Plan to Accelerate Fertilisers Solutions

Axis: 3. Transforming Agriculture and Food Systems 1. Transitioning Energy, Industry and Transport 6. Unleashing Enablers and Accelerators including on Financing, Technology and Capacity Building

Key objective: Achieve a global reduction in GHG emissions from production of fertilisers and optimise global nutrient use efficiency (NUE) by 2035.

Solution: To provide global coordination, political momentum and public/private sector collaboration to accelerate more sustainable production and use of fertilisers through multiple action pathways, accelerating those that work, and innovating new mechanisms to facilitate a global fertiliser transition.

Host initiative: Climate and Clean Air Coalition (CCAC) subject to funding.

Supporting organisations: UK Government, Brazilian Government, UNIDO, FAO, Hydrogen Council, WRI, WBCSD, CEFENP CA4SH, IEA, IFA, World Bank, ICS, Ambition Loop, Global Methane Hub, Systemiq, Mission Possible Partnership, Industrial Transition Accelerator, CGIAR, Breakthrough Agenda.

Scope:

- **Geographic**: Global, with regional focuses where necessary. Overuse in some regions causes ecosystem damage and crop losses worth up to $3.4 trillion annually. Underuse in others—especially in Africa—results in $4 billion in lost soil nutrients and a persistent yield gap, triggering land degradation, and undermining food security and economic development.
- **Sectoral**: Fertiliser sector - this will include inorganic and organic fertiliser production and use, including bio-based solutions, biological N-fixation and soil health. It crosses over with the agricultural, industrial and waste sectors as sources of nutrients and end-uses.
- **Other aspects**: Cuts across supply chain resilience, energy transition, bioeconomy, clean air, water, soil health, food security, biodversity and land restoration.

Key purpose:

To deliver reductions in greenhouse gas emissions from production of fertilisers and optimised nutrient use efficiency as a key route to sustainable productivity growth, unlocking value, restoring and improving soil health, building soil carbon, climate adaptation and reducing environmental harms—ensuring that feeding the world does not compromise our climate, ecosystems, or future generations.

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Fertiliser production and use account for 5% of global GHG emissions. Agricultural practices contribute 75% of global nitrous oxide emissions. Nitrogen pollution is the third biggest driver of biodiversity loss globally. The solutions, however, are different depending on regional contexts. The need for enhanced international collaboration to deliver a global transition to sustainable production and efficient use of fertilisers is clear.

Key events:

- High-level announcement at CCAC/FAO hosted FAST Partnership Ministerial Roundtable on 19th November 1230-1400
- Closed Door PAS meeting on the 19th November time TBC
- Links to UK pavilion event on Fertilisers 20th November time TBC
- Other linked events across COP and pre-COP from supporting partners.

Links to other Plans to Accelerate Solutions:

- Axis 3 - Axis 3 – RAIZ: Resilient Agriculture Investment for net-Zero land degradation
- Axis 3 - Regenerative Agriculture for Healthy Soil and Healthy Diets
- Axis 3 - Carbon Removals in Agriculture
- Axis 1 - Renewable and Low-Emissions Hydrogen
- Axis 6 – Sustainable Livestock and Rice

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Levers assessment: *(each lever is described in the guidance document)*

- **Risk-informed decision-making:** Medium maturity
  - *Rationale:*
  - *There is higher level of information and understanding around the need to decarbonise the agriculture and energy sectors in terms of carbon intensive fertiliser production. There is a lack of informed decision making about how to integrate the organic and inorganic sectors together, how to recycle nutrients as effectively, efficiently and safely as possible in an affordable and equitable manner.*
  - *It is essential to recognise upstream and downstream impacts of shifts in fertiliser production. For example ammonia synthesis via the Haber–Bosch process, accounts for an estimated 3–5% of global natural gas consumption. This represents one of the largest single industrial uses of natural gas worldwide and translates into significant CO_2 emissions from both energy use and feedstock conversion. Therefore, when calculating the sector's total climate footprint, emissions from fertilizer production — linked directly to natural gas extraction, processing, and combustion — must be considered alongside agricultural nitrous oxide and methane emissions to provide a comprehensive accounting of fertilizer-related climate impacts.*
  - *Uncertain quantification of the impacts of improved nitrogen use efficiency on climate change, but also the climate adaption needs in the short/medium/long term future is understudied.*
  - *Farmers do recognise a shift to optimised nitrogen use efficiency would bring economic and environmental benefits, but lack the time, money, right knowledge, incentives, tools, products, and independent services to achieve this. This could be moved more rapidly.*

Technology shifts: Medium maturity
  - *Rationale:*
  - *Technology shifts are underway and globally we are seeing large increase in use of engineering biology, biostimulants and innoculants, as well as novel production methods to recycle nutrients or increase use efficiency. Technology is also advanced in the production of low emission ammonia that is required for low-carbon fertiliser manufacture.*
  - *The products made via these new technologies must however be proven and have sufficient evidence of efficacy.*
  - *Technology for novel small scale fertiliser production and processing on farm is growing, with feasibility projects in a number of countries but lacking scalability and full life cycle assessments.*
  - *Direct and indirect N2O emissions from fertilizer use can also be mitigated through the use of nitrogen inhibitors (stabilized fertilizers). These technologies reduce Scope 3 emissions by 30-40%.*
  - *Technology in fertiliser application is also maturing through Precision Ag and use of AI analytics.*

- **Knowledge & Capacity building:** Medium maturity
  - *Rationale:*
  - *Gaps remain in understanding soil degradation's impact on productivity and climate resilience.*
  - *Gaps in NUE measurement, gaps in farmer knowledge and capacity.*
  - *Innovations include low-emissions ammonia-based fertilizers (LEAF), enhanced efficiency fertilisers (EEFs), and biologicals.*
  - *Long-term monitoring sites across agroecosystems are needed to fill data gaps.*

  - *Circular bio-economies and nutrient recovery are key R&D areas.*
  - *Support international R&D and knowledge-sharing platforms.*
  - *Develop and validate microbial and EEF technologies across diverse contexts.*

- **Inclusive decision-making governance & design:** Medium maturity
  - *Rationale:*
  - *National level governance and policy frameworks show some regional alignment (EU for example) but limited global coordination.*
  - Greater interoperability between sustainability standards and nutrient efficiency goals is needed.
  - *Need to include the full value chain from producer to consumer and re-users of recycled nutrients into the discussion.*
- **Standards & Taxonomies:** Low maturity
  - *Rationale:*
  - *Some standards do exist in this area but no global standards for "low-emissions" fertilisers; terms like "green" or "sustainable" are inconsistently used.*
  - *Need for lifecycle emissions accounting and certification systems, ensuring coverage up the manufacturing chain to capture full lifecycle including geographical differences of where and how something was produced.*
  - *Soil health and NUE indicators are inconsistent globally; a unified monitoring framework is needed, building on existing frameworks.*
  - *Lessons from hydrogen, steel, and cement sectors can guide fertiliser standardisation.*
- **Supply:** Low maturity
  - *Rationale:*
  - *Supply of low emission ammonia based fertilisers is only just starting to be commercially available.*
  - *There is significant supply of biologicals entering the global market but with varying uptake and effectiveness depending on the agricultural demand.*
  - *Organo-mineral fertilisers and bio-based inputs remain in limited supply, with opportunities for scaling through investment, demonstration projects and farmer-orientated programs.*
- **Demand:** Low maturity
  - *Rationale:*
  - *Weak demand signals hinder investment in low-emissions fertilisers. Investment in manufacturing hindered by costs and risk of market, end users of fertilisers also hindered by lack of downstream market signals from retailers.*
  - *Need for cross-value chain approaches to absorb green price premium, underpin demand and spur investment*
  - *Governments can use public procurement, blending mandates, and end-use subsidies to stimulate demand.*
  - *Creation of global buyers alliance for low-emissions fertiliser among FMCGs and governments for a stronger demand signal*
  - *Voluntary labels and third-party certifications can support market development.*
  - *NUE should be optimised (ideal range: 50–90%, global average of 70%) to balance productivity and environmental impact but will vary depending on farm, region and national contexts.*

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- **Public/private finance:** Low maturity
  - *Rationale:*
  - *Low-emissions fertilisers are more expensive; EMDEs face high capital costs and risks.*
  - *Fertiliser technologies are often excluded from green finance frameworks.*
  - *Financial incentives must avoid encouraging overapplication or poor application leading to higher losses.*
  - *MDBs and climate finance institutions should support soil health and fertiliser innovation.*

- **Partnerships and collaboration:** Low maturity
  - *Rationale:*
  - *Current efforts are fragmented across hundreds of initiatives. There is a significant opportunity to improve the effectiveness of these initiatives through better collaboration and coordination.*
  - *The 2024 Breakthrough Agenda Report narrowed focus to livestock and fertilisers for targeted action. The 2025 Breakthrough Agenda report focuses on key areas for priority actions.*
  - *Collaboration is needed across the full agricultural and food value chain—from hydrogen and ammonia production to field application, offtakers, traders, foo manufacturers, food companies, retailers, from organic waste management through to field application, and from other novel manufacturing chains to application.*
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- **Policy & regulatory:** Medium maturity
  - *Rationale:*
  - *Policy frameworks differ across countries, especially between the organic and inorganic sectors.*
  - *Greater alignment and mutual recognition of sustainability principles are encouraged to enhance cooperation and knowledge exchange.*
  - *Existing policies and regulation can incentivise practices that lower NUE in some cases, often better coordination across individual governments is needed to align policies to deliver both environmental improvement and economic opportunities.*
  - *Current discussions on fertiliser emissions often overlook key interactions with other agricultural and waste policies. For example, organic waste diversion and composting initiatives — already adopted by nearly half of organic waste producers — will generate large volumes of compost and nutrients that must be considered in fertiliser planning. Likewise, innovations such as GMH supported water-efficient rice systems, or integrated soil fertility management practices, can improve both water and nutrient use efficiency, showing the importance of integrating fertiliser policies with advances in crop and water management. Similar synergies are evident in manure management and other agricultural practices, which highlight the need for a dedicated space to align and capture the benefits across policies.*
- **Public opinion:** Low maturity
  - *Rationale:*

- *Public perception contains a number of ideologies over which type of fertiliser is best, but there is a lack of understanding that all fertilisers both organic and inorganic, and across all farming systems, can have potential environmental impacts and a transition must contain a versatile mixture of products to facilitate global optimisation of nitrogen.*

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Expected impact of this plan on the 2030 targets (if any):

The fertilisers PAS will be announced at COP30.

Implementation from Jan 2026 with facilitator beginning to convene stakeholders.

Workshops to be planned on:

- Landscape Coordination – mapping existing initiatives working in this space that are not already connected.
- Demand Creation - Build market demand for sustainable practices and sustainably produced fertilisers, including through full life cycle, cross-value chain and scalable approaches that place farmers at the centre, and ensuring public funds deliver measurable economic, environmental and social benefits.
- Policy Alignment and Standards - Promote science-based alignment of sustainability principles, encourage voluntary standards and certification systems, and improve consistency in monitoring, reporting and learning frameworks.
- Finance and investment - Mobilise public and private capital for sustainable production and sustainable nutrient solutions.
- Research and Development - Invest in and promote mechanisms for innovation and knowledge-sharing

Identify priority actions in 2026 based workshops and the existing work, including the Breakthrough Agenda 2025 Report chapter on fertilisers.

Develop KPIs to track progress toward existing national and international targets on fertiliser-related emissions and nutrient use efficiency, acting as accelerators of implementation rather than new commitments.

It is proposed to be a 10 year plan to achieve results by 2035, but also align with the next Global Stocktake in 2028.

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Output	Action Scope	Action	Type of action	Implementation Lever	Responsible	Time horizon	Stakeholder engagement[1]	Committed Stakeholders
International definition for low-emission fertilisers published	Standardization and certification	Develop an internationally applicable definition and life-cycle GHG accounting methodology for “low-emission fertilisers.”	New action	Standards & Taxonomies Technology shifts Knowledge & Capacity building	UNIDO	November 2028 (COP33)	Countries Companies Regulators & Public agencies	UNIDO, ISO, IFA, FAO, EU JRC
Impact Program - Repurposing of Agricultural Support for Soil Health	Policy Reform	The Impact Program is anticipated to encourage the client countries to improve the design and implementation of their fertilizer programs.	New action	Finance, Technology shifts, knowledge and capacity building, demand creation	World Bank	3.5 years from January 2026	Researchers, decision makers, practitioners, companies, farmers.	FARA, ANAPRI, CARDESA, IFDC, CGIAR,FCDO, IFPRI
Low-emissions ammonia fertilizer initiative	Demand creation Finance	Initiative to implement key priority areas for global public-private collaboration to unlock low-emission ammonia fertilizer deployment at scale.	New action	Risk-informed decision-making Technology shifts Knowledge & Capacity building Inclusive decision-making governance and design Standards & Taxonomies Supply Demand	UNIDO	November 2028 (COP33)	Countries Companies Regulators & Public agencies MDBs	UNIDO, Hydrogen Council, Hydrogen Europe, FMCGs, IFA

[1] Such as national governments, local and regional governments, regulators & public agencies, utilities & system providers, large companies, small and medium enterprises, investors and private finance institutions, MDBs, academic and technical institutions, youth, indigenous peoples and women-led groups, multi-stakeholders platform (non-exhaustive)

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Global low-emissions ammonia fertilizer Buyers Alliance	Demand creation	Initiative to ramp up the production of clean ammonia and promote the production and agricultural uptake of low-carbon fertilizer	New action	Technology shifts Supply Demand	Hydrogen Council, Hydrogen Europe, UNIDO, RMI	November 2028 (COP33)	Countries Companies Regulators & Public agencies MDBs	Hydrogen Council, Hydrogen Europe, UNIDO, FMCGs, IFA, RMI
15% reduction in GHG Based on Brazil's National Fertilizer Plan (2021-2025)	National Policy	i. Through process improvement and reuse and recycling of organic waste; ii. Field measurement.	Research, field management and industry innovation	National Fertilizer Plan	CEFENP	10 years	Federal Government, State Government and Industry.	Researchers and Industry.
Accelerate investment in new plants in emerging economies that are well-positioned to produce low carbon fertiliser	Low carbon fertiliser production (including biobased inputs)	Conduct in-country Project Support Programmes designed to orchestrate solution implementation and provide tailored support to selected projects and to deliver critical cross-sectoral interventions, including for the fertiliser sector. The programmes would involve establishing partnerships with project developers, including for sustainable fertiliser plants, and mobilising domestic and international industry, energy, demand, and finance players to leverage expertise and learnings from diverse networks.	Existing action	Supply	ITA/MPP	November 2026 (COP31)	Multi-stakeholder	National governments of countries hosting Project Support Programmes, companies developing projects selected by Project Support Programmes
Accelerate investment in new plants in emerging economies that are well-positioned to produce low carbon fertiliser	Low carbon fertiliser production (including biobased inputs)	Publish a technical report on revenue certainty mechanisms as a solution to mitigate fertiliser price volatility and unlock investment in new facilities, leveraging Brazil as a	Existing action	Public/private finance	ITA/MPP	June 2026 (SB 64)	Multi-stakeholder	

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		case study.						
Accelerate the uptake of AI-enabled, locally relevant advisory services for fertilizer use	Appropriate fertilizer use for maximal NUE	Development, validation, and deployment of advisory services for improving NUE in the context of integrated soil fertility management	Existing action	Demand Policy support	CGIAR	4 years	Multi-stakeholder	Various service providers (can be detailed)
Driving decarbonization in the agriculture and food industry through a value chain approach focusing on fertilizer production and use in the field as a key decarbonization lever	Scaling adoption and action	The initiative aims to drive emission reductions through cross-sectoral value chain collaboration leveraging advances in AI and simultaneously unlocking business value	New action	Finance, Partnerships and collaboration, Public/private finance, Technology shifts	WBCSD	Start January 2027	Corporates, financial institutes, public agencies, policy-makers	Hydrogen Council, IFA and Breakthrough Agenda, FMCGs