



UK Research  
and Innovation



INDUSTRIAL  
STRATEGY

# THE FUTURE OF LOW CARBON NUCLEAR ENERGY WITH SMR'S AND THE REGIONAL IMPACT ON MEETING GLOBAL DEMANDS

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# Industrial Strategy Challenge Fund:



Bringing together leading **research** and **business** to tackle the big **societal and industrial challenges** today.

- Part of government's **Industrial Strategy** to raise **productivity** and earning power in the UK.
  - The UK has an ambitious target to increase its total R&D expenditure to **2.4% of GDP** by 2027 (from 1.7%). **UKRI** is at the heart of that plan.
- Increased funding in research and development by £4.7 billion over 4 years to **strengthen UK science and business**.
- Making **investments** to address the biggest **industrial and societal challenges** today.
- Clean Growth Challenges (£1.1bn); including **Low Cost Nuclear** (£235m + match funding)

# Future SMR product

## A standardised product

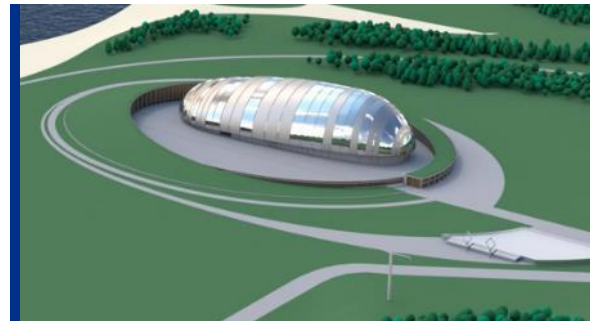


### Per Unit:

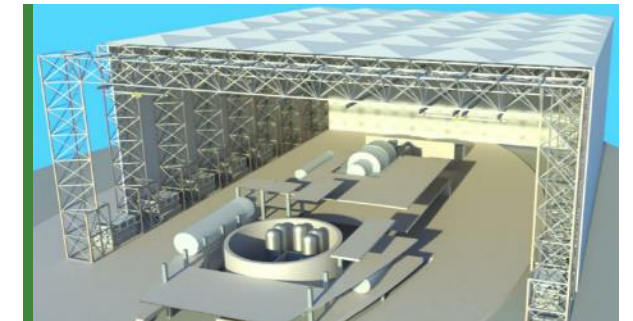
- 440MW output
- Circa £2Bn FOAK\*
- Highly competitive cost of energy
- Employment both on and off-site
- Compact design
- 60-year life
- A single technology/licencing arrangement for fleet making faster deployments possible



**Factory built, tested and commissioned (and transported)\*\***



**Located anywhere on a standardised seismic raft**



**Assembled on-site in environmental canopy**

# The LCN Phase 1 Consortium

Rolls-Royce are leading 9 world class companies

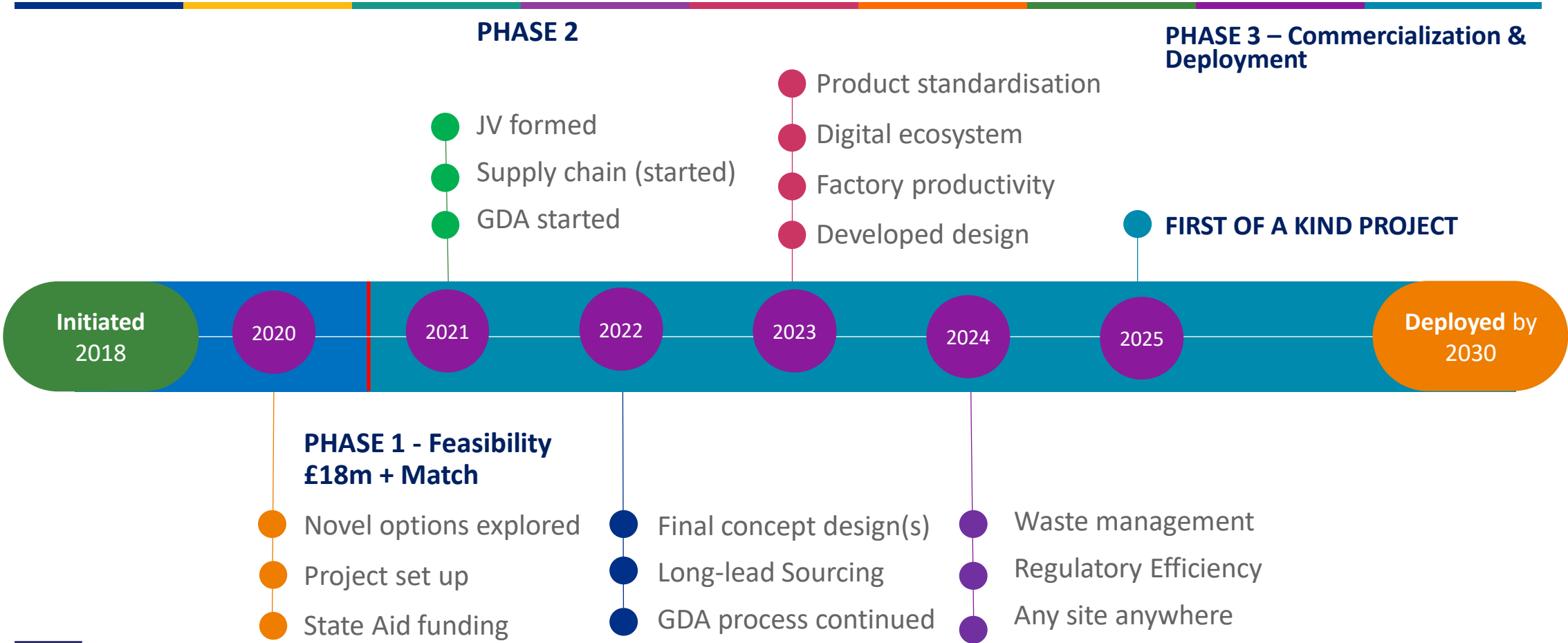


**Delivering  
11  
innovative  
work  
packages  
over 5  
years**

- Reactor Island
- Regulation, Safety and Security
- Verification and validation
- Engineering Integration
- Factory design & modelling
- Civils and Structures
- Cooling Water Island
- Electrical, Controls & Instrumentation
- Turbine Island
- Exploitation
- Balance of Plant

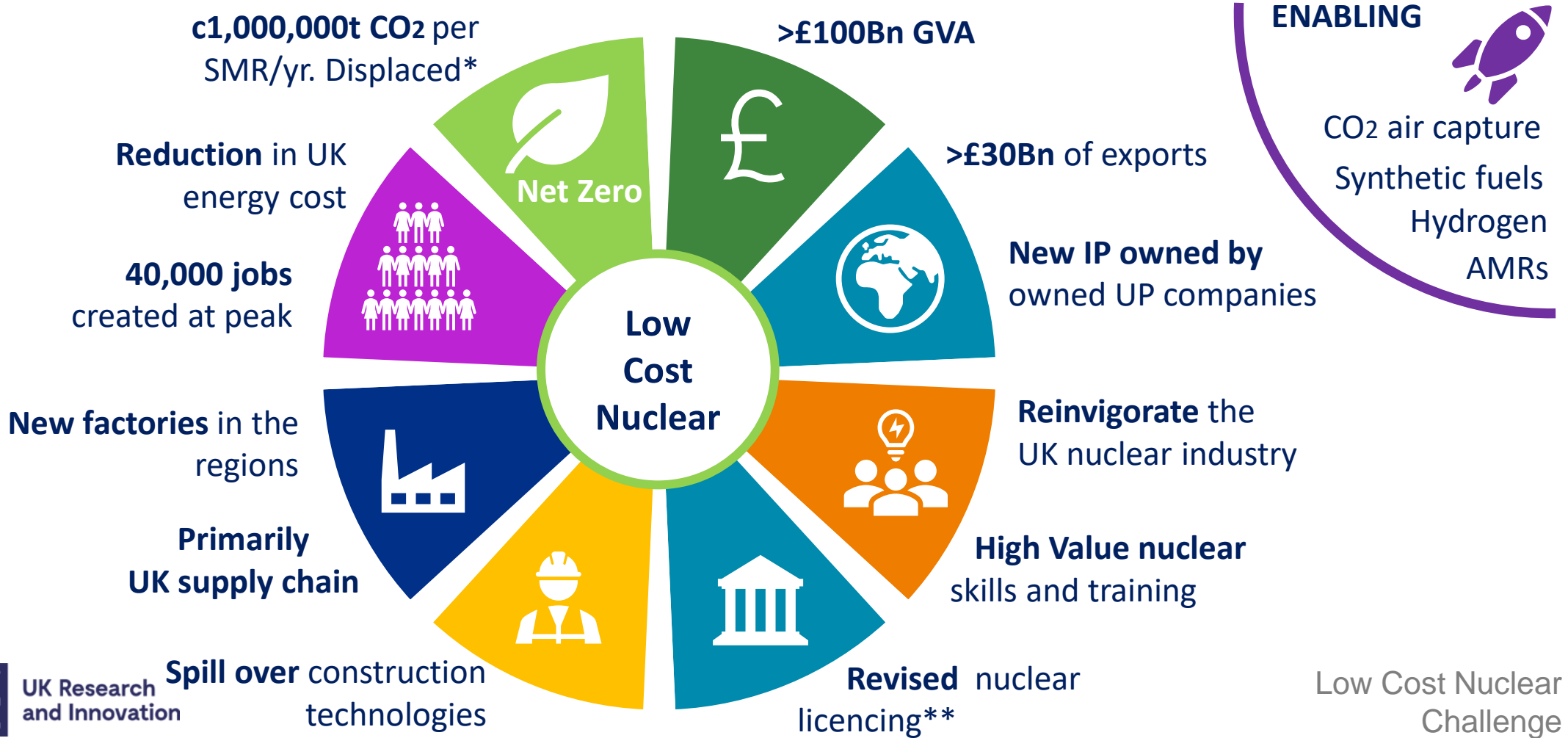
# LCN programme timeline

Subject to enablers



# The vision for LCN programme

Potential benefits from 2030 onwards

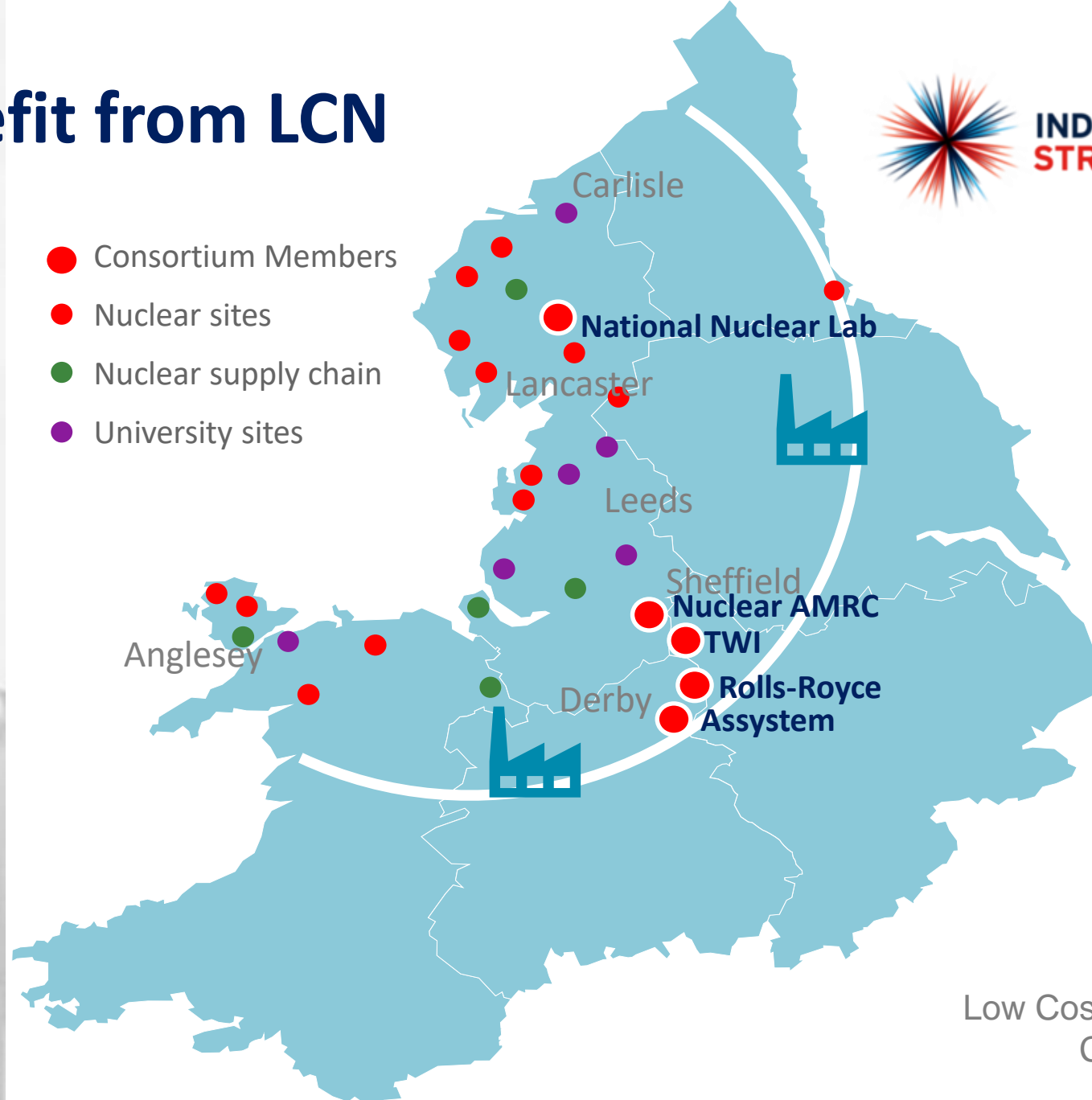


\*For more detail on Net Zero & LCN see: Committee on Climate Change, May 2019: Net Zero The UK's contribution to stopping global warming. & Energy Systems Catapult, March 2020: Innovating to Net Zero: UK Net Zero Report.

\*\* BEIS, October 2019: New nuclear power plants: Generic Design Assessment guidance for Requesting Parties

# The UK will benefit from LCN

- The 'nuclear arc' has **considerable expertise** and supply chain capabilities
- Placement of future factories will need to **draw on these skills**
- The site location(s) and number of the **factories** will be decided in Phase 2



# Low Carbon & Net Zero



## SMRs play an important part in achieving net Zero

- Each 440MWe UKSMR reactor will displace approx. 1m tonnes of CO<sub>2</sub> emissions per year.
  - **Equivalent to a family car driving to the moon and back 5,700 times!\***
- Units will last 60 years, reducing emissions from constructing new ones more regularly.
- A 'standard design' and precision engineering production lines, will lead to a more efficient and lower carbon manufacturing process.



Low Cost Nuclear  
Challenge

\*Calculated with emission figures of a Vauxhall Zafira from [http://www.aef.org.uk/downloads/Grams\\_CO2\\_transportmodesUK.pdf](http://www.aef.org.uk/downloads/Grams_CO2_transportmodesUK.pdf)



# Thank you

## Questions please?

**Our web page:** <https://www.ukri.org/innovation/industrial-strategy-challenge-fund/low-cost-nuclear/>

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