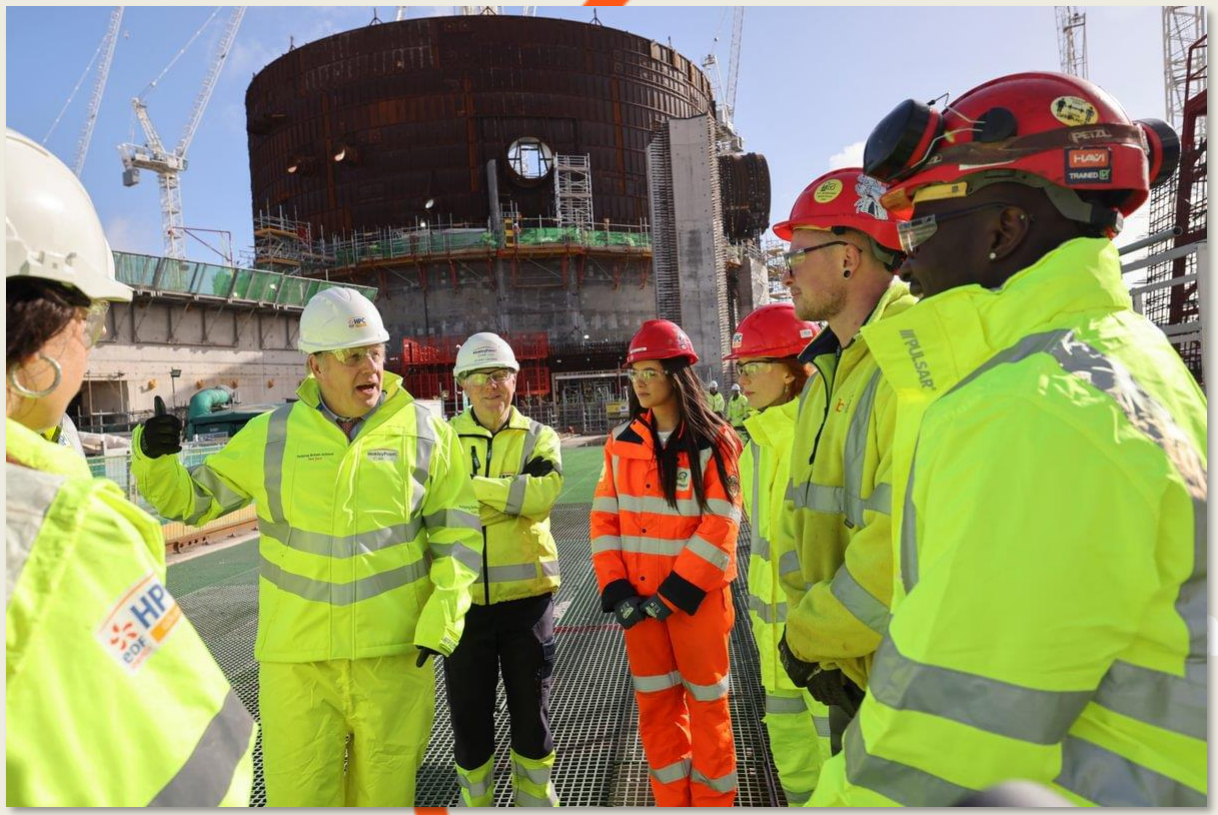
Sizewell C

NIA Legal and Financial Affairs Group 10th May 2022

Xanthe Kueppers, Head of Investor Relations

A new political landscape



“We want Sizewell C and we’ll be bringing forward plans as fast as possible.”

Boris Johnson, 3rd May 2022

HPC - into the next phase

Sizewell C
Doing the power of good for Britain
EDF CGN

HPC - delivering on its promise

£18 Billion
the total projected economic value to the UK

22,000
jobs supported across the UK

£1.2 Billion
spent with companies across the North of England so far

71,000
jobs will be supported by the end of the construction

£4.1 Billion
spent with South West companies so far…almost three times the original commitment

64%
of the value of Hinkley Point C will go to UK-based companies

SizewellC
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EDF CGN

Building a copy

Lowering costs for consumers

Regulated Asset Base

£200bn of British infrastructure

<£1 per month during construction

£30bn saving for each nuclear project

SizewellC
Doing the power of good for Britain
EDF CGN

Replicating the benefits

- ❑ 70% UK content
- ❑ 70,000 jobs
- ❑ 1,500 apprentices
- ❑ MoUs worth £7.5bn

Jack Milton, (pictured centre with managers at Sizewell C) is a projects control apprentice at the nuclear power station

Sizewell C plans to recruit 1,500 apprentices if plant gets go-ahead

More than 1,000 apprenticeships will become available if Sizewell C goes ahead.

The nuclear power plant already offers apprentices to those in Suffolk and Norfolk, but if the new station gets the green light it will see 1,500 apprenticeships being opened up which can lead to a wide range of careers at the station.

Sizewell C is already looking to fill dozens of apprenticeship roles in welding, project controls and pipe fitting.

Sarah Williamson, civils programme director at Sizewell C, said: "Sizewell C will deliver 1,500 apprenticeships and these early opportunities are a fantastic route into the project for students to learn their craft at Hinkley Point C and transfer back to Sizewell C as qualified welders and engineers.

"The opportunities are real, they are being delivered now and I would encourage anyone serious in pursuing a rewarding career in civils to consider the growing nuclear sector."

Although plans for the Sizewell C plant are still being scrutinised with a final decision expected this month, the government's carbon goals for the UK makes it likely that the new power station will go ahead. This would not only lead to more than a 1,500 apprenticeship opportunities, but also thousands of new jobs.

To help ensure that locals can take up the new roles the site has been working with local education provides, such as East Coast College, to help students develop the skills Sizewell C is looking for, from construction and engineering to hospitality and project management.

Some apprenticeships have already started their training at the station, including young people from Lowestoft who are currently working at Hinkley Point C power station in Somerset and will return to Sizewell C to gain their full construction qualification.

Sizewell has a history of recruiting apprentices who have gone on to achieve high-flying careers at the nuclear plant. For example, many of the mangers at Sizewell B studied at Alde Valley Academy and joined as apprentices and then progressed through the organisation to become leaders at the plant.

Joshua Wilkins, Sizewell C Project Controls Apprentice

Joshua Wilkins is a Projects Controls Apprentice at Sizewell C.

He said: "I am on my way to being a qualified welder, ready to work at Sizewell C.

"I am a project controls apprentice for Sizewell C. It is a three-year apprenticeship which I started at Hinkley Point C in Somerset and am completing in Suffolk with Sizewell C.

"Before I joined the project, I studied Level 2 and Level 3 courses in science, IT, maths and game development and engineering at East Norfolk Sixth Form College.

"The 3D modelling and code development in gaming has been useful for working on the 4D design of Hinkley Point C.

"My family recommended the apprenticeship to me as both my dad and grandad worked on the construction of Sizewell B. I am learning so much and really enjoy combining learning with on-the-job experience."

Joshua Wilkins is an apprentice at Sizewell C Pictures: SIZEWELL

Apprenticeships 2022

In partnership with Apprenticeships Ambassador Network East of England, Apprenticeships Norfolk, Ipswich Norwich Essex, Morgan Sindall Construction, Norfolk County Council, NEWANGLIA Local Enterprise Partnership for Norfolk and Suffolk, LOVELL, Larking Gowen

SizewellC Doing the power of good for Britain

EDF CGN

More room for nature

- ❑ Footprint < 0.2% of AONB
- ❑ 250ha designated for wildlife
- ❑ 19% increase in biodiversity
- ❑ Environment Trust

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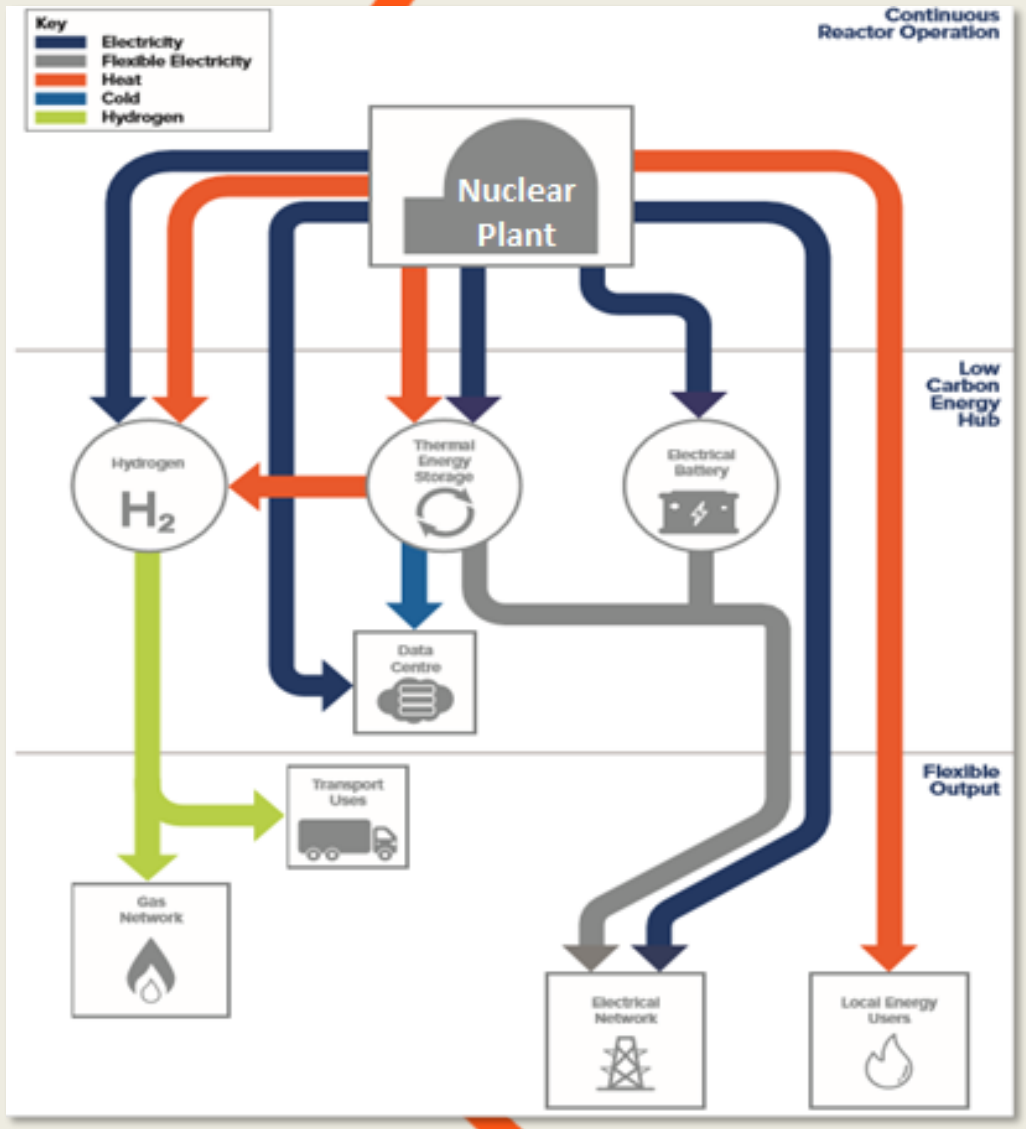
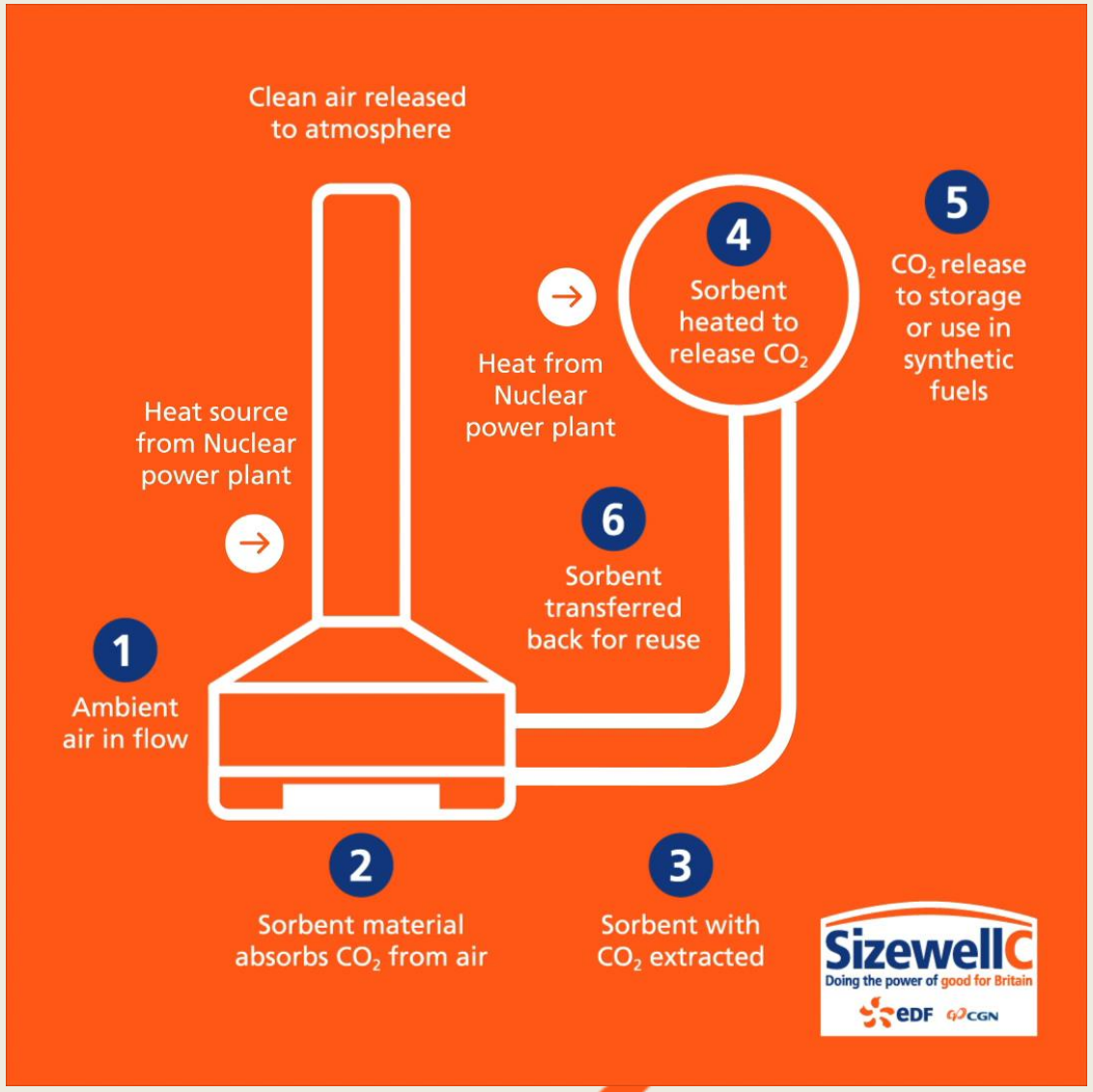
EDF CGN

Supporting new low carbon technologies





The journey to FID

DCO Q2 2022

RAB designation

Site licence
& other permits

FID &
construction

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EDF CGN

Thank you

New Build and Advanced Fuel Technologies

Westinghouse Update

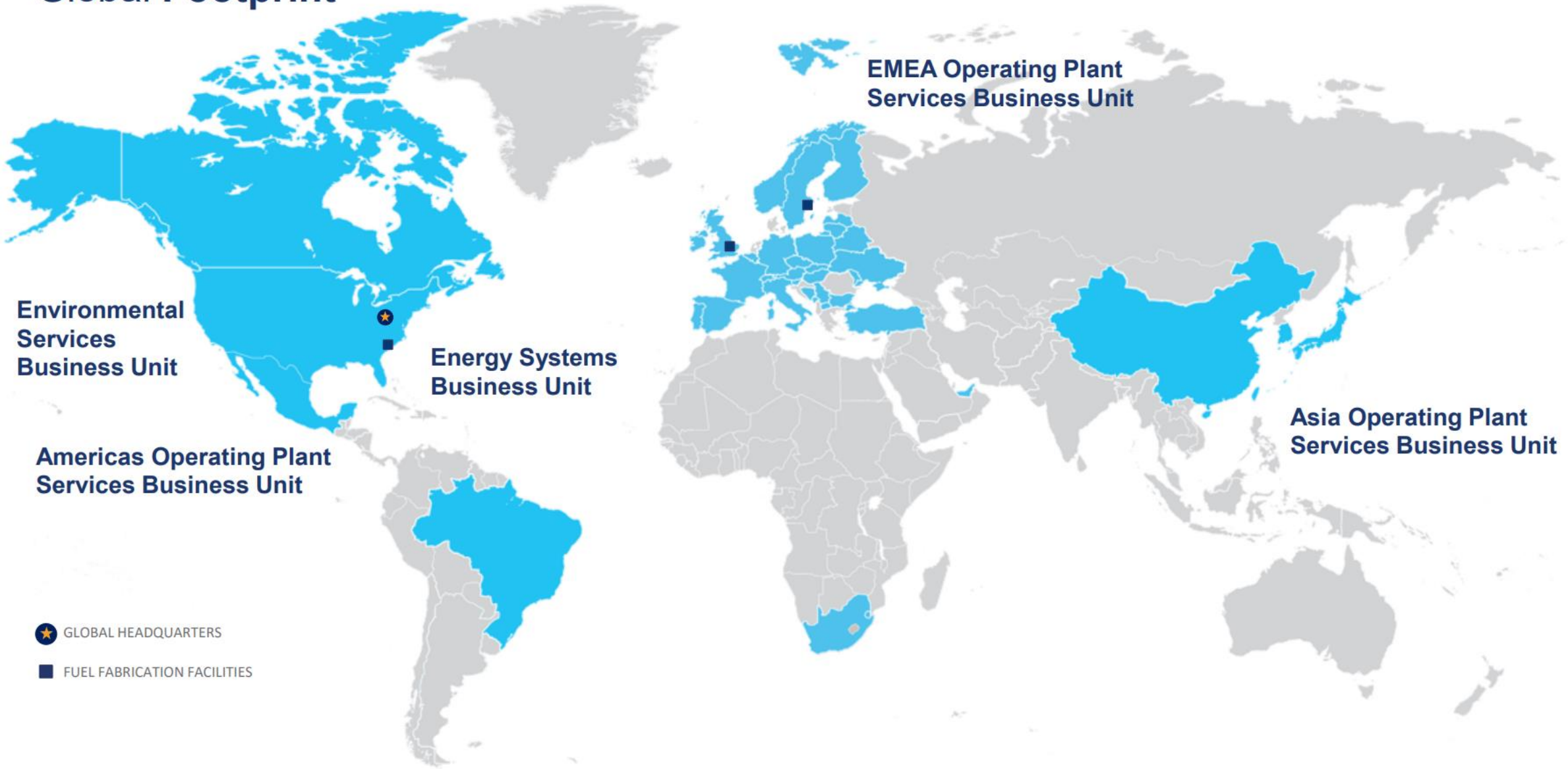
Lindsay Roche

UK Business Director

Westinghouse


Shaping Tomorrow's
Energy
Westinghouse

Global **Footprint**



Wylfa AP1000® Plant Project

Wylfa - Route to Deployment

Westinghouse/Bechtel Wylfa White Paper:

- Clear steps to develop an AP1000® reactor project at Wylfa
- Highlights the value of an AP1000® plant project to Anglesey, the region and UK supply chain

Future Nuclear Enabling Fund support to define and de-risk an AP1000® plant project at Wylfa for future investment

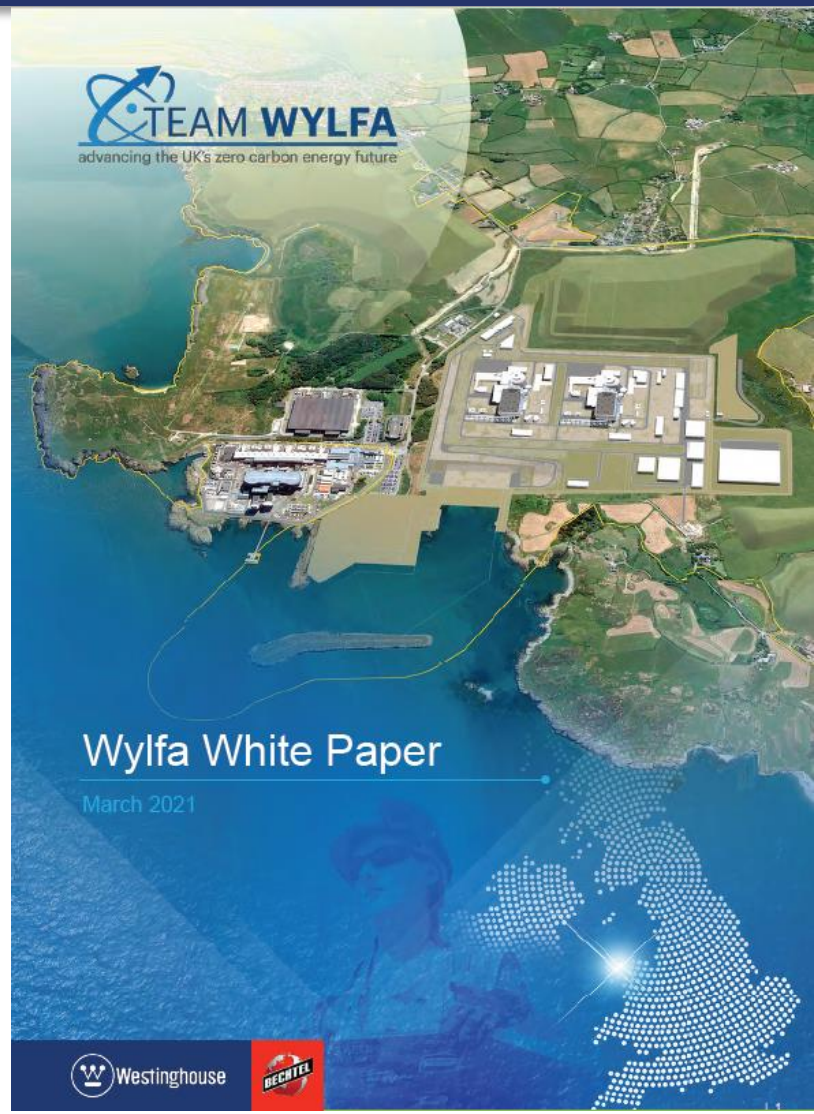
Great British Nuclear Vehicle to develop the project at Wylfa to final investment decision

Regulated Asset Base legislation supports the financing of construction post final investment decision.

Definition

Development

Delivery



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Wylfa Project Benefits

Westinghouse and Bechtel can bring to Wylfa:

- Proven technology delivering industry record-breaking start-up performance and operations
- A completed, standard AP1000® plant design, optimised for construction, with GDA approval
- A wealth of experience from the Vogtle project, synergies from our other European AP1000® plant projects, plus supply chain development expertise

A Wylfa project will provide:

- Transformational development/growth for Wales, delivering real levelling-up opportunities
- Clean, reliable electricity to power the whole of Wales
- UK supply chain opportunities
- Long-term AP1000® reactor fuel delivery from Springfields
- Significant export potential from the growing AP1000® technology programme
- Development of advanced competencies benefiting a future AMR/SMR programme

Sanmen Site, China
Photo © Sanmen Nuclear Power Company, Ltd. All rights reserved

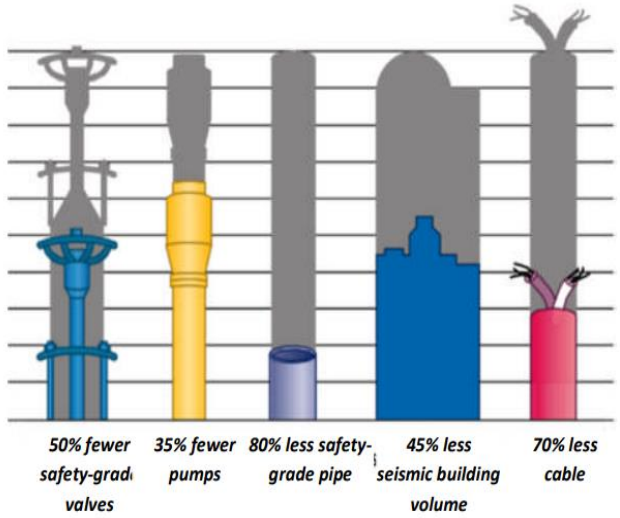
2 AP1000 Units at the Wylfa Site
Anglesey, Wales
© Westinghouse. All rights reserved

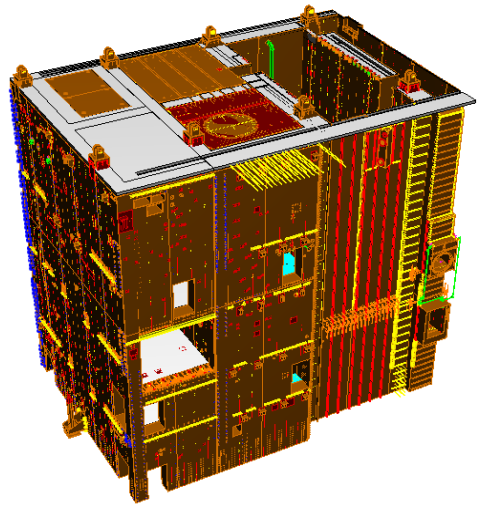
Westinghouse

Wylfa Supply Chain Opportunities

The UK Supply Chain could support multiple AP1000® plants in UK and Europe:

- The plant simplification enabled by utilising all-passive safety systems significantly reduces safety-related quantities of valves and associated equipment.
- Reduced percentage of safety-class equipment provides much greater localisation potential.
- The advanced modular construction philosophy can provide immediate opportunities and build UK competences/capacities for future SMR/AMR programmes.
- Wylfa AP1000® plant suppliers can potentially gain access to the wider AP1000® plant roll-out in Europe leveraging opportunities in Poland, Czech Republic, Slovenia.





Springfields - 75 Years serving the UK and global nuclear industry as a unique and strategic national asset.

Springfields Role in Delivering UK Energy Security

Springfields has an important role in delivering Energy Security Strategy

- UK Indigenous Fuel Manufacturing Facility with unique skills and capabilities across the fuel cycle
- Capability to manufacture a broad range of fuel types to support market demand
  - Growing our PWR fuel capability – large scale GW and SMR
  - Expansion into RepU fuel market
  - Accident Tolerant Fuel
  - Advanced Reactor Fuels – including TRISO, Molten Salt and others
- Preserving and developing critical fuel manufacturing skills
- Opportunities for siting Advanced Nuclear Technologies in collaboration with other organisations.

Westinghouse

Thank you

Lindsay Roche
UK Business Director
rochelj@westinghouse.com

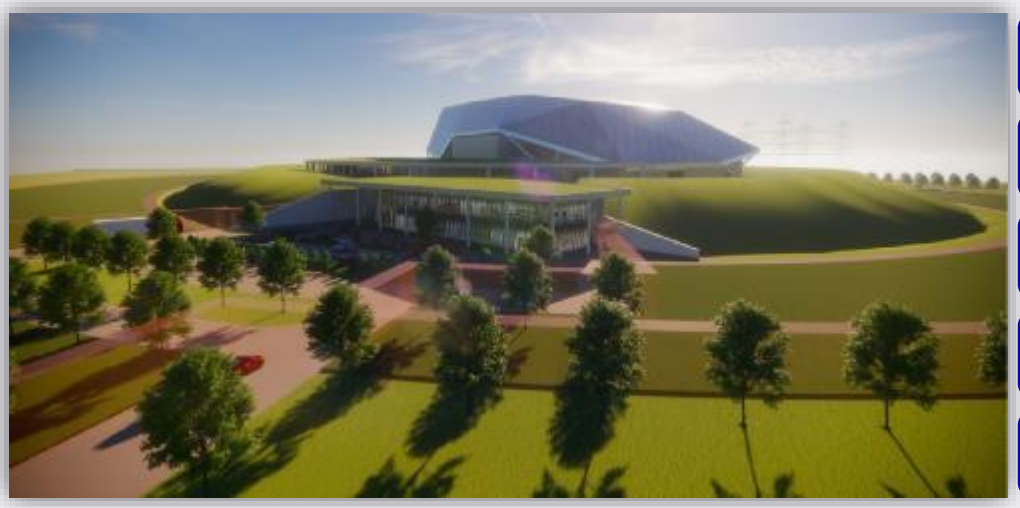
Rolls-Royce SMR

Clean Energy For All

May 2022

Rolls-Royce SMR is a new way of building nuclear to meet the needs of Net Zero

- ~470 MWe net output
- 60-year life @95% availability
- Proven PWR Technology & Standard Fuel
- Power station turnkey delivery
- 4 yr on-site Construction (Fleet unit)



- Enhanced safety and security
- 1st unit on grid 2029
- Adaptable, multi-use power & heat output
- Capital cost under £2bn*
- LCOE range £35-£50 per MWh**

Low cost

Deliverable

Global and scalable

Investable

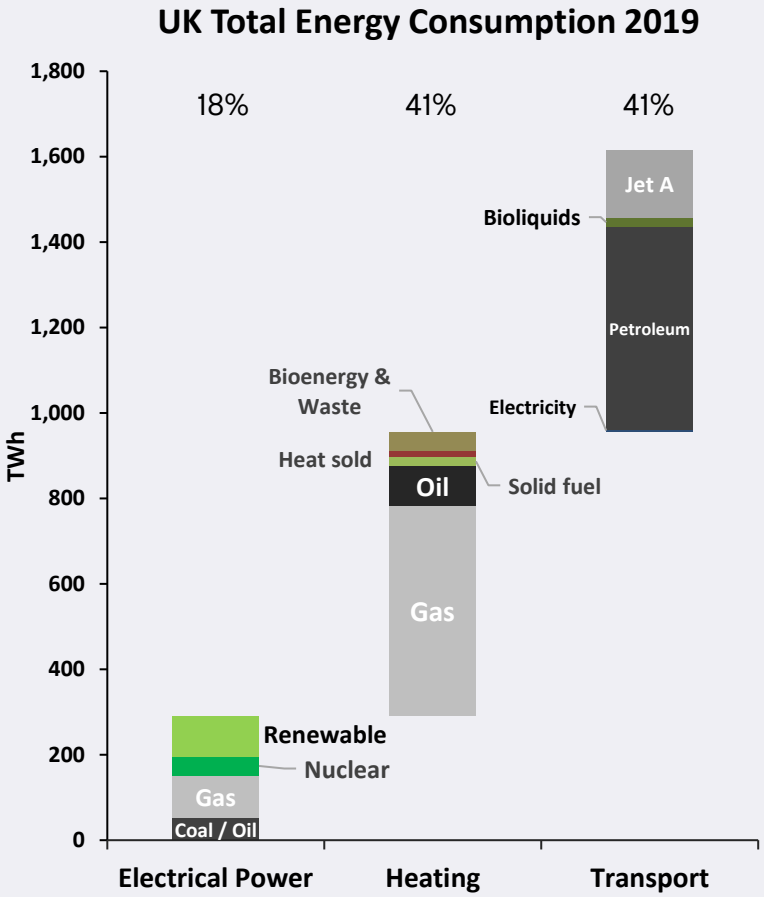
* 2021 economics, fleet unit; costs based on UK labour rates ** 2021 economics, 2 unit plant, range dependent on financing mechanism

Decarbonising the energy system

The Power/electricity sector has been the historic focus

Heating and Transport are a much greater challenge

All forms of decarbonisation will require more clean electricity



Source: https://www.gov.uk/government/statistics/energy-chapter-1-digest-of-united-kingdom-energy-statistics-dukes

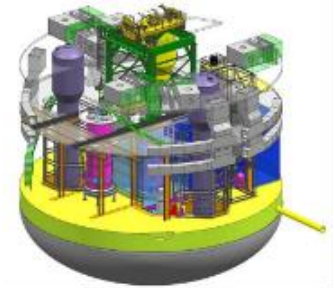
A Factory Fabricated Product

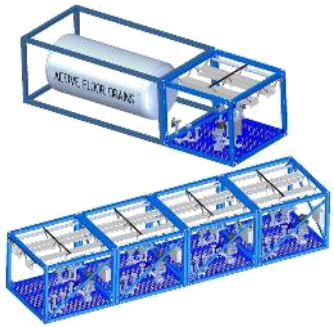
Road transportability of modules is a pre-requisite, reducing Capex per MW and improves delivery time & certainty

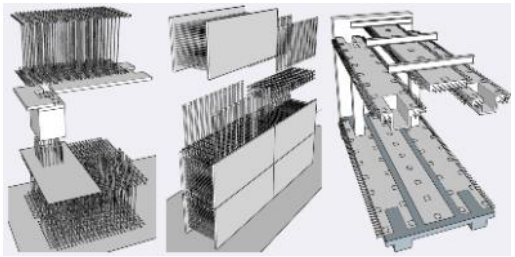
Primary Modules

MEP Modules

Civil Modules





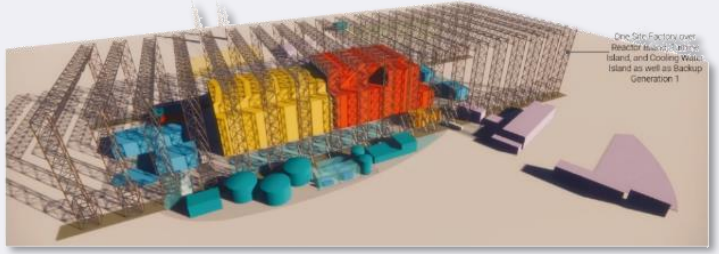


The Site Assembly Facility

Provides major benefits in certainty of costs and schedule

Removing the impact of weather:

- Potential lost days over 4 year construction period ~641 days
- Equates to ~£867M of deferred spend resulting
- Avoids potential extension of programme of ~18 to 24 months



- The removal of this risk will enable:
  - **Certainty on a baseline plan with shorter schedule and lower cost**
  - **Lower premiums on cost of borrowing**
  - **Lower LCOE**

Turning nuclear into a product not a one-off mega infrastructure project

✘ EPC (mega project)

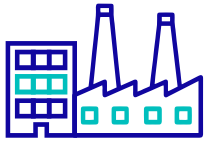
Conventional large-scale EPCs

- Mega projects GBP10bn+
- Government driven
- Commercially complex

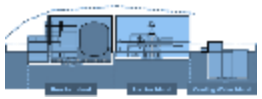
Designed for LCOE and simplicity of deployment

Reducing Project Risk

Factory Product



Standardization



Schedule certainty

Commercial simplification

✓ **EMA (factory product)**

Engineering
Manufacturing
Assembly

- Much lower risk
- Reduced Capital
- Shorter Time to Build

= Reduced financing cost

Industries require low carbon solutions and the scale of clean power demand is increasing

Cummins forecast 2,500GW of electrolyser capacity
(equiv. 5,300 SMRs)

ITM building a 1GW p.a. electrolyser factory
(equiv. 2 SMRs)

0.5-1.0GW for a single data centre
(equiv. 2 SMRs)

c.23GW p.a. current combined data centre demand

Bitcoin requires **c.13GW p.a.**

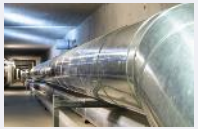
Netherlands necessitates **c.13GW p.a.**

One SMR and associated plant can...

1. **Hydrogen & Synthetic Fuel Production**

Produce 270 tonnes of H_2 / 325 tonnes of net-zero synthetic fuel per day

2. **District Heating**



Heat a city with over 500,000 inhabitants

3. **Desalination**

500million cubic meters of potable water per year

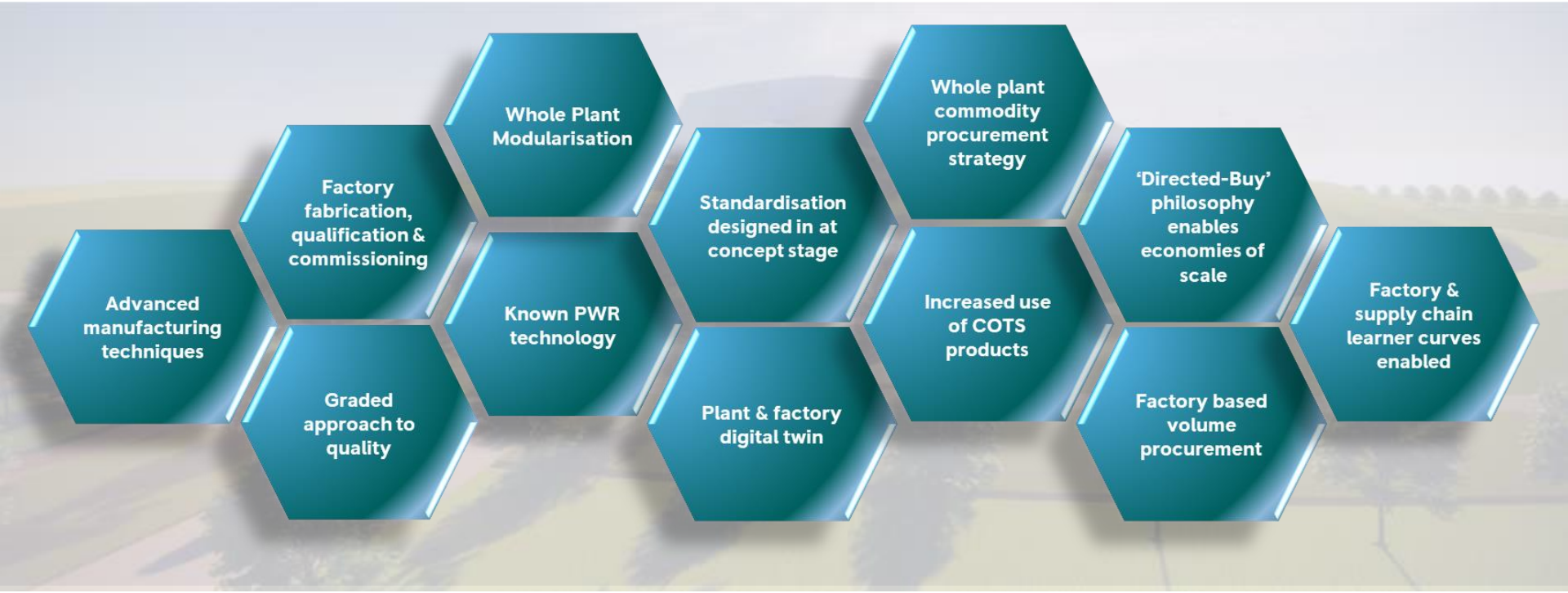
4. **Clean Electricity**

Can power a city of over 1 million homes

Whole plant supply chain strategy enables factory based production

Key requirements:

- Technical Resource – especially nuclear specialisms
- Test facilities and capabilities



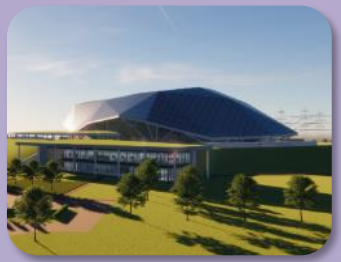
Our focus is now on preparing for delivery of the fleet

Complete Design & Regulatory Approval

- V&V programme
- UK Generic Design Assessment
- IAEA Generic Reactor Safety Review

Build the Business

- Turnkey delivery
- Scalable supply chain
- Global deployment
- Regional hubs
- Flexibility for new markets



Engage with our Customers

- Governments & State Utilities –Energy
- Heavy Industry Grid–Power & Heat
- Transport & Heating - Hydrogen & Synth fuel

Prepare for Manufacturing

- Consultation for initial factory sites
- Engaging/Contracting with suppliers for complete power station

Create the Framework to Realise Faster

Bringing together:

- Technology
- Site
- Finance
- Operator
- Offtake Arrangement
- Licencing

Embedding a culture fit to deliver low carbon power for all

Nuclear Enabled Hydrogen

Future Opportunities

Caroline Longman

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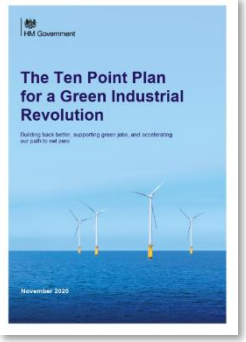
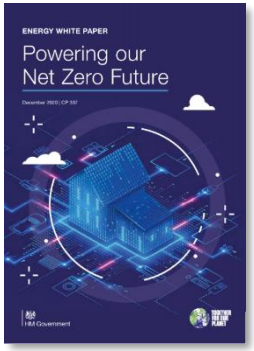
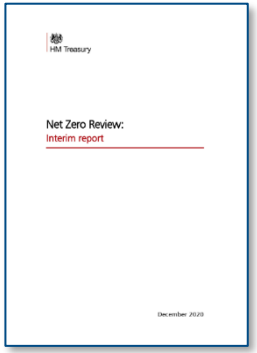
Government Activity



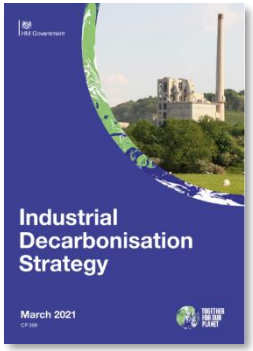
https://www.gov.uk/government/publications/the-ten-point-plan-for-a-green-industrial-revolution



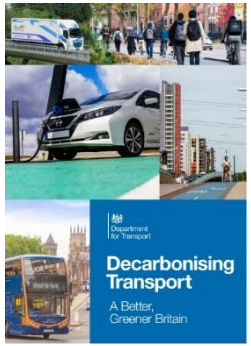
https://www.gov.uk/government/publications/energy-white-paper-powering-our-net-zero-future



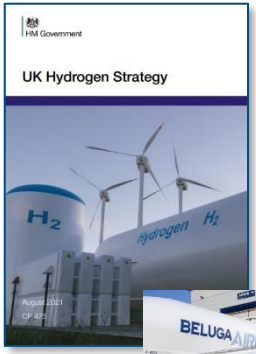
https://www.gov.uk/government/news/net-zero-review-publishes-initial-analysis-of-green-transition



Industrial decarbonisation strategy - GOV.UK (www.gov.uk)



Transport decarbonisation plan - GOV.UK (www.gov.uk)



UK government launches plan for a world-leading hydrogen economy - GOV.UK (www.gov.uk)

Heat and buildings strategy GOV.UK (www.gov.uk)

Mandating the use of sustainable aviation fuels in the UK - GOV.UK (www.gov.uk)

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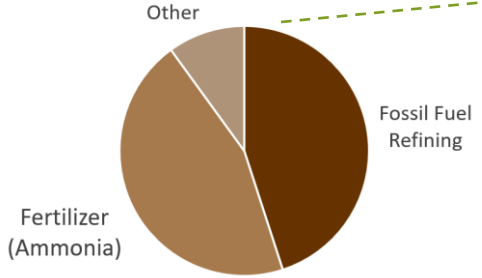
Hydrogen Today and 2050

Hydrogen Today

Usage: 10-27 Tera-Watt-hours with the majority used for fossil fuel refining and fertilizer (ammonia).

Production: 95% hydrogen from methane without capturing CO2 emissions (highly polluting). Remainder from grid electrolysis or imported

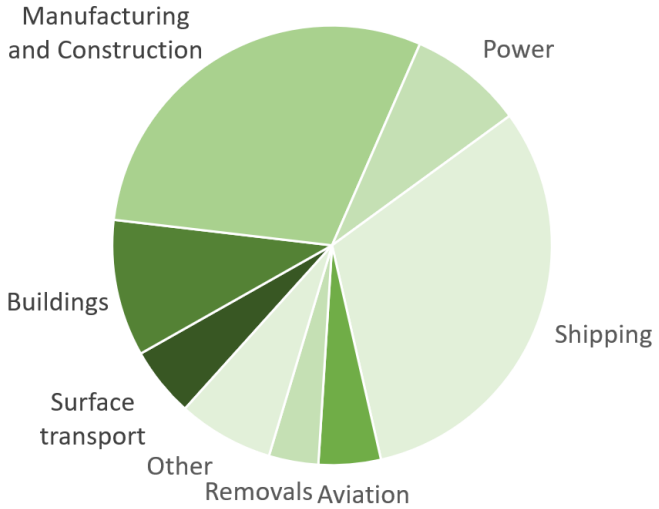


~ 10x increase in demand

Hydrogen 2050

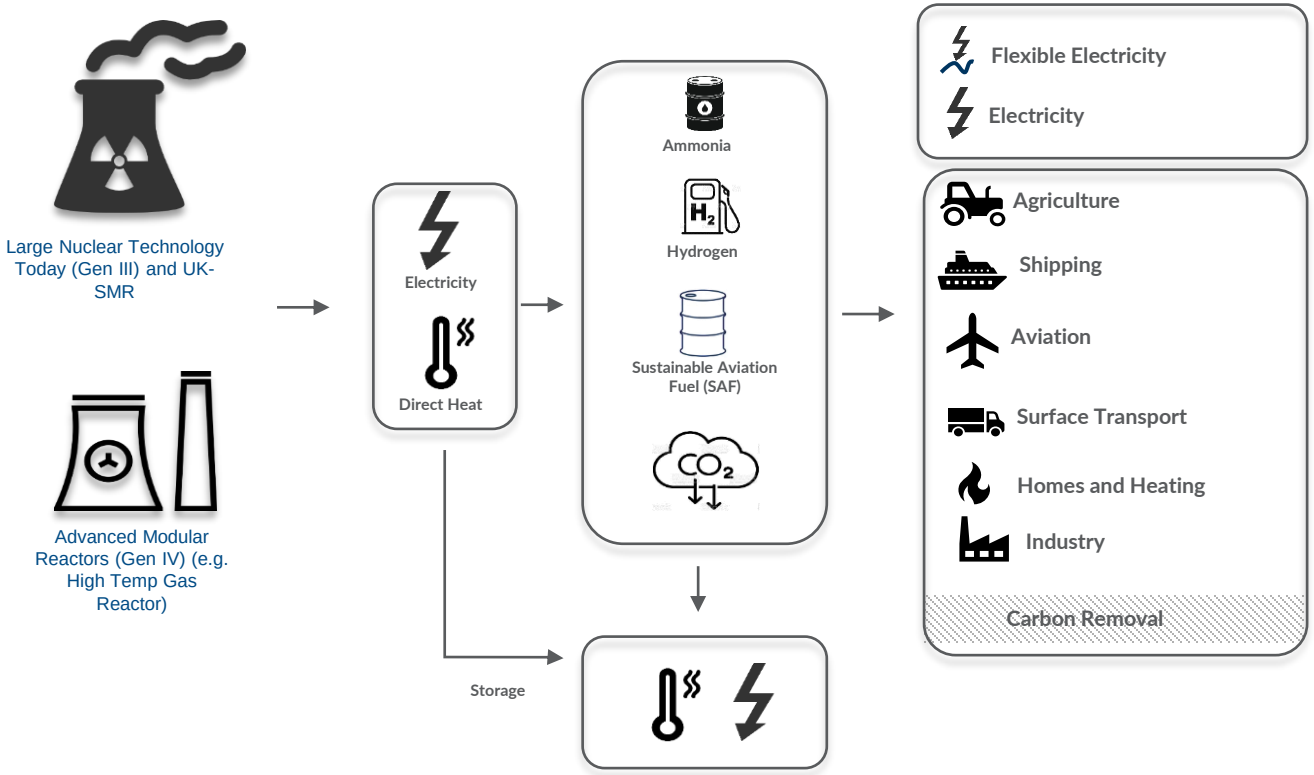
Usage: 160 – 375 Tera-Watt-hours for a wide variety of purposes (see below).

Production: 100% low-carbon methods and imports by electrolysis, biomass CCS, methane CCS. Direct production from nuclear not currently included in supply models.



Data based on 6th Carbon Budget:
The-Sixth-Carbon-Budget-The-UKs-path-to-Net-Zero.pdf (theccc.org.uk)

Nuclear Hydrogen: Beyond Electricity



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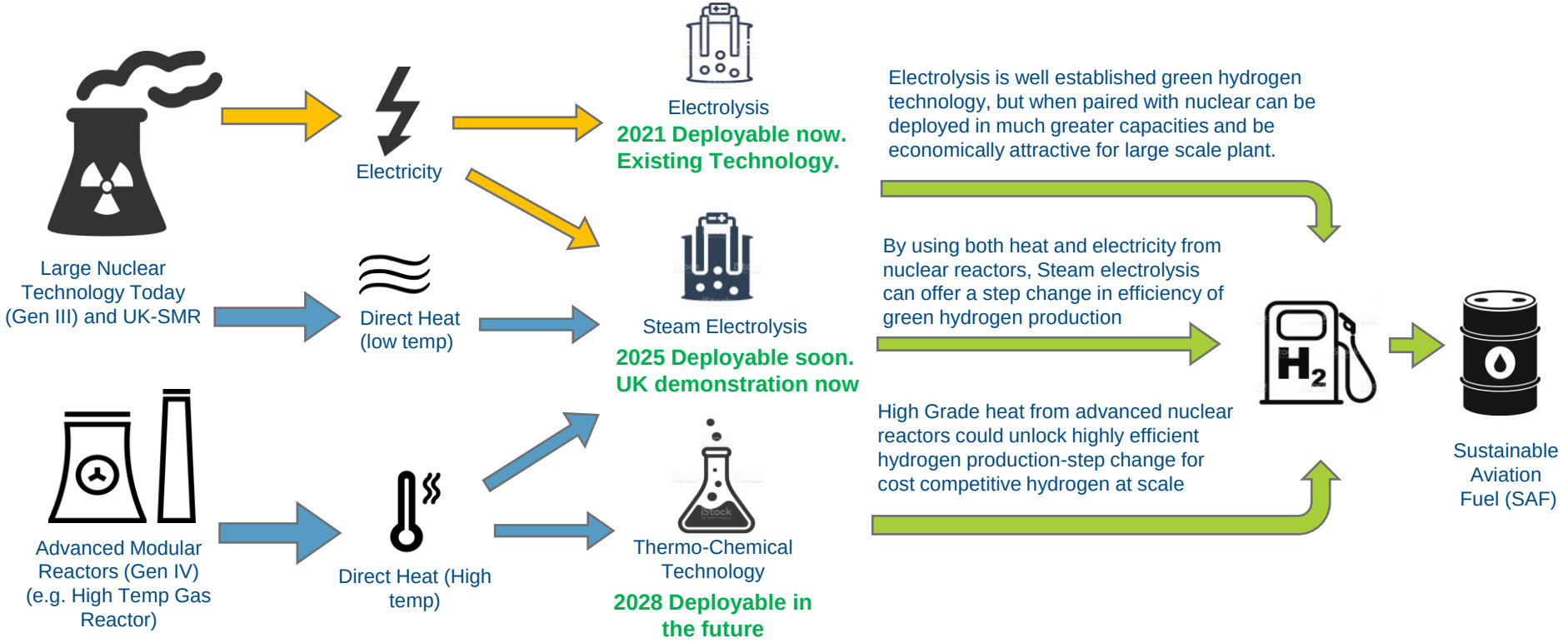
How does Nuclear Energy make Hydrogen



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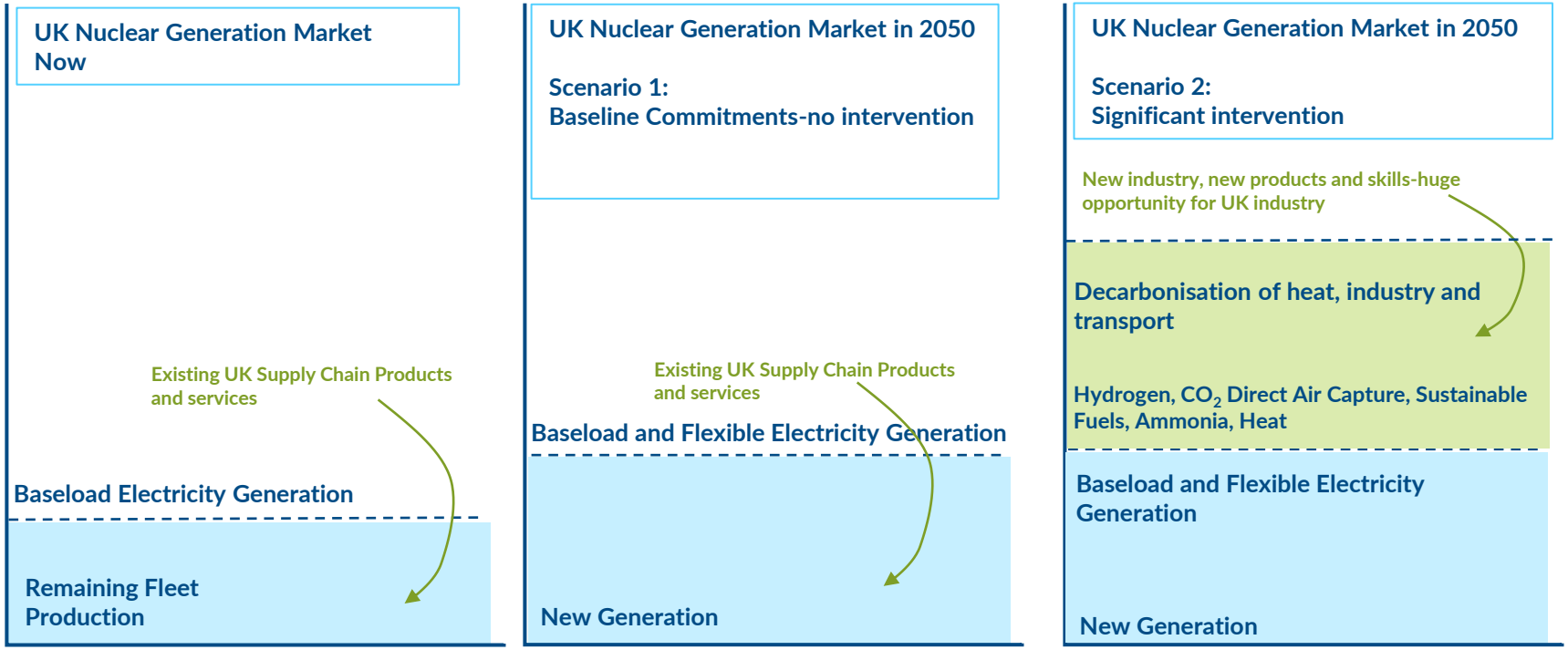
BENEFITS OF NUCLEAR HYDROGEN

	Natural Gas with CCS	Renewables	Current Generation Nuclear	Next Generation Nuclear (SMRs)	Advanced Nuclear
High Capacity Potential	✓	?	✓	✓	✓
Technology Deployable Today	✓	✓	✓		
Support Flexible Generation	✓	✓	?	✓	✓
Zero Carbon Energy Source		✓	✓	✓	✓
Enable Increased Efficiency with Thermal Input		?	✓	✓	✓
Operate 24/7 for Increased Capacity			✓	✓	✓
Provide Higher Temperatures for Higher Efficiency Hydrogen Production					✓

NNL Nuclear Hydrogen Programme

- **Identify applications of nuclear generated H_2 in the future UK energy system**
- Support investors and developers make informed decisions about the energy system and inclusion of hydrogen production in it
- Identify H_2 production systems utilising nuclear energy that have the potential to meet the economic, technical and legislative criteria for UK deployment
- Consider the technical maturity, opportunities and risks of each system and provide the evidence required to deliver investor confidence

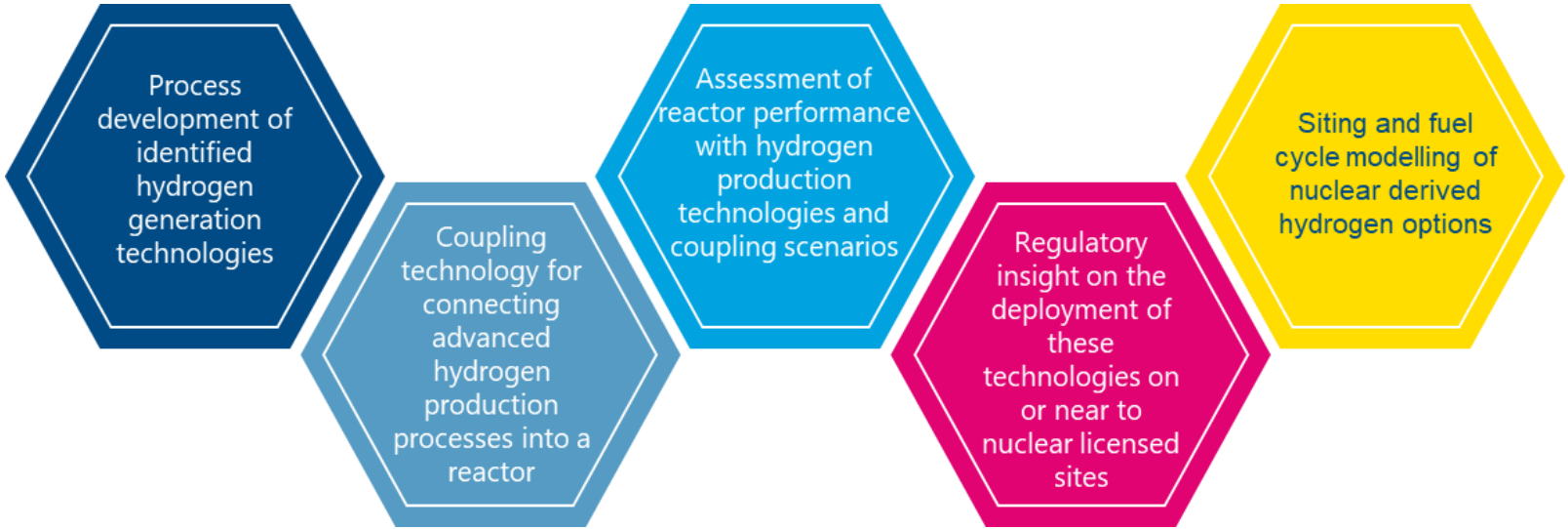
Future Opportunities from Nuclear Enabled Hydrogen



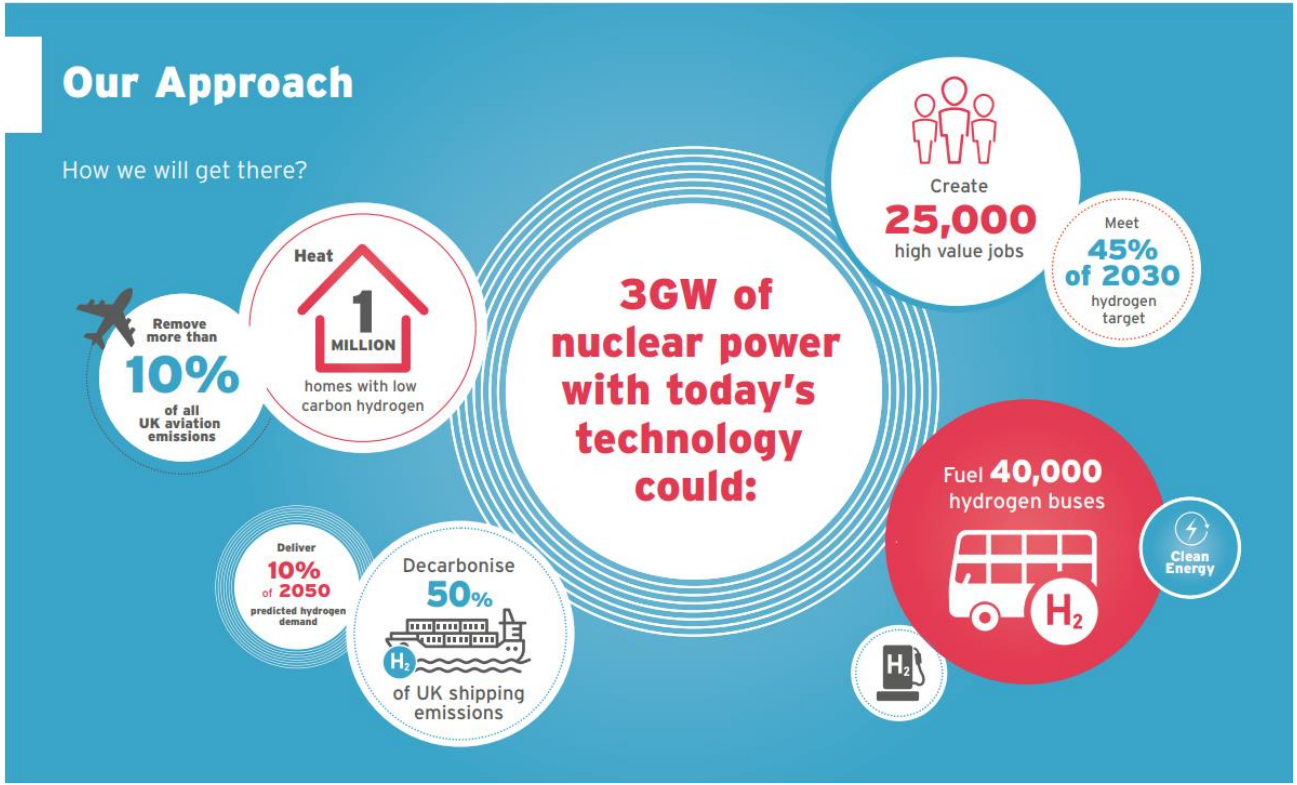
Future Opportunities from Nuclear Enabled Hydrogen

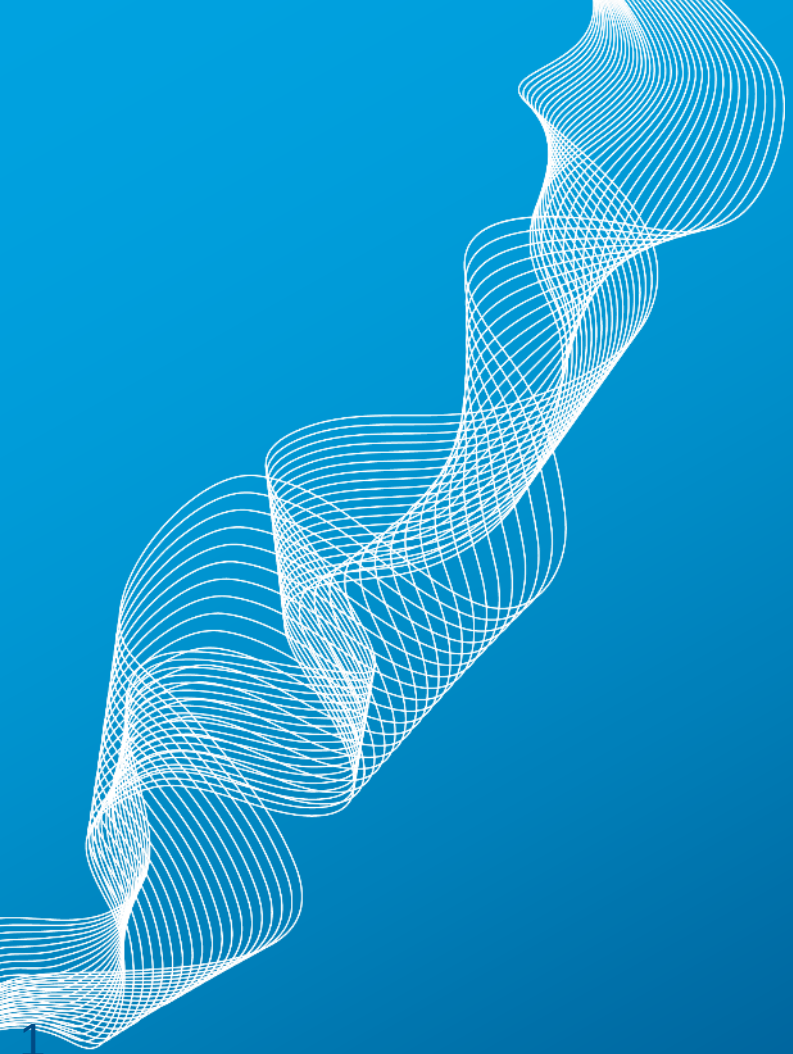
- **More reactors=more supply chain demand**
- **Build capability and understanding** on the application of hydrogen generation from nuclear energy
- **Focusing on the technical challenges** that are nuclear specific;
- **Developing collaborations** across the hydrogen supply chain and academia
- **Provide relevant and robust data** that enables stakeholders to consider the value of nuclear derived hydrogen to a future UK energy system
- **Support the development of UK supply chains** both within the nuclear sector and the low carbon hydrogen sector, recognising the impact of the complete hydrogen value chain on the ultimate cost to the consumer of hydrogen within the energy system.

Key Development Areas



Roadmap for Development


Our Approach
How we will get there?
Heat
1
MILLION
homes with low carbon hydrogen
Remove more than
10%
of all UK aviation emissions
3GW of nuclear power with today's technology could:
Create
25,000
high value jobs
Meet
45%
of 2030
hydrogen target
Fuel 40,000
hydrogen buses
Clean Energy
Deliver
10%
of 2050
predicted hydrogen demand
Decarbonise
50%
of UK shipping emissions



Thank You

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