Enabling the Global Deployment of Carbon Dioxide Removal

Workshop Report | Magnolia Hall, India Habitat Centre | New Delhi, India
4 June 2026

Prepared by Bridge Institute

Convened and co-hosted by Carbon Removal India Alliance (CRIA), Council on Energy, Environment and Water (CEEW), Transitions Research, cKinetics and Bridge Institute

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i Contributing Entities

Carbon Removal India Alliance

The Carbon Removal India Alliance (CRIA) is the only well-recognised, non-partisan industry-led coalition and ecosystem organisation dedicated to catalysing and supporting the growth of a thriving durable carbon dioxide removal (CDR) sector in India. It exists to accelerate the development, commercialisation, deployment, and co-benefits of CDR technologies in India. Through research, advocacy, dialogues and partnerships, and ecosystem-building, CRIA works at the intersection of climate action and innovation. Most of the leading Indian CDR industry players are CRIA members.

Council on Energy, Environment and Water

The Council on Energy, Environment and Water (CEEW)—a homegrown institution with headquarters in New Delhi—is among the world's leading climate think tanks. We use data, integrated analysis, and strategic outreach to support public policy, transform markets, shape technology, and nudge behaviour. CEEW seeks to explain—and change—the use, reuse and misuse of resources. The Council addresses pressing global challenges through an integrated and internationally focused approach. It prides itself on the independence of its high-quality research and strives to impact sustainable development at scale.

Transitions Research

Transitions Research is a social science research collective based in Goa which seeks to discover sustainable transition pathways for India's future by generating anticipatory knowledge, co-creating solutions, and strengthening capacities for societal action.

cKinetics

cKinetics is a global sustainability-focused advisory firm working at the intersection of sustainable markets, policy, finance, and climate transition. It works with investors, businesses, and policymakers worldwide to help shape more effective, interconnected, and better-informed environmental markets. Through its market intelligence division, cCarbon.info, cKinetics provides data, analytics, and forecasts across carbon, clean fuels, and other environmental commodity markets. Its work also supports sub-national climate action and helps inform the design of cross-border transactions and market mechanisms needed to scale environmental markets with integrity.

Bridge Institute

Bridge Institute is a UK-registered Charitable Incorporated Organisation (registration number 1174490) that is working to build peaceful and inclusive societies. It is the belief of the Bridge Institute that Carbon Dioxide Removal is a systemic challenge, such that no entity can bring this to life on their own; it needs government, business and civil society coming together. There are multiple solutions within Carbon Dioxide Removal, and each nation will have their own optimum blueprint. Determining this optimum blueprint and roadmap, and enabling nationwide commitment to this blueprint and roadmap, is the core capability of the Bridge Institute.

ii Purpose

This report records the outcomes of a workshop, convened and co-hosted by the Carbon Removal India Alliance (CRIA), the Council on Energy, Environment and Water (CEEW), Transitions, Transitions Research, cKinetics and Bridge Institute, to examine how the global deployment of Carbon Dioxide Removal (CDR) can be enabled, and what role India can play in supplying, financing and governing high-integrity carbon removals. The workshop was held in the Magnolia Hall, India Habitat Centre, New Delhi, on 4 June 2026.

The workshop brought together approximately thirty participants from policy, industry, finance, civil society and academia. The session opened with five short talks from leading thinkers on Carbon Dioxide Removal (CDR), followed by a structured group exercise in which participants scoped out what would be required, across five thematic areas, to take CDR from its current low level of deployment to the scale that is required: research and development; standards and policy; finance and trading; social engagement; and country roadmaps.

The meeting built on work, led by the Bridge Institute, to explore the development of an international agency for Carbon Dioxide Removal. This event was the fifth in a planned series of twelve workshops around the world; the first four were held in the United Arab Emirates, Canada, the United Kingdom and Germany, with further workshops planned in the USA, Belgium, Singapore, Kenya, Brazil, China and Australia.

The meeting was conducted under the Chatham House Rule, and this report, detailing the outcome of the workshop, has been prepared to be shared with the participants and for them to distribute without restriction.

The workshop and this report are produced under the Chatham House Rule. Comments and insights are recorded without attribution to any individual or organisation.

iii Disclaimer

The workshop on which this report is based was conducted under the Chatham House Rule. Participants are free to use the information received, but neither the identity nor the affiliation of any speaker or participant may be revealed. Accordingly, views, observations, and contributions referenced in this report are not attributed to named individuals or organisations. Where organisations or institutions are named in the report, this is for contextual or illustrative purposes only and does not indicate their participation in, or endorsement of, the workshop or its conclusions. The report also draws on publicly available information and material provided on the record; such sources are cited where used.

This report is provided for informational purposes only. While the information has been gathered from sources believed to be reliable, no guarantees or warranties, express or implied, are made regarding its completeness, accuracy, reliability, or suitability.

The findings, opinions, and recommendations are based on the data and analysis available at the time of publication. Market conditions, research and development, standards and policy, finance and trading, social engagement, and country roadmaps related to Carbon Dioxide Removal (CDR) are subject to rapid change, and future developments may affect the relevance of the information contained herein. The report contains forward-looking statements; actual outcomes may differ materially from those projected.

Nothing in this report constitutes a financial promotion, an offer or solicitation to buy or sell any financial instrument or carbon credit, or investment advice. Readers are strongly encouraged to conduct their own due diligence and seek professional advice before making any business, financial, or strategic decisions based on this report. The authors, contributors, and publishers disclaim any liability for direct, indirect, incidental, or consequential damages resulting from use of or reliance on the information provided.

Any references to third-party entities, organisations, technologies, or data sources are for illustrative purposes only and do not constitute endorsement, affiliation, or approval.

iv Abbreviations

The following abbreviations are used in this report.

Table 1: Abbreviations used in this report

Abbreviation	Definition
A6	Article 6 of the Paris Agreement
ARC	Atmosphere Restoration Centre
ARR	Afforestation, Reforestation and Revegetation
BECCS	Bioenergy with Carbon Capture and Storage
BiCRS	Biomass Carbon Removal and Storage
CAGR	Compound Annual Growth Rate
CCTS	Carbon Credit Trading Scheme (India)
CCUS	Carbon Capture, Utilisation and Storage
CDR	Carbon Dioxide Removal
CEEW	Council on Energy, Environment and Water
CRCF	Carbon Removals and Carbon Farming Regulation (European Union)
CRIA	Carbon Removal India Alliance
DAC	Direct Air Capture
DPI	Digital Public Infrastructure
ERW	Enhanced Rock Weathering
GoI	Government of India
IPCC	Intergovernmental Panel on Climate Change
IRENA	International Renewable Energy Agency
JCM	Joint Crediting Mechanism
KVK	Krishi Vigyan Kendra
MAC	Marginal Abatement Cost
MRV	Monitoring, Reporting and Verification
NDC	Nationally Determined Contribution
NIMBY	Not In My Back Yard
RFI	Rural Financial Institutions
SHG	Self-Help Group
UAE	United Arab Emirates
UK	United Kingdom
VCM	Voluntary Carbon Market

1 Executive Summary

This workshop, held at the India Habitat Centre in New Delhi on 4 June 2026, was the fifth in a planned series of twelve international workshops exploring the development of an international agency for Carbon Dioxide Removal. Around thirty participants from policy, industry, finance, civil society and academia took part, under the Chatham House Rule.

The opening talks set out the case for India as a potential global powerhouse for durable carbon removal, drawing on its agricultural land, surplus biomass, basalt formations, hot and humid climate, competitive cost structures and entrepreneurial capacity. The two techniques identified as the most promising in the context of India were biochar and Enhanced Rock Weathering (ERW). It was projected that in India alone, biochar and ERW could result in around 0.9 gigatonnes of carbon dioxide removal per year, equivalent to roughly ten percent of the global requirement of carbon dioxide removal required to meet the 1.5 degree Celsius Paris Agreement target. Speakers stressed that in the Indian policy context the case for CDR is most powerful when carbon removal is framed alongside its co-benefits for agriculture, air pollution and rural livelihoods. The policy discourse was described as still nascent: India's long-term strategy says little about CDR beyond afforestation, and participants heard that the effort now is to better understand and articulate the role of CDR in India's long-term strategy, particularly in the context of the emerging overshoot debate. A note of caution was also sounded on the social dimensions of CDR, including moral hazard, the regulation of offset-driven private activity, land-use trade-offs and the question of whether benefits accrue locally.

On markets, participants heard that over USD 11.5 billion has been committed to CDR globally, that annual removal capacity is estimated at approximately 18 million tonnes of CO_2 equivalent, and that more than 113 million tonnes of CDR offtakes have been contracted to date, although demand remains heavily concentrated in a small number of corporate buyers. The shared view was that the market must ultimately move towards compliance demand if it is to reach the required scale. The final talk set out the scale of the challenge, arguing that a prudent plan would target 20 billion tonnes of removals per year, and introduced the proposal for an international agency for CDR, assessed against three tests: durability, scalability and acceptability.

The workshop session produced strategic priorities across the five pillars of a potential international agency. The research and development group called for open, equitably shared technology platforms, a user-friendly and inclusive MRV system, and stronger interlinkages between science, policy and markets. The standards and policy group prioritised mapping and harmonising standards across countries, capacity building as a precursor, and embedding decarbonisation in compliance frameworks rather than relying on trading alone. The finance and trading group prioritised a framework for CDR pricing including the cost of inaction, access to capital at the right cost, project bankability, timely cash flows to smallholder farmers, and trading infrastructure including digital public infrastructure for MRV. The social engagement group prioritised public acceptance built on a mitigation-first framing, demonstrable livelihood and ecosystem outcomes, and accessible markets for farmers. The country roadmaps group called for a Government of India CDR mission with near-term, intermediate and long-term targets, a national framework for calculating emissions, integration with the Carbon Credit Trading Scheme and Article 6.2, subsidisation of products such as biochar, indigenous low-cost technology, and grassroots awareness programmes.

The Bridge Institute will circulate this report to participants and, on completion of the series of workshops around the world, will consolidate the findings of all twelve workshops into a single report to be shared with participants in every country.

2 Workshop Overview

The workshop followed a simple structure: registration, welcome, talks and questions; a workshop exercise and discussion; and continued discussion and networking over lunch.

Table 2: Workshop agenda

Time	Item
1100 to 1145	Registration, welcome, talks and questions
1145 to 1300	Workshop and discussion
1300 onwards	Continued discussion and networking over lunch

Five organisations were involved in convening the event. Participants introduced themselves at the outset, and five speakers each gave a short talk of around five minutes, followed by questions and a facilitated group exercise.

The meeting was recorded solely to enable an accurate record to be prepared. Participants were informed that the recording would be disposed of once the report was complete and that all names and affiliations would be excluded. The meeting was held under the Chatham House Rule: “when a meeting, or part thereof, is held under the Chatham House Rule, participants are free to use the information received, but neither the identity nor the affiliation of the speaker(s), nor that of any other participant, may be revealed.”

Figure 1: Workshop participants convened by the Bridge Institute with CRIA, CEEW, Transitions Research and cKinetics, India Habitat Centre, New Delhi, 4 June 2026.

3 Opening Presentations

Five short talks opened the workshop. Consistent with the Chatham House Rule, the talks are summarised below without attribution to individuals or organisations.

Figure 2: Participants during the opening presentations on the CDR landscape and India's opportunity.

3.1 The CDR landscape and India's opportunity

The first talk provided an overview of CDR, both a global view and the specific context of India. All the IPCC scenarios that achieve limiting global temperature rises to 1.5°C above the pre-industrial level, point to a role for removals in compensating for and complementing emission reductions. NITI Aayog's net zero report, launched in February 2026, was cited as identifying around 23 percent residual emissions in India after all decarbonisation activities to 2070; residual emissions can only be addressed by carbon capture, of which CDR is one part alongside point-source CCUS. Durability and additionality, as defined by the IPCC, were emphasised as essential.

Two broad buckets of CDR were described: nature-based solutions, with typical durability of around 100 to 200 years (such as agroforestry, regenerative agriculture and soil carbon); and engineered, technology-based solutions such as biochar, enhanced rock weathering and direct air capture, with typical durability of 1,000 years or more. Pricing differs substantially between the two. The IPCC indicates a need for around 10 gigatonnes of removal per year to 2050 to meet Paris temperature targets, rising to 20 gigatonnes per year from 2050 to 2100. According to the latest State of Carbon Dioxide Removal report, released two days before the workshop, current removals stand at around 2.5 gigatonnes per year, almost all of which is nature-based; only around 2 million tonnes comes through novel CDR, although novel CDR is growing at close to 40 percent CAGR. COP30 in Belém adopted, for the first time, an Action Agenda with a 2030 target of 3 gigatonnes of nature-based removals and 100 million tonnes of durable CDR.

India's case rests on its large agricultural land area, surplus biomass, basalt formations, hot and humid climate, entrepreneurial excellence and low cost structures, making it a potential powerhouse for the supply of land-based CDR such as biochar and rock weathering, with a large demand base to follow given its large corporates. The projection of around 0.9 gigatonnes per year from biochar and rock weathering alone, around ten percent of the global requirement, would represent a USD 90 billion industry at a conservative average price of USD 100 per tonne. The talk emphasised co-benefits: in the South Asian and Indian context, carbon removal can be presented as the co-benefit, with soil organic carbon improvement, water retention, yield improvement, fertiliser use efficiency, air pollution reduction through sustainable crop residue management, job creation and industrial integration providing more compelling arguments to Indian policymakers than carbon removal alone. Policy engagement priorities described included the GOBARdhan scheme (a National waste to wealth programme), national sustainable

agriculture and soil health missions, crop residue management schemes, integration of CDR with chemical fertilisers, Article 6, the Carbon Credit Trading Scheme, the climate finance taxonomy and the development of a national CDR strategy roadmap.

3.2 CDR in India's climate policy discourse

The second talk addressed the larger policy discourse on CDR. The IPCC's seventh assessment report will contain a dedicated chapter on CDR. Because IPCC outlines are approved by governments, this signals that governments around the world consider CDR an important area to understand, and this scientific process ultimately feeds into negotiations, national policies and the ground level.

India's climate policy was described in terms of targets, strategies and instruments. India has its Nationally Determined Contribution which lays out objectives on five and ten year time-horizon, a stated net zero target, and a long-term strategy document submitted to the UN. While the long-term strategy discusses renewable energy, batteries, green hydrogen and many other strategies, CDR does not feature prominently; the only CDR element it addresses is afforestation. The effort described is to better understand, and ultimately better articulate, the potential role of CDR in India's long-term strategy, so that future versions of the official strategy give CDR a more fleshed-out role that can guide ministries and push the agenda forward.

The talk located this within the overshoot debate: the world is likely to cross the 1.5 degrees Celsius temperature rise threshold sooner rather than later, and rather than abandoning the target, the aim should be to return to it as soon as possible after peak warming; it is in that phase that CDR, and the wider discussion of negative emissions and reversing warming, becomes critical. Carbon markets were highlighted as a key element given the cost of much CDR; current activity is concentrated in biochar, with enhanced rock weathering potentially a significant pathway for India in the medium to long term. Finally, the talk stressed that India's climate policy is framed around development and equity as well as decarbonisation; CDR will need to adhere to those guardrails, including farmers' livelihoods and maximising co-benefits for wider society.

3.3 Social dimensions of CDR

The third talk addressed the social dimensions of CDR, observing that the field has moved from the fringes to the mainstream over the past ten to fifteen years, while in India official policy still keeps CDR, beyond forestry, on the periphery. The speaker supported the global case for CDR, including the overshoot argument, while flagging several challenges that deserve serious attention.

First, moral hazard: many technologies remain untested, yet national plans increasingly emphasise CDR, raising the question of whether CDR creates a disincentive for front-loading more rapid emission cuts. Second, offsets: private-sector CDR activity is largely driven by the offset market, including fossil fuel companies opting for CDR as an offset mechanism linked to carbon markets that remain largely unregulated and difficult to monitor and verify. Third, land use: large initiatives requiring substantial tracts of land raise issues of trade-offs for local populations. Even where a project can be justified financially, the question is whether benefits are felt locally, who monitors whether suggested local benefits actually accrue, and what the benefit-sharing mechanism is. The talk concluded that government engagement is needed even if CDR does not become part of the NDC; with so much activity in the space, sitting on the fence is no longer tenable, and projects should be subject to environmental and social impact frameworks and appropriate guardrails.

3.4 The global CDR market and finance landscape

The fourth talk provided an overview of the global CDR market and its financing, drawing on a public data source, the carbon removal and offset monitor, which tracks publicly announced deals on a daily basis (private deals may not be captured). Capital commitments to CDR have exceeded approximately USD 11.5 billion. Afforestation and reforestation funding has been steady over time; from 2021 there was a spurt in overall commitments; direct air capture emerged as a key category although funding has since moderated; BECCS funding has been growing substantially, partly due to government intervention and funding; and biochar has also

been growing strongly. Categorised by source of funds, equity has taken most of the risk with flows of roughly USD 6.4 billion, grants and government support account for roughly USD 4.5 billion, and debt remains relatively small (USD 0.6 billion) at this early stage of market maturity, with more debt offerings expected as the market matures.

Current annual removal capacity is estimated at approximately 18 million tonnes of CO_2 equivalent, up from 12.5 million tonnes a year earlier, led by afforestation and reforestation, soil carbon removal and BECCS; biochar, previously tracked within BiCRS, is now tracked separately given its growth. On demand, more than 113 million tonnes of CDR offtakes have been contracted to date, with more than 40 percent from technology-based solutions; the largest buyer by far has been a single large technology company (Microsoft), and that concentration needs to broaden across the wider corporate space, especially given Microsoft's recent retreat from the market.

The talk concluded that the CDR market is scaling, but that movement to giga scale will only be possible with coordinated support: from policy, including the inclusion of CDR in governments' net zero commitments; from corporates, including the inclusion of removals in corporate target-setting frameworks; and from technology, in particular a substantial reduction in MRV costs. Integrity is central, with investors looking for at least 100-plus years of durability and 1,000-plus years for engineered removals. If India can align policy and financing, it is well placed to thrivein this market.

3.5 The scale of the challenge and a proposed international agency

The final talk drew on eighteen years of work in the field, including twelve years running a university programme assessing the full range of techniques from technical, social and policy perspectives. Three key tests for CDR were proposed: durability (will it keep CO_2 out of the atmosphere for a period comparable to the millennia-scale impact of CO_2 on the climate; biochar may do a good job for a century or two, but more durable approaches are needed); scalability (can it scale to a climatically material level, recognising that no single technique is likely to be sufficient and a portfolio is needed that can together reach many billions of tonnes per year); and acceptability (if something is not socially acceptable, it does not work; Germany possesses the technical ability and financial means to build new nuclear power plants but lacks the social and political will, and the same logic applies to where CDR techniques can be deployed).

On scale, the second edition of the State of Carbon Dioxide Removal report indicated a need in the region of 8 billion tonnes of CO_2 removal per year by 2050, a figure that assumes exceptionally rapid emission cuts. Removals are the remainder: what cannot be achieved by reductions, and if targets to reduce emissions are missed, then the requirements for removals will need to rise substantially. Current emissions are around 41 billion tonnes of CO_2 per year; even if emissions fell every year at the rate achieved during the COVID pandemic (a global reduction of 5.4 percent), the world would still be emitting around 10 billion tonnes per year by 2050. A plan for 20 billion tonnes of removals per year was therefore argued to be more prudent. To convey the scale, an analogy was drawn with global wheat production: all the wheat grown in every country in the world amounts to around 800 million tonnes per year, so 20 billion tonnes of removals means creating an industry 25 times the size of the global wheat industry, in effect an industry the size of the global wheat industry each year between now and 2050.

Driving down the cost of CDR was presented as essential, since carbon taxes are regressive: in Britain, the poorest ten percent of households spend around 8 percent of disposable income on gas and electricity against around 2.5 percent for the top ten percent. Trading removals between countries offers an opportunity to reduce costs, since removals are fungible and worth the same everywhere, making it sensible to remove CO_2 where it is cheapest and easiest; this, however, requires commonly agreed standards of quality and social acceptability, and a move from the current voluntary market towards a regulated base.

4 Plenary Discussion

A short plenary discussion followed the talks. Consistent with the Chatham House Rule, contributions are summarised without attribution.

A participant asked where the money in the market is coming from, whether there are sources of finance other than offsets, and whether governments are buying. The response was that buying has mainly been from an offset perspective; on the policy side, the EU has launched the CRCF, under which purchases of roughly the 2036 to 2040 period may occur, and there are examples of governments investing directly, such as the Swedish government and the City of Stockholm investing in a BECCS plant with offtake of the credits generated. From the corporate perspective, technology companies have been the biggest buyers, and the shared view was that CDR ultimately has to move into compliance markets for uptake to scale; existing compliance examples, such as a market in California permitting roughly 7 to 8 percent offsets, are small relative to the scale required. It was added that the first CDR-focused Article 6.2 deal has recently been concluded between Norway and Switzerland, setting a benchmark; things are happening slowly, but they are happening, and without compliance markets the scale under discussion will not be achieved.

A project developer offered a different view on co-benefits, noting that in biochar the revenue from valorising biomass can far outstrip carbon credit revenue over time, and that carbon credit revenues can be expected to dip as supply grows. The participant asked whether any effort has been made to quantify the cost of not decarbonising, suggesting this is where the case for CDR will start for policymakers, and whether collaboration is occurring with other agencies and regions, such as across Southeast Asia, where CDR is entering policy discussion. In response, it was noted that the value of CDR versus inaction is usually framed through the cost curve of mitigating emissions, but the other relevant comparison is the cost of adaptation. The discussion also noted a dramatic acceleration in warming over the last decade: at the time of the Paris Agreement, extrapolating the previous thirty years of temperatures suggested the 1.5 degree threshold would be crossed in 2042, whereas the same extrapolation now points to 2029. Severe adaptation costs were illustrated by recent extreme temperatures, including a recent temperature record in the UK which exceeded the previous record there by 2.3 degrees Celsius. On the second question, the need for international cooperation and collaboration was affirmed, leading into the workshop session.

Later in the meeting, a participant raised the response to ozone layer depletion as a positive precedent, in which serious government and policy intervention on CFCs addressed the threat, and asked whether comparable quantification exists for climate; the participant cited research presented elsewhere that the health bill in Australia rose by ten percent year on year due to skin cancer linked to ozone depletion, a direct cost to the exchequer. In response, it was observed that there has been considerable analysis of the damage from increased temperature rises, but such projections are contested because they extend far into the future and are often value-based. Two differences from the ozone case were noted: ozone depletion represented an immediate and visible existential threat, whereas climate change is vast but slow (likened to a ten kilometre high tidal wave moving at five miles an hour, by contrast with the COVID pandemic as a ten metre wave at two hundred miles an hour); and the ozone problem had a ready technological substitute on the shelf, with companies willing to lobby for it. The conclusion drawn was that the cost of carbon removal must be driven down until it is trivially cheap; otherwise the social argument will not be won. Co-benefits should not be disregarded, but ultimately CDR is a waste management problem: nobody gets excited about paying taxes for waste disposal, yet people do so because they do not want to live in a world without it. Another participant added figures reported by the World Bank: climate change could cost the global economy USD 178 trillion by 2070, while investing just USD 1.8 trillion could save those USD 178 trillion.

5 Workshop Session: Vision into Strategy

The workshop session introduced the proposal to explore the development of an international agency for Carbon Dioxide Removal, with the International Renewable Energy Agency (IRENA) offered as the nearest equivalent: not a model to copy exactly, but an indication of the kind of body that could help coordinate and support international cooperation on CDR. The objective of the proposed initiative (which has been given the working title of the Atmosphere Restoration Centre (or ARC, for short)) is to support the responsible development and deployment of techniques to remove greenhouse gases from the atmosphere. It was emphasised that a logo and a name represent an aspiration rather than an existing institution, that an international agency is not an international agency unless it has involvement from governments around the world, and that the workshop series exists to listen: participants are free to conclude that such an agency is a bad idea, and that answer would also be heard.

Participants were asked to keep in mind a vision of success ten years hence, and then to work on five areas that, based on the work conducted so far, are considered to span the space of what is required to move from the small, current level of deployment of CDR, to the many billions of tonnes that will be required. Those five areas were described as: (i) research and development; (ii) standards and policies; (iii) finance and trading; (iv) social engagement; and (v) country roadmaps. On country roadmaps, the aspiration described was a bottom-up model of what each country's physical and social geography enables, analogous to IRENA's Renewable Readiness Assessments, feeding into NDCs; a suggestion was made that each country could be required to include a chapter in its NDC on what it is doing about CDR, since even an answer of that they were doing nothing is still, itself, useful information.

Participants self-selected into five groups, one per area. Working first in silence, each person wrote priorities on Post-it Notes; the groups then clustered the notes into themes, and each group selected between three and five strategic choices to present back in plenary. The Post-it Notes were photographed and are transcribed in the appendix. The report-backs are summarised below without attribution.

5.1 Research and Development

The group narrowed its discussion to three strategic choices.

- First, create open science and accessible technologies for everybody, so that there is equitable distribution of technologies; the group felt that technologies and techniques are not currently available uniformly to all, and that research and development should produce a platform through which they are made available to everybody.
- Second, develop a user-friendly monitoring and evaluation system: MRV can be difficult and is not always user-friendly, and a study should examine the available data and information on MRV systems to produce a system that is user-friendly, acceptable to all, and inclusive, noting that current MRV often fails to measure things that should be measured, including environmental and social dimensions of impact.
- Third, develop interlinkages with policy and the market: science-linked feedback systems creating dialogue between policy and the market, with feedback from both ends integrated into a revised system that is available to everybody.

5.2 Standards and Policy

The group presented three points:

- First, on standards: understand what standards currently exist across countries and sectors, identify what does not exist, and build and bring standards together in a common place where everybody can learn from, understand and use them. A critical feature is that standards must be the same across countries and cannot benefit one country more than another.

- Second, capacity building is the precursor to building standards: many people in governments and elsewhere do not yet understand what is being built, and the terminology remains dense, so capacity must first be built to understand the terminology and how to proceed.
- Third, compliance is very important: there should not be excessive focus on trading and offsetting everything through trade; a certain part can be traded, but decarbonisation has to be built within the policy itself.

5.3 Finance and Trading

The group identified five themes:

- First, there was strong alignment around the need for a framework for CDR pricing: developing a clear pricing logic for CDR instruments, defining a clear cost of inaction, and driving corporate accountability.
- Second, the issue of access to finance: securing capital at optimal cost and leveraging government funding, alternative sources of capital and financial instruments.
- Third (a theme, which attracted the most cards and combined several clusters), was project bankability: whether CDR assets can ultimately underwrite a bank loan, and the need for projects robust enough to do so.
- Fourth, stakeholder equity was also identified, after some debate, as a theme: for example, where smallholder farmers participate, whether cash flows back to them and on what timescale.
- Fifth, the group identified trading infrastructure as an essential requirement in the market, including digital public infrastructure from an MRV perspective, and transparency and market-making more broadly.

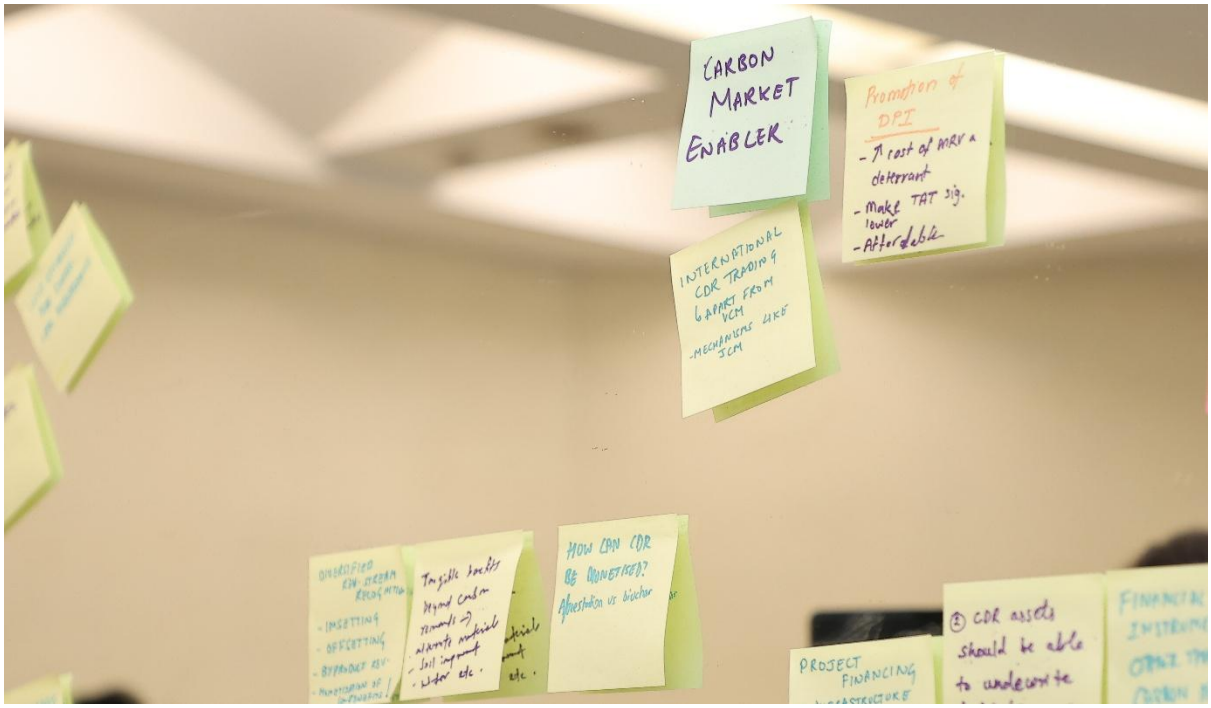

Figure 3: Working group notes on financing and trading mechanisms for CDR.

5.4 Social Engagement

The group categorised its discussion into three themes.

- First, public acceptance: beginning from an understanding that mitigation comes first and is then followed by CDR, and recognising that every CDR method has a different set of stakeholders, each of whom must be aligned and comfortable with at least trying the method out.
- Second, impacts on livelihoods and ecosystems: these impacts should be demonstrated, with marine-based methods, for example, avoiding adverse ecosystem impacts and crop yields not moving in unanticipated directions; such outcomes need to be proven at scale.
- Third, accessibility of markets: where biomass is available, farmers need to be able to reach credible markets and be paid a fair price, with sufficient safeguards in place.

5.5 Country Roadmaps

The group presented its output as a summation of the other pillars put into practice.

- On policymaking, the group called for governmental intervention to put in place a system of policies to address the roadblocks project developers experience in practice; a principal hindrance identified was offtake of biochar product, whose cost is prohibitive, requiring policies under which such products are subsidised at government level, for example in the manner of fertilisers, before high-technology projects can be implemented. Best practices, models and their limitations need to be understood and addressed at the policy level.
- On finance, the group called for the capability to access available green funds and channel them to finance projects, making projects achievable.
- On technology, low-cost, high-impact and indigenous approaches were identified as the way forward, providing self-sufficiency so that international events do not impact the value chain.
- On awareness, the group emphasised reaching the grassroots level through farmer awareness programmes, kisan melas and town halls, so that farmers understand they can let go of decades-old practices and adopt new ones.
- Finally, the group emphasised partnership: joining with partners who have already mastered finance, technology and deployment in order to implement faster and pursue the 1.5 degree goal sooner.

Figure 4: Working group notes on policy frameworks, MRV and implementation pathways.

6 Next Steps

- The thinking captured in the workshop, including the recording and the photographed Post-it Notes, have been drawn together into this report, with the intention of sharing it with participants within two weeks of the event. Consistent with the Chatham House Rule, no participant is credited by name, and participants are free to share the report with anybody who may be interested.
- A total of twelve workshops are planned around the world; this event was the fifth. On completion of the series, a final report will be produced bringing together the reports from all of the workshops, and this final report will be shared with participants in all the workshops.
- The outcome of the series may be that international cooperation and collaboration is not needed; that has not, however, been the message of the workshops conducted so far, which have indicated a strong desire for cooperation and collaboration in this space.
- Rather than the treaty-based route by which IRENA was eventually established, the approach described is to create a coalition of the willing: a small group of countries working together to spearhead the initiative. The organisers will convene further meetings as required and communicate back to participants at the workshops about progress in this initiative. The workshop organisers made clear that they are happy to cooperate and collaborate with other initiatives looking to coordinate international collaboration on CDR.

7 Conclusion

The workshop demonstrated a strong appetite in India for engagement on durable carbon dioxide removal, across policy, industry, finance, civil society and academia. The discussion combined a clear-eyed account of India's potential as a global supplier of low-cost, high-integrity removals. It also clearly articulated what is currently missing in India's approach to CDR - the lack of:

- An explicit treatment of CDR in national strategy,
- Compliance demand, pricing frameworks,
- Bankable projects (with timely benefit flows to smallholders),
- Harmonised standards,
- Social acceptance built from the grassroots up, and
- A national roadmap that connects all of these factors.

It was acknowledged that thirty people in a room cannot adequately represent the1.4 billion people of India; this workshop is a first step, and the stated intention is that it should not be the last, with more workshops to support collaboration and cooperation going forward.

The organisers wish to thank the co-hosting organisations, the speakers for their introductory talks, the facilitators for their role in helping to coordinate the group discussions, and all participants for their active and constructive contributions.

Appendix: Working Group Notes

The Post-it Notes produced by each working group were photographed at the close of the session and are transcribed below verbatim, with light normalisation of spelling and expansion of obvious abbreviations. Consistent with the Chatham House Rule, no attribution is given and any initials appearing on notes have been omitted. Words that could not be read with confidence are marked [partially legible] or [illegible]; text struck through by the authors of the notes is indicated. The grouping of notes under sub-headings reflects the clusters and headings used on the workshop walls where these were visible, and is otherwise editorial.

1. Research and Development

Vision and framing

- Build scientific temper around CDR; grass roots
- Technology is our superpower; R&D is ongoing activity
- R&D needs to be democratised
- R&D: as a policy; for corporates (ESG and R&D); open source

Application areas

- Housing: sustainable (cement, concrete)
- Heating and cooling solutions (independent of current energy)
- Fuel: transportation; industrial energy requirements

Priorities

- Priority A (R&D): Study unintended consequences
- Priority B (R&D): Most efficient pathway for a CDR (as per circumstances)
- Priority C (R&D): Developing integrated measure/score for each CDR
- Priority 1: Create a pool of techniques and technologies in a platform, which can be shared universally and equitably
- Priority 2: Create a technically competent and socially acceptable MRV system, which has user-friendly use for all, by evaluating existing MRVs worldwide

2. Standards and Policy

Demand and compliance

- Policy that creates portfolio of demand for various CDR pathways
- Compliance integration: to drive demand
- Trading credits fixed percentage: 80 percent / 20 percent; compliance / trade
- Standards and policy: codes for tech and other companies to build standards to neutralise what they generate, through compliances

Standards and definitions

- Globally accepted definitions for CDR
- Standards for each intervention in CDR basket
- Harmonised standards setting baseline criteria for quality and integrity
- CDR policy and standards: robust methodology; country agnostic; consistent and transferable; acceptable to all
- Science-heavy; development focused / high impact; integrated with the VCM; tracking and traceability

- Aligned with mitigation hierarchy and MAC curve
- Agreement on which methodologies are acceptable
- The best practices then become policy: domestic, then standardised international policy

Knowledge, capacity and guidance

- A go-to knowledge hub keeping pace with various dynamic standards, policies and methodologies
- A toolkit available for developers, investors and implementers to better inform on appropriate tech, methodology, pricing and timelines
- Capacity building of policymakers
- Differentiating Article 6.2 and 6.4 activities; capacity building for policymakers [second point struck through on the note]
- Guidance on inclusion of CDR in NDCs

3. Finance and Trading

Framework for CDR pricing

- Priority 3: Pricing logic for CDR
- Define clear cost of inaction or carbon emissions cost for corporates
- Cost estimates for India's CDR requirements
- Active market (transparency in pricing, standardisation, MRV)

Access to finance

- Access to capital at the right cost!
- Who finances CDR? Public vs private roles
- Government funds / rebates / incentives
- Concessional debt and lending: CDR bond, like green bond
- Mobilising RFIs: 2 of every 3 Indians; making project-based credit accessible
- Project financing: infrastructure programmes, like renewable energy

Bankability and risk

- Priority 2: CDR assets should be able to underwrite debt / financialisation
- Development of bankable models: recognising that traditional banking approach is unsuitable
- Financial instruments other than carbon markets?
- Risk hedging (an exchange which bears risk, standardisation)
- Risk mitigation models: guarantee funds; insurance products; available

Stakeholder equity

- Vision: all the stakeholders are financially incentivised to do justice to their roles!
- Priority 1: Smallholder farmer cash flows should be timely

Carbon market enabler

- Promotion of DPI: high cost of MRV a deterrent; make turnaround time significantly lower; affordable
- International CDR trading: apart from VCM, mechanisms like JCM
- How can CDR be monetised? Afforestation vs biochar

- Diversified revenue-stream recognition: insetting; offsetting; byproduct revenue; monetisation of co-benefits!
- Tangible benefits beyond carbon removals: alternate materials, soil improvement, water etc.

4. Social Engagement

Public acceptance

- Public acceptance [second ticked item on the note illegible]
- Simplification of mitigation hierarchy to demonstrate to common people, to minimise the moral hazard narrative
- Acceptance and understanding of geological CO2 storage
- Getting CDR tech demonstrated at expos, exhibitions and industrial conventions
- NIMBY / NUMBY: clarity with citizens and developers
- Standardisation of terminologies across countries to make cross-country knowledge sharing easier
- For India, specifically demonstrating local community benefits through media: farmer testimonials, farmer workshops
- Farmer and rural narratives: 1) soil health and yield, fertiliser savings; 2) clean air; 3) stubble burning to income (buy-in)

Community ownership and benefit sharing

- Community ownership
- Clear benefit sharing locally
- Equity guardrails: credit ownership rights, community benefit sharing, grievance redressals etc.
- Community participation in design and monitoring

Livelihood and ecosystem impacts

- Livelihood impacts of fishermen relying on oceans (marine life ecology)
- Livelihood impacts for farmers: incomes, yields, and trust with CDR methods

Market-related acceptance and access

- Market related acceptance / access
- Regulating the market: ease to participate
- Farmer and rural engagement architecture: KVKs, panchayats, SHGs for training and biomass collection
- Monetisation and value allocation to co-benefits, both in voluntary and compliance offsets
- “Biomass” aggregation and selling opportunities

5. Country Roadmaps

Policy framework

- A GoI CDR mission with near-term, intermediate and long-term targets
- Explicit mention of CDR in national climate policy

- Build government policy to help subsidise biochar
- Nodal ministry / department
- Linkage with NDCs
- Fund allocated in national budget

Priorities

- Priority 1: National framework for calculating emissions
- Priority 2: Identify methods based on cost-based approach and sector-based [approach]
- Priority 3: Benchmarking removals/reductions vs cost to reduce emission, to focus on pragmatic policy making [one word struck through on the note]

Article 6.2

- Inclusion of CDR credits into CCTS and A6
- 6.2 inclusion
- India [green bond market: partially legible]
- NDCs: agriculture include
- Subsidy, CCUS-like
- Benefits for Indian companies to buy CDRs

Tech

- Low cost, high impact, indigenous

Implementation

- 1. Approach farmer bodies, institutions, biomass aggregators
- Awareness in different industries on how biochar can be utilised
- Scale up by building partnerships with institutions
- MRV