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## International CCUS Summit

28 November 2018

Chairs' Summary

### *Accelerating investment in a critical climate solution*

- ***Carbon capture, utilisation and storage (CCUS) technologies will play a critical role in meeting globally agreed climate targets while supporting industrial competitiveness and economic growth.***
- ***New business models, supportive policies and global partnerships can deliver a rapid scale-up of CCUS investment.***

Global energy leaders met in Edinburgh, United Kingdom, to drive new momentum in carbon capture, utilisation and storage (CCUS) technologies as a proven and critically-important climate solution. Energy ministers, CEOs from the energy sector and executives from the financial community recognised considerable progress and an increased commitment to deploying CCUS. The potential of CCUS to unlock value across the economy and support industrial competitiveness while achieving significant emissions reductions was highlighted.

The Summit, held just days before the COP24 climate negotiations commence in Katowice, Poland, underscored that investment in CCUS must be scaled-up urgently to achieve global climate and energy goals. Clear policy direction will be central to supporting this investment while new business models are showing that CCUS is increasingly cost-competitive across a range of sectors.

CCUS will be able to support deep emissions reductions in industrial sectors that are important for economic growth and high-value job creation, such as steel, cement and chemicals production. In the power sector, CCUS can provide greater diversity in generation options – potentially reducing overall system costs – and protect substantial capital investment in existing infrastructure.

CCUS can also enable the rapid emergence of new clean energy pathways, including low carbon hydrogen production for heating, transport and power generation, and create new markets for low-carbon and carbon-based products. It can provide the infrastructure and knowhow to accelerate the deployment of carbon dioxide removal (CDR) technologies such as bioenergy with CCUS and direct air capture. The recent IPCC special report suggests that several hundred gigatonnes of CDR would be needed by the end of the century if a broad range of climate actions are taken – rising to 1,000 GT cumulatively if other levers are not used.

### ***A rapid scale-up of CCUS investment is required***

According to the International Energy Agency (IEA), progress on CCUS is well off-track when measured against globally agreed climate and energy goals. Today's CO<sub>2</sub> capture rate represents less than 4% of that required by 2030 under a pathway consistent with the Paris Agreement objectives.

To address this, delegates recognised the urgent need to progress CCUS and identify opportunities for early investment. CCUS projects have a typical development time of between four and eight years, meaning investment decisions need to be taken in the coming years for new facilities to be operating globally by the mid-2020s. The Summit identified priorities and strategies to enable these investment decisions, including:

- ***Prioritise competitive investment opportunities:*** The IEA has identified that as much as 450 Mt CO<sub>2</sub> globally could be captured for CO<sub>2</sub> use or storage with an incentive of less than USD 40 per tonne. This CO<sub>2</sub> is primarily from industrial facilities such as ethanol production, hydrogen or natural gas processing that otherwise vent relatively pure CO<sub>2</sub> into the atmosphere. Delegates recognised that these early opportunities for CCUS investment could make a substantial contribution to emissions reductions at a competitive cost.
- ***Reduce costs through better business models and CCUS "hubs":*** CCUS requires clear commercialisation pathways if investment is to be accelerated. Delegates recognised the need for a swift transition from building stand-alone CCUS facilities with dedicated transport and storage infrastructure, to developing multi-user "hub and cluster" facilities in industrial regions. This approach can reduce unit costs through economies of scale, while reducing commercial risk and financing costs by separating out the CCUS value-chain. Public-private partnerships are an option to support the development of transport and storage infrastructure. The Summit underlined the importance of agreeing appropriate risk-sharing arrangements between governments and industry to support the cost-effective deployment of CCUS infrastructure.
- ***Develop policy frameworks for investment certainty:*** A carbon price or CO<sub>2</sub> tax can provide an important long-term investment signal for CCUS, but boosting early investment will require complementary and targeted policy measures. A range of options including regulatory levers, market based frameworks and measures such as tax credits, grant funding, feed-in tariffs, public procurement, low-carbon product incentives and CCUS obligations and certificates could all play a role depending on national circumstances and preferences.
- ***Include CCUS in long-term climate planning:*** The deployment of CCUS is critical in all viable pathways to achieving globally-agreed climate goals. The communication and planning of Nationally Determined Contributions (NDCs) and submission of mid-century climate strategies provides an opportunity to identify and articulate the future role for CCUS at a national level. These can play an important role in informing near-term policy and investment decisions for CCUS while also guiding innovation priorities.
- ***Identify and develop "bankable" CO<sub>2</sub> storage:*** Confidence in the availability of safe, secure and adequate CO<sub>2</sub> storage is a prerequisite for investment in both transport and storage infrastructure and capture facilities. Global CO<sub>2</sub> storage resources are considered to be well in excess of likely future requirements. In many regions, however, significant further assessment work is required to convert theoretical storage capacity into "bankable" storage, where capacity, injectivity and containment are well understood. Regional and interregional collaboration and partnerships are playing an important role in the identification and development of CO<sub>2</sub> storage facilities globally and need to be increased.

- **Unlock the value of CO<sub>2</sub>:** CCUS can be central to a new market for low-carbon and carbon-based products. Innovation in CO<sub>2</sub> use – for the production of chemicals, building materials, fuels and products such as low carbon steel and cement – could boost future demand for CO<sub>2</sub> as a valuable commodity, driving new markets and providing a commercial incentive for CO<sub>2</sub> capture. Two-thirds of CCUS projects operating today were driven by demand for CO<sub>2</sub> for enhanced oil recovery (EOR), and there is significant further potential for EOR-enabled CCUS investment in North America, China and the Middle East. Given the scale of the climate challenge, opportunities for CO<sub>2</sub> use are expected to complement the need for geological storage, and the proliferation of projects may help to lower costs of capture and use technology and help unlock the economic value of CCUS to economies, supporting industrial competitiveness. Research and innovation on both capture and use technologies across a large variety of industrial sectors should continue in parallel to the deployment of available technologies at industrial scale.

### ***Strengthened partnerships for accelerated deployment***

Accelerating the deployment of CCUS is complex but increasingly urgent and important. It requires government, industry, financial services and key stakeholders to work in partnership and put in place new investable business models, reaching agreement on the sharing of costs, risks and liabilities. It includes partnerships with developing countries to support CCUS capacity building and action. This requires building a significant level of trust on all sides which this Summit has helped strengthen.

Delegates recognised the leadership of the IEA in supporting global partnerships and its central role in providing robust analysis to inform policy and investment decisions for CCUS. The meeting also acknowledged that multilateral organisations and initiatives including the Clean Energy Ministerial CCUS Initiative, the Carbon Sequestration Leadership Forum, Mission Innovation, the Oil and Gas Climate Initiative, and the Global CCS Institute are facilitating international CCUS partnerships. Delegates identified strengthening such initiatives as a priority, and recognised the value of expanding participation from industry, financial services and NGOs, whose support is critical to the accelerated deployment of CCUS.

Importantly, the Summit also confirmed that the private sector is ready and able to deliver CCUS if it can operate within a well-understood fiscal, policy and risk-allocation framework.

The Summit provided an important opportunity to build partnerships, share best practices and identify the solutions to accelerate CCUS deployment. The Government of the United Kingdom and IEA will continue to support the outcomes of the International CCUS Summit, including through existing multilateral initiatives, the Conference of the Parties and will report progress at the IEA Ministerial Meeting in 2019.

Signed:



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