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“Dynamics of Recent Events in the Arab World: Framing the Arab and U.S. Responses”

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Energy Dynamics

Chair:

The Honorable Molly Williamson - Distinguished Scholar-In-Residence, National Council on US-Arab Relations; Adjunct Scholar, Middle East Institute; Immediate Past Senior Foreign Policy Advisor to the Secretary of Energy (2005-2008); former Deputy Assistant Secretary of Commerce for the Middle East, South Asia, Oceania, and Africa (1994-2004); former Deputy Assistant Secretary of Defense for the Middle East, Africa, and South Asia (1993-1995).

Speakers:

Dr. Herman T Franssen - Executive Director, Energy Intelligence Group; Senior Associate, Energy and National Security Program, Center for Strategic and International Studies (CSIS).

Mr. Jay Pryor - Vice President for Corporate Business Development, Chevron Cooperation.

Ms. Randa Fahmy Hudome - President, Fahmy Hudome International; former Associate Deputy Assistant Secretary of Energy; Member, Board of Directors, National Council on US-Arab Relations.

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Remarks as delivered

[Dr. John Duke Anthony] The chairperson for this session on energy is no stranger to many participants at these annual gatherings, the Honorable Molly Williamson, who's been one of the most versatile public servants focused on this part of the world, the Arab world, the Middle East and the Islamic world of any in Washington. Only one other esteemed American leader in the Executive branch I think has held more high ranking positions in numerous different cabinet positions and that was the late Elliot Richardson.

So were talking about Ms. Williamson having served in the department of energy, the department of commerce, the department of state and the American Consulate General in Jerusalem, having both Arabic and Hebrew. So we speak of this region sometimes in terms of two kinds of oil, turmoil and that other kind. This session is about that other kind.

Molly Williamson.

[Hon. Molly Williamson] Thank you so much John. And thank you to the National Council. It's a great honor to be included once again, in this annual policymakers conference. This is a time of great import and opportunity and I am delighted to see the organization and the industry looking so responsibly at these important issues.

In 2008, right around September of 2008, the world was consuming at historic unprecedented levels 86 million barrels a day of oil. That was unprecedented. We had in the ensuing 2 years 2009-2010 economic contraction of global and significant proportions bringing down global consumption of petroleum and petroleum products to 82 million barrels a day. And today we have already exceeded the historic levels of 2008. We are at already more than 87 million barrels a day, as a planet, that's extraordinary. We are looking at very different degrees, very varying degrees of economic recovery for a great many in Asia and in particular that's China and India, it's what recession and for the West we are looking at Europe struggling to figure out which way it wants to bail its constituent members out, and we are looking ourselves at continuing stresses and strains.

According to all projections this planet will remain heavily dependent on petroleum and petroleum products well into the second half of this century. We have additionally some unanticipated demand added through the result of the Fukushima nuclear catastrophe in Japan, causing a ripple effect where countries all over the world and most particularly vocal within Europe, people are walking back from nuclear generated electricity, that amounts to a global impact. If people follow through a global impact of 14 % of electricity the planet now uses generated by nuclear. That means that they are walking away from it, there going to go to other forms of generation for electricity, those will overwhelmingly be the traditional hydrocarbons the planet knows as viable alternatives.

We are looking at a part of the world in which 40% of the world's oil transits three large transit points, the Bab el-Mandeb, the Straits of Hormuz and the Suez Canal. I can't overemphasize the importance of these transit points to global energy and economic security. The United States has enjoyed energy relations with this part of the world

characterized by mutual respect, mutual interests, shared commitment to stable markets even in times of conflict, and this is a region that has known conflict, committed to a healthy marketplace being maintained even under the most contentious circumstances.

Our panel today explores both states of play and projected real and potential partnerships to ease some of these pressures and promote smooth transitions to greater efficiencies, exploring innovation, touching on visions from the region including King Abdullah University for Science and Technology and the United Arab Emirates Masdar initiative, promoting environmentally responsible and responsive technologies.

We have the opportunity to welcome industry perspectives and analyses with our first speaker, Jay Pryor from Chevron, no stranger here. I know you all know him from earlier conferences. We are lucky to have him again and the bios on all of our speakers are in your brochures so I'm not going to go into them in great detail. We are particularly lucky though in the fact that all of our panelists are real experts. You know them all from other conferences as well. With Jay we are looking at someone not only trained in petroleum engineering but also very experienced globally not just part of the world but also Asia, also Africa, also the former Soviet Union. He's had a leadership role in establishing the Center for Sustainable Energy Efficiency at the Qatari Science and Technology Park. We are grateful to have his views.

He will be followed by Dr. Franssen, Herman Franssen who you also know from previous experience. Not only is he the president of the International Energy Associates, he has also been associated with Middle East consultants, the Omani Center in London, he is a senior fellow at the Center for Strategic and International Studies on energy. He has been more than a decade an advisor to the Sultanate of Oman. He has been a liaison for the non-OPEC oil producing countries, and he was the chief economist at the International Energy Agency headquartered in Paris. Also very lucky to have Dr. Franssen.

To explore some of the exciting innovations coming out of this region we are lucky to have Randa Fahmy Hudome, President of Fahmy Hudome International, a longstanding expert with both executive and legislative branches of the government and having served as an advisor to both the Department of State and the Department of Energy.

This is going to be meaty, but it is also the case that this is a serious range of issues, we will try to leave room for questions. You all no the protocol. There are papers and note cards at each desk and those note cards will be carried up to us and we will be able to do that. I'm very mindful of the fact that this is the last panel before lunch, no speaker wants to be in the way between his group and lunch. So we are going to be brutal on time.

Thank you very much and I first turn this over to Jay Pryor of Chevron.

[Mr. Jay Pryor] Well thank you, Molly. I am honored to join my distinguished colleagues in addressing the prospects for energy at a time when we are seeing significant changes in the world in particular in the Middle East. In this area the ties of trust that our industry has developed offers promise for strengthening relationships generally. The ways that people

in the energy sector are linked together, their manner of working together and the way we come together around solutions to meet energy needs all provide a great model for greater independence. As we face many dramatic and drastic changes in the region I think the wise strategy for people of good will would be to draw more closely together.

Today our topic is energy dynamics, which is a very broad topic. But I want to focus for a few moments on a few elements including the complex environment we are in both the economic challenges and the rising energy demand and how we address this environment through a path forward that relies on sound investment, energy efficiency, technology and a real commitment to real partnership.

Recently change has been really the only constant. Relationships are being rethought, reformulated and reengineered. This trend's global, but some of the most dramatic changes are taking place in the Middle East region. While our focus today is on the Middle East, it's also true that we have to look far and wide to find a region of the world that isn't having any of these changes. Many of them are experiencing significant stress, are undergoing very rapid change. From our Detroit auto industry to California's housing market here in the US, and from Germany to Greece in the Eurozone, the global economy has a lot on its plate. But I do see grounds for optimism in the fundamentals behind the basic economic cooperation. Amid change and uncertainty sound partnerships are providing a compass for commercial relationships enabling most of them to move forward despite the challenging external environment.

This is especially seen in the energy sector where significant investment is taking place today. Energy development can be a powerful force generating economic momentum. This is true in the Middle East and equally so for the United States where sound energy policies could revive economic momentum. For the Middle East growth propelled by energy is especially important, for young people under the age of 25 account for more than half of that population. Creating jobs and opportunity are vital for the region's development. The Middle East not only has some of the worlds largest energy opportunities, its also the region with the second fastest energy demand growth behind only developing Asia.

Success then will be required for more investment there alone. That's why the region's growing interest in energy efficiency and in advanced energy development from fossil to non fossil fuels such as solar is so encouraging. Along with fossil fuels, nuclear and renewables, energy efficiency should be viewed as a significant fuel source in the region and in the world. Chevron Energy Solutions, one of our profit centers from my company, has been focused on renewable power and energy efficiency. We've delivered around 30% average savings in energy for education, government and industrial clients. It's not too much to say that the same is achievable on very much an international, national, and regional scale.

Here in Washington last week, my boss, our chairman John Watson made the case for an energy renaissance, and he explained to the central energy transformational power is really around its technology. New application of technology can be a powerful catalyst for innovative solutions that can meet evolving stakeholder expectations and increasing

partner needs. The trend has been central in the recent surge in energy production in the Americas. In the western hemisphere a host of resources once thought to be out of reach are now being profitably produced. Technology has unlocked major new resources, off shore in ultra deep water, in reservoirs holding heavy oil, and from shale gas formations within a half hour's drive of downtown Washington DC. A region largely abandoned by our industry and its early pioneers nearly a century ago.

We are also seeing this trend repeated in our business as technology continues to rewrite conventional wisdom. At one time the deep water U.S. Gulf of Mexico was thought to be empty of large remaining reserves, but fields with enormous potential resources were waiting just beneath the heavy salt layer. Advanced 3D imagery allow today's pioneers to unlock the sub salt potential. Brazil has made very similar discoveries in recent years. Like the Gulf of Mexico vast discoveries remain for those exploring the energy frontiers in the Middle East. Production of difficult resources has great promise there, provided a supportive investment climate is maintained. Cutting edge technologies can be paired with the most promising resource basis. These factors are leading the Middle Eastern producers to unlock their challenged resources.

Saudi Arabia's development of Al Khurais is one of those such examples. Another is found where the kingdom and the state of Kuwait share producing interest in the Wafra field in the on shore petition zone. State of the art application of technology requires solid physical framework and Chevron recently extended and amended concessions to produce oil from the kingdom in the onshore PZ. It is notable for the long-standing trust on which it depends. We've fostered a talented local workforce that approaches 90% Saudi nationals, up to the top leadership are in deep position in the business unit. Within the onshore PZ Saudi Arabia and Kuwait have produced oil using primary production for 60 years, but the potential resource base that is available using enhanced production methods is much larger. Trapped within the two largest carbonate reservoirs are roughly 25 billion barrels of heavy oil. Advanced steam flood technologies promised to free that resource, targeting production of about 500 barrels a day and recoverable resources of around 6 billion barrels, producing thousand of additional jobs and billions of dollars of revenue for Saudi, Kuwait and the partners.

Successful application of this technology could benefit the development of even larger resources of heavy oil inside Saudi Arabia and elsewhere in the region. Technology being used to unlock challenging resources has great promise in the region provided a supportive investment climate is continually maintained. In addition to continued development of the region's robust endowment of hydrocarbons, exploration of these sources and methods of energy production and conservation offers promise. The wide interest across the Middle East in energy efficiency and new sources such as large-scale solar power offers the potential to stretch the regions supplies even further. Beyond the important contribution the Middle East will make to a growing global economy we hope to see the pragmatic cooperative shift that makes the energy industry possible, replicated more broadly.

The Arab term "sharaka" is called for especially here, a sense of togetherness that can last for decades, because it is grounded on a solid foundation of trust and true partnership.

Occasionally this concept is erroneously regarded by some in the West as a much more casual sense than is properly due, to uphold the best spirit of that bond we must both be wise and determined. At Chevron we accept the wisdom and belief wholeheartedly in that Arabic proverb, [Arabic]. Which in English is the same as saying “ we can go forward if we go forward hand in hand.” The approach to partnership is a core principle for us at Chevron. We must make wise decisions that built trust while remaining determined to take the steps that are in the best interests of our long-term relationships.

Let us all hope that those are decisions, which our leaders will make in the days ahead.

Thank you very much.

[Dr. Herman T. Franssen] Excellencies, ladies and gentlemen. I would like to first thank John and the Council for inviting me again to speak at this important event. As I said last year, John, that you are one of the very few if not the only place we can have a real honest discussion on Middle East and Middle East policies. And I think Ambassador Freeman’s excellent keynote this morning showed that again.

As a person who travels an awful lot in the region, I am leaving again tonight, for the region, I unfortunately share his views which are not too encouraging, I feel. But a lot of things we can do, insh’Allah, one day we will change our policies at a more realistic view towards the region.

As far as the energy goes, and energy issues, I will make a couple of observations. A lot of things are changing, but also a lot of things remain the same. Oil is still more than 35 percent, about 38 percent of primary energy in the world. It has been so for a long time. It was at its peak just over 50% in the early 1970s when oil was \$1 barrel. And in that period, and the period immediately after the Second World War, oil was an American fuel. Half of the oil was produced in the United States. Half of the oil was consumed in the United States. And the seven sisters the main companies including Chevron, plus the stepsister Total controlled practically the entire international oil industry. At that time the producers would get a fraction of the one dollar a barrel which was at that time the price of oil and Europe and America benefited, not Europe I would say, Japan benefited to get their economy going after the second world war on an ocean of cheap oil. Japan in 1950 consumed as much oil as Luxembourg today, and Western Europe at that time consumed just over one million barrels a day, all of Western Europe. So this cheap oil that was discovered in the Middle East and North Africa, made it possible for Europe to blossom and get rid of dirty coal and replace it with what at that time was considered a very clean fuel and that’s oil.

So we have seen major changes in them since as some refer to as the postcolonial period that lasted until the early ‘70s. The early ‘70s it was Colonel Qaddafi who changed the picture first, by bringing in two companies ENI and Occidental who were willing to give better deals than the Seven Sisters to the producing states. So that began to change the picture for the producer countries. This was changed more dramatically with the Arab oil

embargo of '73, which the panic that it caused created an atmosphere that led to the tripling of oil prices, and again a similar tripling after the Iran revolution of '78.

Now that brought about significant changes both for the consumers. All of a sudden they found oil was not longer cheap and they needed to move to nuclear power, some moved back into coal and natural gas. The producer countries all of a sudden got massive amounts of money, which they used to pay off the concessionaires and take over full control of the resources in their countries. As they were organized since 1960 in the OPEC organization, only in the '70s did OPEC become a powerful organization.

So they maintained for quite some time the high prices that were caused by the two big events of the 1970s, but within the industrial world the impact of the high prices was so dramatic that oil consumption began to decline rapidly in the Americas and in Europe and Japan. Actually in Japan and Europe it never recovered back to what it was in the early 1970s. And the United States, because we didn't really listen to Jimmy Carter very well and so the good policies that he had enacted on CAFE standards were not listened to and we found the exceptions, the trucks and SUVs and they became more than 50% of the car fleet. So we were not as efficient as Europe and Japan.

We went through this period, OPEC went through this period and learned their lesson that prices were too high they lost market share, because by 1985 they had lost, they were down to about 50% of their production capacity. So they changed policy again. But oil has maintained, when you go backwards, all these changes that took place, on efficiency improvements in Europe and Japan but also here, but also here, fuel switching still in the 1980s, oil was 40 percent of total primary energy in the OECD and it's still 38 percent today. And the IEA with all its optimistic forecasts to renewables, which I think a lot of question marks about it, still sees it at 30 percent in 2035 in the world of the OECD, so despite all the fuel switching and everything. And part of it is in the OECD 70 percent of the oil is used in the transportation sector, and it is very difficult to find a solution, to find something different than oil for the transportation sector. We use of course Ethanol but ethanol is not very efficient, you only get a marginal improvement in global gas reductions than gasoline and it is an inefficient way of producing energy and it also pushes the price of corn up which has an impact on the food supplies in the entire world.

But we have promise by law that we are going to produce as much ethanol by 2022 from other fuels, in other words, from non-food sources than we already have from corn. Now how we will achieve this I don't know, but it's in the law, unlikely though to achieve it. The other thing that we are concentrating on, of course, are batteries and hopefully we will move to electric cars but today a battery for a decent size of car that most of us like to drive is between 15 and 20 thousand dollars just for the battery. So that's not a very cheap proposition. Maybe China will have a solution but at the moment we don't.

So we're still stuck with oil, whether we like it or not. In the '70s when prices rose sharply and there were geopolitical concerns, Henry Kissinger was able of securing with the states in the Gulf a new different kind of relationship which created affordable oil that we would get in exchange for the defense against outside aggressors. Henry Kissinger's arrangement

survived the Cold War, and even survived the whole period of the Peace Process. Right now with the events that happened basically since the invasion of Iraq, but particularly since the beginning of this year, that relationship has a very shaky foundation.

I think Jay already talked about all the future prospects for the demand and for supply and very interesting in this relationship is that while the seven billion people in this world, because now we are going to have very soon seven billion people in the world, moving into about over eight in 2025-2030. These people particularly in Asia if only 15 percent of them are middle class and enjoying the benefits that we have in transportation and others we are going to have a continued escalation in the demand for oil, particularly in Asia and other new areas, newly developed areas of the world. That will continue regardless of whether we continue to cut our demand because of improved efficiencies. And yes we will because the policies initiated by both President Bush and President Obama will dramatically improve the efficiency of American cars from certainly 2015 onward. We will be driving cars like the Japanese and the Europeans whether you like it or not. That's again in the law.

Our consumption will decline, at the very least stabilize because there is still some population growth because we are in the midst of a renaissance on the supply side that most Americans have never even realized. Not only shale gas, but also shale oil. The two formations alone, the Bakken formation in North Dakota and the Eagle Ford in Texas that could dramatically improve the production of liquids from those areas and there are many more.

We can import considerable volumes of Canadian liquids from oil sands through the Keystone Pipeline which is still in question, but in other words the United States has the potential for the first time in a few decades to significantly reduce its import dependence, if it wants to and if its Congress in its wisdom will agree with those policies or the administration in its wisdom agree with those policies.

Europe and Japan cannot. Japan will continue 100% dependence on imported oil. Europe's will increase because the North Sea is in decline so Europe will have to depend more on imported oil and more on imported gas while the United States is basically self-sufficient on gas thanks to shale gas. I call that methane. For oil we could significantly reduce our dependence.

The interesting part of all that all that is related to the Middle East. In other words while Asia now takes up more than half of Middle East oil and it goes into Asian refineries for Asian consumption, Europe is much more dependent on the region than we are. We now get about 15 percent of our oil from the region that has been stable for a very long time but could in fact decline, and I say could decline, it will raise questions about is the United States going to continue to be the only one who pays for the massive defense layout in the region in view of our massive budget deficit. It's a big question mark. Or, should one expect that those that are equal in sustaining affordable prices and sustaining the current boundaries of the region that they share in the cost of defending these resources. That's an interesting question and I don't know if there is an easy answer for it.

In the shorter term we are now expecting that both Iraq and Libya will become major new powerhouses in terms of oil production. Right now the two together produce only about three million barrels a day but if we listen to Minister Shahrastani, Iraq has the capability, he says, to produce 12 million barrels a day and if Libya just goes to what it had before of 1.7 this would be a dramatic increase of production from those two countries in the coming decade. Whether it will happen or not is another matter, I'm not as optimistic about things coming very quickly to massive improvements in Libya nor do I believe Iraq will achieve anywhere near the numbers they are talking about. But even if they would only go from 2.6 to 5 million barrels a day by 2016 that would be a massive improvement over where they are today.

The question then becomes who in the region has an interest in seeing Iraq become an oil powerhouse? If you were sitting in Iran that cannot increase its production you probably wouldn't you would want to see the price of oil go higher. If you were Saudi you would like to see the challenge of a country that could produce as much as you can. So it's going to be still very interesting how this will gel in the future.

There's another issue I just want to briefly touch on that is of concern about internal consumption in the Middle East. Can you eat your cake and have it to? The consumption has been rising very rapidly and if current trends continue they would have to sharply increase, as a region, their production just to sustain current efforts, not to increase them but to sustain them.

So what do they have to do? They have to change the pricing practice. They have to start pricing at what really the fuel really costs, and what the natural gas really costs. The only one that has done this and it hasn't been noticed in the West is Iran. In December 2010 Iran basically dramatically reduced its subsidies and this year so far Iran's oil consumption is down ten percent. No one else since now has dared to follow this because its of course highly unpopular. If you are used to very low prices for gasoline, for fuel, for natural gas to increase it to mean higher costs for water, higher costs for electricity, higher costs for everything and in today's environment that would be very tough to do. This is going to be a very big, difficult question for the future.

Another one that has been touched upon already, the employment issue. The interesting part of the employment issue is that in most Gulf countries half or more of the people outside the government are actually foreigners. All the construction is done by people from the South Asian continent. If these people were to go home tomorrow there would be zero unemployment, but people who have only primary or secondary school do not want these jobs. So that's why they bring in people from outside. Part of the reason is also is because they are very low price. A worker on a construction site gets about 150 dollars a month plus room and board. Now you cannot get a local who wants to have a family, get married and have children to live on 150 dollars.

It would be like if we opened the floodgates from immigrants from outside, and said, well you get a passport for two years, you can come here for two years and we will give you 150

dollars a month and we will put you in the basement and then you go back home after two years. You would have a very cheap labor force, no American would work anymore, would do any menial labor. So this is an issue that can only be solved, I believe, on a GCC basis to have labor laws that will change this and make it more attractive to local people to take menial jobs. And even those many times people do not want. It is very easy for educated people to find jobs, well paying jobs. But for those without a secondary degrees, some even without a primary school education, they cannot get jobs cannot compete with the South Asian labor.

Finally a word on the Arab Spring. So far it has already had an impact on oil prices. In December of last year when we were meeting here oil prices were at 90 dollars a barrel. They moved up to about 120 dollars talking about Brent, naturally. Now it's about 108 dollars. Now most of the increase -- it's hard to say exactly how much but certainly a very big part of that increase was due to the psychological impact of the Arab Spring when it started in Tunisia and Egypt and the rest was due to the loss of 1.7 million barrels of very highly valued Libyan crude. Now if it is 10 to 15 dollars a barrel that it costs we're talking about hundreds of billions of dollars to the global economy. That was caused by these events earlier this year. So if Libya starts coming back and all the optimists are right and they come back to full capacity sometime by the end of next year, perhaps this could have some positive impact on oil prices depending on a lot of other issues. But this still has to be seen. The Western leaders who only a year ago would be kissing and hugging Qaddafi only to get nice juicy contracts in the oil industry as well as other industries now are probably going back to Libya hugging and kissing the new leaders of the country.

The question, however, is will the oil industry get a better deal than they got in the past because Libya under Qaddafi had a very tough deal for the oil industry, whether it was Al-Badari or Shoukri Ganam as the Minister got, the deals were tough, they were very good for Libya not so good for the industry. Can any Libyan nationalist taking over as Minister of Oil be doing anything other than what was being done before? If he doesn't he will be accused of favoring the foreigners. We have seen this already in Iraq, where now coming to the fore, the real contracts, we knew the contracts before before that appeared, the margins were very small. Now it turns out that some companies had additional contracts, which made the rate of return more attractive. These are all things you can do.

Finally a very few words about the Arab revolt. The Arab revolt is probably a better word than Arab Spring, though maybe Tunisia may turn out to be a spring, but definitively Yemen is not a spring. You can compare this with Europe in 1848 when the ancien regimes of Europe under pressure because of the revolution in France and the revolution the Hapsburg Empire and German kingdoms and Italian kingdoms, but since that revolution which was played out differently in all these different countries, when they happened it's still two decades before all the issues were resolved and the European countries finally became modern democracies.

This year too a lot of common themes running through, the people want improvement of the socio-economic conditions but already said, some of them are going through very difficult until there is a mind change. All of them want some changes. When you talk to

young people all over the region. They all want accountability. They all want to have a majlis that is elected. They want to have a Prime Minister that is elected. They want a judiciary that is independent from the Executive Branch, etcetera, etcetera. Young people in all the countries speak that some kind of language. So there is going to be tension unless these issues are resolved.

The regional issue that was brought up this morning the fear in some countries of a Shiite crescent spreading from Iran through Iraq through Syria, because Assad has not lost yet. Lebanon is a perceived fear among many in the region and creates, what we heard this morning, the potential for an arms race. At the same time I think the U.S. is one of the big losers so far of what has happened in part because of our policies of the past brought up this morning already. Our policies towards Iraq which created enormous dislocations inside of Iraq and externally upset the balance of power in the region quite dramatically. As already was said the Saudis are very upset about that. The Saudis are also upset we were so quick to see Mubarak dropped. They are very unhappy with our inability to rein in Netanyahu. They are very unhappy about the a lot of things we have and are still doing in the region and as Ambassador Freeman said they want to follow their own policies. They are going to be less dependent in terms of their political and geopolitical policies than they have in the past.

On the other hand I also agree with Ambassador Larocco that the United States has again showed in Libya that we are the only country that can actually deliver when it comes to military power. U.S. spent half of what was spent in Libya on military forces but not only that when you really read the technical magazines if it hadn't been for U.S. intelligence, U.S. penetrating bomb, etcetera, etcetera, this adventure would not have succeeded as quickly as it did. And that message probably is well noticed everywhere else in the world, that the U.S. when it comes to the military, it leads supreme.

So finally what is the outcome of all this? Most oil exports in the Middle East will continue to go to Asia. Europe will be a secondary but also a very important importer of oil. The US at the best we will see falling from the region over time. Whether that will shift our interest in the region to some extent at the margin it's too early to say. The shifting economic realities, the world economy is shifting to the center a shift, and has shifted already to Asia. And we see in the Middle East we see that same reality. People are buying more and more goods and services from Asia and of course Europe and far less from us if you take out the defense component. We don't really sell all that much in the region.

The question ultimately will the flag follow trade. Will Asia become much more engaged in other ways than economics and oil in the region? Could it be speeded up by U.S. self-reliance on, self-reliance in terms of energy and imports from inside the Americas. We don't know. In other words there are many, many questions at this point and very few answers.

Thank you very much.

[Ms. Randa Fahmy Hudome] Thank you. And thank you, Dr Anthony and Molly and the panelists today for your wonderful presentations. I think it lays the groundwork for what I would like to talk about today and it's a topic that often not highlighted when you speak about energy interests in the Arab world, and that's renewable energy.

I know Jay touched upon it. But in order to take a look at renewable energy in the Arab world I would like to stop for a minute and take a look at renewable energy here in the United States. When we discuss the topic here in the U.S. its often in the context of three principles. The first is national security. As we've heard the mantra over and over again from politicians we need to reduce our dependence on foreign oil as a matter of national security. Sometimes when these politicians feel like being particularly combative they will say we need to reduce our dependence on Middle Eastern oil -- code word somehow funds from the sale of Middle Eastern oil is a danger to our national security in the United States. When, of course, the facts of the matter are that the majority of oil imported into the United States comes from Canada and Mexico.

The second theory, and I'll be happy to debate this in the question and answer session because I don't want to go to deeply into it, but the second theory of why renewable energy is good is jobs creation. As many of you know the Obama administration announced a stimulus package in the amount of 787 billion dollars, of which a great amount of that went to the Department of Energy to encourage renewable energy programs. And I'm not a big fan of the idea that, indeed, it is creating jobs here in the United States.

And finally, but certainly not least, renewable energies are important here because we are good global citizens, and because we want to pay homage and respect our environment.

Now it does seem like any oxymoron if you raise the issue of renewable energies in the Arab world but the reality is it's not. It's a reality that's growing every day in the region. You know when I worked in the government there was always this vexing question that politicians put forward every time we raise the issue of renewable energy here in the United States, and the times when I was in the government the hydrogen fuel cell was the hot issue. Does that drive OPEC crazy? Maybe we can get OPEC to behave if we start talking about renewable energies, and they will get scared. Then they will back off and produce all the oil that we want and we'll lower the prices here in the United States.

The reality is that that doesn't happen because many of these OPEC member nations themselves are in robust programs and are developing robust programs of renewable energies. And you might ask why. Ask some of the principles in the Arab world, why are they developing renewable energies when ostensibly they have a very abundant supply of petroleum and gas? The answer is diversification of their economy. In deference to of course the growing youth population and the need for increased employment in that area. Also the demands of the growth of population is going to demand more power generation and the ways to get power generation are often through renewable energy sources. There is also a need in the Arab world and much belief in conserving the existing resources that they have so the conservation awareness is certainly there as well.

And finally, last but not least, like us the Arab world shares the desire to be good global citizens in the environment today.

So I'd like to bring up seven different examples here today and I apologize in advance if I might have forgotten one that many of you are particularly involved in or know about, but because of the time constraints I can only discuss these seven but I would be happy to discuss more in the Q & A.

The first project I would like to bring up is the King Abdullah University for Science and Technology. Many of you may know about this new coed, graduate level university that irony of all ironies happens to be funded and developed by the state owned Saudi Arabia Oil Company, and that's Aramco. Within the university itself they have a variety of studies but one of them is clean combustion. They are also looking at the Red Sea for science and engineering, new technologies they are looking at solar and alternative energy in the science and engineering fields, and they are also looking at water desalination and reuse of those waters prospects.

Staying on Saudi Arabia it was just recently announced that Saudi Arabia inaugurated its first solar power plant. In combination with the Japanese energy company they built the plant on Farason Island which is off the Red Sea coast. Interestingly enough and this goes to the conservation issue the new solar plant will save about 28 thousand barrels of diesel fuel that's normally sent to the island for power generation purposes.

Again staying with Saudi Arabia, but branching out into the broader Islamic world many of you may be familiar with the Islamic Development Bank. They are based in Jeddah, Saudi Arabia but they are a financial economic development bank that represents their 56 member countries. Those 56 member countries are countries who are members of the Organization of Islamic States. Within the Islamic development bank they recently announced a new 250 million dollar fund for renewable energy projects within their member countries. And that is a critical issue because, indeed, it will provide many of the financial loans and resources that some of the less developed countries are going to need in this area.

Moving on from Saudi Arabia let's focus on the United Arab Emirates. I'm sure many of you have heard about UAE's vision 2030. It is a vision for economic development which includes of course the famed Masdar city in development. It is the future energy city that will rely solely on solar and renewable energies with the target of zero carbon, zero waste.

Also another little factoid about the United Arab Emirates, and particularly Abu Dhabi, Abu Dhabi was chosen out of the whole world for the home of the new International Renewable Energy Agency. This new agency of course will focus on renewable energies, so that's a real coup for the United Arab Emirates and for the renewable energy industry as a whole.

Again, staying on the United Arab Emirates many of you are aware that two years ago the United Arab Emirate launched and announced the bidding for 14 new nuclear power plants and interestingly enough, Molly you mentioned Fukushima. This was prior to the

Fukushima disaster, that being said they are full steam ahead in the UAE. In fact I read today that they are just ground breaking on four of the new nuclear power plants.

Now what's interesting about this particular project I have to say is that the United Arab Emirates did this project, launched this project, extremely politically smart. What they did is they reached out to the global society, giving people a heads up that they were intending to do this. They put a plan together, a step by step plan about how they were going to develop this. They allowed, and they are continuing and will continue to allow inspectors from the International Atomic Energy Agency. They also were being very wise about the spent fuel that will be created from this project. They also set up a nuclear regulatory commission, which is a new thing for the United Arab Emirates to somehow you know mirror other nuclear regulatory commissions around the world. So I say that, I think you can guess, in contrast to another particular country who insists on developing their nuclear energy industry not so smartly.

Next moving on to Qatar. Of course Qatar is known in the Arab world and in the Gulf itself for its innovative and new ways of everything in that region. But one key element of renewable energy again is the financing. So Qatar and this year again they held a summit, holds a summit every year, that's focused on alternative energies. It's called the Alternative Energy Investment Summit. It's the ultimate gathering of one hundred hand picked investors. So they are vetted before they come and they are hand picked to focus on particularly pre-qualified investment opportunities in the renewable energy sector. It's a match if you will, you know. I like to compare it to the Clinton Global Initiative where people come and pledge their support for a variety of issues. In this case it is solely and purposefully dedicated to alternative energies. Also something that Jay, I know you have worked on, I know Qatar has a science and technology park focused on development of the technologies in 60 different solar areas, as well as other technologies.

Now certainly beyond the Gulf countries we have Morocco, and I love to use Morocco as an example because Morocco has a very, and has had for a very long time, a healthy sector in the solar area. It's one in which Morocco has been focused on for years and very much wants to continue to develop that potential in Morocco.

One certainly can't ignore what I call now the Arab awakening countries, and that would be Tunisia, Libya and Egypt. You have the situation where of course Egypt has a healthy supply of gas, and Libya has oil and gas as well. But in deference to the term Arab Spring I think Tunisia got its liberation in January, Egypt got its liberation in February, and Libya got its liberation in October. None of that was spring. I'd like to use the terminology Arab awakening because it focuses the actually comes from a 1938 book written by George Antonius. Many of you are familiar with that book. It talked about the loss of Arabization of Palestine at the time. But the term Arab awakening I think really captures the spirit of what people want in the region now, and certainly from my travels in the region in Tunisia, Libya and Egypt they are extraordinarily interested in developing their solar energy and their wind energy. That's something that of course is going to take two things, technology advancement and financial resources.

So in conclusion I personally see a very, very bright future for renewable energies in the Arab world because of three critical elements. One, is the financial support and resources that many of these countries have and are willing to invest in renewable energies. Two, is the willingness to dig down deep on the research level to get that technological knowhow to move them forward in the renewable energy field. Third, is certainly the will and the need particularly in these Arab awakening countries to diversify their existing economies into this new and very hopeful future for renewable energies.

Thank you very much.

[Williamson] Thank you to all our panelists. I have several questions here on nuclear and in particular to Randa the question of how well civil nuclear power plans are progressing throughout the GCC countries? What if any is the extent of US company involvement in that?

For Dr. Franssen, a question of the issue of subsidies. Have they continued the subsidies for fuel throughout the countries for their internal consumption? How long can that continue and how can that make room for solar innovation to become competitive?

And for all our panelists question about the potential impact of shale oil and gas in the marketplace especially given growing demand from Asia. So why don't we start with you Randa and move to the other questions.

[Hudome] The development of civilian uses of nuclear energy is always a critical issue from a national security perspective. Let's be blunt here. The Iranians have caused a great deal of angst throughout the world because of the way they have gone about it and gone through it in essence, extremely combative, not very transparent and created difficulties for everyone else in the region who wants to develop it. That being said I believe that the United Arab Emirates can serve as a model for other GCC countries who wish to develop nuclear power plants certainly. And there has been desire by some of these other members in the GCC to do so but you know what the sensitivities are. The big issue that I talked about, reprocessing of uranium, uranium enrichment process is always a key issue but as long as these countries move forward in a transparent fashion with discussions around the world, with the key players I can't see why there wouldn't be a successful venture for those who wish to move in that direction.

As far as U.S. companies involvement in it, certainly we have two or three big companies here in the United States who are involved in this industry. I do know that in the UAE bidding process, as it moved forward there was American content on all three teams. The team that ended up winning was the South Koreans, Kepco, and US content on that team was Westinghouse Toshiba. You know Westinghouse is majority owned by the Japanese, they are still a very strong presence in fact in my home state of Pennsylvania, and often looked at many of the materials used are in the United States. So it portends, I think a bright future for particularly American companies who are invested in or involved in that particular industry.

[Franssen] On the question of subsidies, the subsidies for both oil and natural gas, most of the gas in the Gulf is in Qatar and Iran. The other gas it is called associated gas that goes up with oil production. So when you don't produce the oil you don't get the gas.

Most of the countries have a very tight situation with natural gas but they are still selling it at very low prices. Until recently you could get gas for less than a dollar a million BTU's, that's the equivalent of \$6-7 oil. There are many American and other countries there wanting to go for the deep gas. It's much more expensive you have to pay 3-4, 4-5 dollars a million BTU's. But how do you sell that gas in a subsidized environment. The same is true for oil. Aramco studies as well as the King Abdullah University have indicated that at the current rate of consumption of liquids continues in Saudi Arabia it would go from 2.8 million barrels a day today to 8 million barrels a day in 2030. That would actually eat into the actual potential unless you dramatically increase your production. So they really know that they have to do something. The question is when are they going to do it and what is going to replace the oil.

[Pryor] I think I will take the shale gas issue and the potential impact of shale. I think if you think about shale both light oil shale and gas shale one, important thing to recognize is that shale is the source rock for most hydrocarbon that has been produced today. So the source rock is around all over the world. So what you are doing is using new technology to bring the cost down to produce something that people know exists on a worldwide basis. That's the real issue. So when you start talking about the development of shale, when you start looking at the facts very closely it's a very extensive resource. I know in the U.S. we talk about 100 TCF of gas, as a petroleum engineer we have always been very conservative on estimates of resource. My first year in the industry in 1979 I was told by some of the geologists and engineers what are you going to do after 8 or 10 years because we are going to be out of business. I've been here 33 years and we have more today than when I started. So I think you can look at those estimates as quite conservative.

The potential impact is really around the market and around where do you develop it and how does it impact the overall global situation? The U.S. has been endowed where currently today 100% of our gas is produced domestically, so we don't need to import any gas. There is still some LNG coming into the country and other things from Canada, gas being imported, but you could produce 100% of the gas from the country. There are other parts of the world, especially the Middle East, when you think about shale being a source rock for oil, there's plenty of shale in the Middle East as well. So I think over a period of time you will start to see more and more gas developed in the Middle East around shale but it is going to have to deal with some of the issues Herman talked about relative to subsidies, and pricing and infrastructure.

The reason the U.S. popped so quickly with shale gas was the infrastructure was already here and had been amortized over a long period of time. So it was basically paid for. So it made it very easy to hook up directly to currently existing infrastructure, that's why the development path for shale gas in the U.S. happened so quickly.

[Williamson] Thank you very much. It was, I think, you will all agree that this is a meaty topic, lots of exciting prospects not only for continued and expanding partnership between the United States and the countries of this region. Also some things for us to plan and muddle through together, some storms we have to weather through together, but a clear potential and determination that we do so with mutual respect and mutual interest to be prevailed.

I know there are more questions I have a good hand full of them here. I'm sorry though that if we go down that path I would be keeping you from lunch. That is something that is a cardinal rule for any speaker not to do so I encourage you to grab our panelists and chat with them as we make the space available for lunch preparations. Thank you all very much, and thank you for our panelists.

The Honorable Molly Williamson

Ms. Williamson speaks extensively on US foreign policy, the interagency process, energy, economic and demographic factors affecting policy formulation and US-Middle East relations, especially the Israel-Palestine conflict, Iran and nuclear challenges. Ms. Williamson is a scholar with the Middle East Institute, a Distinguished Scholar-In-Residence at the National Council on US-Arab Relations, a consultant, and a lecturer at Johns Hopkins University Osher Institute. She is a former Foreign Service Officer, having served six presidents, and achieved the rank of Career Minister. She is also a member of the American Foreign Service Association and board member of the American Academy of Diplomacy.

From 2005 to 2008, Ms. Williamson was the Senior Foreign Policy Advisor to the Secretary of Energy, with global responsibilities at the nexus of foreign policy and energy policy. Prior to that assignment, Ms. Williamson served as U.S. Charge d'Affaires in Bahrain. She was also assigned to special projects regarding Israel/Palestine, Iraq, and the United Nations.

From 199 to 2004, Ms. Williamson was Deputy Assistant Secretary of Commerce responsible for advancing trade relations with eighty-six countries in the Middle East, South Asia, Oceania, and Africa with a trade portfolio valued at over \$120 billion/year. Prior to that assignment, she was Principal Deputy, then Acting Assistant Secretary of State, International Organizations Bureau, responsible for the policy and programs affecting UN political and Security Council matters, peacekeeping, and humanitarian operations. From 1993 to 1995, Ms. Williamson was Deputy Assistant Secretary of Defense responsible for the Middle East, Africa, and South Asia. She was engaged in operational defense structure bottom-up reviews, and the policy challenges of Iraqi provocations, crises in Rwanda and Somalia, and nuclear tests in South Asia.

Ms. Williamson has had numerous postings in the Middle East, including Chief of Mission and Consul General in Jerusalem during the Madrid Peace Process (1991-93), which culminated in the Oslo Accords.

Ms. Williamson, a native of California, has been awarded two Presidential Service Awards, the Secretary of Energy's Exceptional Service Award, the Department of Commerce Performance Award, the Secretary of Defense' Service Award, and fourteen awards from the Department of State. She has studied both Hebrew and Arabic.

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Dr. Herman Franssen

Dr. Franssen is currently a Senior Director of the Energy Intelligence Group. He is the President of International Energy Associates Inc.; a Senior Fellow with CSIS, an Adjunct Scholar with the Middle East Institute; a Distinguished Associate of the FACTS (Fesharaki and Associates) Global Energy Group; a Visiting Fellow at the Center for Global Energy Studies in London and a Senior Associate with Nuddke East Consultants in London. He also serves on the board of numerous academic institutions and publications.

Prior to establishing International Energy Associates Inc., Dr. Franssen was Senior Economic Advisor to His Excellency the Minister of Petroleum and Minerals of the Sultanate of Oman (1985-1996). In this capacity, helped to organize IPEC (Independent Petroleum Exporting Countries), an independent group of 14 oil-exporting countries and provinces. He was also the technical liaison of the Ministry of Petroleum with the OPEC Secretariat as well as with individual oil-exporting and oil-consuming countries.

From 1980-1985, Dr. Franssen was Chief Economist of the International Energy Agency (IEA) responsible for IEA's energy economic analyses and its first major IEA World Energy Outlook in 1983. Between 1978 and 1980, Dr. Franssen had similar responsibilities in the United States Department of Energy as Director of the Office of International Market Analysis. In the mid-1970s, Dr. Franssen was a Research Associate on Science Policy at the Congressional Research Service of the U.S. Congress, providing Senators, Congressmen, and Congressional committees with advice on energy and ocean policy. Dr. Franssen has lectured extensively on the international energy issues in more than thirty countries and is responsible for numerous publications related to all aspects of the global oil market, policy, and industry.

Dr. Franssen was born in The Netherlands where he attended the University of Amsterdam. He received a Bachelor's Degree from Macalester College in St. Paul, Minnesota and his Master of Arts, Master of Arts in Law and Diplomacy, and PhD degrees from the Fletcher School of Law and Diplomacy of Tufts University in Medford, Massachusetts.

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Mr. Jay Pryor

Mr. Pryor is Vice President for Corporate Business Development at Chevron Corporation. He is responsible for identifying and developing new, large-scale upstream and downstream business opportunities, including mergers and acquisitions.

Mr. Pryor earned his Bachelor's Degree in Petroleum Engineering from Mississippi State University in 1979. That same year, he joined Chevron U.S.A. Production Company as a Petroleum Engineer and held a number of production-related positions. Mr. Pryor held a succession of management positions with increasing responsibilities in Asia, the United States, Europe, and the former Soviet Union. In 1999, he became Managing Director of the Asia South Business Unit and Managing Director of Chevron Offshore (Thailand) Ltd. In 2002, Pryor was named Managing Director of Chevron Nigeria Ltd., one of Nigeria's leading petroleum exploration and production companies. Mr. Pryor assumed his current position in May 2006.

Mr. Pryor is a sought-after speaker at industry conferences, including the Annual Arab-US Policymakers Conferences and the World National Oil Companies Congress.

Mr. Pryor is a member of the Society of Petroleum Engineers and founded the society's first branch in Kazakhstan. He is a member of the Board of Trustees of Eisenhower Fellowships, the Ernst & Young Corporate Development Leadership Network, the RAND Corporation Business Leaders Forum, and the US-Russia Business Council.

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Ms. Randa Fahmy Hudome

Ms. Fahmy Hudome is the President of Fahmy Hudome International (FHI), a strategic consulting firm which provides critical advice and counsel to Fortune 500 companies, foreign governments, media organizations, and private sector entities with business interests in the Middle East and North Africa. She is also a member of the Board of Directors of the National Council on US-Arab Relations.

Prior to founding FHI, Ms. Fahmy Hudome was appointed by President George W. Bush to serve as the United States Associate Deputy Secretary of Energy. Working with the White House and the Departments of State and Commerce, she helped develop and implement the Bush Administration's international energy policy. Ms. Fahmy Hudome was also the point person at the Department of Energy for increased advocacy on behalf of American energy companies seeking business around the globe. From 1995-2001, Ms. Fahmy Hudome served as Counselor to United States Senator Spencer Abraham (R-MI). During the six years

she spent in the legislative branch, she was credited with shaping many pieces of legislation that affected US interests abroad, including financial assistance to US allies in the Middle East.

Prior to her government service, Ms. Fahmy Hudome was a practicing attorney with the law firm of Willkie, Farr, and Gallagher, where she specialized in areas of international trade and corporate litigation. She received her JD from the Georgetown University Law Center, where she held the post of Administrative Editor of *The Georgetown Journal of International Law*.

Ms. Fahmy Hudome's expertise in international economic policy and energy has been sought by the US Secretary of State, who appointed her to serve on the US State Department Advisory Committee on International Economic Policy, and by the Secretary of Energy, who appointed her to serve on the US Secretary of Energy Advisory Board. Ms. Fahmy Hudome's opinions on international diplomacy have been published in the *Wall Street Journal*, and she appears frequently as an expert analyst on NBC's *Today Show*, MSNBC, Fox News, CNN, and Al-Jazeera.