ConocoPhillips: CTO Stephen Brand Discusses R&D Efforts in Cleantech & Energy Technology

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ConocoPhillips (COP) has always been the quietest of the majors when it comes to the press, so I was delighted when CTO Stephen Brand agreed to speak on the record on energy technology, cleantech and alternative energy technology with Cleantech Blog. He recently also headlined the Rice Alliance for Technology and Entrepreneurship forum. Stephen himself came out of the Phillips organization from the exploration and production side of the business, originally starting as a geologist.

ConocoPhillips has always been a quiet leader, with technology budgets at levels swamping all but the largest venture capital organizations in cleantech, and was the first oil company to join US Climate Action Project and is part of the Carbon Disclosure Project. It is also quietly repositioning the company around a global energy strategy – not just oil.

This move tracks the history of the company. While one of the oldest oil companies in the world, 20 years ago Phillips was not generally considered a major player in the oil industry, and given the changes driven through M&A in the last 15 years, which Amoco, Mobil, Arco and numerous other massive organizations did not survive as independent, it certainly was not clear the Phillips would become one of the Tier 1 companies. But today, at $178 Bil in assets, it clearly is.

The current CEO, Jim Mulva, took over as chief executive about 10 years ago, and the moves the company has made, including deals that brought Conoco, Inc. and Burlington into the fold, helped vault the company well above its historical presence. In some respects COP is positioned to do the same thing in energy and technology more broadly. Especially given that its annual capital expenditures of $15 Bil are on the same scale as the whole solar industry revenues or the global venture capital sector, and in one underreported move in the last couple of years it doubled annual technology spending to $500 mm.

I put a few questions to Stephen during our discussion to outline what all of this means.

Stephen, how important do you see technology to the future of the oil patch in general?

Neal, by 2030, global energy demand is forecast to be about 50 percent higher than it is today, even with improvements in energy efficiency. Emerging technologies will help us

meet the world's growing energy needs as we look for oil and natural gas in ever more challenging environments - for example the deepwater Gulf of Mexico and offshore Arctic – and in more challenging forms such as oil sands and gas hydrates. Innovation also will help us to minimize the impact on our environment and reduce greenhouse gas emissions.

In the 1980s/1990s oil companies under oil price pressure cut back on R&D drastically as WTI prices fell down to $10, was that a mistake in hindsight, even though it made financial sense at the time? Besides energy prices, what else has changed?

We take a long-term view of our business which enables us to stay focused on results. We apply a consistent, systematic business model with the flexibility to adapt to changing business conditions around the world, but we understand that we need to take a long-term perspective of for innovation that will develop future business opportunities. ConocoPhillips is committed to invest in people, technology and projects that allow us to safely, reliably produce oil, natural gas and to develop the next generation environmentally superior fuels to sustain our economy and way of life.

In which area is technology most important for the energy business?

Technology is important in every segment of our business. It is one of the most important tools we have for finding and producing new sources of oil and natural gas, but also for developing and delivering energy in new, more efficient ways. For example:

New exploration technology - 3-D seismic - allows us to detect undersea oil and gas deposits at great depths with minimum impact on the environment;
Breakthroughs in lithium-ion battery technology greatly improve the safety, power and reliability of batteries for hybrid vehicles, thereby improving fuel economy and reducing emissions;
A "coal-to-gas" technology that allows the use of this abundant resource in an environmentally superior manner;
Innovations in carbon capture and storage will allow us to address concerns regarding global climate change.

You have announced the long term transition of ConocoPhillips from an integrated oil company to a global energy company, what does this mean, and how does that apply to technology?

Yes, ConocoPhillips is not looking just at oil for the future of our company, but energy broadly. Technology is a key part of that transition. Any moves into new markets for any company requires access to innovation and technology. The ConocoPhillips Technology group has more than 350 scientists and engineers – 50 percent of them with Ph.D.s. These are the people driving our innovations and our transition as we become more technologically sophisticated.

One of the most significant aspects of that transition, I believe, will be our ability to recruit and retain the kind of scientists and researchers who can develop the next generation of energy. That's one reason why ConocoPhillips is creating a new 400 acre global technology center outside of Denver, Colorado and why budgets have gone up.

I've followed the Company for a while, but can you share some perspective on COP's technology budgets are with our readers, and how and where they have been growing?

We have doubled our research and development spending. In 2008, we invested $500 million in technology - technologies that improve our existing assets, as well as those that create new emerging businesses. We expect that figure to grow in the future. As I mentioned, our global technology center, projected to open in 2012, is another indication of our emphasis emerging technologies and their role in the future.

In the last several years ConocoPhillips made a number of moves in technology, including a much reported biofuels effort, but also launched a groundbreaking lithium ion battery electrode business called CPreme. But more broadly what technology areas is COP interested, and how might you rank them?

Safety is always our top priority; and we believe safety is very much tied to operational reliability at all our facilities, which is large part a technology problem. But in addition to using technology to enhance operational reliability at our core upstream and downstream facilities, we're focused on identifying breakthrough technologies that can deliver energy while lowering greenhouse gas emissions - next generation energy including alternatives like biofuels and renewables like solar and geothermal; and technologies to reduce industrial CO2 emissions.

Are you looking to do more in-house R&D or external partnerships?

Both. We are actively recruiting for our own efforts, and to foster technology innovation, we have several co-ventures with Iowa State University, the Colorado Center for Biorefining and Biofuels and the U.S. Department of Energy's National Renewable Energy Laboratory. We also established the ConocoPhillips Energy Prize, in partnership with Penn State, to recognize new ideas and original, actionable solutions that can help improve the way our country develops and uses energy. The first awards will be announced in October.

Okay, so then do you see COP making technology acquisitions at any time in the future, or will it all be homegrown?

We are supporting innovation inside and outside the company. While we have not made any technology acquisitions, being open to new concepts and innovation means that we would not rule that out.

As far as the internally grown R&D efforts, you've had a major expansion in the

works for some time but hasn't gotten much press. Can you share a little about the upcoming Denver technology center?

Our Louisville, CO, technology and learning center outside of Denver, slated to open in 2012, will be a center of innovation for us. In Louisville we will have a purpose-built facility where we can work to explore new and expanded research and development opportunities in upstream, downstream, environmental, renewable and alternative technologies. This is also part of our push to recruit and retain top talent.

Oil and gas is not the only core technology area for the company. COP has had a long history in materials technologies, and most people don't know has developed some of the most innovative lithium ion battery technology in the world. Can you talk some about Cpreme?

Our CPreme ® graphites are the highest-performing anode materials currently available for lithium-ion batteries. We are rapidly scaling up to meet growing transportation demand. We are also developing high performance cathode material to help reduce the cost of batteries, while meeting demanding automotive industry performance standards. This product will be available soon for testing by battery manufacturers, and we have begun commercializing the technology – not only can we develop new technologies but we can move from R&D to the commercial side.

And the COP biofuels program has gotten lots of press, what can you share about that?

We are engaged in development and production of new biofuels that have a better environmental footprint than existing sources. We currently produce renewable diesel fuel at our Whitegate refinery in Ireland using vegetable oils as a feedstock, and are testing the process at our Borger refinery in Texas as part of our arrangement with Tyson Foods (TFN) to utilize by-product animal fat as a feedstock.

We are also doing research – internally and outside the company - on new biomass fuels. We have a joint development agreement with Archer Daniels Midland (ADM) to develop fuels from agricultural wastes and a relationship with Iowa State to research all phases of biofuels. We are also a founding member of the Colorado Center for Biorefining and Biofuels, a cooperative research and educational center devoted to the conversion of biomass to fuels and other products and where we will be studying the prospects for algae in biofuels development.

What else do you see COP looking at alternative energy? Solar? Wind?

We look at those innovative alternatives where there is potential for technology to make a significant breakthrough. With our emphasis on research and development, alternatives like solar, geothermal, clean coal and battery technology are where we put our efforts, in addition to moving forward on renewables like biodiesel and cellulosic ethanol.

And I should ask before I let you go, when exactly did COP decide to create the position of "CTO"? That's not a typical oil company title.

Well Neal, officially I'm the senior vice president for Technology. ConocoPhillips created the position in 2007 to better centralize and coordinate research and development (R and D) efforts that had always gone on in different parts of the company. This focus on R and D allows us better pursue projects that help strengthen energy security and to better allocate financial resources to invest in new technologies that reduce the environmental impact of our operations.

Stephen, thanks for finally coming on the record with us. It is exciting to see what's going on.

Disclosure: None