"Energy, the Environment and Development: The Ultimate Human Agenda"

By:

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Ladies and gentlemen, good morning.

It is a pleasure to join you for the first Energy Pact conference engaging multiple stakeholders on global energy issues. I would like to thank Mr. Schroder and the Energy Pact Foundation for convening this broadly inclusive gathering and creating an institutional platform for effective, non-partisan solutions to today's critical energy concerns.

How fitting that this inaugural event should take place in Geneva, given this great city's history of fostering international debate and accord, its prominence in global finance and commerce, and its contributions to intellectual thought, human rights and fairness.

I have been asked to share my thoughts on energy in its intertwined environmental and developmental contexts. These are urgent issues that take on even greater exigency in the current global economic and social environments.

In keeping with Energy Pact's goal of helping optimize the world's existing energy mix, and charting a realistic energy path through a challenging economic and environmental landscape, let us first assess the current picture.

Much is at stake in the energy debate, with issues ranging from security of supply and future demand to environmental sustainability and energy for emerging economies looming large – all against a backdrop complicated by today's tough economic conditions, price volatility, and evolving energy policies. At the heart of the debate is the sheer magnitude of energy's importance. Energy is the fuel that powers the world's economic engines; in turn, economic development and its resulting prosperity enable social progress. All nations require energy to sustain not only their economies, but also their societies.

Cycles of progress and growth are particularly vital for emerging nations, which need abundant, inexpensive energy supplies to develop their economies and to pursue the human right of a better quality of life. For even less developed nations barely at subsistence levels, access to affordable, modern forms of energy is key to survival; it is a means of food, clean water and medicine – and the hope of lifting families and individuals from crushing poverty.

The next factor driving the urgency of the energy debate is of course environmental sustainability, and the need to make all energy sources safer, cleaner and greener. Again, this imperative gathers gravity from the perspective of emerging economies, where energies can carry financial, political and social costs arguably greater than those same costs paid by developed economies for different reasons.

Third is a more quantitative concern: that of meeting burgeoning future energy demand.

Complicating our task is the fourth factor, the state of world's economy and finances, which today are in a condition that inhibits investment and expansion for traditional and alternative energies by removing commercial incentives and funding sources.

Against this complex backdrop, let us now examine energy constraints identified by this conference.

The first constraint named is, quote, "dwindling fossil fuel resources," end quote. Here let me place my remarks in context of the Kingdom of Saudi Arabia's petroleum policy.

Saudi Arabia is the world's leading petroleum country in terms of reserves, production and exports. The Kingdom is home to one quarter of the world's petroleum reserves; these are the planet's largest proven conventional resources. We also hold the world's fourth-largest natural gas reserves.

At our current, average crude-oil production rate, proven reserves alone are conservatively estimated to continue for approximately 80 years. I emphasize the moderate nature of these estimates, especially in light of evolving exploration and production technologies, and our ability over many years to replace our annual production capacity with new reserves, which could extend the life of these immense resources quite considerably.

Now let us look at the world's total liquid energy resources in place, encompassing not only conventional oil estimated from six to eight trillion barrels, but also non-conventional liquids, ranging from condensates and natural gas liquids to tar sands, oil shales and extra-heavy oil, and estimated at seven or eight trillion barrels or higher.

These figures tell us that while the days of *easy* oil may be over, the days of oil as a primary fuel source for the people of the world are *far* from over.

These vast resources clearly point to our need to prioritize research, development and technology applications for finding, extracting and replacing our energy reserves. They also compel us to think about an energy future inclusive of all sources, not exclusive, and where petroleum, like other energy resources, has its rightful place in the mix.

For now, let us look at petroleum energy in the context of world energy demand.

At present, fossil fuels meet more than 80 percent of the world's energy requirements. Energy demand has been moderated by the economic downturn, but this dampening is broad-based, lock-step with the economic slowdown.

That is because as the world's population grows toward 9 billion by the year 2050 and economic growth continues, an appropriate increase in energy consumption is forecast – and consensus agrees that fossil fuels will continue to meet the call. Many authoritative energy-tracking organizations predict that fossil fuels will continue to meet four-fifths of the world's energy requirements for at least the next few decades. In addition, transportation will continue to depend largely on oil: according to World Energy Council studies, four decades hence, the transport sector will still be reliant on petroleum.

There are clear reasons for this dominant position. Fossil fuels, especially conventional oil, are proven, abundant, reliable, affordable and safe energy; they are supported by extensive production, transportation and distribution networks; and they have the advantage of an aggressive technology campaign to improve their sustainability as an environmentally friendly source. They are, and will continue to be, an integral part of modern life.

In response to the question of diminishing fossil fuels, I would say that given their massive scale, non-renewables will remain the world's energy work-horse for many decades to come. I would add that the oil industry is committed to improving the efficiency and environmental friendliness of petroleum, and that we will continue to see strides in its sustainability, thanks to an emphasis on conservation and a strong new innovation focus.

The oil industry's unprecedented drive to push the limits of technology is yielding results unimagined even a few years ago. Saudi Arabia's national oil company, Saudi Aramco, is focusing research and development campaign on technologies that help find and recover more oil in an environmentally sustainable, cost effective manner.

Some of the company's frontier technologies have implications for the entire industry. Three such technologies are Extreme Reservoir Contact wells that optimize recovery; giga-cell reservoir models which increase our understanding of reservoir behavior over time; and the I-field, or intelligent field, concept, facilitating quick data transmission to inform production and reservoir management decisions.

The horizon is full of such futuristic, beneficial applications. The company is looking ahead with the industry award-winning "resbot" concept, which deploys nano-scale reservoir robots into oil-reservoir rock to analyze and store vital mapping information.

Stunning technologies like these, present and future, are just a glimpse into the industry's proactive commitment to research and development to assure supplies of environmentally sustainable energy for many decades to come.

Given the immense promise that such technologies hold, there is no excuse to pin our hopes only on alternatives, which today are just supplemental energies, when it comes to optimizing our energy future. When the supplies are there, and when we are continually making their harvesting and production greener and cleaner, the answer is an inclusive energy mix. Considering the role fossil fuels play in keeping economies functioning and improving quality of life for billions, let us continue to enhance their sustainability, use *all* energies more efficiently and conservatively, and create an energy context that lets all viable sources become efficient, cost effective, safe, and clean enough to contribute.

Here I must offer a word of caution against calling for a premature shift from fossil fuels to slowly evolving alternatives. Regardless of intentions, the consequences can be deeply counter-productive to global energy security, and indeed to the natural environment.

When we talk about such a shift, two negatives quickly emerge. One negative is progressively lower levels of investment in the fossil fuels that make modern life possible; after all, demand uncertainty creates a strong sense of investment risk for producers. New technologies such as Extreme Reservoir Contact wells and resbots emerge only in a culture of innovation and applied research; inhibiting that culture significantly impedes the adequate, timely flows of money to the energy sector that make such breakthroughs possible. Diminished investment in fossil fuels will impact our ability to provide the energy that will be needed when the economy turns around; to meet growing future demand; to develop the products and processes and conduct the studies that continually lighten our environmental footprint; and to enhance energy conservation practices.

A second risk in advocating a premature shift from fossil fuels is increased market speculation. Over the last several years, we saw how talk of peak oil created a speculative environment, pushing oil prices to unreasonable levels. Today's low energy prices are just as unsustainable as soaring prices. This kind of price volatility not only obscures market signals needed to ensure levels of investment required to meet future demand, but can also make global economic recovery a much more difficult, more distant prospect.

Ladies and gentlemen, we all share a collective responsibility to care for our environment, and are concerned about the potential impact of future climate change. At the same time, we have an obligation to sustain growth for our global economy, and to serve the cause of eliminating poverty everywhere. To achieve these goals, we will need the contributions of all types of safe energy. As we search for renewable energies that can contribute in the long run, we must acknowledge that fossil fuels will serve these needs for decades to come. Our immediate focus, then, must be to make fossil fuels cleaner and more efficient.

Energy Pact's call to examine all, and here I quote, "credible and sufficient alternatives to fossil fuel energies," unquote, is one echoed by the petroleum industry; in fact, many international oil companies are beginning to position themselves less specifically as oil companies, and more as energy providers, with a new concentration on areas such as wind power and biofuels. As for Saudi Arabia, we are investing in another natural, renewable resource plentiful in our part of the world – sunlight.

For example, King Abdullah University of Science and Technology, or KAUST, the Kingdom's new research university set to open this fall, was conceived as a global partnership to develop solutions to world matters like energy and the environment, while educating the scientists of tomorrow. KAUST, which is modeled on interdisciplinary centers featuring state of the art equipment and facilities for conducting research in targeted scientific areas, includes an institute committed to resources, energy and the environment. This institute will feature a dedicated center for solar energy studies.

Although the university will officially open in September, KAUST is conducting solar energy studies worldwide through a number of research centers that it funded while the physical campus is under construction. Many of the activities of these centers will relocate from their countries of origin to KAUST's Red Sea campus when the university officially opens its doors.

One such center is the KAUST-Cornell Center for Energy and Sustainability, currently in New York, whose focus includes solar energy as well as carbon capture and sequestration.

KAUST's green design includes a solar plant that will power the university's hub buildings and laboratories.

Another component of the Kingdom's energy focus is the future King Abdullah Petroleum Studies and Research Center. This premier energy and environmental think tank's aims will be supporting reliable energy supplies to sustain the world's economic prosperity and growth, and fostering our role as an environmentally responsible energy supplier.

An additional example of the Kingdom's sustainable energy efforts includes Saudi Aramco's use of solar power in some of its facilities and communities.

If it should come as a surprise that the world's largest oil exporter also hopes to be the world's biggest solar provider someday, this diversification strategy was planned decades ago. Aside from their gross domestic product contribution, oil and gas have for many years played a central role in developing other, related industries and services for the Kingdom.

For instance, establishing a unique petrochemicals industry fueled by gas and oil for power and feedstock has positioned Saudi Arabia among leading petrochemical producers and

exporters. The Kingdom has also leveraged oil and gas to develop such industries as power generation and water desalination.

That strategy to derive maximum value from our natural resources, and to pursue an inclusive energy plan, is driving the Kingdom's eventual diversification of our energy base to solar over many years. Saudi Arabia thus aims to be a leader in renewable energy production – specifically as the world's largest exporter of clean electric energy produced from our abundant sunlight. And we will continue using our energy sources, whether solar or otherwise, to broaden the Kingdom's economic base.

Just as the Kingdom's examination of credible, sufficient alternatives to fossil fuel energy is based on extensive scientific inquiry and investment, our response to global warming, the second constraint identified by the Energy Pact conference, is rooted in knowledge. We are using technology as a flywheel to speed the development of our carbon-management products and techniques, and for addressing the wider issue of environmental protection.

Transportation is the most energy-intensive petroleum application, and the eventual economic recovery and phenomena such as the coming population boom will mean more people on the move. In light of this increasing demand and our commitment to continually enhancing sustainability, Saudi Aramco is making strides in desulfurizing whole crude oil products. The company is also developing cleaner-burning fuels, including new formulations consistent with next-generation, super-efficient engine technologies.

Cooperative efforts are another part of the Kingdom's response to climate change. Last fall, Saudi Arabia, Norway, the Netherlands and the United Kingdom formed a cooperative to incentivize carbon capture and storage financing.

This group seeks CCS project approval in the Clean Development Mechanism of the Kyoto Protocol so that investors in projects cutting greenhouse gas emissions in developing nations receive carbon credits to offset emissions elsewhere. This step will create a global commercial market for technologies to trap greenhouse gases from industrial processes. Saudi Arabia also supports carbon capture and sequestration as a means of enhancing oil recovery, and is active in the Carbon Sequestration Leadership Forum.

As I have noted, the position of Saudi Arabia is that all energy sources will have a role to play in meeting future demand as the world's population and its energy use balloon. Whether we are considering solar, wind, hydroelectric, geothermal or biofuel energies, we must ask if these technologies are now, quote, "credible and sufficient alternatives to fossil fuel energies," unquote. If the answer is "not yet," we must then ask when they can become contenders.

If we apply the sustainability criteria of accessibility, availability and public acceptability to new and alternative energies, we find that many still face significant cost, performance, reliability and infrastructure hurdles on the path to viability.

Certainly, these obstacles are of concern to advanced industrialized economies and their populations. They take on a special urgency, however, when we explore the third constraint being examined at Energy Pact – the development needs of the world population.
Every human has the right to affordable, reliable and safe energy supplies, but as this conference has pointed out, a shocking number of the world's 6.7 billion people lack the

better-quality energy that can have a profound ameliorating effect on their poverty. More than one and a half billion people have no access to electricity or other modern energy. More than a billion people drink biologically and chemically contaminated water, leading to devastating disease and death rates, particularly infant mortality. From 1.5 to 2 million people die each year due to indoor pollution caused by improper ventilation of burned biomass fuels such as charcoal, wood and animal waste. Clearly, such energy poverty also degrades and devastates our natural environment.

Such limited access to energy translates into limited economic growth, and in turn, stunted opportunities for families and individuals. When these nations and communities cannot support the costs of developing new and alternative energies, the gap between rich and poor will only widen.

The World Bank has stated, and I quote, that "Oil and coal will inevitably continue to be major fuel sources for the world's poorest people for the foreseeable future," end quote. This prediction is one of the most compelling reasons to continue making fossil fuels more sustainable while all credible forms of energy are being developed. Without a doubt, the ability of energy to drive economic progress and create increased prosperity should be deployed for the good of all, and not limited to benefit of some.

Ladies and gentlemen, let me close by emphasizing the four important messages that I hope you will take away this morning.

The Earth is well endowed with plentiful fossil fuel resources. My first message is that we can rest assured that the world will not run out of these resources, including petroleum, any time soon. Thanks to human ingenuity, transformative technologies are revolutionizing the ability to find and produce petroleum sources, and to do so in a manner that makes our environmental footprint progressively lighter. For these reasons, I believe it is essential to acknowledge the role of fossil fuels in an inclusive energy mix. Let us be mindful how casting doubt on fossil fuel consumption can cause oil sector investment to constrict. Ample energy supplies will be needed to return economies to health, to meet demand as the world's population grows, and to serve billions of our fellow humans who rightly aspire to a better way of life for themselves and for their children.

Second, I hope that you will take away fresh insights into how nations and producers are working together to address global warming, through cooperative agreements and through collaborative research into ameliorative products, technologies and operations.

Third, there has been considerable progress in making petroleum less impactive, more abundant and more affordable for the benefit of the world's population – particularly the poorest among us.

And finally, we are all for alternatives; however, many have technical, financial, legal and other barriers and risks to overcome before they can contribute significantly. We do note that great effort is being made in the research, development and propagation of renewables. Saudi Arabia recognizes and supports this tremendous effort in developing alternative fuels such as biofuels, wind and solar; as I have shown, we ourselves are leaders in exploring extensive solar energy research and applications.

Therefore, an inclusive, transparent energy strategy that considers the viability of all sources; acknowledges the ongoing role of fossil fuels; enables innovation to promote the sustainability of all contributions; and encourages their efficient and conservative use is our best hope for a secure, shared energy future.

Ladies and gentlemen, throughout history, energy has powered productivity, and enabled prosperity, for the world's population. I commend Energy Pact for creating a platform for better understanding and cooperation in setting a future course toward a more sustainable, more inclusive energy future. By understanding the interdependence of energy, the environment, and economic and social development, we ultimately serve one single, common agenda: the human agenda.

Thank you for your kind attention.