BEIS
Net Zero Innovation Portfolio:
Industrial Fuel Switching

5th July 2021

Department for
Business, Energy
& Industrial Strategy

Welcome, Purpose & Agenda

Purpose: to present our thinking for a speculative Industrial Fuel Switching innovation competition and seek your views.

Agenda:

Time	Item
10:00 – 10:05	Welcome & introductions
10:05 – 10:20	Context and background to industrial fuel switching innovation
10:20 – 10:30	Q&A on context and background
10:30 – 11:10	Proposed scope for industrial fuel switching innovation competition with breaks for your feedback via XLeap
11:10 – 11:20	Break
11:20 – 11:35	Q&A on the proposed scope
11:35 – 12:00	Networking opportunity

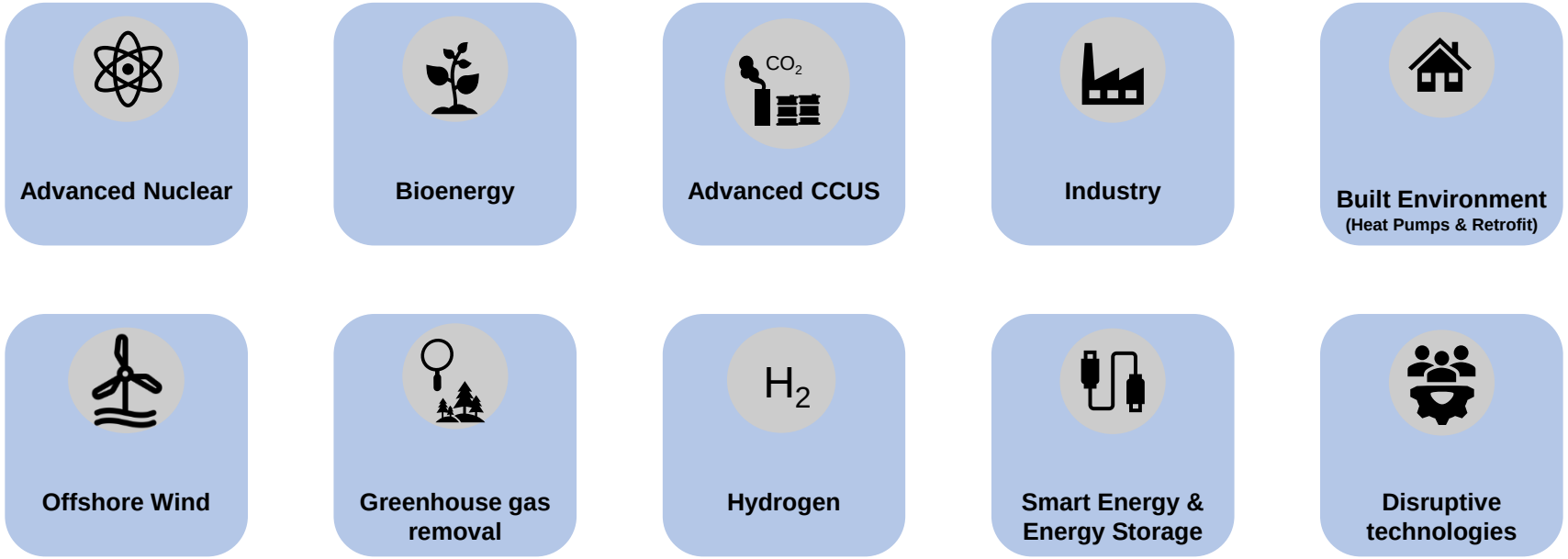
Context: Industrial Decarbonisation

- **16% of greenhouse gas emissions from industry** (2018), 3rd largest emitting sector in the UK[1]
- As **Net Zero by 2050 requires** near-complete industrial **decarbonisation**, switching industry from high to **low carbon fuels will be vital**
- **Industrial decarbonisation** technologies need to be ready for large-scale **deployment from the 2030s**
- Developments in Policy landscape: **Industrial Decarbonisation Strategy, upcoming Hydrogen Strategy**
- **Industrial Decarbonisation Strategy** sets out expectation for industrial emissions reduction of two-thirds by 2035 and at least 90% by 2050 (compared to 2018)
- Energy Innovation Needs Assessment work identified **fuel switching** is an innovation **priority**

1. The Industrial Decarbonisation Strategy, p.16 analysis based on Final UK Greenhouse Gas Emissions, 2018

Net Zero Innovation Portfolio (NZIP)

- **£1bn** of funding for **innovation** over **4 years** (2021 – 2025)
- As per the “Ten Point Plan for a **Green Industrial Revolution**”



NZIP – Industry and CCUS

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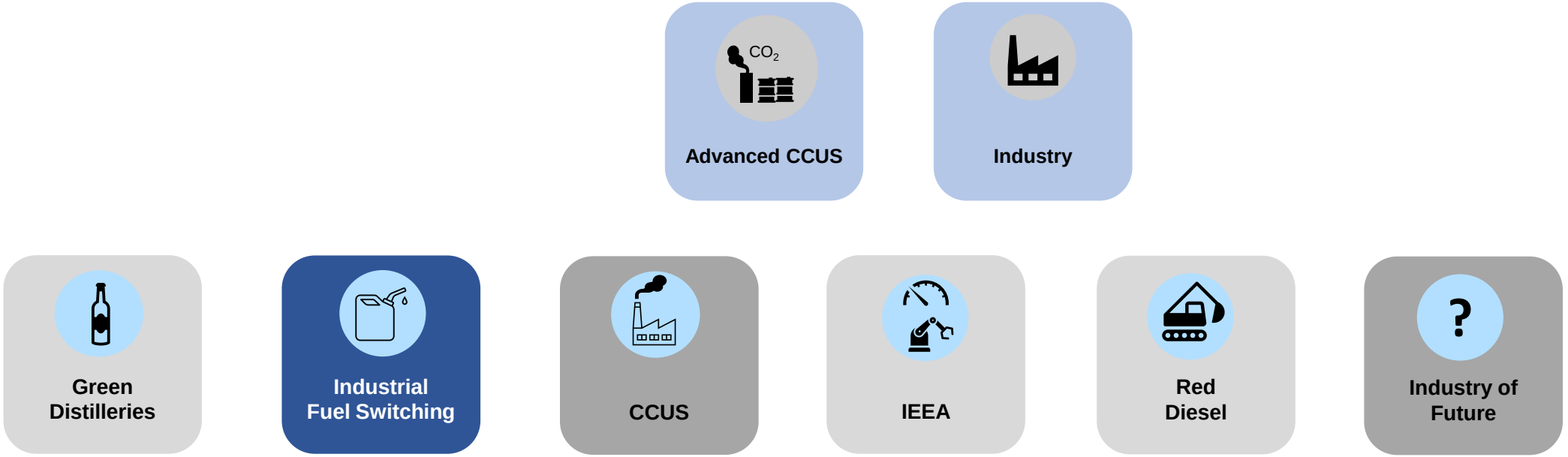


Call for CCUS Innovation 2.0

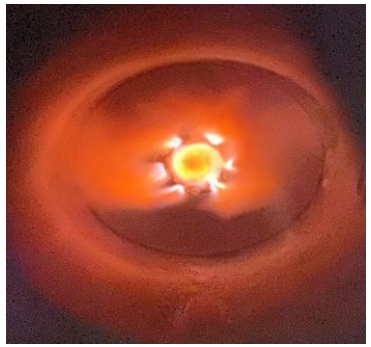
- **Accelerate** the **deployment** of **next-generation CCUS** technology in the UK, so that it can deploy at-scale by 2030.
- £20m Call for CCUS Innovation 2.0: **grant funding** over two calls, to increase the TRL and CRL of **next generation CCUS** that can be used on **industrial, waste, or power generation sites from 2030.**
  - Call 1: Applications open mid July and close end of August.
  - Call 2: May 2022
- In Call 1, BEIS will consider grant application of:
  - Up to **£1 million:** projects developing/piloting mid-stage **(~TRL 3-5)** technology.
  - Up to **£5 million**: projects developing late-stage **(~TRL 6-8)** technology
- 9-month **review of next generation carbon capture technology** being developed in the UK and internationally, which has the potential to **deploy at scale by 2035**, and is of direct relevance to UK **industry, waste, and power sites.**
  - Up to £200,000 for an independent, third party contractor to conduct the review, working with industrial stakeholders and technology developers
  - Start in August 2021 with results available for applicants of Call 2 (May 2022)

Webpage: £20m Call for CCUS Innovation 2.0

Industry of Future

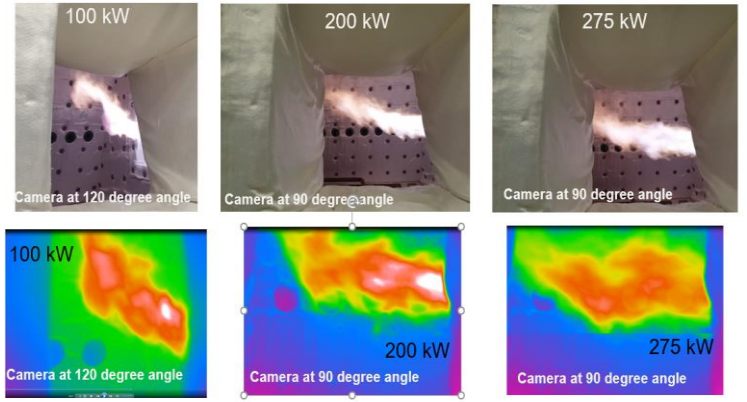
- Programme to **support industrial sites** by awarding funding to develop their **decarbonisation pathways**, through incorporating the **next generation of decarbonisation & energy efficiency technologies.**
- **Help companies** to better navigate the complex technology landscape and **transition to net zero** more quickly and effectively.
- **Stakeholder engagement event: 13th July** – Event will be published on Eventbrite.
- Expect to publish competition guidance in September
- Expect to start programme in December 2021

Previous Industrial Fuel Switching Competition (2015 -2021)



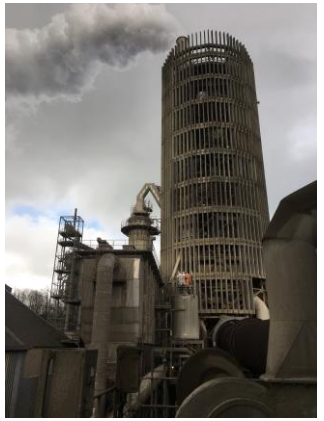
HyNet

£20m: Testing the potential of industry to switch to low carbon fuels. Supporting:
7 Feasibility Studies
4 Demonstrations



Glass Futures

BLA



MPA

Previous Industrial Fuel Switching Competition (2015 -2021)

What went well?

- Innovative and ground-breaking projects funded, further industrial decarbonisation knowledge.
- Trialling hydrogen, biofuels, electricity in cement, lime, glass, refining, and manufacturing sectors.

What could have been better?

- Getting hold of hydrogen for trials has been challenging.
- Wider range of fuel switches sought - more diversity needed.
- Some scopes/ costs shifted as projects progressed, to be expected, but will be looking for realistic and thorough project plans.

Hanson's Ribblesdale cement production site

Q&A on the background and context?

(10 minutes)

NZIP Industrial Fuel Switching Competition:

Proposed Scope

This is speculative, and subject to change

What we Can/Cannot Change

When giving feedback, please bear in mind:

- Our remit is to fund innovation projects
- We cannot change policy or the market conditions
- We cannot change the overall competition objectives
- We cannot change the overall competition budget (TBA)
- We cannot change the length of the competition - the funding period ends on 31st March 2025
- We can tweak the design of the competition based on your views

Note: This proposed scope is speculative, subject to changes

Competition Objectives

- Demonstrate **potential for industrial GHG emission reductions** via fuel switching technologies, to contribute to Net Zero by 2050.
- Demonstrate the **potential commercial viability** of industrial fuel switching solutions.
- **Increase awareness of** potential **industrial fuel switching solutions** and technologies, by collecting and disseminating findings to industry and investors.
- **Strengthen supply chains and skills** for industrial decarbonisation around the UK.
- Gather evidence to **inform future industrial decarbonisation policy making**.

Note: This proposed scope is speculative, subject to changes

Technology & Lots (1)

- We will look for innovative **fuel switching and fuel switching enabling solutions**, at **TRL 4 to 7 at** the **start of the projects**.
- Competition open to **industrial sectors/industrial fuel switching technology developers**.
- Academic, research and public sector organisations must work as part of **project consortium with private sector organisations**.
- Funding divided into **3 Lots to increase diversity** of funded solutions.
- Soft ringfence, funding could be shifted between Lots depending on volume/ quality of applications.

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Technology & Lots (2)

Lot	Examples (not exhaustive)	% of funding
1: Hydrogen Industrial fuel switch to hydrogen, or technology to enable this.	• Trial fuel switching appliances from natural gas to hydrogen. • Develop and test industrial hydrogen appliances (e.g. hydrogen boilers/furnaces). • Direct reduction with hydrogen (steel manufacturing). • Develop and test onsite hydrogen storage solutions for industrial sites.	~45%
2: Electrification Industrial fuel switch to electricity (grid or local renewable), or technology to enable this.	• Develop and test industrial electric appliances (e.g. electric boilers, kilns, furnaces). • Develop and test microwave, infrared or induction heating systems. • Storage systems to support fuel switching to renewable electricity. • Develop and trial industrial heat pumps.	~36%
3: Biomass, Waste, Other Industrial fuel switch to biomass or waste fuel, or technology to enable this. Fuel switch to another fuel not listed, which must be compatible with Net Zero.	• Direct reduction of solid biomass/waste materials. • Sustainably sourced biomass or waste combustion (where other low carbon options are not viable).	~19%

Note: This proposed scope is speculative, subject to changes

Feedback on Technology & Lots

Questions (15 mins):

1. Do you have any general comments about the technology scope?

2. Do you have any comments on the Lots by fuel type approach?

3. If you are involved in hydrogen, do you have any thoughts on how to mitigate the risks with hydrogen supply for hydrogen fuel switching trials? If known, what are the approximate volumes of hydrogen you would need?

4. Do you foresee any technical barriers to carrying out innovation projects under these Lots (e.g., electricity grid connection constraints)?

Note: This proposed scope is speculative, subject to changes

Technology Exclusions

The following are excluded from this competition:

- Energy and resource efficiency projects without a fuel switch (inc. waste heat recovery) - *a fuel switch that results in energy efficiency is encouraged.*
- Fuel switches that increase GHG emissions.
- Fuel switches to unsustainable biomass sources.
- Switching of feedstocks, except where feedstock provides chemical energy to drive the process (e.g., reduction of iron).
- Biomethane & synthetic methane (this is essentially chemically identical to methane, with little or no innovation needed for end users).
- Fuel production for the fuel switch (e.g., hydrogen production, which is the focus of the Low Carbon Hydrogen Supply 2 Competition).
- Carbon capture, utilisation, storage (CCUS) projects (this is the focus of a separate competition – Call for CCUS Innovation 2.0).

Note: This proposed scope is speculative, subject to changes

Feedback on Exclusions

Questions (5 mins):

5. Do you think there are any issues with this list of excluded technologies?

- energy and resource efficiency projects without a fuel switch.
- fuel switches that increase GHG emissions.
- fuel switches to unsustainable biomass sources.
- switching of feedstocks, except where feedstock provides chemical energy to drive the process.
- biomethane & synthetic methane.
- fuel production for the fuel switch.
- CCUS projects.

Note: This proposed scope is speculative, subject to changes

Procurement Route: SBRI

What is an SBRI?

- Small Business Research Initiative (it is open to organisations of any size)
- Pre-commercial procurement – aimed at solutions which are not yet ready for the commercial market
- Projects must be 100% funded by BEIS
- Sharing of risks and benefits – suppliers receive financial support and retain arising IP (certain rights of use retained by BEIS). SBRI contracts are therefore expected to be priced below market rates, reflecting these benefits to the supplier

Note: This proposed scope is speculative, subject to changes

Procurement Route

- 2-Phase SBRI, funding 100% of eligible project costs:
  - Phase 1: feasibility studies, minimum £50k, maximum £300k per study*.
  - Phase 2: demonstration projects, minimum £1m, maximum £6m project*.
- Standard practice for SBRI contracts is to have Phase 2 applications closed to those successful in Phase 1.
- Currently considering having Phase 2 open to the market, if a separate market for proven technologies exists alongside those requiring feasibility studies.

*Based on the previous round of the fuel switching competition

Note: This proposed scope is speculative, subject to changes

Feedback on Procurement Route

Questions (5 mins):

6. Do you have any comments on the minimum/ maximum funding amount per project for Phase 1 (£50k - £300k) and Phase 2 (£1m - £6m)?

7. Do you have any comments on whether Phase 2 should be closed, i.e., only those who participate in Phase 1 can apply for Phase 2, or does a market exist to keep Phase 2 open?

Note: This proposed scope is speculative, subject to changes

Proposed Timeline (subject to change)

Activity		Date
Phase 1 (Feasibility)	Open to Applicants	Sept/Oct 2021
	Closes to Applicants	Nov/ Dec 2021
	Projects Start	Jan/ Feb 2022
	Projects Complete	Nov 2022
Phase 2 (Demonstration)	Open to Applicants	Dec 2022
	Closes to Applicants	Feb 2023
	Projects Start	Apr 2023
	Projects Complete	Dec 2024
Programme close		Mar 2025

6-8 weeks to complete applications

~10 months for Phase 1

~21 months for Phase 2

Note: This proposed scope is speculative, subject to changes

Feedback on Timeline

Questions (5 mins):

8. Do you have any comments on the proposed timeline?

9. Does the split between Phase 1 and Phase 2 seem appropriate?

Note: we cannot change the end date of 31/03/2025

Note: This proposed scope is speculative, subject to changes

Eligibility for Funding (1 of 3)

Item	Subject	Eligibility
1.	Technology Scope	The technology must be in scope for this competition – fuel switch/ fuel switch enabling technology, not on exclusion list
2.	Innovation and technology readiness	TRL 4-7 at the start of the project, targeting increase in TRL by the end of project.
3.	Retrospective Work	BEIS is unable to fund retrospective work on projects
4.	Additionality	Evidence must be provided to show that innovation would not progress without public funding

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Eligibility for Funding (2 of 3)

Item	Subject	Eligibility
6.	Contract size	Aligns with min/ max funding amounts
7.	Eligible project costs	Projects requesting funding for commercialisation activities are not eligible. SBRI funding only available for R&D activities of an innovative process, material, device, product, or service prior to commercialisation
8.	Project end date	Completion by December 2024
9.	Risk benefit sharing	Projects receive financial support and retain any intellectual property generated, with certain rights of use retained by BEIS. Project outputs are also expected to be shared widely and publicly and project teams are not permitted to include profit in the eligible project costs

Note: This proposed scope is speculative, subject to changes

Eligibility for Funding (3 of 3)

Item	Subject	Eligibility
11.	Delivering multiple projects	If project consortium member(s) are part of multiple successful applications they must be able to deliver on them and they must not have applied for funding for the same piece of work more than once
12.	Multiple applications	If the intention is to submit multiple applications, lead organisations may only enter **one** application into each Lot as the project lead. Technology providers/OEMs are limited to one application for a particular technology/solution requiring development per Lot.
13.	Prompt Payment (for contracts > £5m)	For contracts > £5m, if you intend to use a supply chain for this contract, you must demonstrate you have effective systems in place to ensure a reliable supply chain.

Note: This proposed scope is speculative, subject to changes

Assessment Criteria

Criteria	
1	**Technical and regulatory feasibility, and performance of fuel switching solution** – theoretical feasibility, novelty, impact on product cost/ quality, lifetime costs, emissions savings, barriers to implementation
2	**Dissemination and Development plan** – dissemination, commercialisation plans
3	**Social Value** - wider value to society (i.e., jobs, education etc.)
4	**Project financing** – project costs, value for money, additionality
5	**Project delivery** – Team, project plan and risks

Minimum score of 60% in application to be eligible for funding

Note: This proposed scope is speculative, subject to changes

Feedback on Eligibility & Assessment Criteria

Questions (8 mins):

10. Do you have any comments on eligibility criteria?

11. Do you have any comments on assessment criteria?

Additional question on testing facilities:

12. If it existed, would your organisation be interested in using a centralised industrial equipment testing facility for demonstration purposes (complete with a supply of hydrogen/ large electricity grid connection)? Why/ why not?

Note: This proposed scope is speculative, subject to changes

Break

(10 minutes)

BEIS Next Steps

- Publish this presentation and Q&A
- Internal agreement on competition
- Announce/launch later this year
- Run launch events with final competition details

Note: This proposed scope is speculative, subject to changes

Q&A on the proposed competition scope?

(15 minutes)

Networking

- Random Breakout rooms
- Discussion:
  - Introductions: 30s intro to yourself and your organisation
  - What potential is there for IFS in your sector/organisation?
  - What could your organisation do relating to IFS innovation?
  - Thoughts on the scope for the speculative IFS competition?

Thank You For Joining, BEIS