

BHP

Climate Change and CCUS Policy Development Pathways

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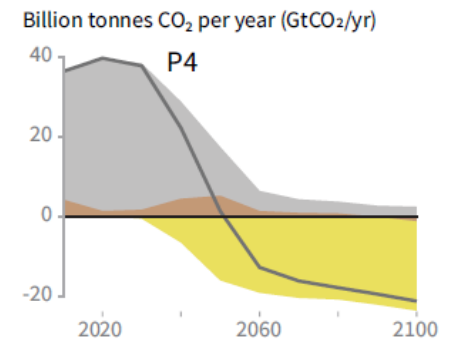
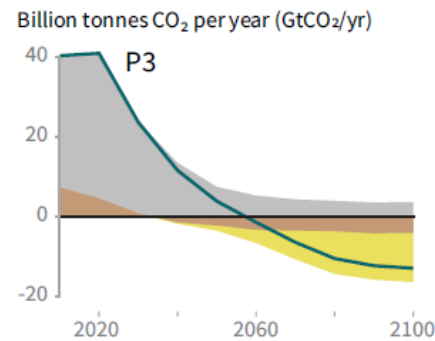
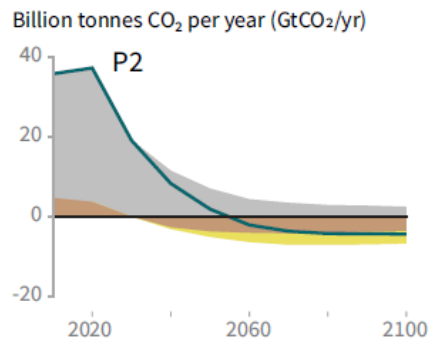
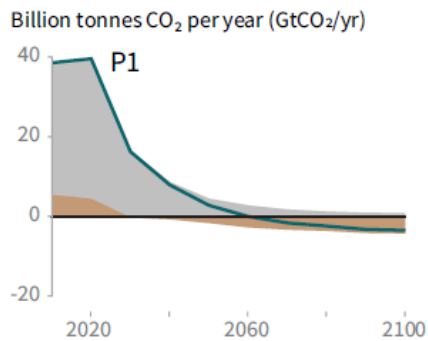
Paris Agreement: Bold Ambition

- Target of keeping temperature change to ‘well below’ 2° C aiming for 1.5° C
- GHG emissions neutrality needs to be reached between 2050 and 2100
- Both outcomes can only be achieved by including “negative emissions”
- Both developed and developing countries are expected to undertake ambitious climate action, though it is recognized that peaking emissions will take longer for developing countries and that they will require support for ambitious action.
- Within 12 months of the UNFCCC meeting in Paris in 2015, **191** Parties had signed the Paris Agreement and **85** Parties had formally joined – including China, the United States and India (world’s top three country emitters).
- 163 Nationally Determined Contributions, representing a countries most ambitious climate action plan, have been officially submitted.
- These NDCs represent 190 countries and correspond to almost 99% of global GHG emissions (including land use and forestry).

IPCC 1.5°C report

Breakdown of contributions to global net CO₂ emissions in four illustrative model pathways

● Fossil fuel and industry ● AFOLU ● BECCS



P1: A scenario in which social, business and technological innovations result in lower energy demand up to 2050 while living standards rise, especially in the global South. A downsized energy system enables rapid decarbonization of energy supply. Afforestation is the only CDR option considered; neither fossil fuels with CCS nor BECCS are used.

P2: A scenario with a broad focus on sustainability including energy intensity, human development, economic convergence and international cooperation, as well as shifts towards sustainable and healthy consumption patterns, low-carbon technology innovation, and well-managed land systems with limited societal acceptability for BECCS.

P3: A middle-of-the-road scenario in which societal as well as technological development follows historical patterns. Emissions reductions are mainly achieved by changing the way in which energy and products are produced, and to a lesser degree by reductions in demand.

P4: A resource- and energy-intensive scenario in which economic growth and globalization lead to widespread adoption of greenhouse-gas-intensive lifestyles, including high demand for transportation fuels and livestock products. Emissions reductions are mainly achieved through technological means, making strong use of CDR through the deployment of BECCS.

Paris Agreement NDCs

Canada

- Economy-wide target to reduce greenhouse gas emissions by 30% below 2005 levels by 2030.

The EU

- Target of an at least 40% domestic reduction in greenhouse gas emissions by 2030 compared to 1990.

China

- To achieve the peaking of carbon dioxide emissions around 2030 and making best efforts to peak early;
- To lower carbon dioxide emissions per unit of GDP by 60% to 65% from the 2005 level;
- To increase the share of non-fossil fuels in primary energy consumption to around 20%; and
- To increase the forest stock volume by around 4.5 billion cubic meters on the 2005 level.

India

- Reduce the emissions intensity of its GDP by 33 to 35 percent by 2030 from 2005 level.
- About 40 percent cumulative electric power installed capacity from non-fossil fuel based energy resources by 2030.
- Create an additional carbon sink of 2.5 to 3 billion tonnes of CO₂ equivalent through additional forest and tree cover by 2030

Algeria

- Reduction of greenhouse gases emissions by 7% to 22%, by 2030;
- 27% of the electricity produced nationally is derived from renewable sources of energy.

US

- Economy-wide target of reducing its greenhouse gas emissions by 26-28 per cent below its 2005 level in 2025 and to make best efforts to reduce its emissions by 28%.

South Africa

- Emissions by 2025 and 2030 will be in a range between 398 and 614 Mt CO₂-eq, as defined in national policy.

Australia

- Reduce greenhouse gas emissions by 26 to 28 per cent below 2005 levels by 2030.
- Under Australia's Renewable Energy Target scheme, over 23 per cent of Australia's electricity will come from renewable sources by 2020.

Climate Change: A Policy Response



Emissions tax

Emissions trading

Direct investment

Subsidies

Regulation

GCCSI: Tailored Policy Support is necessary

Principles of CCS Policy:

- **Predictability** in policy setting is paramount
- A need to address **multiple industries**
- **Commercial integration across all three elements** of the CCS chain
- **Early identification** and characterisation of suitable geological storage sites
- **Legal and regulatory regimes** that provide clear obligations and liability provisions
- Robustness in **research and development** efforts
- Increasing **community awareness** of the importance of CCS

GCCSI: Policy Fundamentals

Minimum policy asks:

- Setting of credible and **economy-wide emissions reduction targets**, consistent with the aims of the Paris Agreement
- Designing policy to **achieve medium-term emissions reductions** in a range of sectors and in line with these longer-term targets, combined with measures that meaningfully deal with or compensate those who lose from transitioning to a low-carbon future
- Explicitly including CCS in national climate action plans or similar flagship policy statements, which either **implicitly or explicitly acknowledge how CCS can play a role** alongside other low-carbon technologies.
- Securing policy certainty via a **government commitment that has been demonstrated to extend beyond political cycles** and to be resilient to conflicting political demands.
- Establishing (region-relevant) **public/private business models** that better manage risk allocation between the capture, transport and storage elements of the CCS chain, thus reducing overall risks.
- Devoting special attention to accelerating investment in **storage exploration and characterisation**, in view of the long lead times for development in certain regions.

Accelerating Policy Development



An International Commitment to CCS: **Policies and Incentives to Enable a Low-Carbon Energy Future**

Coal Industry Advisory Board Submission
to the International Energy Agency

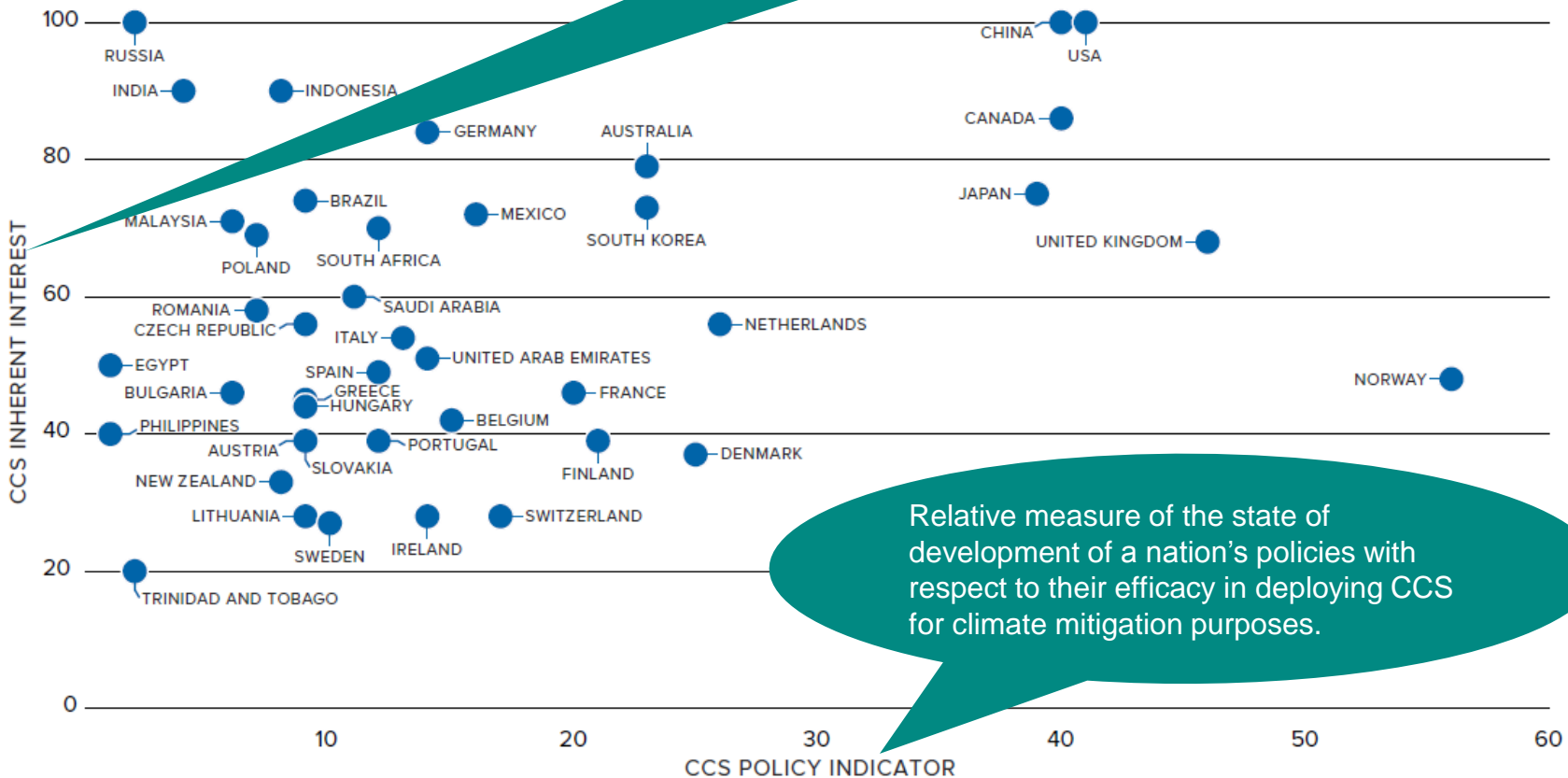
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Policy

- Stimulate market update
 - PPA
 - Policy parity
 - Price on carbon
- Support project development
 - Streamlined permitting etc
- Enable project funding
- Streamlined permitting etc
 - Investment & production tax credits
 - CO2 price stabilization
- Advance next generation CCS technologies

Global CCS Institute Policy Indicator

Relative measure of the state of development of a nation's policies with respect to their efficacy in deploying CCS for climate mitigation purposes.



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Policy Measures

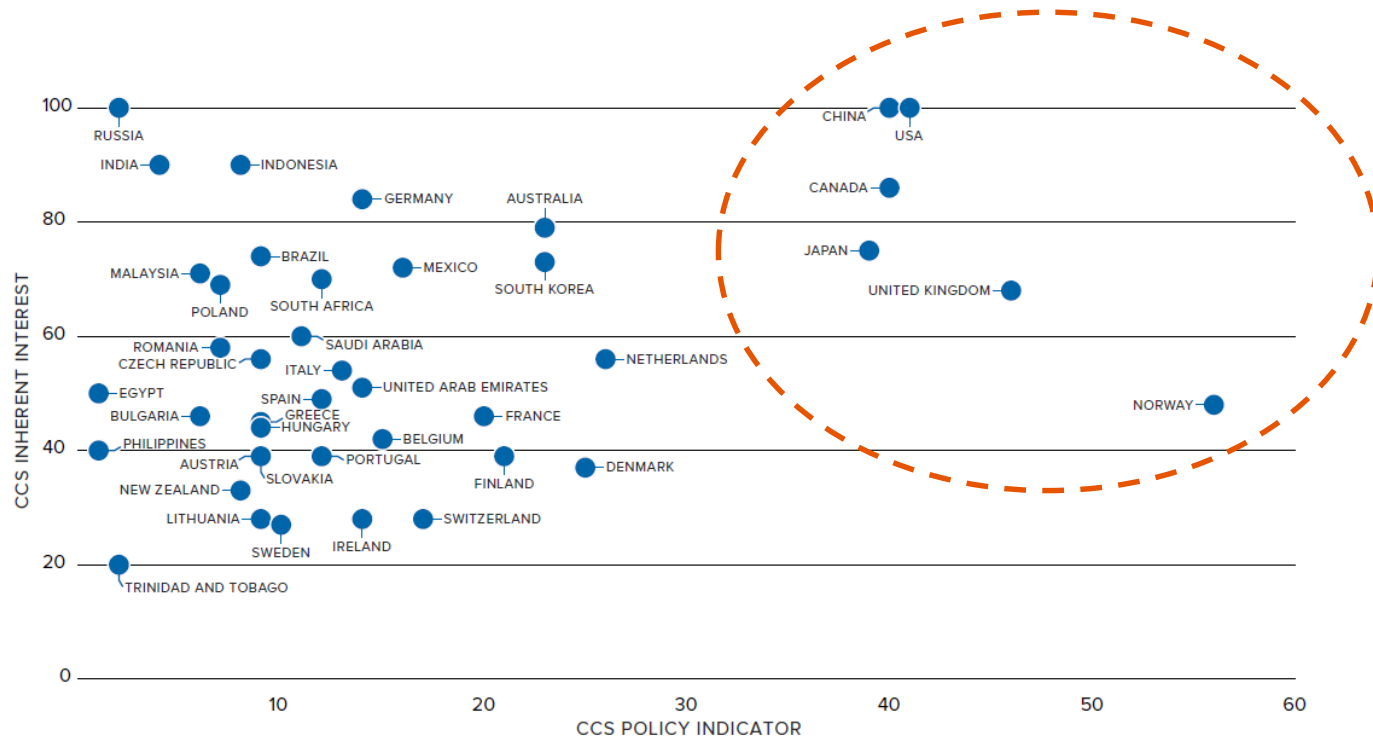
- Policy Leadership
- Government Commitment
- Fiscal Incentives
- Information Sharing and Adoption
- Regulations
- Public Finance
- International Collaboration
- Market Mechanisms
- Institutional Strengthening

Policy Tools

- *Economy-wide emission reduction targets*
- *Sector-specific emission reduction targets*
- *CCS deployment targets and programs*
- *Financial incentives such as capital and operational support for CCS deployment (e.g. capital grants, contracts for difference, feed in tariffs, CO2 storage payments)*
- *Development of CCS-specific legal and regulatory regimes which address all aspects of the project lifecycle and the establishment of capacity within institutions to apply them*
- *Removal of legal barriers to CCS*
- *Introduction of a robust value on carbon*
- *Sustained research and development support*
- *Public education and international collaboration*

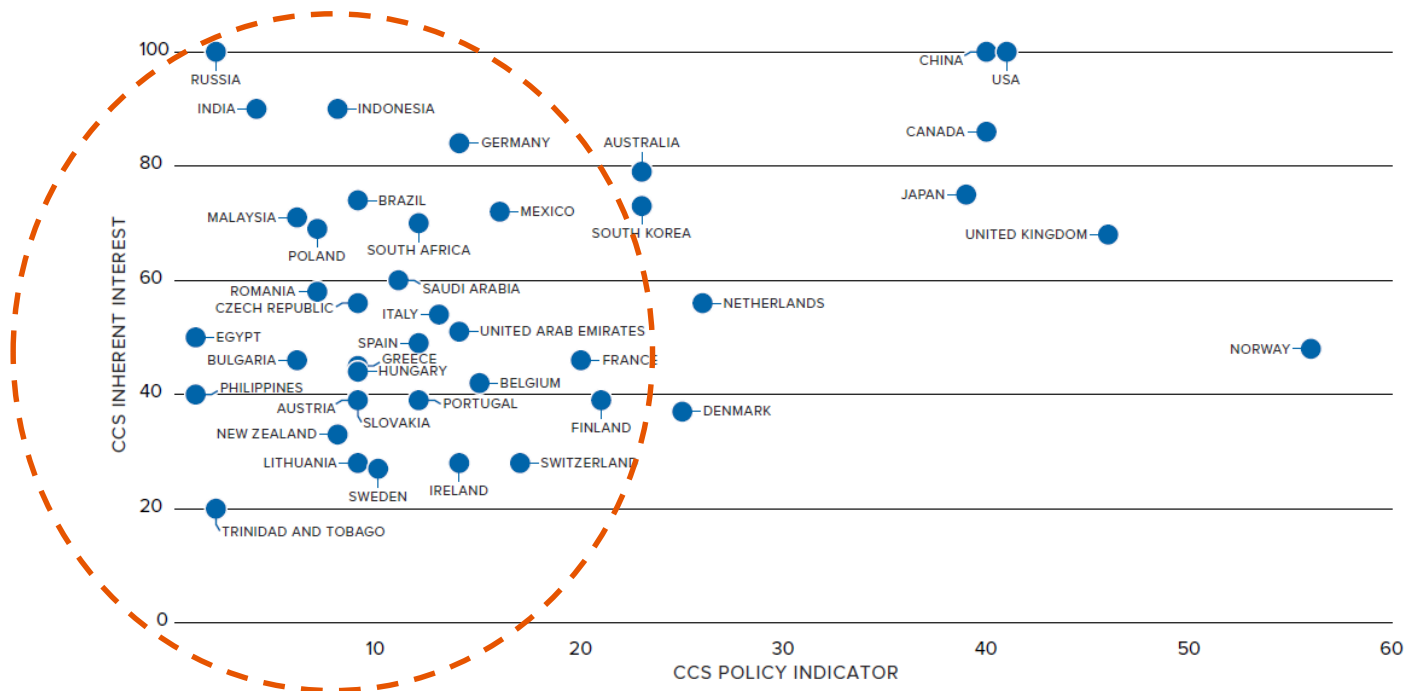
Global CCS Institute Policy Indicator

- Whilst no nation has yet implemented policies to deploy CCS consistent with achieving climate targets agreed in Paris, six have established themselves as clear leaders.
- These nations are Norway, the United Kingdom, United States of America, China, Canada and Japan. All of these countries have experience in constructing and/or operating large-scale CCS facilities or smaller scale pilot project activities.



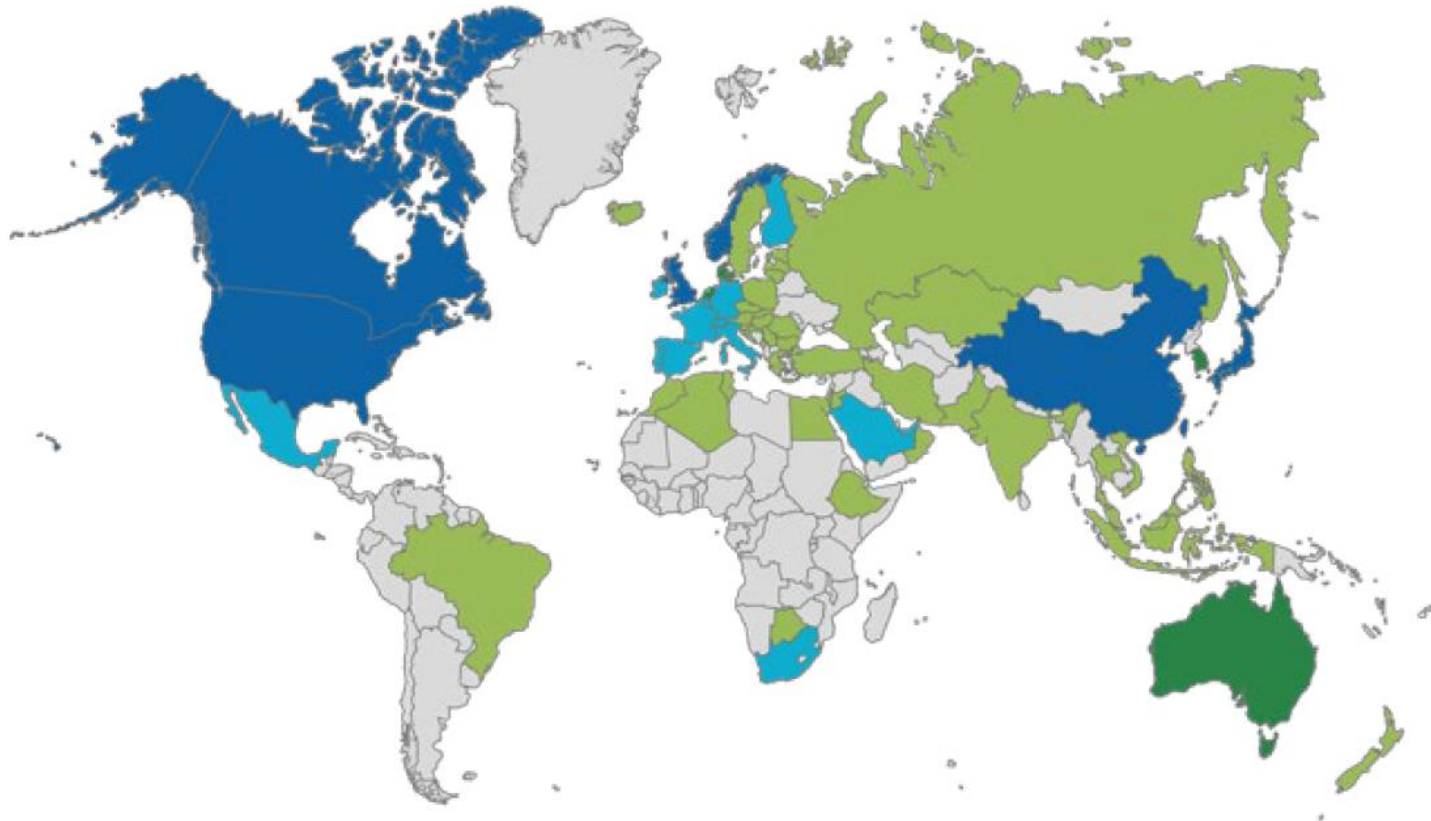
Global CCS Institute Policy Indicator

- The policy response of nations outside of the top ten identified in the previous sections are very immature, with little or no effective policy to incentivize emissions reduction through CCS.
- It is notable, however, that three of these nations have operating large-scale CCS facilities. These nations are Saudi Arabia, the United Arab Emirates and Brazil.



Global CCS Institute Policy Indicator

- Many countries do not have any score recorded



45Q Tax Incentive in the US

- CCUS advocates have a renewed sense of momentum in the US due to the passage of The FUTURE Act.
- Experts have concluded that the reformed 45Q is likely to result in CCUS deployment in the US (particularly ethanol production, natural gas processing, ammonia production).
- To understand the challenges for the US coal sector, the Petra Nova project can be used as an example.
- The capital for the carbon capture facility were approximately \$635 million for Petra Nova.
- Over the 12-years of eligibility, the tax credits generated would be worth about \$588 million for a 240MW capture project.
- With the capital costs nearly covered by the reformed 45Q and the operating costs covered by oil sales, a new integrated CCUS project could be viable at coal-fired power plants.

A Supportive Narrative for CCS

“**Inevitable and Impossible**” to “**Necessary and Doable**”

The barriers to wide scale CCS deployment are **not predominantly related to technology or analysis**. Instead, they arise from a combination of interconnected factors including:

- A lack of natural champions.
- A fragmented narrative in which CCS deployment is simultaneously perceived as being both inevitable/crucial and impossible/unnecessary/actively harmful.
- A lack of coordination across the value chain.
- Inadequate regulatory frameworks.
- Insufficient market mechanisms and lack of a clear business model.

The **CCS Alliance of Champions** seeks to activate and energise a coalition of key who:

- Identify the optimal roles for CCS in delivering the goals of the Paris Agreement.
- Co-construct a new set of enabling narratives on the role of CCS in achieving the common climate goal – **allowing sensible policy to be implemented**.
- Become active champions to deliver the narratives for maximum impact.
- Identify the most significant barriers to scaling CCS in the relevant sectors and design catalytic interventions to address them.
- Identify existing coalitions that could implement and fund these interventions.



Conclusion

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