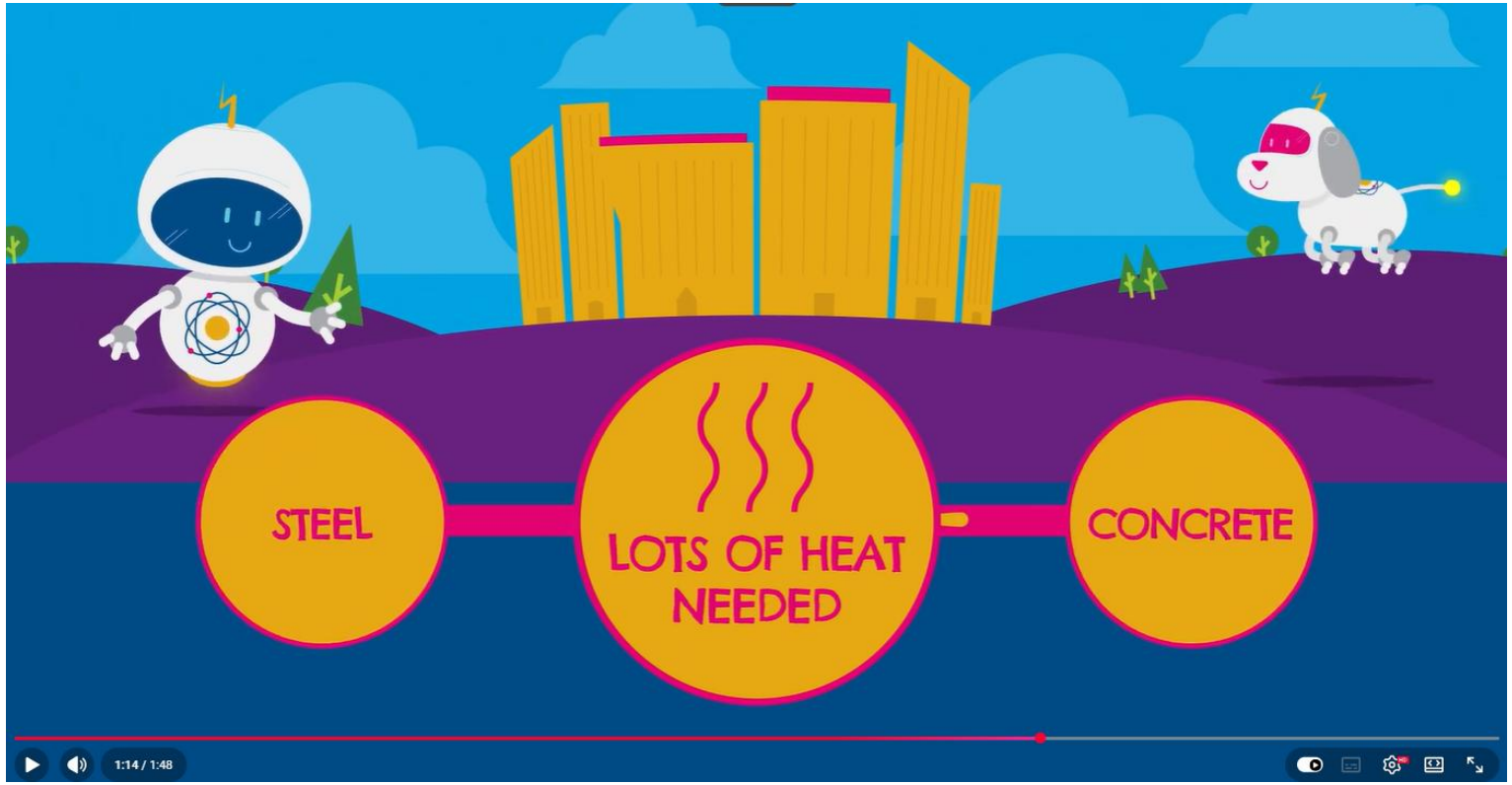
Educational Videos



https://www.youtube.com/watch?v=e6ihwhel9r0

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Hands on Science

https://www.youtube.com/watch?v=YyXforr2WjE

https://www.instagram.com/reel/DQ3y_hSlND1

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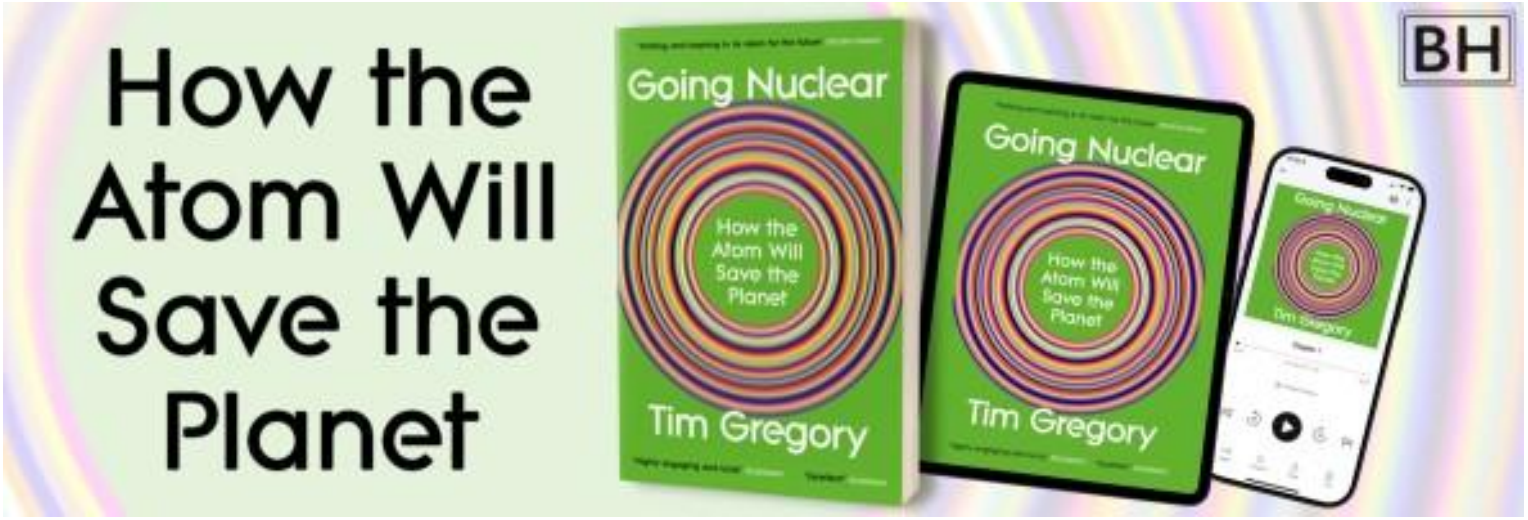
Books



'Fascinating ... Informed facts over uninformed opinions'
JAMES O'BRIEN

'Gregory makes a clear, unflinching case for taking nuclear energy seriously in any realistic path to net zero' *i NEWS*

'A master class in nuclear science, technology, economics and history'
WALL STREET JOURNAL

Online Interactive Resources:
Create your Pathway to a Low Carbon UK by 2050

My 2050

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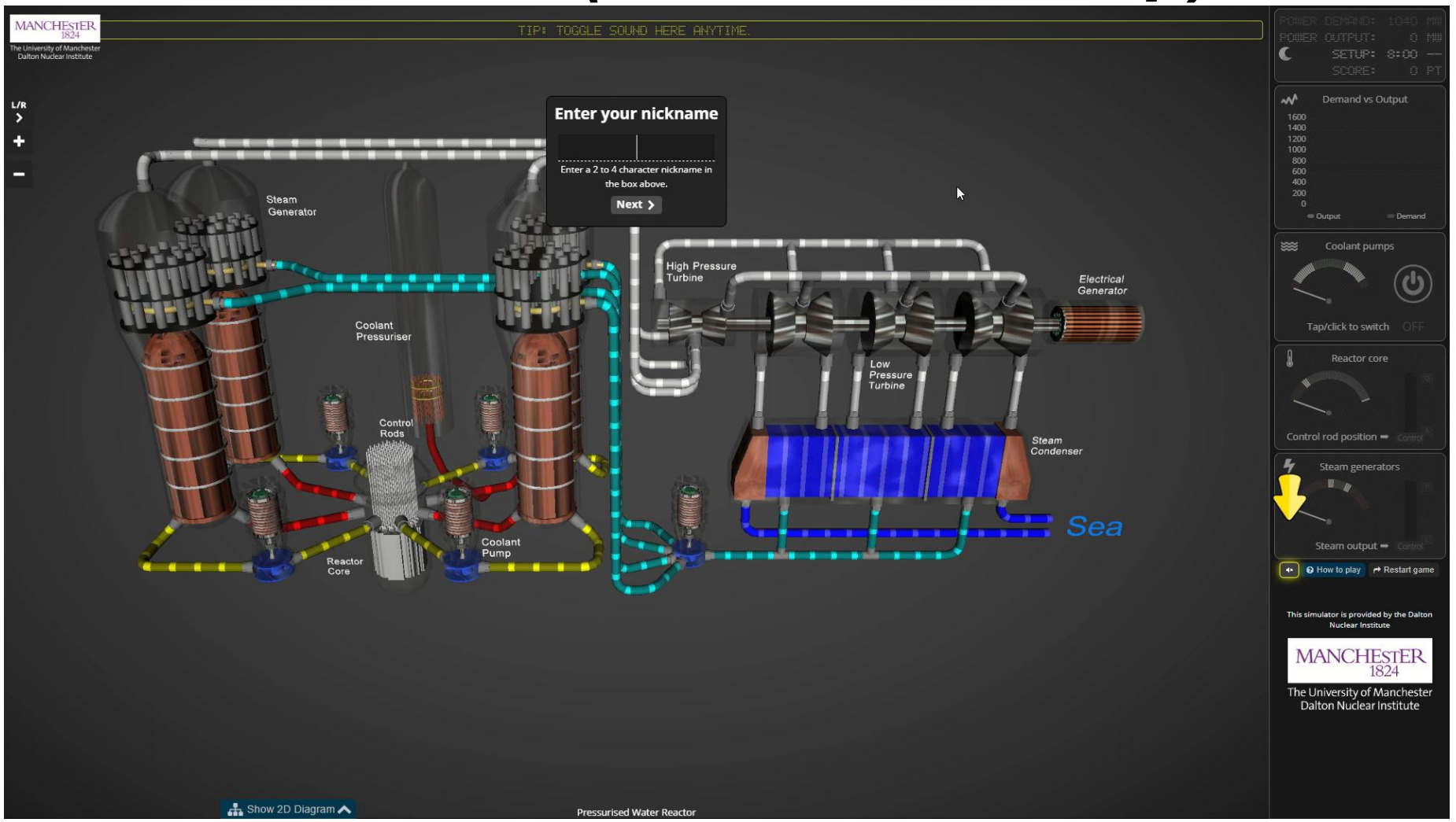
Online Interactive Resources: Nuclear Reactor Simulator *(Reactor Start up)*



Nuclear Reactor Simulator

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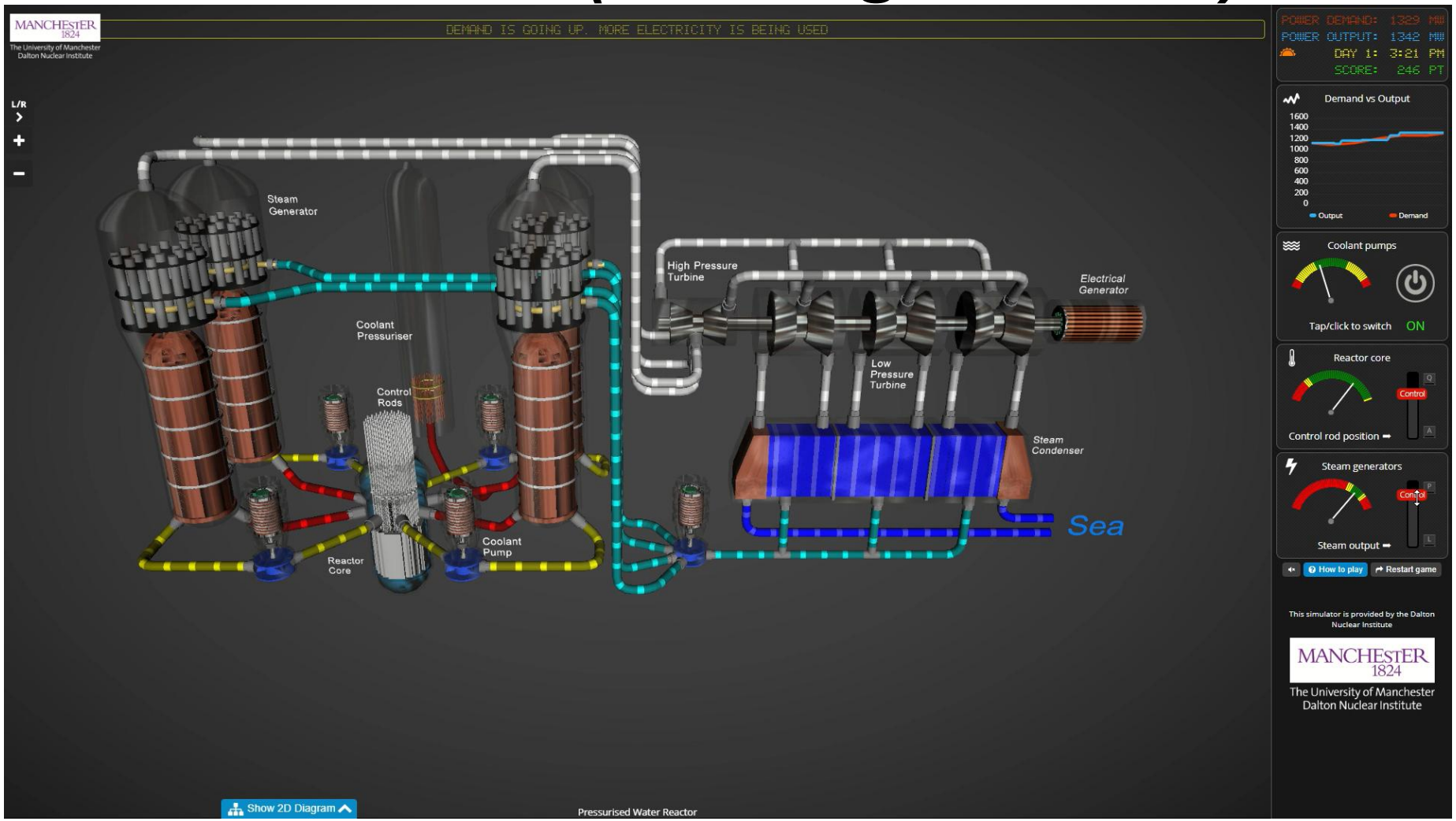
Online Interactive Resources
Nuclear Reactor Simulator *(Evening Demand)*



[Nuclear Reactor Simulator]

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Summary:
Considerations for Outreach Tools

10 Considerations for Outreach Tools

1. **Easy to deploy, scale, and deliver** – simple to roll out, expand, and reuse across settings
2. **Enjoyable** – includes elements of fun to make more memorable
3. **Interactive/ Engaging** – active participation & sustained interest
4. **Future-proof** – unlikely to become obsolete quickly
5. **Educational value** – supports learning and understanding
6. **Target audience (Diversity/ Equality)** – children, adults, under-represent communities
7. **Cost-effective** – affordable to run and easy to reproduce
8. **Training or expertise required** – knowledge or preparation required to deliver or use
9. **Method of delivery** – in-person (small or large groups) or self-directed online
10. **Clear intended outcomes** – inform, reassure, explore career options, or other goals

Rethinking Possibilities- The UK Nuclear Institute

Fission Chips Episode 1: The Next Generation of Nuclear

YGN Flash Mob- CoP26

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United Kingdom National Nuclear Laboratory

Thank you & Questions

Robert Alford
Delivery and Engagement Lead Nuclear Energy Applications
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Upcoming Webinars

Date	Title	Presenter
12 August 2026	Diamonds are a Reactor's Best Friend: Novel Sensor to Investigate High-Valence Actinides in Molten Salts	Dr. Hannah Patenaude, Los Alamos National Laboratory, USA
10 September 2026	Thermal properties of molten salts: crucial data for the development of MSRs	Prof. Juliano Schorne-Pinto, University of South Carolina, USA

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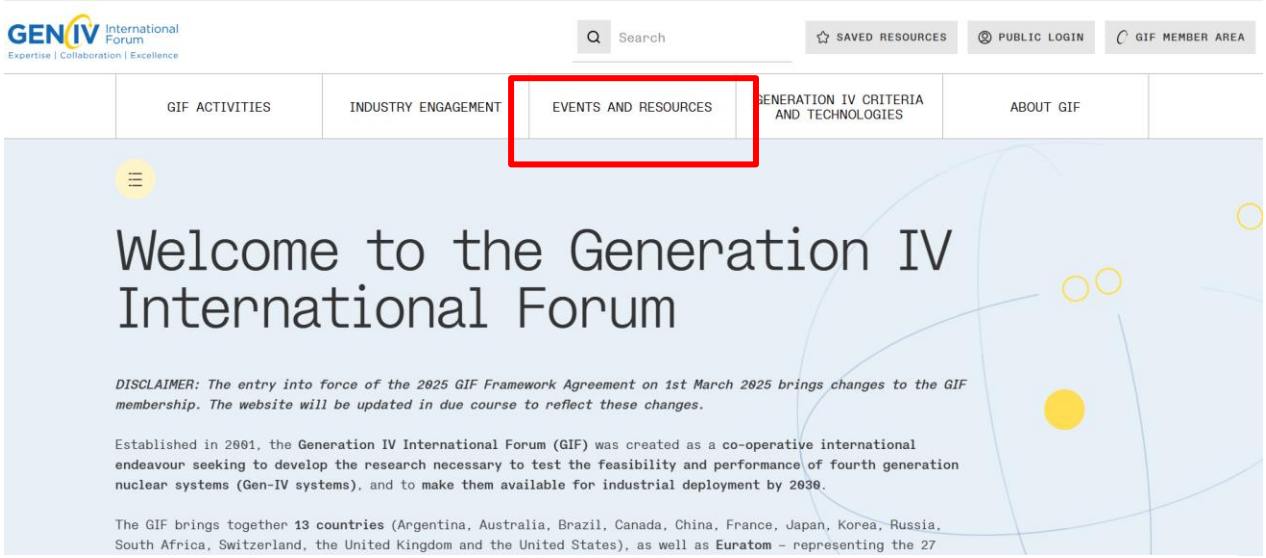
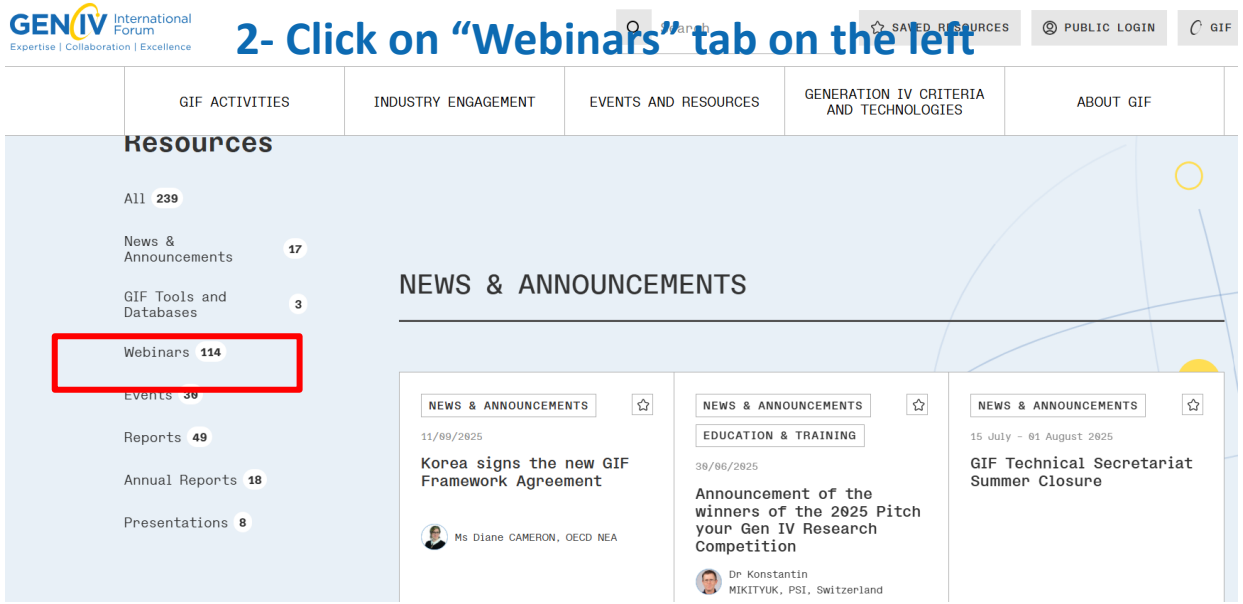
How to find the recorded GIF webinars – www.gen-4.org

1- Click on “Events and Resources Tab



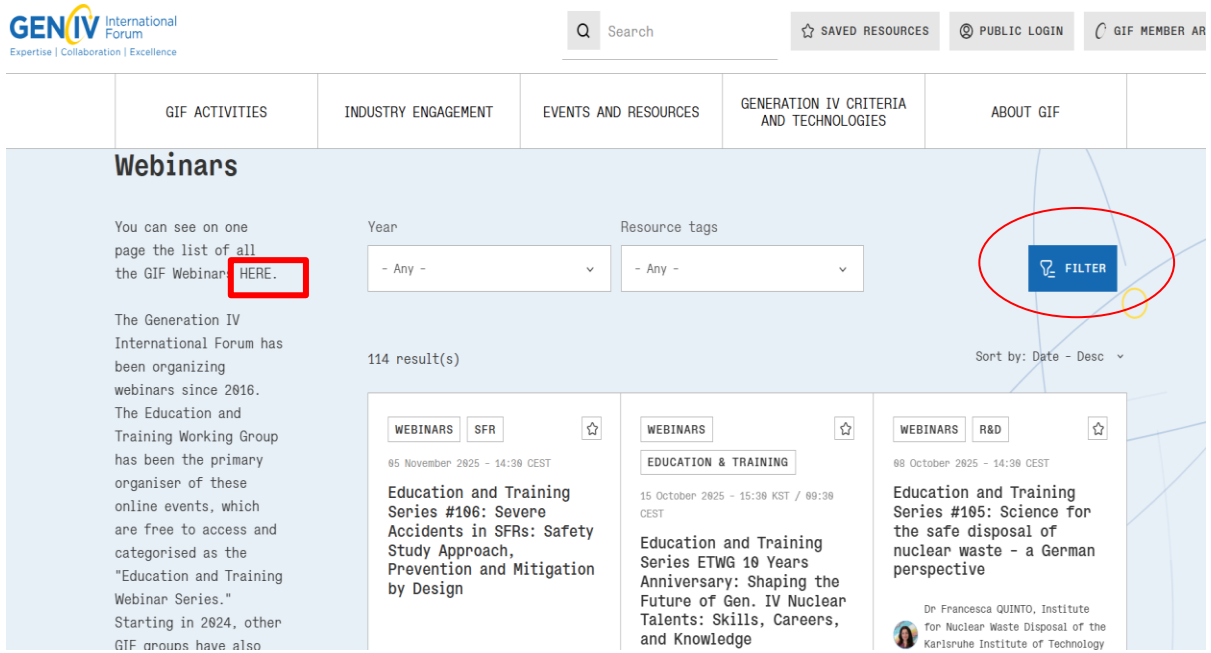
2- Click on “Webinars” tab on the left



3- Click on “HERE” to see all the webinars

Or

4-Use the Year and Resource tag and click on Filter



Thank you
Questions?

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