CARBON CAPTURE USE AND STORAGE

A suite of technologies that can capture CO₂ emissions, preventing them from entering the atmosphere.

WHAT IS CCUS?

Carbon capture use and storage (CCUS) prevents CO₂ from being released into the atmosphere. The technology involves capturing CO₂ produced by electricity generation and large industrial plants, compressing it for transportation and then injecting it deep into a rock formation at a carefully selected and safe site, where it is permanently stored.

One of the ways CCUS has been deployed to date is to utilise the captured CO₂. This has mostly occurred for enhanced oil recovery (EOR) but there are other uses being deployed too. Commodifying the CO₂ for use helps pay for the deployment of CCUS.

HOW IS CCUS LINKED TO GLOBAL CLIMATE GOALS?

The key approach for the world to transition to a low carbon future is not to replace fossil fuels, but rather to address the CO₂ emissions from them.

Given society’s ongoing reliance on fossil fuels, CCUS is vital to achieve the required level of emissions reduction. The deployment of CCUS is crucial in ensuring that solutions are developed at the lowest cost possible.

138% Rise in the cost of climate action without CCUS1. 10 billion Tonnes of CO₂ per year that need to be captured globally in order to meet international goals, the International Energy Agency (IEA) estimates.

Contribution of different technologies to cumulative annual emissions reductions

<table>
<thead>
<tr>
<th>Technology</th>
<th>Contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electricity savings</td>
<td>28%</td>
</tr>
<tr>
<td>Fuel switching and efficiency</td>
<td>2%</td>
</tr>
<tr>
<td>CCUS</td>
<td>12%</td>
</tr>
<tr>
<td>Nuclear</td>
<td>13%</td>
</tr>
<tr>
<td>Other renewables</td>
<td>3%</td>
</tr>
<tr>
<td>Wind</td>
<td>15%</td>
</tr>
<tr>
<td>Solar</td>
<td>16%</td>
</tr>
<tr>
<td>Hydro</td>
<td>5%</td>
</tr>
<tr>
<td>Biomass</td>
<td>6%</td>
</tr>
</tbody>
</table>

The contribution of CCUS to cumulative annual emissions reductions in order to meet the 2° scenario.


CCUS is part of a cost-effective solution to meeting climate goals and must play a significant role alongside other technologies, such as renewables and energy efficiency.

1 Intergovernmental Panel on Climate Change (2014) IPCC Fifth Assessment Synthesis Report p. 86
**Why Policy Parity is Important?**

Policy parity will drive the investment that is integral to achieving the necessary carbon emission reductions from CCUS.

Policy tools available for renewables are not generally made available for CCUS, which has a dampening effect on investment.

Growth in renewable energy technology has been driven by policy that provides $100 billion in subsidies every year. It is vital that CCUS receives the funding, tax credits and policy support provided to renewable energy. Consistent policy and support frameworks will ensure economic viability of the CCUS industry and enhance the economic competitiveness of countries’ industrial sectors and energy systems.

**Clean energy investment**\* between 2004-2013 (billion US$)

![Graph showing clean energy investment between 2004-2013](graph)

- **CCUS**
- **All clean energy**

\*Includes technology development, projects, M&A. Source: IEA

**What About the Other Fossil Fuel Industries?**

CCUS is particularly important because it will be needed in industry and on gas, as well as coal. Unabated gas is not a solution to climate change – it, too, requires CCUS.

Coal, oil and gas all have significant contributions to make in meeting global energy needs affordably and securely, while also reducing our CO₂ emissions.

The World Coal Association supports closer co-operation with other industries as we work together to deliver a comprehensive response to the energy and environmental challenges the world faces.

**Has CCUS Ever Worked?**

CCUS has been a well-established technology with key processes in operation, such as CO₂ separation, for over 60 years.

Large-scale CCUS operations at SaskPower’s Boundary Dam in Canada begun in October 2014 and demonstrate the viability of its application in the coal-fired power sector. The plant sells most of the CO₂ that it captures to a nearby oilfield for “enhanced oil recovery” and stores the rest.

**SaskPower’s Boundary Dam Project: in numbers**

- 100% Reduction of SO₂ emissions.
- 115 MW Near-zero emission base-load electricity produced.
- 90% Reduction of CO₂.
- 1 million Tonnes of CO₂ captured annually by the Boundary Dam CCUS project.
- 100,000 Homes powered by the project.

SaskPower has estimated that the next CCUS plant would be 30% cheaper to build, thanks to the lessons learned from Boundary Dam. There are 22 large-scale CCUS projects either in operation or construction around the world\¹ and the global CCUS coal portfolio will be further strengthened in 2016 as Kemper Energy Facility and Petra Nova Carbon Capture come online.

**¹GCCSI, Global Status of CCS 2015**

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1% The cumulative value of government policy support provided to CCUS to date compared to what is provided to renewable technologies.