Great British Chemicals (GBC) Kick-off Workshop Report

Sheffield United Stadium – 19 September 2025

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Executive Summary

The kick-off workshop of the Great British Chemicals (GBC) consortium marked the launch of a seven-year funded programme focused on defossilising the UK chemical supply chain. The event brought together a diverse group of academics, industry leaders, policymakers, and societal stakeholders to build shared understanding, align ambitions, and co-develop early solution pathways.

Through a sequence of structured activities, participants defined the consortium's ambitions, mapped its ecosystem, analysed stakeholder journeys, and generated ideas for potential solutions. The resulting discussions revealed strong consensus on the need for systemic transformation in the chemical sector, supported by evidence-driven policymaking, resilient workforce development, and courageous, high-risk innovation.

The workshop outcomes are crystallised in the consortium's mission to catalyse bold and disruptive solutions that defossilise the chemical industry, demonstrating the environmental, social, and economic value of circular chemistry while fostering collaboration and risk-taking. Its vision is a thriving UK industry where chemistry underpins prosperity and wellbeing, where waste is reimagined as a resource, and where innovation is both courageous and inclusive.

The following sections expand on the workshop context, describe each activity and its rationale, and present a detailed analysis of the outputs, before concluding with recommendations and next steps for the next six months.

Introduction

Background and Context

The Great British Chemicals programme represents a national-level systems approach to industrial decarbonisation. It builds on the recognition that the UK's chemical supply chains are central to the economy but also deeply embedded in fossil dependency. The consortium is committed to reimagining these supply chains in line with circular economy principles, where prosperity is balanced with environmental responsibility and social inclusion.

The kick-off workshop, held on 19 September 2025 in Sheffield, was the first gathering of the consortium partners and stakeholders. It was intentionally designed not only as a formal launch but as a participatory event to build alignment across diverse disciplines and institutions. With academics spanning chemistry, engineering, AI, environmental sciences, biology, and petroleum studies, as well as representatives from government, finance, and civil society, the event sought to set the tone for a seven-year collaborative journey.

Workshop Aims

The workshop aimed to achieve three key objectives. First, it sought to create alignment around a shared vision and mission for the consortium, giving participants space to articulate their ambitions and expectations and then synthesise these into a collective direction.

Second, it aimed to map the consortium's ecosystem of stakeholders, clarifying who needed to be involved at different stages of the programme and what roles they might play.

Third, it was designed to open up the solution space, encouraging participants to think creatively about opportunities for incremental improvements, transformative shifts, and disruptive moonshot projects.

With these three objectives in mind, the workshop was designed to:

- Align the consortium's ambition and vision.
- Map critical stakeholders and their journeys.
- Generate solution clusters across short-, medium-, and long-term horizons.
- Establish a shared understanding of opportunities, barriers, and offers of expertise within the group.

Workshop Outcomes and Analysis

Activity 1: The Journey & The Vision

The first activity asked participants to imagine the consortium as a train setting out on a journey. The purpose of this metaphor was to enable groups to articulate three elements: the destination they aimed to reach (their ambition), the fuel that would carry them forward (skills, knowledge, and relationships), and the brakes that could slow them down (barriers and challenges). This was followed by a synthesis exercise in which groups were invited to summarise their ambition, goals, and mission in a more structured form.

The outputs revealed a set of strikingly aligned ambitions across groups. Participants consistently envisioned the transformation of the UK chemical industry into a sector that could thrive within a decarbonised and circular economy. Several groups highlighted the importance of demonstrating the value of carbon capture and utilisation (CCU) as a transformational tool, not only in terms of technological feasibility but also in its economic and environmental impact. Others emphasised the role of systemic change, with references to “systems of systems” approaches and the need for courageous, unconventional innovation that breaks free of established industrial pathways.

Goals and objectives reflected a strong orientation towards translation and impact. Across groups, participants stressed the importance of scaling new processes from the laboratory to industry, reaching higher technology readiness levels through pilots, demonstrators, and proof-of-concept projects. A recurring theme was the need for robust evidence, particularly through life cycle assessment (LCA) and techno-economic analysis (TEA), to justify and support adoption at scale.

The missions and visions articulated in this activity positioned the consortium as both a technological driver and a social enabler. Beyond technical ambitions, groups emphasised resilience, workforce development, and the creation of platforms for knowledge exchange and policy influence. This reflects the recognition that defossilising chemical supply chains is not only a technical challenge but also a socio-economic and political one.

In a nutshell

Ambitions (Shared Across Groups)

- Transform the UK chemical industry to thrive within a decarbonised and circular economy.
- Leave UK chemistry in a stronger position through innovation, resilience, and skills.
- Make CCU and carbon-negative technologies transformational and demonstrably viable.
- Establish effective knowledge exchange, evidence-based policy, and strong community building.
- Pursue courageous, disruptive innovation to break free of conventional thinking.

Goals & Objectives

- Translate sustainable chemistry from lab to industry (TRL progression to TRL9).
- Demonstrate economic and environmental value (LCA, TEA, standards).
- Scale pilots and proof-of-concepts.
- Build resilient workforce pipelines and communities of practice.
- Secure well-allocated funding and investment.

Mission (Consensus)

To catalyse bold and disruptive solutions that defossilise the chemical industry, demonstrating the environmental, social, and economic value of circular chemistry, and fostering a culture of risk-taking, collaboration, and evidence-based impact.

Vision (Consensus)

A thriving UK industry where chemistry underpins prosperity and wellbeing, where waste becomes resource, innovation is courageous, and policy, people, and industry align to build a cleaner, fairer, and more resilient society.

Consortium Support Offer

- **Technical:** CO_2 mineralisation, catalysis, synthesis, AI, spectroscopy, process engineering, environmental monitoring.
- **Translational**: entrepreneurship, policy engagement, industry partnerships, advocacy.
- **Educational:** workforce development, leadership, mentorship.
- **Strategic:** industrial hubs, national and regional networks, investment leverage.

Activity 2: Stakeholder Mapping

The second activity moved the focus from internal ambitions to external ecosystems. Participants were asked to identify all stakeholders relevant to the consortium's mission, cluster them into themes, and map them across the three programme stages: workstreams (applied projects), function streams (impact and assessment), and moonshots (radical innovation). The rationale for this activity was to create a shared understanding of the wider network that needs to be engaged and to highlight the diversity of actors whose involvement is critical to success.

The resulting maps highlighted six broad clusters of stakeholders: government and policy actors, industry, finance, academia and research, civil society, and workforce and skills providers. The government was recognised as both a funder and regulator, requiring robust evidence to underpin policymaking. Industry partners, spanning multinationals, SMEs, Catapults, utilities, and petrochemical hubs, were seen as central to scaling and implementing innovations. Finance actors, including banks and venture capitalists, were considered essential to support risk-tolerant investment in emerging technologies. Civil society and NGOs were mapped as voices of accountability, while universities and training bodies were identified as critical for developing the future workforce.

By situating stakeholders within the workstreams, function streams, and moonshots, participants began to articulate the temporal and functional roles these groups will play. For instance, industry and Catapults are vital for workstream pilots, NGOs and policy experts are key for function stream assessments, while visionary start-ups and risk-tolerant investors are crucial for moonshots. This activity reinforced the consortium's role as a convening hub across sectors, capable of bridging science, industry, policy, and society.

In a nutshell

Stakeholder Clusters

- Government & Policy: DESNZ, UKRI, devolved governments, regulators, APPGs.
- Industry: Multinationals, SMEs, Catapults, utilities, petrochemical hubs, construction, agriculture.
- Finance: Banks, venture capitalists, impact investors, entrepreneurship mentors.
- Academia & Research: Interdisciplinary universities, PDRAs, ECRs.
- Civil Society: NGOs, advocacy groups, professional societies, communities.
- Workforce & Skills: Universities, training programmes, apprenticeships, professional associations.

Stakeholder Roles by Stage

- Workstreams: Industry, Catapults, SMEs, academics.
- Function streams: NGOs, LCA/TEA experts, universities, government.
- Moonshot: Start-ups, visionary researchers, risk-tolerant funders, high-impact demonstrators

Activity 3: Stakeholder Journey Analysis

The third activity invited participants to examine the journey of priority stakeholders by identifying their pains, frustrations, and barriers and then articulating how the consortium might alleviate them. The purpose of this exercise was to ensure empathy with stakeholder perspectives and to identify opportunities for the consortium to add value through support and evidence.

The analysis raised several common challenges. Industry actors face the high cost and risk of adopting unproven technologies and fear of stranded assets. Government actors often lack robust and timely data, making it difficult to create strong policies or align incentives. Academia struggles with slow translation of research into practice and the absence of clear pathways to scale innovations. Financial stakeholders find it difficult to assess the risks and returns of emerging technologies, particularly when evidence is lacking. Civil society and NGOs expressed concerns around transparency, fairness, and environmental justice.

In response, participants identified ways the consortium could directly support these groups. Demonstrators and pilots emerged as a critical tool for reducing industry and finance risk. The consortium could also provide robust baselines, evidence, and horizon scanning to inform government decision-making. By supporting tech transfer and entrepreneurship, the consortium could help academia bridge the gap between research and application. Communication and engagement strategies were proposed to build public trust and ensure inclusivity.

In a nutshell

Common Challenges

- **Industry:** High cost and risk of adopting new technologies, fear of stranded assets.
- **Government:** Insufficient evidence to underpin robust policies.
- **Academia:** Slow translation from lab to practice, lack of demonstrator funding.
- **Finance:** Uncertainty over risks and returns in emerging technologies.
- **Society:** Concerns about fairness, transparency, and environmental justice.

Consortium Support Pathways

- Deliver robust data and baselines (LCA, TEA, standards, horizon scanning).
- Provide demonstrators and pilots to reduce perceived risk.
- Act as a convening hub between science, policy, and industry.
- Support workforce development and interdisciplinary training.
- Lead communication and public engagement to build trust.

Activity 4: Solution Clusters

The final activity asked participants to brainstorm possible solutions and cluster them across three horizons of change: incremental improvements, transformational shifts, and disruptive moonshots. The intention behind this activity was to expand the solution space while also categorising ideas according to their potential impact and the degree of change required.

Solutions in the improvement category focused on efficiency and measurement, such as enhancing CO_2 monitoring, improving processes, and training the workforce in sustainability skills. These ideas are incremental but important in building a foundation for wider change.

Transformational solutions included demonstrators for CCU and circular chemistry, regional hubs for sustainable feedstock use, and large-scale pilots of renewable-powered chemical processes. These represent step-changes that could reshape industry practice while remaining grounded in existing trajectories.

Disruptive solutions challenged the very structure of the chemical industry. Ideas included moonshot CCU technologies that turn waste streams into feedstocks, fully circular and carbon-negative industrial platforms, AI-led materials discovery, and radical policy mechanisms such as carbon-negative procurement. These proposals embody the consortium's mission of fostering courageous innovation that can break away from conventional models.

In a nutshell

Improvement (Incremental Gains)

- Enhanced measurement and monitoring (CO_2, LCA).
- Process efficiency.
- Skills and workforce training.

Transformation (Step-Change)

- Pilots and demonstrators for CCU and circular chemistry.
- Regional hubs for sustainable feedstock use.
- Renewable-powered industrial processes.
- AI-enabled data-sharing platforms.

Disruption (Radical Innovation)

- Moonshot CCU technologies using waste as feedstock.
- Fully circular, carbon-negative chemical platforms.
- AI-led sustainable material discovery.
- Radical policy mechanisms (e.g. carbon-negative procurement).

Conclusion, Key Recommendations & Next Steps

The workshop has highlighted a unified vision for the consortium, grounded in courage, circularity, and collaboration. The day demonstrated strong alignment on the need for system-level transformation and positioned the consortium as a convening hub bridging government, academia, industry, finance, and civil society.

While challenges are significant, particularly around funding allocation, industrial risk, and workforce development, the consortium brings a breadth of expertise and networks capable of addressing these barriers.

The immediate focus should be on consolidating the outcomes of the workshop into actionable steps. Over the next six months, the consortium should formalise stakeholder engagement, scope, identify and launch early demonstrator projects, and establish the governance and reporting structures required for the programme. Particular emphasis should be placed on evidence generation through LCA and TEA, workforce development initiatives, and building strategic relationships with finance and policy stakeholders.

In a nutshell

- **Stakeholder Engagement:** Formalise stakeholder mapping into an engagement strategy with clear roles and priorities.
- **Early Demonstrators:** Identify 2/3 pilot projects to serve as early proof points for CCU and circular chemistry.
- **Evidence Generation:** Establish baseline data collection (GHG, energy demand, economic values).
- **Governance & Structure:** Finalise Steering Group and Advisory Board, clarify reporting and decision-making.
- **Workforce Development:** Design training pathways and engagement programmes for ECRs, industry apprentices, and interdisciplinary teams.
- **Funding & Investment:** Map financial partners and begin dialogues with VCs and impact investors to de-risk early projects.

Appendix

Activity 1a & 1b: The Journey & The Vision

Table 1. Shared Ambitions by Group

Theme	Groups	Example Expressions
Transform UK chemical sector	1, 2, 3, 5	“Transform the UK chemical and materials industry for sustainability” (G1)
Circular economy & CCU	1, 5	“Make CCU a transformational tool” (G1); “Fostering a change to a circular economy” (G5)
Courageous innovation	2, 5	“Do things that are different, be courageous, fail fast” (G2)
Workforce development	2, 3, 4	“Skilled future workforce” (G3); “Talent and capability development” (G4)
Policy & evidence	1, 3	“Evidence-based policy” (G3); “Quantify environmental benefits” (G1)
Community building	3, 4	“Develop community and capacity building” (G4); “Effective knowledge exchange” (G3)
Funding & investment	5	“The right amount of funding in the right places” (G5)

Table 2. Goals & Objectives Across Groups

Category	Examples
Demonstrators & TRL	“Translate processes from lab to industry and scale up” (G2); “Pilots, proof of concepts” (G3)
Economic & env. data	“Quantify benefits via LCA/TEA” (G1); “Standards, evidence, data” (G3)
Workforce	“Educated workforce and technical staff” (G5); “Education and training” (G3)
Policy influence	“Policy engagement” (G3); “Framework for government” (G2)
Funding & resilience	“Economic resilience through communities” (G2); “Investments/divestments” (G3)

Table 3. Offers of Expertise

Group	Offers (examples)
1	CO_2 mineralisation, waste valorisation, new materials, entrepreneurship skills
2	Catalysis, synthesis, process engineering, LCA, advocacy, policy skills, leadership, industrial networks
3	Expertise in chemistry, biology, engineering; influence on money/resources; policy engagement; tech transfer
4	AI, catalysis, atmospheric monitoring, manufacturing expertise
5	Links to built environment, construction, mining, Grangemouth hub; carbon sequestration; carbon capture to chemicals

Table 4. Barriers (Brakes)

Barrier Theme	Description
Scaling challenges	Difficulty moving innovations from lab (TRL1–3) to demonstration (TRL7–9).
Economic uncertainty	Costs/benefits unclear without robust LCA/TEA.
Supply chain complexity	Resilience, resource availability, dependencies.
Skills gap	Need for interdisciplinary and future-focused training.
Funding allocation	Misaligned incentives; lack of risk-tolerant finance.
Industry conservatism	Resistance to disruption; reliance on legacy infrastructure.

Activity 2: Stakeholder Mapping

Table 5. Stakeholder Clusters

Cluster	**Examples**
Government	DESNZ, UKRI, devolved administrations, regulators, APPGs
Industry	Multinationals, SMEs, Catapults, utilities (energy, water, waste), petrochemical hubs, agriculture, construction
Finance	Banks, venture capitalists, entrepreneurship mentors, investment agencies
Academia	Universities, PDRAs, ECRs, interdisciplinary consortia
Civil Society	NGOs, advocacy groups, societies, citizen groups
Workforce/Skills	Training institutions, apprenticeships, and professional bodies

Table 6. Stakeholders by Stage

Stage	**Stakeholders**
Workstreams	Industry partners, Catapults, SMEs, academics
Function streams	Policy, NGOs, LCA/TEA experts, universities
Moonshot	Start-ups, visionary researchers, risk-tolerant investors, disruptive industry demonstrators

Activity 3: Stakeholder Journey

Table 7. Stakeholder Pains

Stakeholder	**Challenges**
Industry	High cost of new tech, stranded asset risk, uncertain regulations
Government	Lack of robust data/evidence, fragmented industry voices
Academia	Translation barriers, slow adoption cycles, lack of funding for demonstrators
Finance	High uncertainty, limited risk assessment frameworks for emerging tech
Society/NGOs	Transparency concerns, fairness in transition, environmental justice

Table 8. Support Pathways Offered by Consortium

Stakeholder	**Consortium Support**
Industry	Pilots/demonstrators, risk-sharing, co-investment
Government	Data (LCA, TEA, baselines), future demand scenarios
Academia	Tech transfer pathways, entrepreneurship support, collaborative networks
Finance	Evidence of viability, risk-sharing models, and investment partnerships
Society/NGOs	Inclusive communication, citizen engagement, transparency frameworks

Activity 4: Solution Clusters

Table 9. Improvement-Level Solutions

Theme	Examples
Monitoring & evidence	Better CO_2 measurement, baseline standards
Process optimisation	Incremental process efficiency improvements
Skills	Workforce and training programmes

Table 10. Transformation-Level Solutions

Theme	Examples
Demonstrators	CCU and circular chemistry pilots and regional hubs
Renewables integration	Renewable-powered chemical processes
Data platforms	AI-enabled cross-sector data and knowledge sharing

Table 11. Disruption-Level Solutions

Theme	Examples
Radical CCU	Waste-to-chemical feedstock moonshot projects
Circular chemistry	Fully circular, carbon-negative industrial platforms
AI material discovery	AI-led sustainable alternatives for petrochemical products
Policy disruption	Carbon-negative procurement and radical industrial strategy

Detailed Stakeholder Analysis (Raw data)

Moonshot Stream

Core Stakeholders	Critical Stakeholders	Secondary Stakeholders	Supporting Stakeholders
Industry (TOP 1) Chemical industry UKRI GBC team Chemical users and manufacturing industries Government at the highest level Funding bodies	Public (TOP 2) Government for global policies (TOP 3) Policy (DESNZ, DEFRA) End users Oil and gas sectors Environmental organizations GB Chemical partners Flex fund partners Global Third sector Workforce/People	Academia/research Funding bodies (NERC, EPSRC, DESNZ, DSIT, DEFRA) Environmental regulation Learned societies (RS, RA engineering, RSC) Social media CEFIC Consumer goods companies Technical professionals Sovereign Wealth Funds Post-docs University support Technicians Innovate UK Philanthropy	NGOs and pressure groups Citizens Early career researchers Rural communities Disruptive innovators (academia, startups) Software engineers Standards bodies UNIDO

Work Stream

Core Stakeholders	Critical Stakeholders	Secondary Stakeholders	Supporting Stakeholders
Chemical industry Oil and gas industry UK Energy companies and grid DEFRA, DESNZ, EPSRC, CBI, NERC Learned Societies (SCI, RSC, CIA) Professional bodies (RSC/ALS, EUChem) Royal Academy of Engineering Energy systems and transport University operations and contracts	SMEs Regulators (DEFRA, HSE) Policy makers Regional, national and global corporates Disruptive technologies businesses Food and Drug Administration Tech (control) companies Local governments Investors Catapult Schools Industry sector cluster groups (e.g., NEPIC)	Bio feedstock group (York) Engineers EU REACH and legislation Local councils and authorities Custom and Excise Regional innovation bodies Public Media influencers CO2 producers and emitters Academia Large industry Environmental Agency CPI	CAT Hub - 1 mention Natural Resources Wales, SEPA EPC Environmental NGOs (WWF, Greenpeace) Water industry Honeywell Social media Manufacturing and process automation businesses Environmental groups EPC companies

Function Stream

Core Stakeholders	Critical Stakeholders	Secondary Stakeholders	Supporting Stakeholders
Energy sector Global universities Environmental NGOs UKRI Sustainable manufacturing hubs Royce General public BP	Publics AI companies Industrial clusters Environmental agencies Communities Chamber of commerce Oil and gas sectors AI Research hubs Public	Renewable power generator AI innovators Regulatory Bodies of standards University leadership UK Institute for technical skills & strategy Government ministers and civil servants End users (companies using chemicals) Voters Off-chemical regulators Consumer products Farmers Pensions and Investment as shareholders Fine chemical Pharma Natural resources	SEPA DESNZ, DEFRA and Welsh/Scottish equivalent environmental agency Politics/influencers Unions RSC, RS, RA Engineering, IChemE Energy storage Coating industries and paints Agri-chemical Petro-chemical Learned societies Finance + business sectors AMRC