EIA Energy Conferences & Presentations, April 8, 2009

Session 9: "Investing in Oil and Natural Gas – Opportunities and Barriers"

Mr. Bawks: Thank you all for staying to the last session of the conference. Appreciate you all for being here. I think this is a very important session, and we have a very good panel of people to discuss a very important issue, that of investing in oil and natural gas. We'll talk about some of the obstacles, some of the opportunities in the market. We'll talk about the changes that are taking place in the market and how that's affecting investment and what that might mean for future supplies.

Let's see, first let me just briefly introduce our panel and then I've got a couple of slides I'm going to show. This is set up as a round table discussion as several of the sessions have been. And so I'll be asking them questions, and we will be getting their expertise on these issues. So first I'll start at the far left, your left. Susan Farrell. Susan is a senior director at PFC Energy's Upstream and Gas. And Susan brings over 20 years of experience in the assessment and implementation of strategic and investment planning for international markets. Susan also had previous positions with Brown and Root and J.Ray McDermott.

And next, John Felmy. John is the chief economist of the American Petroleum Institute where he is responsible for overseeing the economic, statistical, and policy analysis of the institute. John brings more than 25 years experience in energy, economic, and environmental analysis.

And next, Michelle Foss. Michelle is chief energy economist and head of

the Center for Energy Economics at the Jackson School of Geosciences, at the University of Texas-Austin. And she has a broad range of experience across the energy chain and 29 years of experience in energy and environmental research and consulting.

And then we have Paul Sankey. Paul is Deutsche Bank's lead U.S. integrated oil and refining analyst based at Wall Street. He was rated the top integrated oil analyst on Wall Street in the 2008 Greenwich survey, and Paul had previous positions with Wood McKenzie and the International Energy Agency. So, I think it's a very prestigious group and very happy to have them here. Glad they are able to take time to be with us today.

With that, I'm going to just show a couple of slides to introduce our topic. And I guess the first one—I guess I should introduce myself. I'm Bruce Bawks. I'm the team leader of the financial analysis team with EIA. And one of the things that we do, we collect data on our financial reporting system survey. This is some of the data that we collect: expenditures for exploration, development, and production, which is a little bit broader measure than capital expenditures. And what this shows is that prices do matter. We can see when prices came down back in the mid-eighties, expenditures quickly followed. When prices went back up the last four/five years, expenditures have also increased. And now we're on the down side again, prices have dropped. And we're hearing reports once again investment is coming down. And one indicator of how quickly that's happening is the rig counts. And this shows that just since last summer natural gas rig counts have dropped from a little over 1,600 and now they're just a little over 800, almost half. Oil is down almost a similar amount. So the market is responding. Some of the things we want to

talk about is how the market is responding to the changes that have taken place, and what's happening in investment. So at this point I'm going to sit down and start asking some questions and let the panel provide their expertise.

So I guess first question to start off, we've been hearing a lot and we've been seeing the headlines of companies that are saying that they are cutting back on capital spending for this year. And so, give us a sense of how significant industry wide are these reductions and also, it hasn't been the majors, it's been some of the larger independents and smaller companies. Why those companies? What are the common characteristics of these companies that are doing the cutting? So who would like to jump in on that?

Ms. Foss: Folks with the most exposure are the folks that came in late with the most leverage. And after saying that I'll leave it to John and Paul to follow up. But in terms of what we're watching at the university where we're watching our donors, our industry program participants, groups like that—it's always an adventure at times like this to look across the population of companies that support the University of Texas. That's right now the major driver. And anyone that came in, buying at the top of the market, acquiring properties for top dollar, carrying a lot of debt, overextending cash flow, those were all the big adjustments are happening right now. Anyone with a credit problem or credit issue that they haven't been able to renegotiate. Lines of credit obviously have a huge amount of exposure. I wanted to mention for myself in the spirit of full disclosure, the other side of my household is an exploration and production shop. We're in a buying mode. So for every piece of bad news you might hear, there's good news which is for those of us who have been waiting to get into the market, it's been a very expensive market. It's

been hard to get access to assets because companies and investors have been hanging on to them, and we're finally starting to see some things shake loose, for the better I think. So that's kind of a broad observation to start off.

Mr. Felmy: I'd reinforce that. I mean, a lot of size distribution. I think the majors have really pretty much kept with their plans. They were heavily criticized last year for not investing a lot more when we had oil at $147, and I think that was a little unfair. They were prudent with what they did back then and they're prudent with what they've done now. The smaller folks, particularly the ones—and you see that reflected in rig count for natural gas. That's down 50 percent. Oil prices for this quarter were down about 56 percent for example, and gas about 48. So it's not surprising to see that, and that's especially true for the smaller firms which are more concentrated in gas where if they have cash flow issues, liquidity issues, and credit issues, it's really a tough business right now.

Mr. Sankey: May I put up a slide? What we did is we just calculated the data—actually yesterday I did this for what we found with—really the answer is—our answer to that same question. These are the cuts that we've seen by company. I don't expect you to read that, but I hope you can read this. What it shows you is exactly what we were just saying on the panel. The billions cut are on the left-hand side and the percentage is on the right-hand side. We were forecasting for '09 and '10 capex by subgroup as of April last year and as of January this year, the cuts that we saw. And the really dramatic one obviously is Canadian heavy oil. You've lost around ten billion dollars of expenditure that we had thought—really within a matter of months. It wasn't even from April to January. It was really from October. The price collapsed, the collapse of

Lehman, and suddenly these guys were just abandoning projects. We've also, of course, seen the combination of Petro Canada and Suncor very much and obviously a function of that issue. The other ones you can see from a percentage point of view. Large cap refining has been a huge cut. That's sort of the third from the right, blue bar. Large cap refining is cut by 20 percent, and then you can see the mid-cap majors less so right now in small cap E&P because this is also a hedging distortion which I'm sure you can talk about on the panel as well. And just to show you to support the idea that it's all about balance sheet, this is again not impossible for you to read, but hopefully you can see here that what we have is a very different set of balance sheets. This is debt to cap, super major oils, mid-cap oils, large cap E&P. You can see the small cap E&P already under considerable pressure, and small cap refining. And then where you've seen the most dramatic cuts, Canadian heavy oil, this encompasses our current view of capex. If they hadn't cut capex you can see that their balance sheets would have deteriorated by around 30 percent from where they are now. So essentially they were forced for financial reasons in a very short period of time to really slash at projects. And I'll put the slides up. I don't want to go on too long, but we can go into why that was, but essentially it's about the marginal cost of production and investment in those areas.

Ms. Farrell: Let me say something else about the other investors. I know we're very U.S. focused here, and we want to be, but the U.S. companies are not the only ones who invest in this global business. And I think that's something we have to keep in mind here. This is a global business, not only on the oil side, but the gas side. Although gas is more regional, the inflow of LNG has a strong influence on the marginal price in the U.S. and it's going to have

that in 2009 as well. So if you look at who spends money, about one-third of it is the national oil companies, and they are a very diverse group. It's a little easier to lump big independents together and then the hundreds of much smaller companies in the U.S. and the U.K., and then the majors. Those you can sort of follow. They all report, etcetera. The NOCs are very diverse, and they're facing a period where some of them are absolutely going to continue to follow up with their plans. Some of them have huge amounts of cash, Petronas, the Malaysian national oil company is one, but others of them are in a period where their governments—because the prices dropped so sharply, their governments are going to go to them for yet more money in this period. So they will be in a position of having their budget reduced because the government has yet to adjust quickly enough their spending plans and needs some money coming out of the national oil companies. So you have a very diverse set of investors coming up in the next couple of years in addition to the ones we've just been talking about.

Ms. Foss: That raises an interesting question, in fact. One of the things that we've been debating is to the extent to which international companies are having to step up to help national oil companies make their cash calls for their working interests. And we've been debating internally in our group how big of a factor this really is. So how about some free input from you all, virtue of this panel, do you have a comment on that? What do you think? I mean, we hear different things from different countries. It looks like in some locations this is happening, in other locations it seems to be a bit of an accounting trick. It sort of varies a lot. But in terms of trying to anticipate where this is going to play out or how this is going to play out when we're looking at prices moving back up

again in a few years, or whenever that happens. One of the things that will drive that is the ability for projects to continue to go on where the NOCs themselves have funding obligations.

Mr. Sankey: Yes, that's exactly what we're seeing. On the way up, we highlighted it. There was a very perverse effect in global oil which is as the oil price rose, the opportunities there shut down. And so Exxon was getting nationalized in Venezuela. Rex Tillerson told me the other day they were about to buy—not Yukos but another company in Russia—but the Kremlin rejected the deal. Essentially high oil prices in power, weak governments if you like that have the remaining resource, and that's the problem for Exxon. The other part of that equation that we also highlighted was the higher the oil price went the more demand went up because the same governments give away or subsidize more oil. So we always thought we were in a spiral cycle where high prices meant less supply and more demand at the margin. And if you look at the history of Exxon in terms of for example having been nationalized twice in Venezuela, it's absolutely at the points of the lowest oil prices that they get their opportunities. At the high oil price there, returns performance, the management performance is undifferentiated because everyone has good returns at the top. What's interesting is that at the bottom that they still have the returns. And that's when their balance sheet comes into play. The biggest single opportunity is obviously Brazil. There you're clearly going to have an enormous resource and enormous investment requirement. The most uncertain is undoubtedly Russia.

Mr. Bawks: This is giving some opportunities for the international oil companies to cooperate with the NOCs, is this just something that is going to

be temporary? I mean when prices go back up and recover—

Ms. Foss: I think that's one of the really interesting questions. Does this change fundamentally the partnership arrangement, the relationship? Whether it's just a stop gap, or is it more serious than that? Will it push some governments to actually maybe think about what they had been doing in the past few years and reconsider their fiscal regimes? I think those are kind of fall-out questions.

Mr. Felmy: There's also the issue of some of these companies—I like to think about as you mentioned nationalized twice. The old adages fool me once, shame on you; fool me twice, shame on me. And so the companies out there are going to be very cautious about what are going to be the rules of the road going forward. You see these whipsawing rules of the game and so on because they're committing resources that require 30/40 years to recover and what will the prices be, and what will the relationships be? What will governments be? Those are all some questions that are very, very difficult.

Mr. Bawks: Are there things that they can do to protect themselves, to protect their assets or are they at the mercy of the government?

Mr. Sankey: I would say they diversify. They don't go all out into one particular region or theme. The other point I've made which I think is really why I'm here in D.C. today in many respects apart from this time to speak is what happens in the U.S.? I mean, if you ask Exxon who their most hated government is, they'll probably tell you Alaska. Alaska would be their answer essentially. That's the government they've had the most trouble with. The most unstable government is known to be the U.K. fiscal regimes. It's not just about whether or not it's a hostile place from the movies. It's about how hostile it is in

the corridors of the tax takers. But essentially, as you say, history says that they're going to keep getting nationalized, and they're going to keep struggling. So I think it is just a question of divergence. The question is now with the amount of resources that's concentrated into the hands of only a few somewhat mischievous governments, really how well can you diversify, especially with the complexity of CO_2 and Canadian heavy oil sands which is really the last major easy to invest in, if you like, province in terms of fiscal and government stability.

Ms. Foss: I think you do what John said. You be careful with your cash. Try to hang on to as much of it as you can.

Ms. Farrell: Well, that's always great in hindsight. And I think that's a good segway to what Paul put up as the huge differentiation among individual companies, where they got caught. Showing us where they got caught when the great drop came. And like him, we've looked at a lot of different companies, and we're in the position of the haves and have-nots this year. There are a whole lot of them who've spent two years with their M&A departments, churning away, churning away, churning away. They never bought anything because every time they went to look at something the future value was already priced in the deal. So they end up with a lot of cash. There are a lot of other companies we looked at, as Michelle mentioned, which were operating very highly levered models. A lot of the service sector companies, very highly levered models. And then not only does the price drop, but they can't get funding. And they have big cash calls come in for a debt they took out to order new equipment, and new capacity which is now going to come on just as demand has cratered. So you have a very disparate set of financial situations among these companies. In the U.S., and again the U.K., you have the same thing where

you have a lot of smaller players. And it's therefore a year where there's going to be a lot of sorting out to be done over the next 18 months I would say.

Mr. Sankey: Yes, over the next 18 months certainly, but you've got to remember we came into this with mostly very strong balance sheets amongst the big oil sellers and some of the smaller ones. So I think certainly the way the equity market is looking at the group is that you get a pass for this year, but we better get back to $70 next year. If we have another $50 year next year, a lot of these guys you can see who are already at 100 percent debt cap and beyond, they're going to get—they're basically going to collapse. And I think we're expecting the M&A round that we all expect—not to be this year, but actually to be next year. The most extreme companies at the margin being Suncor and Petor Canada in terms of heavy Canadian oil sands obviously lead the way with already having done a deal. I think as we hit next year we've got hedging, as I mentioned for E&Ps who are weak for 2009. We've got residual strength and balance sheets for 2009, but as of 2010, it could easily be a blood bath.

Mr. Bawks: So you're expecting merging and acquisition activity to increase next year?

Mr. Sankey: Yes.

Ms. Foss: Around town I would say more people are concerned about 2010 so I would agree with that. I mean I think people think there's a way to muddle through 2009, unless the bottom totally dropped out. But I think that's generally what people here are talking about. There has to be some sort of light at the—near the beginning of the tunnel, if not at the end of the tunnel to kind of provide some guidance.

Mr. Sankey: The other issue for us is that the equities are still pricing a

pretty aggressive oil price. So you've got a problem between the bid/ask spread. Those who own the resource still view it as a $70 resource. Those who are prepared to pay for it would be looking at a $40 or $50 debt in which to do the economics. So there's simply not—there isn't a meeting of bid/asks that would allow for a deal to be done essentially.

Mr. Bawks: So if there's an increase in merger and acquisitions, what does that do to investment? Does that help investment or does that hinder investment?

Ms. Foss: I'll make a provocative statement that everybody can challenge. I actually think it hurts. I think to a large extent what you're doing is you're pulling capex out of the business when you do that. You're really about cost cutting and cost management when you go in that route. So you get pushed in that direction for a variety of reasons. In some cases you really are trying to leverage and build value around things. But generally, you're taking somebody out of the market. So it doesn't always work out that the combined capex after the transaction is done is larger. And in fact a lot of times it's smaller. So I don't know. That's a rough back of the envelope view of how things have been the past few years, not just this cycle, but going back through the 1980s and kind of looking at the results of a lot of the 1980 combinations.

Mr. Felmy: And the last major mergers group you had was in the late nineties when you had a collapse in prices and so on. One difference that I think you might see if you do see some mergers, and of course, that draws on what is the government going to do about mergers in the industry. So that's the first question. But also I think the companies are facing a little different right now than they were in previous times, and in particular in regards to labor,

because that's really a huge issue out five/ten years. You know, 50 percent of the industry can retire in 10 years. So I think from some of the initial cutting that we've seen it's not been focused on labor like it has been in the past. And so that has a plus and a minus. It means that you're not saving as much, but it also means that you've got the skilled folks ready that if you want to move forward you can process stuff more quickly and perhaps accelerate otherwise in ways that you wouldn't have in the past.

Ms. Foss: I guess another thing is availability of money, too. That sort of depends. That's like a contextual factor that would influence things. A lot of money was available to come into the business for a whole variety of reasons that you guys have written about a lot. The question is if there's a—if you have a lot of consolidation, you have a lot of adjustment, but if part of the scenario is recovery in financial markets and attraction back to commodities because everybody thinks that that's where the returns are—which is what everybody is thinking—then that might help sort of lubricate the capex a little better.

Mr. Sankey: Yes, I think another reason you probably won't see big M&A this year from the big American companies is because there's so much tax pressure here in D.C. that the last thing they want to do is stand up and attract attention to themselves essentially by some sort of controversial deal. So they're really talking down, particularly the limitation in refining just the fact that you'll get a lot of attention from Washington essentially if you try and do a deal. I think it's another reason why we won't see too much in 2009. Our view would be another year of low oil prices is possible, debatable whether or not people will truly lose interest in oil, and then they can get on with some M&A activity. And I would support what you were saying about staff and availability

of capital as both being big points at the moment, why we might not see much this year and see more next.

Mr. Bawks: Some of the headlines that came out of CERA Week, and I think it was the majors that were saying that we need to invest through the down cycle. Can companies do that? What are the incentives for them to continue to invest through this down turn?

Ms. Farrell: Well, they're measured on reserves additions and production. And I think that the very big companies, it's absolutely true when you see that. You see—they say we're continuing with our program, and so forth. What does happen is things slow down. Decision making simply slows down. And if you think about it if even for relatively big companies if you have the cash and you've seen a price up at $140, even though it was very short lived—our memories are very short term. The average for the year was a little under $100. So this spike up to $140 or $150 was very short. So therefore, the statement as well, we weren't planning on this price anyway surely. We have a whole suite of projects which are profitable at $50. But if you're sitting on a board of directors and you see a train wreck in front of you and you're driving a bus, first thing you want to do is reevaluate everything. And that's what happens with mergers and acquisitions as well. O gosh, they slow down for a year. You see two decent size companies merge, nothing happens for a year. Everybody is worried about their job. It's just human nature. They can't make decisions. They have to reevaluate the new portfolio and reprioritize things. So what you get is a lot of project delay. So what we're seeing here is really a recalibration on a global scale of—demand has dropped significantly, particularly from the automotive and petrochemical side for oil. But, supply is

dropping, too. And many of our clients are asking us where is the new inflection point? What's the new recalibration? And it's not intuitively obvious as you know until you actually start running numbers. How much of the oil sands project is going to be delayed? What about deep water? And then you look on the gas side. You see this tremendous drop off in drilling rigs. What is that really going to mean in terms of supply? And then when will the lower supply start impact the demand? It's straightforward economics, but all is in play at the moment I would say.

Mr. Felmy: Right. If you see the decline, you've got decline in activity, decline in cost, which gives me an opportunity to promote your product, Performance profiles for Major Energy Producers—which is a great document and EIA is to be complimented for it, where they give good cost data on finding, lifting, and so on. And so I'm really looking forward to the 2008 edition because I think that will show significant changes. I disagree a little bit about demand. Demand has dropped from 86 million barrels a day to maybe 84/85 a day, 1.5 percent. That's much less than what we experienced back in '85/86, in that range in the early eighties. That's relatively small, and it could bounce back. And so I think that companies recognize that if you have recovery, if you have world so on, if that small of a demand decline led to this small of a price decline, or small increase in demand for oil led to a price increase, a lot can change very quickly. And so they are going to be paying very close attention to that.

Mr. Bawks: Do you think that would be a good reason for them to continue to invest, to anticipate that?

Mr. Felmy: Yes, that means you've got to invest now to produce very quickly. It takes a long time, so it's something they've got to be careful in terms

of timing.

Mr. Sankey: Yes, we saw in the 1998 price cycle the companies that cut capex at that time amongst the big companies which really Shell was a notable example of a company that cut back on its capex. To an extent Chevron as opposed to Exxon and Total that didn't cut capex, that kept spending through that $10 environment, were the guys who five years later by the time you got to 2003 had by far the stronger growth whereas you had a real crisis in terms of volume amongst those who did cut. So I think for the biggest guys there's an imperative to maintain spending through this down cycle. The reason we characterize oil as a boom and bust business because of the difference in the supply and demand cycles in terms of their length. Quite simply, I think it's why oil has always been boom or bust. We now have a supply cycle that is probably seven years from the decision to go and drill to the first oil at best, and we have right here a demand cycle that is triple negatively aligned. You're coming out of winter. You're in a dreadful economy, and you have the biggest unknown which is the secular shift against oil. I mean, it seems to be a policy imperative to anything but oil. That becomes a very tough environment for the price. Quite simply, we have some lagging supply growth. You'll notice that U.S. oil production is currently rising. That's from projects from the previous supply cycle still coming on stream at the same time we've got this demand downslide. And it becomes once again a question of balance sheet. Who can actually tough it out the longest will be really essentially, we assume, the winners, assuming oil demand growth in the future which is probably the biggest consensus assumption that worries me, that we will definitely have oil growth in the future, oil demand growth in the future. But that goes back to a question of

how successful this administration is in terms of getting people off oil.

Ms. Foss: I think there are a couple of other things, too. Size and scale of project and how it's financed. So in the LNG world, for instance, there's a lot of discussion about this because once you start at LNG trains, you can't really just stop. If you have project financed investments, and unless you're willing—you really have to just work through the pain of restructuring that somehow. The cash flow is imperative so you continue to move the project forward. So there's some of that. And then I sort of think there's kind of a PR thing, too, given all the attention on investment trends in the industry. I sort of feel like everybody doesn't want to get caught under investing and having all that to deal with on the other end. I mean, we all know that overall the industry really has to work hard to communicate, build its image, make its case, all that sort of thing. So I think if anything the experience, certainly in this cycle should have been instructive in terms of how uncomfortable it is to get hauled up here and put on a panel and scrutinized for your investment.

Mr. Sankey: I think the people who are most concerned about under investment are the Saudis, and they tell you that. They are very worried that if we stay at very low oil prices, we are going to get a sling shot. We're going to get dramatic underinvestment. They're going to have an even bigger problem again because the Saudis worst nightmare came true which is $147.50. It's not $20. They can handle $20 better than anyone. But $147.50 has essentially changed the policy agenda in their biggest consumer to anti-oil, regardless of price now. So it doesn't matter how cheap gasoline gets. The fact is you don't want gasoline anymore. And so essentially by losing control of the market—which actually they did by not having the refining capacity to control the market

anymore, they found themselves in a situation now where they're much more worried about how low prices stay than the potential effect of that to be that we go back up to $150 again which will further exacerbate really the global shift away from oil. I mean, we're really seeing the 21st Century as being—the shift from the 20th Century to 21st Century as being the death of oil, and the end of the oil era. And we don't really know what the future holds, but it's probably not going to be an oil century. That was the 20th Century, and that is the biggest threat that the Saudis face. And what they need is to really keep prices low and with less volatility now in order to re-encourage the future growth that we get in the economy to come in an oil driven way rather than an alternative fuel way. Bizarrely, the Saudi oil minister the other day was saying that he felt we needed high prices to encourage biofuel production as well. One of the three points he made, which completely stunned me. I didn't know what he was talking about. It's also funny that we now have Obama saying we don't need a windfall tax below $80 a barrel which was his statement late last year, and the Saudis saying we need $60 to 75 a barrel which was Naimi's statement two weeks ago. So ostensibly the Saudis now have a lower price target for oil than the U.S. administration does which is the kind of era we live in.

Mr. Bawks: Can the majors continue to spend at the rate that they've been spending if prices stay around $50? Do they need prices to get up to $60 or $70 to keep spending?

Ms. Farrell: In some of the work we've done looking project to project for example, there is a big break at $50. We've run all these projects, maybe 100 projects, at $30, $40, $50, $60, $70 just assuming it stayed at that rate going forward, and you do see a very large break in the bigger projects below

$50 a barrel. You wouldn't shut them in if you were in them. But our real question was if this were the price and cost structure would you start new? And the answer is probably no. You're just not going to get the internal rate of return that would make sense for public companies to do. So $50 is pretty important or the expectation of $50 is important. And that's the other thing. What are these boards of directors and these executive management teams using as their pricing going forward? Perhaps you can comment on that, Paul.

Mr. Sankey: Yes, I think it's very elegant that the market has settled at $50 which exactly as you say we would say is around the marginal point of pain. So we would find as you'll see in the quarterly results that are coming out for the oils that Hess will be losing money, quite significant amounts of money, so it's break even, which is really simply cash from operations as against its capex is above $50. It's probably more like a $60 or $65 oil price environment that it needs. It actually lost money in Q4 when we had $60 oil. So you know that it's probably even higher than that actually. Conoco in the U.S., Conoco Phillips in the U.S. Rockies will lose money in the current price environment which is around $4.50, Henry Hub, about a $3.50 Rockies gas price. And then some other names for example in my space, Occidental or Exxon Mobil are easily profitable below $50. So I completely agree that the number is around the $50 mark. In terms of project costs, I can show you a similar slide which hopefully illustrates the point on an individual company basis. This is just showing that Canadian heavy oil sands needs $100. These are a number of different projects. This is Angola deep water. We think it needs $41 on average, but you can see several of the projects need more than $80 to be developed. And this is the biggest uncertainty that we have is how costs react

to the current environment. What we've got on the left there, the line is the supply of ultra deep water rigs going forward. The various colors are the demand for those rigs at various price scenarios. So the blue is if we stay at $40, arguably you're going to have—the light blue I should say is $40 oil demand for ultra deep water rigs. Really because of this, the fact that you're not going to develop ultra deep water projects unless we get higher than $41 oil in many cases. So what we've got there is really a potential significant over supply of rigs going forward which will bring down costs, which will then tighten the market on the supply side. Wall Street equity investors are long oil, were buying oil, because it self corrects. We have a world of tremendous uncertainty. We have too many banks forever. My head of securitization research told me that she believes there's no equity value in any bank in the U.S. right now. We don't know if you've got too many retail stores, but what you know with oil is that at least however deep the cyclical down size is it will self correct. And this is really the sort of slide that talks about—equally most of us are convinced that once we are through the cyclical down turn we're going to be in an inflationary environment. And again, oil protects you against that. So the market really is staying long oil despite what looks like a very challenging environment right here.

Mr. Felmy: And if you would compound that, I think the $50 is interesting because that's about what your finding cost averages out in your FRS. So I wouldn't disagree with it. But the added challenge is not just the cost and sales looking forward, but it's a political environment. Because in addition to what we're facing in terms of challenges, and break even, and hurdle rates, and so on, we've already had the administration come out with a budget

that takes $80 billion from the industry. And then if you add on cap and trade potential, it could be another $400. So these are very big numbers in terms of how it will affect your ability to invest or ability to be able to perform going forward. That's one of the biggest uncertainties. And finally, just the whole access uncertainty. What will happen with the Interior's efforts and so on? We've seen some leases delayed. We've seen R&D delayed, and then the five year plan delayed. So that's something that companies have to deal with in terms of looking forward to make those investments.

Mr. Bawks: Let's talk a little bit about how do companies make the decisions? When they start saying we're cutting capital spending by 20 percent, 30 percent,how do they decide what is being cut? And I guess to add on to that, at what point are we going to see these cuts affecting current production or is it already affecting current production?

Ms. Foss: It's a mystery of life. It would be wonderful to be a little fly on the wall in a boardroom these days and try to see how people wrestle with this because I think corporate cultures start to kick in pretty hard. And people cling to things, especially if it's something that we had to compete hard to get into. There is a huge reluctance to let go of projects. And so the more hard-nosed corporate environments, its numbers and tolerance on the project, if you can delay it, if you can refer it, if you can stretch out a program or something like that, depending on your lease conditions, service contract arrangements, your money, all of that sort of thing, but I think a lot of it is really sort of management personality, board personality driven to a large extent. That's just an almost gut feel really because it's so hard to know

Ms. Farrell: Talk about capex versus opex. I think that's an important

way to look at it. Very little gets shut in. At these prices at $50, you don't shut things in in an oil project. What you do is delay new projects. And there are two sides, of course, to any investment decision. One is the price and the other is the cost. And there's also the anticipation that if you wait, not only with the price rise, the cost will drop. So there are lots of incentives to put off new projects. That's on the oil side. So what you are doing is creating from the company's standpoint a portfolio gap coming up. So you're not investing at the same rate which means several years down the road indeed there's going to be a portfolio gap. On the gas side, the U.S. gas side, which is an entirely different animal. I think it's worth discussing a little bit, and you all probably know more about it than we do, but the huge drop off in the rigs, and it hasn't finished yet. And this is a highly rig intensive business. You have to keep drilling or the production drops pretty quickly. What is a little less known I think is that if you look at the—and this is the on-shore wells—if you look at the on-shore wells, there's a wide variety of productivity amongst the wells. So if you knew which were your best wells, and there are hundreds of companies in this business, you could cut hundreds of rigs and only affect—it's really an 80/20—only affect a small portion of the production because it was the $100—not the $100, but the $8 gas price which brought in all these extra rigs. You could cut an awful lot of them and make a lot of on-shore drillers really miserable without affecting the productions that much. So that's going to take a little while to shake out as well. The other thing I think that's worth mentioning again, back to the global side. A lot of re-gas terminals were built around the U.S. before we had the tremendous increase in unconventional gas production, thinking that we would have to have LNG. Well, we're going to get LNG. Unfortunately, it's going to come this year

when we don't want it. The two biggest LNG consumers in the world are Japan and Korea. They account for about 55 percent. Their economies have dropped dramatically as you know. The demand for gas is down. And it's down in the same year in which they already had big new contracts coming out for contracted LNG supply. So there's a certain amount of—a good amount of LNG— spot LNG that they took in 2008 that now has no where to go. As Michelle said, you don't shut down LNG plants. You keep producing so it's going to be produced. And there are only a couple of places it can go. One is Europe, and the other is the U.S. So there is going to be an influx of LNG into the U.S. market which is going to put pressure on prices in 2009 even though there's no demand for it, we don't need it, but it's coming because we have storage. It can go into storage, but it's still going to keep prices under pressure.

Ms. Foss: There is a stress test for the gas business on the way this summer for sure. I don't know if it came up in the gas panel yesterday, but $2/2.50 could be in the future. So there's a lot of thought and talk going on about that. I think the general views on gas are that we're long on gas. The problem is cost. I think the capex/opex split is a good point. I think it applies to the U.S. gas business as well. The big question on the gas side is if you're a shale gas producer, that's been your business, that's your niche, your specialty, what's your tolerance in that play given the conditions that are out there and there is a real disparity when you look at the folks who have come into the different shale gas plays depending on where they are in terms of acreage, what basin they're in, how much they had to pay to get in, how hot their money is, all of that sort of thing. So that is, I think, causing a lot of heartburn, is possibly the right word for it these days. And at the same time, when you look

at what was accomplished in the shale gas business, never mind the scenarios on LNG and what could happen with that, when you look at what has been accomplished on the shale gas business, this is sort of the best of times and the worst of times because we have proven yet again—this is what happened with coal bed methane a few years ago after the big burst of drilling with Section 29 and so on. We know it's there. We have a tremendous resource base. It's gas in place. That's the challenge. What does it take to get it? Can you get to the technology plateau that will allow you to be more flexible when you've got such an intensely competitive environment with regard to your commodity price? And I think that thinking is really once—as people think through how things are going to get sorted out in terms of the industry, organizational side of things, I think the thinking is really focused really hard on a sustainable natural gas business model. That's where everybody really has to really concentrate I think.

Mr. Sankey: Yea, I agree with what you're saying about the board rooms. And typically the bigger companies will have a Monte Carlo approach where they'll run economics at various scenarios and then they'll just prioritize what works best in a multiple series of potential oil price outcomes. Clearly, for the U.S. gas it's I think proved very obviously that it's a cost of capital business over the past five years because supply, unlike oil where I mentioned the higher the price the less supply you had, you very clearly had a supply response to high prices here. And you now have because of these shale plays identified drilling opportunities, actually a lot of wells that need to be linked to pipelines even overhanging. So there's this tremendous overhang to combine with the LNG story which is obviously part of the supply cycle that we talked about being

misaligned to the demand cycle that leaves us only saying that the hope for U.S. gas is that everyone is so negative, that the consensus is so worried about the prices that somehow we'll be wrong. In terms of—you mentioned the impact of lower spending on decline rates, we were talking on the podium before we started, I think that's the biggest single controversy that we have on Wall Street regarding oil and gas is that just what the impact of the slower spending is going to be both in terms of the very rapid decline rates that we have in the U.S. gas production, but also as I mentioned the issue of Venezuela, the issue of Russia, and the issue of just how much lower spending is going to feed through. It's a very rapid oil decline rate. I don't think that—Susan mentioned that the PFC has done a big study on this—I don't think we're 100 percent certain how it plays out. We know the consensus is it's going to be a very dramatic effect within the next two or three years in terms of how rapid decline rates are. And that again is why the market is pricing a slingshot in oil prices. The equity market is actually pricing the oil equities above the current strip. So when we do that calculation—which I'm going to illustrate to you right now. What you can see here is this is the future strip over the past six years. The red strip is the current strip, and then the dot is the price that we calculate as discounted within the oils. So you can see that right now on the red strip, the strip is at about—stuck in contango from $55 up towards $70. That's on March the 4th of 2009 is the red strip. We calculate that the oils are actually discounting $80 oil at just about the same price they were discounting a year ago when you had the blue strip which was over $100 a barrel. So you can see that the market was aggressively discounting the $100 environment, but now is equally doing the opposite to the current environment. And that—I think the

single biggest reason for that is the effect of decline rates as a function of lower spending, that and the potential for inflation because we've only got two places to go in inflationary wealth, probably gold and oil, gold and hard commodities, gold and hard stuff. And a lot of the hard stuff doesn't work in deflation. You don't want to own a car or a house in a deflationary environment, but you do in an inflation environment. What you have with oil is something that self corrects in deflation and then is good in inflation. That's why Exxon is five percent of the S&P 500 which is by far the biggest company in the world.

Mr. Bawks: We talked earlier about the various cycles we've seen in gas and oil, too. Is there anything that can be done to try to break out of some of these cycles, or at least lessen the swings in prices and investments, and surplus to tight markets that we've seen? Are we just stuck with this? I mean, what can be done?

Mr. Felmy: Well, there's not a lot. I mean, when you have a market that has fundamentally low supply and demand price elasticity's, one expects that small changes in demand for supply lead to relatively higher swings in price. We saw that back in the 1980s when we saw demand down sharply in the early eighties, and you saw rigs drop every bit as much as they did—although there were much more rigs going. You had over 4,000 rigs running back then. We've seen that happen in the late nineties. We see it happen again. And so up or down, those are just the nature of the tight markets that you have.

Ms. Farrell: There's also the time lag, I must say, about the length of time it takes to start working towards a correction. So for example, since 2004 the OPEC countries have added three and one-half, four million barrels a day to capacity. Well, that's like a train on a track. They don't really need it now, but

it's there. A lot of it is already built. A lot of it is about to be finished. And that is going to dramatically loosen up the market. It's like we were working at—it's like we had a manufacturing facility in the global oil economy in the last couple of years and we were trying to run at 98 percent capacity. Any little thing that happened just had tremendous price implication. Well, now they've added a lot of excess capacity that's going to be sitting there for some years before demand catches up again. Same thing on the cost side. We talked a lot about the oil and gas companies, but there is pure made of structure underneath that and people who service those businesses. And they took a long time remembering the eighties, deciding to invest in new capacity. Well, a lot of that new capacity which was going to alleviate the cost pressure is coming on in 2009, '10, and '11. So you have these long cycles of building drilling rigs, or off-shore platforms, or whatever, which exacerbates the problems of this business, and makes it a real boom/bust because by the time you make your capital decision and it comes out, you may not be in the demand environment that actually needs it.

Ms. Foss: I think to the extent that—speaking to the natural gas side—the best customer is a 24/7/365 day a year customer which we have fewer and fewer of unfortunately because of the impact on the industrial base from higher gas prices a few years ago, and then general economic conditions and that sort of thing, to the extent that there's more stability that could be generated through an economic recovery, a style of economic recovery that would provide a robust industrial base. I think that would help hugely on the natural gas side. But I think as Paul's vigorous comments on the outlook for U.S. policy and a lot of things that a lot of us are concerned about, it's not clear where that's going to

go. Is a natural gas feedstock industry a welcomed industry? Gas for power generations, sure, everybody knows that, but that's a fairly volatile environment as well. So I think for the gas side the erosion of the industrial customer base which fortunately seems to have stabilized a little bit. Lower prices may help with that. But I think that has helped some. I mean it is coincident with some of the rough going what seems to be increased volatility in prices and demand on that side of the business.

Mr. Sankey: Yes, I think there's a natural volatility in oil and gas which we have spoken about because of the difference in the supply and demand cycle. The efficiency of the industry where we say that if you stop producing gold tomorrow, there's 120 years worth of inventory. If you stop producing oil tomorrow, you've got 55 days. People forget just how just in time the industry is and how it margins things out so that suddenly as you referenced we go from $147 to $47 within a year, makes it pretty hard to plan. What I know and what we're really here saying repeatedly is the government is going to make it worse. The more the government gets involved, the more they screw it up.

And the fact is that what we're going to see here is an unknown outcome that is essentially set by what we call the conspiracy of ignorance about oil. And the conspiracy of ignorance about oil basically was a phrase I took from a book by a woman called Lisa Margonelli called Oil on the Brain, and she had come in ignorance of oil by her own admission and decided to immerse herself in the subject for two years. And in the process she started at a filling station in San Francisco and ended up living for six months in the Delta of Nigeria. And she came back and her conclusion was that when she started in oil she assumed the oil was a conspiracy between Exxon Mobil, Hugo Chavez, the

Russian mafia, and Dick Cheney, or whatever. Her conclusion after two years was that the conspiracy in oil is a conspiracy of ignorance on the part of the U.S. consumer. And that people just don't get it, and don't bother to get it. They just assume there's some other conspiracy that's causing it to be held up at the pump. And the problem with that is that the agenda is then set by the U.S. consumer because that's the voter. You then end up with government policy that is essentially set by ignorance. And so I don't know how this is going to play out. Again, that's why we're here.

You mentioned to me you don't think there's a friend of oil in Washington, D.C. right now. Exactly how that plays out is going to be, I think, something that ultimately has volatility, and we'll see. If you did it well which is to add a gasoline tax simply as supported by Exxon Mobil and gently raise the price of oil here to a price that better reflects the risk and challenges of oil dependence, you could probably simplify the issue and improve the overall outlook. But this idea of gasoline tax being political suicide, again going back to the conspiracy of ignorance idea means that you're going to go down a cap and trade route which we support as a bank because we want to trade the credits, but I think in all reality intellectually we struggle with it as whether it's really the best idea. It's been a very challenged market in Europe, and there's no reason to believe it won't be here. And ultimately I also believe very strongly that these additional taxes, although theory you would say a gasoline tax is regressive, the cap and trade tax is going to be worse. So I do appeal to you all to get out there and try to inform people to the best extent you can. What people also forget is that high oil and gas prices are good for the U.S. economy. This is the third biggest oil producer in the world, and the second biggest natural gas

producer in the world. When we did a capex study of global industry we found in the U.S. that 25 percent of U.S. capital expenditure by companies is in oil and gas. The next biggest sector with eight percent is the auto industry. So don't underestimate how attacking the oil and gas industry is going to harm the long term U.S. economy. I think it will.

Ms. Foss: There's a conspiracy of ignorance on natural gas as well, but I'm not going to be so liberal in naming names. Let me show everybody one thing here because this usually makes an impression on people. There's been a lot of stuff that has been advertised about the amount of natural gas we have in our resource base. I made a remark earlier about that. The problem is that a lot of it looks like this. This is from one of our guys at the Bureau of Economic Geology who figured out how to make thin slices of shale cores so that under an electron microscope you can actually see the fractures that exist. So this is nanoscale—or what one of the guys in the industry calls nano Darcy business environment. We think you can produce gas out of these kinds of fractures. But in terms of the technology plateau that I referred to being able to get some of the gas that's talked about in some of these basins, what you have to do is conquer this environment. You cannot see this with the naked eye. You can't see it under a conventional microscope with a standard thin section of the type that people use when they're describing cores and trying to figure out what's going on. You need a whole new reservoir engineering paradigm to be able to get this stuff out of the ground with sustained volumes.

Back to the problem with the decline curves. I think what everybody knows is that depending on where you are in the shale gas business you drill a well; you end up declining that well pretty fast. It ends up being a very drilling

intensive business because of that. So new drilling techniques, new reservoir treatment, new materials for fracing, given all the environmental concerns as well about this resource, I think that's important. But this is like Nirvana. When people talk about 500 trillion cubic feet of gas in place in Haynesville, this is the kind of thing that we're talking about. It's there. We can use it. I mean 500 TCF of gas in place in a basin like that for the United States is an amazing asset base. So somehow, again, forward thinking, thinking about getting through the environment that we're in and into a technology realm where this can be developed at a time when people have just learned that natural gas is a hydrocarbon. And that a hydrocarbon is a fossil fuel, and a few other bits of education that has happened lately. That's the challenge is to reap that harvest and get it into the market and be able to do all the things with it that everybody talks about.

My biggest concern on this side of the business, from the natural gas side of the business is that certain policy actions will get ahead of where we are with this. You start putting pressure on gas because it is the fallback if you're trying to solve other things, emission targets, or whatever it is, and then you start putting huge pressure on delivery and you get the price impact as a result of that. We've been through that already two or three times in the business. This is reality. This is what it looks like. We know it's there, but it's another universe. We have to figure out how to get that universe.

Mr. Felmy: That's an excellent point. You could also say for the Marcellus shale play which is Northern Pennsylvania where I'm from—and I'm happy to see that they are actually starting to develop it. August 27th is the 150th anniversary of the oil industry. And it's good to see that they're talking

about that because I remember as a kid growing up in the sixties through North Central Pennsylvania up in the mountains they had seismic trucks going up and down constantly around there. And I often wondered what they were looking for. There's no oil here because Central Pennsylvania you've got coal to the east, hard coal, you've got oil to the west. Nothing in between. So why shouldn't there be something there? But it's high cost. They knew it was there for a long time, and that defines the problem. So if you're going to combine it then with policies that are going to take taxes from the industry, or other types of regimes to raise our cost, it's really going to push these two things together. And it's not proper policy in terms of trying to meet all your goals.

Ms. Foss: And it's a shame because it's an opportunity to think creatively about some of this. And I kind of wish that we could do that. Find a way to have that sort of creative conversation about what it is that we think we own, and the best ways of being able to develop it and balance all of the other things that we want to try to do. But that keeps us in our jobs, I guess.

Mr. Bawks: I think this is probably a good point to have our summary. As I ask them to each kind of summarize what do we need to take away from this session? What do policy makers need to know about this issue? So let's go ahead and have each of them provide us with their summary.

Ms. Farrell: Thank you, Bruce. I'm going to go back to the holistic discussion of oil and gas within the global context for just a minute or two. This is the approximately $500 billion spent in 2008 on exploration and production. So this is oil and natural gas globally. And if you look at this as I mentioned earlier, the top NOCs spend about one-third, or thirty percent of that. The top NOCs being national oil companies, the top international oil companies, so

that's your Shells, and your Exxon's, etcetera, top twenty. Down to companies about the size of Anadarko or Encana. They produce about 35 percent. And then you have hundreds of other smaller companies that produce another 35 percent. So it is a global business. So some of the policy comments made certainly in the last year about it really doesn't matter what we do, well then this whole context how much we produce is important, but it won't be the ultimate driver.

The price versus cost issue, the upper left hand side is what happened to oil prices since 2000. And the reason I've got these little boxes on is I like to use them as reference points. So in the first four years of this decade the average price was $28.31. And then in the period during which a lot of the new projects are coming on now the average price was $59. So the environment was such that people made go ahead decisions in a $59 world, and then the price spiked up. And then it came back down again. But at the same time cost base was rising dramatically. Now it's very hard to feel sympathy for an oil company when they say we can't make any more investments because the cost base has gone up, but it did go up. In fact, return on investment was dropping because of this very thing. So on the left hand side is just one of the models that we used that looks segment by segment at different costs of large U.S. Gulf of Mexico projects. And you'll see that in a two year period the cost base rose 52 percent. And that is because there were bottlenecks in the system. So the contractors providing different segments could ask that much more money because they were backlogged so much. So you had cost going up as well. Now you think costs are going to be coming down, and that contributes to what I mentioned about the economic driver to just wait a year and see what

happens. Bruce showed something similar to this. This is another look at E&P spending since 1982. In fact, it was very similar to this except we have a forecast on it about what's going to happen. We think prices are going to drop—E&P spending is going to drop dramatically. People have said at the beginning of the year maybe they'll cut about 13 percent. It could be based on history somewhere between 29 and 30 percent cut, excluding some of the major NOCs. So this is an IOC, international oil company, look.

Now what's going to happen in the industry? If you just go back and look at the last big consolidation we had. This is a view in 1995, and you have some companies you recognize there like Unocal for example which no longer exists, Enterprise, and this is the same set in 2007. So there was a big change in the number of companies. Now some new companies started, of course, but this is just looking at the ones that were operating in 1995. So we think, again, perhaps in 2010 according to Paul, there's going to be a big shakeout as the haves start acquiring the have nots. Now there was a residual impact with this which I don't have any slides on, but these companies tend to be the big explorers. They're not integrated companies in general. They often are the e-part of the E&P companies. So you do create an exploration hole when some of these companies disappear. The decline rate question. At the same time people have been spending a lot of money because the price rose so much, we have been unable to arrest the decline rate in non-OPEC. So we have, excluding FSU on the top, because the FSU base had been neglected for so long that the decline—when you started putting money into it it changes the look at the other non-OPEC. But you will see over this period when prices went from the average of $29 up to an average of $100, the decline rate of the

existing base continued to increase. So think about it. You would we putting whatever you could into your existing base to get out whatever you could at those prices, and did, and still the decline rate continued to increase. So this says something a lot about the geology of the existing non-OPEC fields.

Second one on decline rate. This is a model of all the deep water projects in the world by year. So whatever country they were, as of the lowest slice here is 1987, and the top one is 2008. So we just took all the projects that started in those years and added them and put on their production profile. And as you can see the red line is 2009. There's about a 12 percent annual average decline rate of the deep water. The other thing that is really pretty interesting if you just count down four from the top you'll see that you had a plateau of about—and the fourth one down, four years, and the next one up is three years, and the next one is two years, and the last one is one year. So you're using technology—two things are happening. One is you're using technology to bring forward your production as much as possible which means you have a much steeper decline rate. The second is you found the better fields first. Like any other play you found the bigger fields with the longer plateau earlier in the cycle of this play and therefore we now are going to have find an awful lot more deep water to replace these fields that are already coming on.

And finally, one last view. This goes from 1995 and it's our projection out to 2030 of the liquid supplies outlook, and a few lines on for demand. Not a demand forecast. So what you have here is a pretty standard view of non-OPEC—and liquids is the oil, the crude as well as natural gas liquids added in which is in plateau now. And somewhere around 2020/2022 starts a very

gradual decline. Then you have OPEC liquids which is the OPEC crude and their natural gas liquids. And then on top of that we've got tar sands and then biofuels added on. If you look at a demand layered on top of that—say we're in a low case scenario and the demand—this is potential. This is what could be potential. So we have demand lower than supply in 2009, which it is. We've got inventories we have to work down. But you also see that you start getting to a period of increasing pressure on prices somewhere after 2020. And we think now—you'll see an IEA forecast for example, and what some companies do or some organizations do they make a demand forecast. They've got the non-OPEC. And they simply plug the rest of it with OPEC. It must be there if it's Middle East there must be enough oil to keep producing for years, and years, and years. Well, we've gone and modeled every country and we have a slightly different view on that. But again, what we're saying that from a policy standpoint this has just dramatic implications of where the oil is going to be coming from, of the inability of non-OPEC, no matter what the price, to get more out than is geologically possible even given some technology gains. Even given biofuel increases and tar sands, and so on, and the climate change issues associated with them. So this has dramatic influence on policy. The question is with—as we said slightly, not huge decrease in demand, but nevertheless demand response to the current economic environment and the supply response, we've now moved through this inflection point out to a little after 2020. And hopefully it will not have moved outside of the vision of the policy makers because this is going to be something which we think is going to happen. And that can only be moderated as you work on the demand side. Thank you.

Mr. Felmy: Well, I think that last slide is especially helpful because what we have in Washington right now is a disconnect with policy with some facts. That clearly laid out that oil is going to continue to be used because it's so tightly linked to the transportation sector. Much discussion is being made right now about comprehensive energy policy that includes energy efficiency which is clearly important. Alternatives, and its all talk about solar, wind, and geothermal, but it's also talked about as we're going to have all this wind that's going to reduce oil use and oil imports. And no one has explained to me how that works because we don't have a fleet of electric cars, and the 250 million cars out there run on petroleum. But yet what we have is the policies that are basically we're going to take money from the oil industries and spend it on alternatives. And so this presents a very real challenge that on top of the difficulties we already face and have been talked about in this session, we're adding further government challenges on that. And I think it's great that we expand solar, wind, and geothermal, double it, but that takes it from one percent to two percent. And right now we have 63 percent of our energy from oil and gas. DOE's forecast, which is not inconsistent with what you've seen there, says that by 2030 it will be roughly 56 percent, not including biofuels. And so what we really need to moving forward is let's look at what this reality is and how can we actually help the motoring public in terms of oil and gas because those 250 million cars are going to be around for a long time. And I hope we do have electric vehicles coming on. I hope we have a fleet of Volts and plug-in hybrids and things like that, but there's always unintended consequences because what's the likely battery technology for them? Lithium. Where in the world are 50 percent of the world's lithium reserves? Bolivia. So what we

substitute is imports of one thing from an area we're concerned about with imports from other areas potentially. And so let's think all of these things through in terms of the potential on unintended consequences that could come about.

Ms. Foss: Just too kind of add to what Susan and John just said, thinking globally again, and trying to kind of be a little bit more optimistic perhaps, or encouraging, I think that Paul made a really important point. It's not just in the parts of the world that we worry about where what governments do matters. It does matter here as well. It matters in the U.K. It matters in Canada.

One of the ongoing debates is whether if governments provide workable investment regimes, do you see results? And in the work that we've been doing with the World Bank on national oil companies, for that cluster of entity especially the gate keepers to oil resources outside of the known parts of the world, the major consuming areas like the United States, there really does seem to be something to this. These are the best reporting national oil companies. In our view, the most reliable in terms of data.

First of all, they share some information on reserve replacement rate. And what we did was come up with a set of scores that attempts to rank the quality of investment frameworks in the different countries where the companies are based, their own governments in other words. And so there is a story out there. Governments that make an attempt to try to think about how to sustain long term investment in the oil and gas industries, provide reasonable rates of return, reasonable tax environments, more transparency with regard to regulatory regimes, other things, do get results. And so I think this is something

useful to think about as far as what the future might hold, what we might hope governments do as everybody comes out of this cycle, what we need to think about ourselves in terms of maintaining a robust investment climate here precisely because of what John said and what Susan showed. This is reality. Reality is we use these fuels and it's rather fearsome to think about where we would be if they weren't available and can't be delivered during whatever period of time that we have as a transition to go through. So we are trying to get people to think about this more.

The quality of investment framework really really matters. How well the hydrocarbon sector is put together. What the tax regimes are like. Whether companies operating in them are able to commercialize the way they need to. Whether there's transparency on the regulatory side. Can they form partnerships, viable partnerships? All of that really does matter.

And I guess the other point that I wanted to make, back to the natural gas story here for a minute. We've all been arguing about, I guess, and talking about the competitive position of natural gas relative to other fuels and we've tended to argue this point mainly in the electric power realm and debating things like natural gas and fuel oil switching at the burner tip, and stuff like that. The green lines are all of the Btu equivalent, petroleum products. The red line is Henry Hub, and the blue line is the real calculated ratio which most of the time is lousy. If you're in the gas business you really have to wonder what business are you in. Gas on gas competition is not any fun. This summer is really not going to be fun. And as I've said before I wonder if there's not an opportunity to rethink things a little bit. We really couldn't think about gas as a transportation fuel at $7 or $8 or $10, but at $5 or below maybe it's easier to

think about. And I'm not thinking about direct use of gas. I'm thinking about the liquid fuels businesses. And I'm wondering if out there somewhere there isn't a viable commercial test for gas to liquids here in our country. If we really think we're long on gas, if that's where we really think that we're heading, and we think that we have that kind of a resource base and we think we can get it, then why not think about that as far as our own transportation fuel security, as a bridge to whatever the other thing is out there, the smart grid, smart car environment which is going to take a lot longer to put together than I think people think it will. So I would like to see some discussion about that. Not kind of the story lines that are out there right now with regard to natural gas as a transportation option, but maybe some more creative thinking about what we might be able to do with the natural gas resource base to get there.

Mr. Bawks: Paul.

Mr. Sankey: Yes, I mean I would very much back up particularly what John was saying in terms of policy makers which I guess comes back from the NPC study which Deutsche Bank was involved with through Adam Sieminski which is essentially that we needed oil. We need the demand restraint. We need the technology. We need the natural gas, and we need the supply side. And I just encourage policy makers not— as you've mentioned with lure of untended consequences—to go too far down any given path whether it's excessive tax on the supply side or excessive tax on the demand side. And just to take the importance of the industry to the U.S. economy very seriously and to make sure to the best extent possible we maintain a balance here. We're all pro-efficiency, but at the same time I think we recognize the supply challenges we face. And it would be no more simple or complicated than that to my way of

thinking.

Mr. Bawks: Okay. We have a few minutes left so if anyone would like to ask a question there's a couple microphones. You could come up to a microphone and ask a question. I guess if you're ready go ahead.

Speaker: Great talk. Thank you very much. I was curious to hear from each of you on the Saudi oil minister's comments. It was mentioned briefly by Paul as being ununderstandable. About a month ago at this CERA conference in Houston he made some explicit threats, and I thought it wasn't covered very much in the press at that time. It was—Wall Street Journal was four, five, six, or something page. But if each of you have a comment on what you think he's thinking or Aramco policy on investment would be in general would be appreciated. Thanks.

Mr. Sankey: I wasn't invited to the CERA conference. I'm sorry. I don't know what he said.

Ms. Foss: Neither was I, but they keep drawing lines in the sand.

Mr. Sankey: What did he say, I'm sorry.

Speaker: He said that—and he was talking to the U.S. Houston audience in general. I wasn't there either. I just read about it in the newspaper. But he said—he threatened by saying if we see—we're not going to invest. We're going to under invest and we're going to cause what is going to be called the slingshot scenario because we're going to under invest if we see movements towards renewable in the U.S. And he didn't seem to be—it seemed to be so unusual from the usual very politic presentation. And as you mentioned, Paul, that you heard him say comments that were ununderstandable. So it seems two for two at this point in the last couple of

months, and I wondered what your thoughts were.

Mr. Sankey: I just noticed that previously the King had said $145 or at $145 he said the price was too high. And then at $50, he said we really want $75 oil. Consequently, Naimi said they want $60 to $75. So I really noticed that he was kind of lowering the price target on what they expect they can achieve in terms of the oil price. And then as I mentioned I was pretty amazed in the comments I saw that he said we need more investments in biofuels which seems to be counter to what you said he said at CERA. So I'm not sure how to square that circle I'm afraid.

Ms. Farrell: Let me just throw out a couple of facts, one fact, which is how much they have invested in the last four years. It's such that the excess capacity is going to go up dramatically which they're well aware of as I said in the next several years until demand catches back up with it. So that investment was made. In fact, some of the projects have had to be delayed because they don't need more than 5 million barrels a day excess capacity up from 1.5 which is what caused the really high price spike.

The other semi-fact is when we talk about countries; we tend to look at the country balance sheet when we're looking at the underlying desire for prices. And if you at the country external reserves and the ability to survive at different prices of the OPEC members you see a pretty broad range. You see Venezuela and Nigeria up in the nineties, given the social programs they have and where the money ends up going to as well. And you see Iran also pretty high. You get down to the Gulf countries and $45 and $50, they have been operating at a level which was pretty conservative. So they could run their countries at $45/50. I'm talking about operating running. They have reserves

that could last a month longer than that. So our interpretation is indeed—and this has been a very evolving thing. OPEC was afraid that at $70 that demand was going to crater. And it didn't at all. So they kept ratcheting up with a number they would really like. Well, then when demand did crater which is their greater fear. It fell much quicker than their ability to respond with supply cuts. I think what we're seeing is the internal discussion, a little bit more public than usual, about what number can really be sustainable for their economies, but which won't go too high, too quickly, so to hamper further growth. I think that's exactly what we're seeing is the internal debate in a very quick changing environment.

Mr. Bawks: Okay. Let's go to the back. Please say your name and affiliation.

Lee: Hi. My name is Lee. I'm a blogger for the Wonk Room. My question is for John. I'm interested in how different stakeholders are working to influence the proposed realignment of energy incentives. What are API's legislative and lobbying priorities, and how do you feel about the alternative budget proposed by the house GOP last week?

Mr. Felmy: Well, I've been traveling extensively so I haven't seen it. So I can't give you any insight on that. I mean, our concern broadly taken is that in a period when we're talking about trying to stimulate the economy, trying to reduce imports, that the proposals to tax the industry are taking a step backward. Both the direct taxes of $31 billion and then the taxes on other provisions which our share would be another $50 billion is an $80 billion hit to an industry when what we think should be done is basically expanding access in this country, allowing leasing in areas to generate bonus bids and royalties.

That is a win/win. We've tried taxation in the past. This level of taxes is about what we experienced back in the Carter period when they were imposed on that. We saw losses of investment, losses in production, increases in imports. So what we would make a plea to everyone, and that's what we basically are doing, is telling folks this is what our experience is in the past and let's not repeat that mistake.

Mr. Copits: My name is Steven Copits (sp?). I manage the New York office of Douglas Westwood. I have a question about the bid/asked on oil companies that you have said the buyers are looking for $50; the sellers are looking for $70. That gives you from top down I think 28 percent or something like that gap. Do you expect the equity prices of the selling companies to decline by nearly 30 percent through to the end of the year to facilitate the M&A transactions? And if so, do you see that as a divergence from the general equity markets?

Mr. Sankey: Yes, I think that if oil stays low they're going to be in risk of bankruptcy and their share price is going to come under a lot of pressure. It's as simple as that. So either the oil price recovers to the point where these guys are justifying their $70 evaluation or their equity prices are going to fall. Our view is-Adam Sieminski does our oil price view-is that we average $55 next year. And therefore we think that that outcome—the downside outcome is the one you're more likely to see. But at the same time we recognize that oil is a tough thing to forecast and that's just our view. We only have two buyers in my space, Exxon and Oxy and that's just because they're the most defensive names against what we think will be pretty tough couple of years for the oil industry.

Mr. Bawks: Go to the back.

Ms. Quiner: My name is Elaine Quiner (sp?). I'm from the Department of Interior. And prior to that I was in Houston, I know Ms. Foss. But I have three questions actually. First, knowing very well how capital intensive all international projects are what do you think is the current credit crisis? What's its effect on the capacity to borrow money from big banks such as EBRD and so on and so forth? And what is the bank—those banks baseline judgment price in order to finance projects which are in the tens of billions of dollars? What is the expectation for prices? Second question I have regarding the partnerships which are currently you think viable for the IOCs in the rising power of NOCs? Are the PSAs the choice of partnership, concessions, other contractual agreements? What do you think would be the best for the IOCs to play the game overseas? And the third question is do you believe in Mr. Pickens' plan?

Mr. Sankey: I was thinking of an answer. The nature of the IOC, NOC is up for grabs. I mean, I think in Brazil we expect some sort of agreement which involves a lot of capital being put out by an international major in exchange for participation, or greater participation. The nature of the contract is difficult to second guess. I think it's going to be—it's essentially going to be a mix of all the outcomes, but the level of uncertainty at this stage makes it difficult to identify a major trend in that respect. I think we're still at the point where the dust is settling really as a function of the collapse of oil prices, and it's not clear how it will all play out in terms of whether we have more PSCs or more royalty type contracts being signed. Generally speaking the PSCs have held up pretty well to the high priced environment because it's kept the government involved, you know that you've shared the upside. And therefore,

you've seen less renegotiating of PSCs than you did of royalty contracts. So I guess the temptation now having learned from the experience of $147 oil will be that PSCs are the favored route for future developments. And they are the predominant type of contract in OPEC countries. So by extension, if the remaining oil is concentrating into OPEC, that's what we would expect to see.

Ms. Foss: Well, let me-on the NOC, IOC financing-let me just mention that the reason why we got pulled into the World Bank's national oil company project wasn't just because we were already doing work there. What they're wrestling with is how to lend in a lot of the locations out there that—where they think they should have a presence and where they haven't had a presence for a while—in the upstream businesses. And this is a delicate dance. It's always tough for these multi-laterals to go out and talk to governments about fiscal regimes, and investment frameworks because generally the host governments tend to feel like viewpoints are being imposed that challenge their sovereignties. So there's a lot of stuff that's getting discussed right now about how to do that in locations where it may be necessary for the bank, IFC, and other multi-level banks to step in and try to help sustain some certain governments and certain activities in places where there's a lot of vulnerability.

And with regard to the Boone doggle, Mr. Pickens' plan—he's a lovely guy, you know? Very popular chap. Natural gas is being used for fleet vehicles. That's already being done. The company he had bought, clean energy is a very nice business model. Lots of utilities do this. Lots of groups have pulled natural gas into the transportation fleet that way. Beyond fleet transportation fuel management which is a discrete business, broader application to the transportation fleet in the United States, or really anywhere,

has always been a challenge. It's an infrastructure constraint issue. I mean, do you go out and invest in a natural gas transportation distribution business? Do you force or encourage auto makers to design those kinds of engines? Do you do something else? The plug-in hybrid model seems to be kind of winning out in that argument. And all we're trying to suggest is that there are other models to consider. And if some of those commercial gas-to-liquids tests in places where natural gas feedstock is really cheap work and you can scale these things out, you've already got a petroleum fuel infrastructure that makes sense. You can pull the liquid fuel into that infrastructure and not have to come up with another way of delivering that. I think there are some alternative ideas out there that I would like to see discussion on and not have one idea dominating. I think that's kind of the bottom line.

Mr. Sankey: Yes, the most interesting model I've seen is Denmark where they have 20 percent of their electricity comes from wind. They have smart metering, and they balance the grid by putting electricity into the cars and taking it out of the cars so the cars become your electricity storage. And it works basically. Literally Denmark's not the biggest place in the world relative to the U.S.

Ms. Foss: And that's had a lot of influence on the ideas that Boone Pickens and others here have. But the good investment, and timing, and all that sort of thing is definitely a factor.

Mr. Bawks: If you've got a quick question and then we need to wrap up.

Mr. Parr: I'm Paul Parr (sp?) from CRS. You didn't talk at all about the gas pipeline industry. Can you talk just briefly about what has all this done to the health of the gas pipeline industry, and how has it affected their prospect of

that industry to continue its build out? And I'm thinking of things like the Alaskan natural gas pipeline and perhaps build out in support of new gas plants under some national carbon control policy.

Mr. Sankey: I actually cover the MLPs as part of my coverage. They've done actually very well given the demand environment. They've been pretty successful at managing the environment that we face. There's actually M&A in that area. We have more M&A news flow coming out as they begin to consolidate. From my point of view the biggest challenge is going to be whether or not the U.S. natural gas demand is going to stay as subdued as it is or whether we're going to see a recovery. And you mentioned particularly petrochemicals as being the biggest marginal level or area of uncertainty. The other issue from my company's point of view is again whether the government changes the rules regarding partnerships which would be a very big threat to them. But broadly speaking I think that the industry seems to me, given the scale of demand destruction we've seen, to be in pretty good shape actually. I don't think the Alaskan gas pipeline is going to happen anytime soon based on what I said about Rex Tillerson's least favorite government being Alaska. You can't keep changing rules and expect that kind of investment to get made.

Ms. Foss: I think Rockies Express is proving that you can build a pipeline in a low gas price environment, and guess what, it will probably be full. Everyone in the producer's segment will be impacted by that. But you can sell a lot of gas at lower prices and keep infrastructure like that full. So I agree on the MLP side. That seems to be the case.

Mr. Felmy: If you look at some of the new areas like Marcellus shale, you really don't have much capacity in there right now. Interestingly you've got

the oldest oil pipeline in the world located from Bradford, Pennsylvania right down through Marcellus that is a nice right away that you could put a pipe in if it were not for the fact that it's full of fiber optic cable right now. So I think those areas we'll clearly see some more development to be able to get the gas to market.

Mr. Bawks: Okay. We need to wrap up. Please join me in thanking our panel. Thank you very much, and thank you all for coming.