

Opening Remarks by Steve Winberg, Assistant Secretary for Fossil Energy
for CSIS's "Status of Carbon Capture 2017," held on November 28, 2017

Thank you, Sarah (Ladislaw, *Director, Energy and National Security Program at CSIS*). I'm pleased to be here this morning. And it's good to see some familiar faces.

For those of you whom I haven't met, I'm Steve Winberg, and I was sworn in just last Wednesday as the Department of Energy's Assistant Secretary for Fossil Energy so this is my first speaking event as Assistant Secretary.

Before coming to DOE, I spent 39 years in the energy industry, most recently at Battelle Memorial Institute and prior to that at CONSOL Energy. During my career, I've been involved in both the policy and the technology sides of the energy industry, particularly coal and natural gas – but also alternative fuels. While at CONSOL, I was given the opportunity to speak at a GCCSI meeting and am well familiar with the important work that you do. I am less familiar with the Center for Strategic and International Studies but have seen some of your work and look forward to getting to know your Center better.

U.S. energy policy is guided by the goals of the President's America First Energy Plan – a plan that recognizes and embraces the fact that we have vast untapped domestic energy resources in North America. In addition to being good for our economy, boosting domestic energy production is also in America's national security interest. And by encouraging U.S. energy exports, it benefits our friends and partners around the world.

Our America First Energy Plan clearly states that developing our energy resources must go hand-in-hand with responsible stewardship of the environment, with an absolute need to protect our air and water. These things – energy development and environmental stewardship are not mutually exclusive; in fact, technology-enabled solutions will allow us to balance and attain all of our goals.

That's why the Trump Administration is committed to advancing clean coal technology, including Carbon Capture, Utilization, and Storage. CCUS is a well understood approach for CO₂ emissions reductions from coal and gas power plants, as well as from other industrial sources of CO₂ emissions. These technologies, when coupled with supportive policies, can significantly reduce carbon emissions from traditional fossil fuels.

Even though CCUS is being demonstrated around the world, we all know that there is a need to reduce the cost and that investment in and deployment of CCUS technologies lags behind other clean energy technologies. One of the main reasons for this is the lack of strong policies to support CCUS research and demonstration – policies that are aligned with the innovative era of energy abundance that we live in. More robust policies for CCUS R&D will drive the cost down and help inform the myriad of issues needed to be understood and resolved to support the development of CCUS supply chains, commercial infrastructure, and private investment.

This support is not a subsidy for the fossil energy industry. Just the opposite – CCUS should receive equal treatment with other clean energy technologies as part of a robust suite of low emission energy solutions. Parity for CCUS will help to ensure a strong portfolio of clean, resilient, and affordable energy sources to succeed in growing our economy and improving our environment.

But we should be clear -- this doesn't mean a one-size-fits-all approach. Each country has its own goals and requirements. So, the appropriate policy framework will necessarily vary among countries and across industries.

In the United States, we're working to level the regulatory environment that has favored certain energy sources and technologies over others and we're reviewing federal government regulations that impede domestic energy production and investment.

Appropriate regulations are needed to strike a pragmatic balance between progress and environmental stewardship.

We've seen that at the state level. Our Air Products CCUS Project, the Petra Nova Project – both in Texas – and the Illinois Industrial CCS Project reflect how CCUS has been implemented where supporting regulatory, funding, commercial, and technical factors have converged to support a viable business case. Moving forward, additional projects should be catalyzed by smart policies that provide appropriate incentives to help offset the cost and promote successful deployment.

While smart policies are necessary, research and development – and learning by doing – can help drive down the costs of new technologies. For instance, the 21 large-scale CCUS projects in operation and under construction around the world provide an opportunity to facilitate the sharing of lessons learned and best practices. These projects are driving innovation by providing opportunities for testing, demonstrating and refining advanced technologies, while developing critical infrastructure that will facilitate and de-risk future projects through further cost reductions.

In the U.S., the Department of Energy's Fossil Energy R&D program has supported and led world-class research on CCUS since 1998. DOE-supported, first generation CCUS technologies are now operating on both coal power plants and industrial applications. At the same time, a variety of advanced second-generation capture technologies have progressed to the small pilot plant phase that focus on reducing overall system costs.

Our R&D program is also pursuing transformational technologies such as chemical looping, electrochemical-based approaches, supercritical CO₂, advanced membranes, and advanced modeling and computational tools to identify materials and systems to reduce carbon capture energy and capital costs by greater than 50 percent.

We're also focusing on advanced materials, sensors and controls development to decrease the cost and increase the efficiency of both existing and new coal-fueled generation plants. And we're pursuing new cross-cutting tools such as advanced

simulation and additive manufacturing, to further reduce cost. Our CO₂ storage efforts include a core R&D program designed to demonstrate that CO₂ can be safely and economically stored underground. Over 15 million metric tonnes of CO₂ has been injected in the United States as part of DOE's Research, Development, and Demonstration programs combined.

Our work is complemented by the Regional Carbon Sequestration Partnership program, which includes 43 states, four Canadian Provinces and over 400 organizations. This government/industry cooperative effort is developing guidelines for the most suitable technologies, identifying geologic formations suitable for storage, informing the regulatory process, and identifying infrastructure needs for CCS in different regions of the U.S. and Canada.

Going forward, our research and development will explore carbon capture from industrial and natural gas sources, and the use of CO₂ in enhanced unconventional oil and natural gas production. At the same time, we're exploring novel technologies for CO₂ utilization beyond enhanced oil and gas recovery and that can add additional commercial value to CCUS.

In the end, though, the public and private sectors must do more to advance CCUS technologies from the laboratory to the commercial marketplace. In the U.S., we are working together as government and industry to address these challenges and barriers. For instance, Secretary Perry recently asked the National Petroleum Council, a 200-member industry advisory committee, to define pathways for commercializing CCUS.

Just as public/private collaboration is critical to CCUS commercialization, so too are international partnerships. The U.S. has in the past and will continue to work with our partners in the international arena toward this goal. For instance, at the Clean Energy Ministerial in June, Secretary Perry stated that the U.S. feels strongly that CCUS should be included within the suite of clean energy technologies under consideration by CEM.

We're also leading actions, in collaboration with a number of countries, to develop a new CEM initiative on CCUS, which we plan to formally launch at CEM9 in May in Copenhagen. This initiative will strengthen the framework for industry-government collaboration on CCUS through complimentary, value added efforts beyond the activities of existing organizations and initiatives. And just last month, Secretary Perry and Dr. Fatih Birol, Executive Director of the International Energy Agency, co-chaired a CCUS Summit ahead of the IEA's Ministerial Meeting. The participants - from industry and government - called for a renewed push for investment in CCUS. So, the U.S. government remains a strong voice for CCUS, and we will continue to work in the global community to push for its commercialization.

At the end of the day, the challenges to CCUS are real - but so are the opportunities. Collaboration between industry and government - and between international partners - can help drive down CCUS deployment costs, develop best practices, and build on lessons learned to develop the policy frameworks that will promote the commercialization of CCUS.

Thank you.