



Speeches and webcasts

Carbon Capture and Storage: An opportunity we can't afford to lose

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Speech given by Roxanne Decyk, Corporate Affairs Director, Royal Dutch Shell plc, at the "Oil & Money" Conference, October 28, 2008, London, UK.

The world has a brief opportunity to deploy the one technology that can substantially reduce carbon dioxide emissions: Carbon Capture and Storage (CCS). By capturing CO₂ at emission points and storing it in underground formations, CCS may deliver 15 to 55% of the CO₂ reductions recommended to avert the worst effects of climate change. This technology may have the greatest impact when applied to stationery emissions points that produce large amounts of carbon dioxide, such as coal-fired power plants. It also presents substantial business opportunities for the Oil & Gas industry. Yet much work remains before a global network of CCS infrastructure and capabilities can be achieved. The world must act quickly to develop these projects before it's too late to achieve CO₂ reduction targets.

Carbon Capture and Storage: An opportunity we can't afford to lose.



Today we confront one of the most urgent challenges of our generation: how to tackle major climate change issues while providing the energy people need to fuel economic growth.

Despite these challenges, I think we stand on the brink of a substantial opportunity. Today we have the chance to develop viable CO₂ capture and storage capabilities. But we've got to act fast and we have to do it right, or that chance will be lost.

CO₂ capture and storage, or CCS, is a process where CO₂ is captured at industrial sources such as coal-fired power plants or petroleum production and refining sites. Then the CO₂ is injected into deep saline formations or depleted gas fields. It can sometimes also be injected into mature fields to enhance oil and gas recovery.

CO₂ capture and storage is an opportunity that we can't afford to miss. Why is that?

First, CCS is an essential companion to our cap and trade systems, and it's one key to reducing greenhouse gas emissions globally. Thanks to the European Union's international leadership, the world today is moving toward binding targets to reduce emissions. The EU Emission Trading System is a crucial and cost-efficient tool to help us achieve CO₂ goals. But, while it's true that cap and trade systems encourage us to reduce emissions, they can't remove even a single molecule of CO₂ from a smokestack by themselves. They require enabling technologies.

CCS is the only technology we have today that can substantially reduce the amount of CO₂ we release into the atmosphere from burning fossil fuels. According to the United Nation's Intergovernmental Panel on Climate Change, carbon capture and storage might deliver from 15 to 55% of the emission reductions that scientists recommend to avert the worst effects of climate change this century. As governments worldwide cap emissions, that critical contribution from CCS simply can't be ignored.

Some people wrongly believe that the sole purpose of cap and trade is to make hydrocarbons so expensive that you wind up with an incentive to develop alternative energy. Then, as alternative energy becomes more available and affordable, fossil fuels will become obsolete.

The truth is, the world can't do without fossil fuels. People's appetite for energy will grow over the next few decades a lot faster than we can possibly satisfy with renewables. Oil, gas and coal will remain the main staples in the energy diet for many, many years to come, even though their percentage of the overall energy mix could be reduced.

Many companies in our industry are grappling with how to continue meeting this escalating demand for energy as glaciers melt and CO2 limits get tighter and tighter. Somehow, we have to turn down the CO2 volume from fossil fuels. That means reducing emissions in transportation *and* power generation *and* other heavy industry—all of the above. CCS can be part of the solution.

Currently, the Oil & Gas industry is the most capable of delivering the entire CCS value chain, from capturing the gas to transporting and storing it. While certain sectors, like coal-fired power, will rely on these technologies more than others to remain viable in a world managing a strict CO2 budget, it's also logical that we learn how to apply them at our own production sites and downstream facilities.

Opportunities in Oil & Gas operations

Shell is already pioneering this type of project. For instance, we're capturing some of the CO2 at our Rotterdam oil refinery in the Netherlands and piping it to greenhouses to boost vegetable production. We're also working toward expanding that capture with permanent underground storage in one of the big depleted gas fields near Rotterdam.

One reason we're doing this is that the world can only meet emission reduction targets if major companies everywhere take action.

At Shell, we have found that reducing our carbon footprint is good business. It's an opportunity to meet carbon dioxide targets and avoid the costs of exceeding limits.

It's also an opportunity to mitigate long-term business risk. By that, I mean the cost that could result from climate change itself—and from social backlash against our fossil-based products if we aren't clearly helping to bring emissions under control.

In the industry, we know that CO2 can be used productively to enhance oil recovery. Shell was one of the first to begin using this technology during the 1970's.

Traditionally, naturally-occurring carbon dioxide is produced and provided by suppliers who pipe it to mature oil fields. However, natural, underground CO2 is in short supply, and it's not always close to the oil fields where it's needed.

If enough CO2 could be captured from industry and piped to the right places, then used to enhance recovery, it could quadruple America's recoverable oil reserves, according to figures from the U.S. Department of Energy. Injecting CO2 is common in the Southwest United States and will also be an important solution for maintaining production in the Middle East.

So, we see capturing industrial CO2 for use in enhanced recovery operations as another potential business opportunity—a way to reduce emissions while helping to improve production and meet the world's energy needs.

Opportunities in the power sector

Capture at petroleum facilities, however, presents only a limited potential for CO2 reductions. CCS will become even more important in capturing emissions at other industrial facilities, especially power plants fuelled by coal.

Globally, electric power generation already accounts for more than a quarter of CO2 emissions. According to the IEA, that 27% number could grow to 44% by 2050 as more coal plants come online in India and China.

In a world of CO2 reduction, the oil industry must respond to these new coal plants by supporting their adoption of CCS and helping to develop CCS technologies.

Many companies in our industry are grappling with how to continue meeting escalating demand for energy as glaciers melt and CO2 limits get tighter... CCS can be part of the solution.

Why? Because coal is an indispensable part of the future energy mix, and CCS is how we can keep massive volumes of CO2 out of the atmosphere while still providing people with plenty of clean electricity from coal. It's important to remember that coal is incredibly important to many nations' energy security, including China's and Poland's.

Most people think of liquid transportation fuels, such as diesel, gasoline, and jet fuel, as the primary culprits in greenhouse gas. In fact, transport fuel contributes 21% of CO2 emissions globally, a bit less than the 27% produced by power generation. By 2030, however, the International Energy Agency predicts that the growth in CO2 emissions from coal-fired power in just three countries – China, India and the US – could outpace the growth in transport emissions worldwide—by 80%!

While it's clear that we must reduce emissions from every source possible, including transport, reducing CO2 emissions from power plants is

critical. And CCS, which is best applied at large, stationary emission sources, is the ideal solution for this challenge.

Opportunities in the transportation sector

So, what can we do about transport?

In the transport sector, we obviously can't capture emission from hundreds of millions of exhaust pipes. Rather, the challenge is to reduce the CO₂-intensity of liquid fuels-based transport on a wells-to-wheels basis.

This can be done by mixing in the right biofuels, building lighter-weight vehicles, developing more efficient engines, and, in the longer term, adding CCS to liquid hydrocarbon fuel production.

For a long time to come, these types of measures will reduce transport emissions faster and more conveniently than we could achieve with vehicle electrification or by using power generated from renewable resources.

Opportunities for society and for business

With only so much "carbon space" available in a kettle that's already overflowing, it makes sense to tackle the biggest sources as a priority – especially coal fired power plants.

That approach will remove substantial amounts of CO₂ from the pot. It will also make room for people to continue using cheap, convenient liquid fuels as a responsible and vitally important supplement to alternative fuels.

As I said, the world will need all the energy it can get from all available sources. At the same time, we must trim emissions from every source that's practical.

The world's challenge is to create the complete CO₂ value chain—from capture to transportation to storage. And, we have to build it virtually from scratch!

When other industries begin implementing CCS programs of their own to reduce emissions, the Oil & Gas industry will be called in to help. Because our industry is presently the most capable of delivering all phases of CCS, we should be prepared to work with other industries to share our resources, technologies and experience.

Industries of every type will require an incentive to adopt CCS. Cap-and-trade programs and other conditions need to make it more economically interesting for industrial facilities to limit emissions than to continue business as usual.

CCS is not a silver bullet. However, I don't think we should underestimate the opportunities it presents to help energy companies remain competitive and relevant in the low CO₂ economy.

CCS can help us reduce emissions from our oil and gas operations, manage our business risk, enhance oil recovery, alleviate CO₂ pressure on the planet and enable liquid fuels to continue helping to satisfy the world's ravenous appetite for energy.

These opportunities are good for society and they're good for business. The world needs our industry to remain vital and financially sound if we're going to deliver the energy that people need and meet the aspirations of a developing world.

Moving forward

Because of the energy industry's intimate relationship with CCS, I believe we have a responsibility to help bring it online quickly, so that the world can meet urgent reduction targets.

The world's challenge is to create the complete CO₂ value chain—from capture to transportation to storage. And, we have to build it virtually from scratch!

Even tougher, we have to do it at lightening speed. At least, that's how it seems in this long-lead-time industry.

The EU has committed to a 20% reduction in greenhouse gas emissions by 2020. CCS is an important part of that plan. That means that, in just 12 years—4,000 days—CCS needs to be a large-scale commercial proposition with about 100 major CCS facilities under development or already in operation around the world. Beyond that, all new coal power plants built after 2020, at the latest, should be using CCS.

For every single year we delay, we commit the atmosphere to another one part-per-million increase in long-term CO₂ stabilisation levels. We don't have many parts per million to play with. The EU's target is 450 parts per million, and some scientists believe we are close to the CO₂ equivalent of that already.

The pressure on politicians and on the energy industry will increase as citizens of all nations—our customers, asset owners and voters—find delay unacceptable.

All of these reasons add up to one reality: a worldwide CCS network by 2020 is a target we really can't afford to miss, not just for the opportunity it provides traditional Oil & Gas companies to remain competitive and relevant, but for the welfare of society as a whole.

Thank you.

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