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**The Impact of the Tight Oil and Gas Boom on Latin America and the Caribbean:
Opportunities for Cooperation**

Mr. Chairman and Members of the Subcommittee, it is an honor to speak with you today about the role that the Western Hemisphere plays in U.S. energy security.

The global energy economy is undergoing significant changes, and the unconventional oil and gas revolution in the U.S. has played a large role in transforming global markets. The transformation of these markets could impact the entire Western Hemisphere. Regional producers will largely see market growth in Asia, not the U.S. Energy consumers will benefit from increased energy supply stability, resulting from exports of petroleum products from the U.S., and, potentially exports of light oil and natural gas as well. Latin American producers will have to compete for capital with unconventional energy investment opportunities in Canada and the U.S., both of which offer a more stable investment environment, better terms of investment, and a more favorable and welcoming political climate. This could be a pathway to developing more open societies in the hemisphere, with more productive economies.

All of this is evidence that the U.S. needs a fresh approach to energy diplomacy in the hemisphere. The United States will enhance its energy security by engaging the region on issues that concern its people: job creation, poverty alleviation, migration, and trade promotion. An asymmetrical approach, one that addresses a broad range of issues rather than just energy security, may pay dividends equal to or greater than one focused solely on energy. But the opportunities for creative energy diplomacy are numerous. The U.S. can explore avenues for improving the investment climate of the Hemisphere, spreading advanced clean and unconventional energy production technology in the Hemisphere, advocating for shale gas and renewable energy technologies as climate-friendly alternatives to oil and gas, and weaning Caribbean nations off fuel oil as a primary energy source through the export of LNG. These initiatives, if realized, would render positive benefits for U.S. influence in the Hemisphere and for our broader energy and climate goals simultaneously. The U.S. must also ensure that it has the flexibility to utilize sub-regional energy dialogues and that any new framework strengthens, rather than weakens, the energy diplomacy missions of the Department of Energy and the Department of State.

I. The Unconventional Energy Revolution

Only a short number of years ago, the U.S. was facing a future of resource scarcity. Domestic energy production was falling. Oil and gas imports were projected to rise. The advent of the so-called ‘shale gale’ has changed that outlook entirely. U.S. natural gas production has risen by 20 percent since 2000. Shale gas production alone grew from 0.75 Tcf to 7.85 Tcf between 2005

and 2012.¹ Further innovations saw the same horizontal drilling and hydraulic fracturing technology expanded to the production of tight oil. U.S. crude oil production has grown from 5.2 million barrels per day (mbd) in 2005 to 6.5 mbd in 2012 as a result.² As a share of that production, tight oil accounted for 1.2 mbd in 2011.³

We no longer expect to import significant quantities of liquefied natural gas (LNG). These cargoes, once bound for the U.S., were rerouted to other consumers. Many of the companies that built costly liquefied natural gas (LNG) import terminals are now seeking approval to build export terminals. The production of tight oil has changed the U.S. oil import scenario as well. While the U.S. will continue to import foreign oil for the foreseeable future, both to meet total demand and to fulfill the requirements of domestic refineries that are not designed to process the light tight oil, imports are expected to continue to fall. The EIA estimates that imports could be as low as 34 percent of total liquid fuel use in the U.S. in 2019, compared to 60 percent in 2005.⁴ This is as much a credit to demand side measures such as increased fuel efficiency standards, changed driving habits and biofuels as it is to increased supply. Some experts have even begun to call for a reexamination of the ban on crude oil exports, arguing that exports or swaps of light and heavy oil would be the most economically efficient manner to meet U.S. refinery needs, sustain U.S. production and capitalize upon the U.S. tight oil boom.

Our resource wealth has helped reduce our trade deficit from \$753.3B in 2006 to \$539.6B in 2012.⁵ Low cost natural gas has also advanced our climate agenda. Total U.S. GHG emissions have dropped from 7.2 to 6.7 billion metric tons of CO₂ equivalent between 2007 and 2011.⁶ U.S. energy-related emissions of carbon dioxide have dropped considerably, falling to 5.3 billion metric tons of CO₂ in 2012, the lowest emissions since 1994,⁷ in large part from substitution of natural gas for coal.

We have also become a significant supplier of petroleum products to Europe and the hemisphere. Our efficient refinery system allows us to make the gasoline we need, but also the diesel products we need and the fuel oil and other products imported by our neighbors in the hemisphere. Roughly 60 percent of U.S. crude oil and product exports go to nations in the Western Hemisphere, with over half of those exports going to Canada and Mexico. We thereby improve our export balance, increase domestic revenues and provide a more competitive market for petroleum products.

This great wealth of domestically produced gas and, increasingly, oil, leads some to believe that the U.S. is on the cusp of an era of “energy independence.” Many adherents of this line of thinking predict that the unconventional revolution will allow the United States to look inward and take less interest in international affairs, including those of the politically challenging countries that produce oil and natural gas in the this Hemisphere, the Middle East, Africa and

¹ Energy Information Administration, “Annual Energy Outlook 2013 Early Release,” <http://www.eia.gov/forecasts/aeo/er/index.cfm>

² Energy Information Administration, “United States Overview Data,” February 12, 2013 <http://www.eia.gov/countries/country-data.cfm?fips=US&trk=m#pet>

³ Energy Information Administration, “Annual Energy Outlook 2013 Early Release”

⁴ Ibid

⁵ U.S. Bureau of Economic Analysis, “International Economic Accounts” <http://www.bea.gov/international/index.htm#bop>

⁶ Environmental Protection Agency, “Draft Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2011,” February 2013 <http://www.epa.gov/climatechange/ghgemissions/usinventoryreport.html>

⁷ Energy Information Administration, “Today in Energy: Energy-related carbon dioxide emissions declined in 2012,” April 5, 2013 <http://www.eia.gov/todayinenergy/detail.cfm?id=10691>

elsewhere. This is unlikely to happen. Despite more production from shale deposits like the Bakken in North Dakota, oil's share of total U.S. energy demand is expected to decrease only to 32 percent from 36 percent in 2011 by 2040. Natural gas will increase its share to 28 percent from 26 percent and renewables will grow to 11 percent from 8 percent, according to the EIA.⁸ Oil, even that produced domestically, will continue to be priced at market levels, meaning that prices here will continue to be impacted by global events. The most strategic factor in American consumption will remain the price of oil and the effect of disruptions on the U.S. and the global economy, not the source or quantity of U.S. imports.

The shale boom will, or at least should, lead to changes in U.S. policy. We have the opportunity to use our energy supply and our technology as a powerful tool for good in the hemisphere and worldwide. By sharing our best practices for safe and efficient development of tight oil and gas formations, engaging our hemispheric partners on clean energy technologies, encouraging resource rich nations to practice transparency in how they manage their resource sectors, and being a direct supplier of oil, natural gas and products, we can help foster a more free and prosperous region.

A. The Unconventional Revolution: Impacts on Latin America

Latin America is a strategic region for U.S. foreign policy for many reasons. We are neighbors, trading partners, and investment partners, and we share deep familial and cultural ties. The hemisphere is largely democratic, with one notable exception. In the energy sphere, the hemisphere provides the U.S. with a large portion of our diverse oil and gas supply and it remains an essential contributor to global oil and gas supply. For this reason, the failure of the hemisphere to realize its potential for growth is a serious concern for U.S. and global energy security. While the investment climate in key Latin American countries is deteriorating as state control increases, even in Venezuela access to exploration acreage remains superior to some countries in the Middle East. Additionally, the non-OPEC producers in this region exert counter-pressure on OPEC's monopoly power.

Mexico and Central and South American nations delivered just over 12 percent of global oil production in 2012,⁹ and possess significant proved reserves, which are concentrated heavily in Venezuela, Brazil and Mexico. The region has also been a major refining center, and additional capacity is currently being planned and constructed with major projects underway in Brazil, although some delays have been experienced. Regional refineries were primarily designed to serve the specialized needs of U.S. markets. The most important exporters, Venezuela and Mexico, consistently rank in the top four sources of US oil supply along with Canada and Saudi Arabia. Venezuela averaged 0.95 mbd in 2012; Mexico averaged 1.03 mbd in that year.¹⁰

The impacts of the tight oil and gas boom on Latin America could be significant. Increased natural gas production in the U.S., if it leads to greater exports of LNG, will mean more supply for consuming countries at lower prices than are currently available to them. Such U.S. exports to the Western Hemisphere could help reduce Caribbean dependence on subsidized and high-carbon fuel oil supplies, including those from states whose goals in the region have been at odds with

⁸ Energy Information Administration, "Annual Energy Outlook 2013 Early Release"

⁹ Energy Information Administration, "International Energy Statistics, Petroleum Production," <http://www.eia.gov/cfapps/ipdbproject/IEDIndex3.cfm?tid=5&pid=53&aid=1>

¹⁰ Energy Information Administration, "US Imports by Country of Origin" http://tonto.eia.doe.gov/dnav/pet/pet_move_impcus_a2_nus_ep00_im0_mbbllpd_a.htm

U.S. interests. The U.S. has free trade agreements (FTA) with ten countries in Central and South America and the Caribbean. If we can allow some exports to countries that do not have FTAs with the U.S. we can help other major consuming nations as well. Natural gas consumption in non-OECD Latin America is expected to rise from .6 Tcf in 2008 to 8.8 Tcf in 2035,¹¹ and U.S. shale gas exports could be a significant factor in meeting energy demand and lowering carbon emissions in the Hemisphere through the offset of coal and fuel oil.

There are great prospects for greater energy self-sufficiency in the hemisphere, which will provide economic gains from lower cost energy, production related job growth, and reduced dependence on high carbon fuels for power generation. A report published in 2011 by Advanced Resources International, Inc. (ARI) for the EIA estimated that there could be as much as 1,195 Tcf of natural gas in Latin America.¹² ARI estimated that the largest potential reserves of shale gas in Latin America are located in Argentina, Mexico, and Brazil, with 774, 681, and 226 Tcf of estimated reserves respectively.¹³ Smaller shale gas resources, less than 70 Tcf apiece, were estimated in Chile, Paraguay, Bolivia, Uruguay, Colombia and Venezuela. The U.S., through the Unconventional Gas Technical Engagement Program (UGTEP) at the Department of State (the successor to the Global Shale Gas Initiative I launched during my tenure at the US Department of State), is actively engaged in assisting foreign countries develop their unconventional gas resources safely and efficiently. Through UGTEP the Department of State partners with the Department of the Treasury, the U.S. Geological Survey (USGS), the Department of Interior, the Department of Commerce's Commercial Law Development Program, and the Environmental Protection Agency (EPA). UGTEP can offer nations expertise on scientific, technological, legal, commercial and environmental issues related to shale gas development. Some nations, like Argentina and Colombia, are already making strides towards developing domestic programs for shale gas exploration and production.

The unconventional revolution will also force the resource-endowed nations of the Western Hemisphere to develop more competitive investment frameworks. North America has become the investment destination of choice, with large markets, attractive fiscal terms, strong rule of law and respect for contract sanctity in the U.S and Canada. As will be discussed in greater depth, many Latin American countries are noted for resource nationalism, volatile investment frameworks, and political extremes rather than stability. In order for Latin America to compete, investment terms will have to improve and regulatory frameworks must be enforced with equity and consistency. In short, the southern half of the Hemisphere must prove that it can adapt to changing markets, resource bases and technologies in order to compete with the opportunities found in North America. The prospects for this adaptation are mixed, providing opportunities for U.S. energy diplomacy.

II. Energy Trends in the Western Hemisphere

The Western Hemisphere has seen the rise of two trends in energy governance in recent years. One trend is towards rising state control of energy resources – in Venezuela, Argentina, Bolivia and Ecuador in particular. The concern here is that this trend will limit the growth of global supplies of oil and gas by undermining the value of existing investments, discouraging future

¹¹ Energy Information Administration "International Energy Outlook – natural gas,"

http://www.eia.gov/forecasts/ieo/nat_gas.cfm

¹² Energy Information Administration, by Advanced Resources International, Inc., "World Shale Gas Resources: An Initial Assessment of Regions Outside the United States,"

www.eia.gov/analysis/studies/worldshalegas/pdf/fullreport.pdf

¹³ Ibid

investment and leading to political instability resulting from declining living standards. The economic consequence of this trend is that the hemisphere will contribute less to the diversification of oil supply, thereby engendering a tighter international oil market more vulnerable to the negative effects of supply shocks, increasing the importance of OPEC supply and, over time, undermining economic development in the region. The political consequences of these trends include the decline of U.S. influence in the region relative to competing ideologies and the erosion of democratic structures.

A second, much more positive, trend is towards creative fiscal regimes that welcome foreign investment and require state owned companies to compete with international companies, with independent regulators that promote fair and efficient regulation. Countries observing this model are increasing production or stalling the decline of existing reserves. Colombia, Trinidad and Tobago, and Peru are key examples of this creative model.

When I last testified on Latin American energy trends before Congress, Mexico was generally considered to be a part of the first group, making the net trend negative. Today, however, Mexico's government is actively seeking reforms that include, but are certainly not limited to, the energy sector. A new question mark hangs over Brazil, however. While Petrobras had been viewed as an exemplar national oil company in recent years, it has recently seen its production estimates curtailed, and its market value tumble. The company is no longer second in value only to Exxon Mobil. Perhaps as a sign of changing regional dynamics, Petrobras is now reported to be worth less than Colombia's national oil company, a development that would have been thought to be nearly unthinkable just a few years ago.¹⁴ While natural gas production is rising, oil production is falling, as Petrobras has faced major challenges fulfill both its newfound responsibilities in the deep and ultra-deepwater subsalt resources, companies face challenges meeting aggressive local content requirements and Petrobras struggles to meet the political expectations of the government.

Venezuela and Mexico are the most important oil exporters in the hemisphere. While Brazil, Colombia and Argentina are important destinations for foreign investment, and helpfully produce enough oil to meet their own domestic needs and make some contribution to the global export market, they are not strategic suppliers to the global market at this time. Only Mexico, Brazil and Venezuela produce more than a million barrels per day, although Colombian crude oil production rose as high as 944,310 barrels per day in 2012,¹⁵ and Federico Renjifo, the Colombian Energy and Mining Minister, has stated that the country expects to produce 1.01 mbd in 2013.¹⁶ Bolivia has enormous gas reserves, but exports mostly to Brazil and modestly to Argentina. Only Trinidad and Tobago is a key supplier to the world gas market.

A. The Rise in State Control

From those countries now committed to increasing state control, the U.S. faces two key challenges: the loss of production growth and diversity of supply from the region if new economic frameworks are unattractive to foreign investors and, most critically, the loss of U.S. influence vis-à-vis competing political visions.

¹⁴ Simon Romero, "Petrobras, Once Symbol of Brazil's Oil Hopes, Strives to Regain Lost Swagger," *New York Times*, March 26, 2013

¹⁵ Energy Information Administration, "Colombia Overview/Data," <http://www.eia.gov/countries/country-data.cfm?fips=CO>

¹⁶ Carlos Vargas, "Colombia expects higher average oil production in 2013," *Reuters*, Feb 7, 2013

The Economic Impact of Rising State Control

The recent wave of changes in contractual terms and dramatic changes in tax regimes in Venezuela, Bolivia, Ecuador and, in recent years, Argentina, threatens to slow new investment and eventually deepen instability and poverty in these nations, as well as destroy shareholder value for the companies invested there. The deterioration in the investment climate for energy in these countries is primarily an economic threat, as it foments an environment where supply is constrained and prices are high. We are seeing the revision of economic terms at a time when producers rather than companies hold more market power.

Venezuela

In 2007, President Hugo Chavez led the nationalization of oil exploration and production in Venezuela, mandating renegotiation of contracts with a minimum 60 percent PdVSA share. While sixteen companies, including Shell and Chevron, complied with the new agreements, ExxonMobil and ENI refused to cooperate and were forcibly taken over. Both companies have pending complaints before the International Centre for the Settlement of Investment Disputes (ICSID) at the World Bank that are expected to be decided in late 2013. As a result of those claims, particularly the ExxonMobil claim, Venezuela withdrew from the ICSID in 2012.¹⁷ The impact of the nationalizations, according to expert analysts like Deutsche Bank and Wood Mackenzie, was a massive flight of investment capital from Venezuela's heavy oil sector to Canada's oil sands, effectively freezing development of the hemisphere's largest oil reserves during one of the greatest oil booms in history. The net impact on Venezuela's credit and credibility are quite negative, again with serious negative long-term consequences for the global oil market and Venezuela's own economy. In 2008, ENI and Total came reached an agreement with PdVSA regarding a 2005 joint venture requirement that they had not previously signed an MOU for. Terms for involvement in natural gas development in Venezuela are slightly more beneficial, although in 2012, the year before his death, President Chavez expressed some interest in altering those terms. It is generally expected that Venezuela's oil production will continue to fluctuate or stagnate without considerable outside investment. According to the EIA, some analysts estimate that PdVSA must spend at least \$3 billion annually in order to keep production at its current levels.¹⁸ Venezuela plays a significant role in the Western Hemisphere, acting as a proxy for Cuba and providing oil at favorable cost and financing terms to Caribbean nations through Petrocaribe and the Southern Cone through Petrosur, ventures which add stress to the country's fiscal situation. While change is unlikely to happen quickly, pressure stemming from the recent failed currency devaluation, rising inflation, and vast external subsidies will take a toll on the economy and are ultimately unsustainable.

Bolivia

In Bolivia, President Evo Morales ensured the adoption of a new Bolivian Constitution in 2009, the 17th in the country's history. One of the clauses in the new Constitution states that "all hydrocarbon resources are the property of the Bolivian people and that the state will assume control over their exploration, exploitation, industrialization, transport, and marketing (Articles

¹⁷ U.S. Department of State, "2013 Investment Climate Statement – Venezuela," March 2013
<http://www.state.gov/e/eb/rls/othr/ics/2013/204759.htm>

¹⁸ Energy Information Administration, "Venezuela Country Analysis Brief," October 2012
<http://www.eia.gov/countries/cab.cfm?fips=VE>

348 and 351).”¹⁹ Under the new constitution, the state-owned company Yacimientos Petrolíferos Fiscales Bolivianos (YPFB), which had also benefitted from government action in 2006 that gave it control of all domestic production and transportation, is responsible for managing all transport and sale of hydrocarbons, as well as determining whether it can be exported.²⁰ The U.S. Department of State considers investment in Bolivia to be difficult for both domestic and foreign companies. For companies seeking to operate in hydrocarbon industries, the only contracts available are negotiated as service contracts, although there are “no restrictions on ownership percentages of the companies providing the services.”²¹ Because all foreign companies in the hydrocarbon industry are subject to state sovereignty, with a limited ability to appeal for international arbitration, there has been extremely limited foreign investment. This is deeply unfortunate and Bolivia has enormous reserves of natural gas that could be monetized to address the country’s longstanding poverty.

Ecuador

In Ecuador, President Correa convincingly won re-election in February 2012, defeating several candidates from a political opposition that analysts routinely describe as fractured. Given the death of President Chavez, Correa is now arguably the most prominent Bolivarian leader in the region and may seek to bolster his international profile. Yet it is unlikely that Correa has adequate resources to turn Ecuador into a regional player with influence commensurate to Chavez’s Venezuela. While Correa hasn’t launched a nationalization campaign in a scope equal to that of Chavez, critics have raised concerns that he is aggressively expanding Presidential power and is seeking to clamp down on the independent media. The climate for foreign investment in Ecuador is considered relatively hostile. While the State Department’s 2013 Investment Climate Statement for Ecuador notes that the nation is “relatively open to foreign investment in most sectors” and that policies have been enacted aimed at drawing investors to the country, they add the caveat that “other legal changes have reduced private sector participation in so-called strategic sectors, most notably extractive industries.”²² Continued changes to the nation’s economic, commercial and investment policies, as well as tax codes, prevent the investment climate from being stable for any industry and presents significant difficulties to the development of business plans. The continuation of high profile legal cases against foreign oil companies, most notably Chevron, has also served to limit interest from foreign investors. In 2010, under President Correa, reforms to Ecuador’s Hydrocarbons Law came into effect, providing for the negotiation of contracts with foreign oil companies operating in the country, and as a result five operators successfully negotiated contracts, while three other companies did not. The operations of those companies reverted to state control. The Occidental field, which Ecuador asserted state control over in 2006, is still not a productive field. Despite the domestic resources and production, a lack of refining capacity in the country means that Ecuador is forced to export crude oil and import refined products in order to meet domestic demand.

Argentina

Argentina boasts considerable natural resources, but its recent history of nationalization, particularly that of YPF SA in the shale gas fields, have made it a risky destination for foreign

¹⁹ U.S. Department of State, “2013 Investment Climate Statement – Bolivia,” February 2013

<http://www.state.gov/e/eb/rls/othr/ics/2013/204605.htm>

²⁰ Ibid

²¹ Ibid

²² U.S. Department of State, “2013 Investment Climate Statement – Ecuador,” February 2013

<http://www.state.gov/e/eb/rls/othr/ics/2013/204634.htm>

investment. The country has recently made efforts to revamp its image, most recently in January 2013, when the government unveiled reforms of the oil export taxes aimed at luring in new investors. In November of 2012, President Cristina Fernandez announced that wellhead natural gas prices would be permitted to rise as high as \$7.50 per million British Thermal Units (BTU), a 44% increase over the previous \$5.00 cap. These reforms, coupled with a willingness to adapt contract terms, have made it easier for companies to take on the risk of operating in Argentina, particularly in the shale gas fields that are estimated to be even larger than those in Europe.

The net effect of these developments is that new investment in these countries is virtually frozen at a time when prices should be driving new exploration and production. It is notable that even China, which is aggressively competing for exploration acreage worldwide, is not a major player in the hemisphere. Since 2008, China has finalized oil-for-loan deals with a number of Latin American countries, including Venezuela, Brazil, Ecuador and Bolivia. Observers have suggested that China has recently appeared less willing to provide additional financing to Venezuela, perhaps due to compounding economic difficulties there and the political uncertainty that such negative developments could eventually bring about. Several companies, including Occidental Petroleum, Repsol YPF Ecuador SA, and Noble Energy, have filed complaints against Ecuador with the ICSID at the World Bank. The most notable case was that of Occidental Petroleum, which was awarded \$1.77B in October 2012, although President Rafael Correa disavowed the award and has threatened in the past to expel any company that sues it in international courts. The future growth potential of the hemisphere is being undermined and the region's economies risk a major contraction if oil prices drop significantly anytime over the next decade.

Brazil

Brazil has received enormous, well-deserved credit for the contribution that sugar based ethanol has made to its self-sufficiency in oil. But equal credit should go to Brazil's opening of its oil sector to foreign operatorship, which led to technological innovation and a boom in its domestic oil production. While the adoption of a competitive model made Brazil one of the most desirable destinations for exploration, even this 'success story' has seen recent overtones of state control. As recently as 2008, Brazil's aggressive oil production strategy increased domestic oil production by 1 mbd over 10 years. In 1995, Brazil produced less than 700 mbd. In 2008 they produced close to 2.4 mbd.²³ Their jump in domestic production had as great an impact on reduction in oil imports as anything else.

Since 2008 Brazilian production has fallen by roughly 14 percent to 2.061 mbd in 2012.²⁴ Petrobras was recently the second most valuable publicly traded energy company behind only Exxon Mobil, but its value has fallen drastically. This trend has been, in large part, attributed to attempts by the government to assert higher levels of control over Petrobras, placing it in charge of the deepwater oil discoveries in 2010, despite the attempts of the 1990s to end the Petrobras monopoly. Brazil's local content requirements, lack of sufficient refining infrastructure and delays to construction of new refineries, and the use of Petrobras to shore up the national economy have all had an impact on the countries energy situation. In spite of these challenges,

²³ Energy Information Administration, "World total liquids production by region and country, Reference case" http://www.eia.gov/oiaf/aeo/tablebrowser/#release=IEO2011&subject=5-IEO2011&table=38-IEO2011®ion=0-0&cases=Reference-0504a_1630

²⁴ Energy Information Administration, "Brazil Overview Data," February 12, 2013 <http://www.eia.gov/countries/country-data.cfm?fips=BR>

Petrobras remains profitable, and remains a publicly traded company influenced by global markets, giving it an advantage over the fully state-run companies of Venezuela and Bolivia.

Mexico

Mexico has been a long time reliable supplier, but its oil production has been falling steadily since 2004. Due to constitutional constraints, foreign involvement in upstream development and ownership of resources has been strictly limited. In 2008 minor reforms were undertaken that loosened those restrictions, granting PEMEX greater autonomy and making it possible for some private participation in exploration and production through incentive-based contracts with foreign oil companies, but the impact was minimal and production has continued to fall. In 2011, PEMEX announced the first production licensing round in Mexico in over 70 years, with 20 blocks noted for international bidders.²⁵ For a number of years, analysts have noted that unless the Mexican government dramatically increases the amount of PEMEX earnings it can keep for capital investment (in 2004 PEMEX paid the government 60% of its revenues), the company would have significant difficulties in maintaining production, not to mention expanding into more technically complex and diverse resources. Mexico has enormous oil potential on its side of the Gulf of Mexico and a change in policy could both change global oil markets and create a formidable source of wealth for development of the country itself.

Change appears to be forthcoming for Mexico. In 2012 Mexico ratified the US-Mexico Trans-boundary Agreement that would permit foreign investment in the Mexican Gulf of Mexico if a trans-boundary reservoir were to be found, and if companies on both sides of the reservoir wished to cooperate. This is an effort I helped launch during my tenure at the Department of State. The US needs to adopt implementing legislation allowing the U.S Department of Interior to implement the agreement, and the US needs to notify the Congress, although it does not require Senate ratification in my view. More recently, the new government of President Enrique Pena Nieto has announced plans to undertake major reforms of the energy sector and conduct some experimentation with Mexico's shale oil and gas reserves. Some analysts view these reforms with skepticism, noting that the constitutional nature of the restrictions on the energy sector may require that any reforms are backed by a constitutional amendment, but the initiative appears to be sincere. If the reforms are unsuccessful, the EIA estimates that Mexico, currently one of the largest sources of oil exports to the U.S., could see its production sink as low as 1.4 mbd by 2025, compared to 2.96 mbd in 2011. Any incremental step that Mexico can take would be helpful to the global oil market. I am optimistic that Mexico will make significant reforms, including constitution changes.

B. The Market Model

The hemisphere is not monolithic. We have seen remarkable success stories, including Colombia and Peru, which have created independent regulators and obliged their national energy companies to compete with outside companies for exploration rights. Such progressive cases provide bright spots in the region.

Colombia

²⁵ Energy Information Administration, "Mexico Country Analysis Brief," October 2012
<http://www.eia.gov/countries/cab.cfm?fips=MX>

The story in Colombia is largely positive. Colombia has set up favorable fiscal terms for foreign investment, has an independent regulator working to ensure safe and efficient development of resources, and recognizes the importance of competing in the global economy. While Colombia, like many other Latin American companies, legally considers all natural resources to belong to the state and centers production under state-owned companies Ecopetrol and Ecogas, the country has made strides to make foreign investment attractive. Colombia allows foreign companies to take 100 percent stakes in oil ventures, competing with Ecopetrol. The government has also undertaken several initiatives, including partially privatizing Ecopetrol in 2007 and “establishing a lower, sliding-scale royalty rate on oil projects and lengthening the time for exploration licenses.”²⁶ As a result, Colombia has experienced growing oil production, up 47% between 2008 and 2012 according to EIA, and is also the recipient of significant new investment in its shale gas resources. Colombia is taking a model approach to shale gas development. It selected a small number of qualified companies to participate in its first shale gas bid round in 2012, and has engaged in an intensive effort to develop best practices for environmental protection.

Trinidad and Tobago

Trinidad and Tobago is another example of a Latin American country that has worked to develop its energy resources as part of the global economy. The economy of Trinidad and Tobago is driven primarily by the energy industry, making it one of the only Caribbean nations that do not rely primarily on tourism for government revenue. The island nation produces only minimal amounts of crude oil, but produced 1.4 Tcf of natural gas in 2011.²⁷ Nearly half of that gas is exported as LNG, making the nation a fairly significant player in global LNG trade. Given that the U.S. no longer requires LNG imports, much of its LNG supplies will likely flow to Asian consumers. Trinidad and Tobago is considered to be friendly to foreign investment, and numerous U.S. companies are invested in the oil and gas sectors. Looking to the future, the U.S. Department of State notes that challenges lie ahead for the nation’s economy, as it must cope with declining gas reserves, high production costs, production slowdowns, and a lack of political will to invest in the future of the energy sectors. Depending on how developments take place in Venezuela, the country could become a center for liquefying and transporting Venezuelan LNG.

III. The Impact of Hemispheric Energy Trends on U.S. Foreign Policy

The tight oil boom will produce competitive pressure on the region’s oil and gas producers. If global oil prices soften, revenues could fall significantly and put major fiscal pressure on governments highly dependent on resource revenues for their budgets. The market will impact these economies far more than any U.S. policy can. But there will be a debate over economic frameworks in the hemisphere, and the U.S. should be a part of it. While U.S. influence in the hemisphere has waned in key areas in recent years, our ability to help these economies revive through energy investment, and to grow through more competitive energy feed stocks can help change this pattern if we take advantage of it. We have key strategic partners in the region including Brazil, Mexico, Chile, Argentina, and Colombia. We can effectively use trade as a tool for good, as witnessed by the US-Colombia Free Trade Agreement. We need to appreciate the salience of legitimate regional issues like poverty and advocate how our economic and political

²⁶ Energy Information Administration, “Colombia Country Analysis Brief,” June 2012.

<http://www.eia.gov/countries/cab.cfm?fips=CO>

²⁷ Energy Information Administration, “Trinidad and Tobago Overview Data,” February 12, 2013

<http://www.eia.gov/countries/country-data.cfm?fips=TD>

models can alleviate them. Examples of this are addressing trade barriers to agricultural imports, expanding educational opportunities in the U.S. for future leaders, improving the visa application process, dealing with migration issues with Mexico in a spirit of respect and fairness, supporting World Bank and Inter American Development Bank infrastructure programs in the hemisphere, supporting the development of civil society and the capacity of democratic institutions, and treating our relations with our hemispheric neighbors as intrinsically important, not as litmus tests of loyalty to the U.S. on issues external to the region itself. In countries where we face ideological competition, it is crucial that we do not abandon the field. We need to increase our diplomatic engagement and defend our way of thinking.

A. Uncertainty in Venezuela

Venezuela has long been seen as the leader of a regional group of states seeking to wage an ideological and political competition for regional influence with the U.S. Yet the death of President Chavez, whose charisma has long been regarded as a key facet of the Bolivarian narrative, and Venezuela's growing economic problems, which were recently reflected by the government's efforts to devalue the currency by more than 30% against the dollar, have led some observers to believe that the influence of the Venezuelan model has peaked. Many are now forecasting that the Brazilian economic model, which still provides for a generous state role in the economy, yet does so in a more market-friendly and democratic context, will gain clout among states in the region that remain skeptical of liberal economics and the Washington consensus.

In the wake of Hugo Chavez's death, many questions remain about whether political change is possible in Venezuela itself. Indeed, the opposition candidate in the April 14 election to succeed Chavez, Henrique Capriles, is a vocal adherent of the Brazilian model that many say is gaining regional traction. Yet it is widely assumed that Chavez' handpicked successor, Vice President Nicolas Maduro, will win the election. Several divergent prognostications have been made regarding what a Maduro Presidency would entail for the U.S. While some perceive Maduro as a pragmatist who may be amenable to normalizing bilateral ties, others believe that he will be eager to prove his Bolivarian credentials to Chavez's constituency and reject any U.S. entreaties to reengage. Still others doubt whether he will be able to retain the Presidency at all should the economic situation deteriorate further. Diosdado Cabello, a fellow Chavez adherent who is President of the National Assembly and is reported to be a popular figure among the Venezuelan Armed Forces, is commonly cited as an individual capable of seizing the Presidency, potentially through forcible means, should an opportunistic situation present itself.

The manner in which the next Venezuelan President manages Venezuela's oil wealth will have significant implications for international oil markets, which remain fairly tight due to supply disruptions in geopolitical hotspots Iran, South Sudan, Yemen, and Syria. In February 2012, the *Economist* estimated that international markets have lost 1.25 million barrels per day as a result of these and other recent supply disruptions.²⁸ Venezuela is an even more significant player in international markets; EIA estimates that it exports around 1.7 million barrels of crude per day.²⁹ The impacts on Venezuela's own economy will also be very profound, as Venezuela's economy is far from diversified and remains nearly entirely dependent on the oil sector. In recent years, PdVSA's exploration and production capital expenditures have not been sufficient to reverse

²⁸ The Economist, "Oil Markets: High Drama," February 25, 2012
<http://www.economist.com/node/21548272>

²⁹ Energy Information Administration, "Today in Energy," January 22, 2013
<http://www.eia.gov/todayinenergy/detail.cfm?id=9651>

production declines in the country's mature conventional fields or to harness the country's massive oil sands reserves in the Orinoco Belt. These unconventional resources are thought to account for around 90% of Venezuela's remaining proven oil reserves. In order to maintain production at a reasonable clip, the next Venezuelan President will have to improve the country's oil and gas investment regime to attract international firms with expertise in enhanced oil recovery techniques in conventional fields and in the unique, challenging technical requirements for producing the extra heavy crude oil in the Orinoco Belt, and that also have the resources to alleviate massive infrastructure bottlenecks that plague the oil sands production.

It is hard to be optimistic about Venezuela's near term prospects. Canadian heavy crudes are likely to fulfill a greater share of the US need for heavy crude. While heavy coking refinery capacity is growing world wide, Venezuela will face a challenging market for its crudes and lower profit margins as the distance to market will grow.

B. The Status of Current Dialogues

The US has had a number of bilateral and multilateral energy policy forums in the hemisphere over the years. These forums are platforms to understand market dynamics, share best practices on energy efficiency and conservation, share understanding on ways to enhance energy production, and exchange views on how a nation's energy policies may be enhanced or reformed to promote the nation's own policy. These policy dialogues are also essential for building the understanding and relationships that are essential for trade promotion and conflict resolution.

Numerous dialogues and programs have been enacted since 2008, when I wrote that engagement with the Western Hemisphere needed to be renewed. Among those are a number of programs and initiatives aimed at energy relations.

The Energy and Climate Partnership of the Americas (ECPA) was founded at the invitation of President Obama following the April 2009 Summit of the Americas, hosted in Trinidad and Tobago. ECPA was intended to focus on issues including energy efficiency, renewable energy, cleaner and more efficient use of fossil fuels, energy poverty, and infrastructure, and Secretary of State Clinton later proposed expanding the focus to include sustainable forests and land use and climate change adaptation. ECPA brings together governments and public and private sector partners to implement initiatives and complete projects, and boasts numerous initiatives in Central and South America and the Caribbean.

Among the ECPA Initiatives are the Colombia Biomass Initiative, which aims to develop a technological plan for the production of energy from agroindustrial biomass, and the Chile Renewable Energy Center, which is intended to serve as a tool and resource for the region as it seeks to increase its use of renewable fuels. Both projects are undertaken in collaboration with the U.S. Department of Energy, which provides technical assistance and opportunities for collaborative work.

Numerous dialogues exist today between the U.S. and Brazil. The U.S.-Brazil Strategic Energy Dialogue (SED), a presidential-level partnership aiming to deepen energy cooperation between the two nations, is one of the most significant. Strengthening energy security, the creation of new jobs and industries and reduction of carbon emissions are key goals of the SED. Major topics of the dialogue include biofuels, renewables and the sustainable development of oil and gas resources.

The US has a trilateral energy policy dialogue with Canada and Mexico, which has addressed electric power, energy conservation, harmonization of standards and market outlooks. It has taken many forms, but it functions very well. In May 2012 the U.S., Mexico, Canada Map of Potential Carbon Dioxide Storage Capacity was released, identifying capacity in North America for at least 500 years worth of carbon dioxide emissions. The “New North American Carbon Storage Atlas” was created through the North American Carbon Atlas Partnership, and was developed by DOE, Natural Resources Canada, and the Mexican Ministry of Energy.

We have many paths for cooperation. What we need now is a sharper focus on what we should prioritize, so we can maximize our impact and make the most of the limited engagement of our senior officials.

IV. Energy Security Opportunities for the U.S.

The Committee is wise to see the unique period of opportunity that the massive changes in oil and gas markets have created for U.S. foreign policy. While we will be more self-sufficient at home, our national security will still depend on a diverse global supply of oil gas, one able to withstand the inevitable disruptions we will face. If we can take this moment to help the hemisphere increase its own self sufficiency, wean itself from high carbon fuels, access more cost competitive feed stocks for power and transportation, and reduce dependence on subsidized Venezuelan fuel oil, we will have helped our own national security interests and helped to foster a freer, more prosperous, and more climate secure hemisphere. Here I offer six steps that the United States can take to meet its energy security goals in the Hemisphere.

1. Sustain Efforts Aimed at Energy Efficiency and the Adoption of Biofuels and Renewable Technologies

Lowering global carbon emissions in order to mitigate the impacts of climate change is an important step towards ensuring global energy security. Latin America is highly dependent upon fossil fuels for its energy needs, most notably oil, coal and natural gas. Fuel oil is still a frequently used fuel for power generation, in spite of the fact that it is relatively inefficient and particularly bad for the environment. Hydropower has long been the favored form of renewable energy in Latin America, but changing weather patterns and droughts have prevented it from being fully reliable. The United States has, as described above, undertaken initiatives aimed at expanding the spread of biofuels and renewables in the Western Hemisphere, and this should remain a priority. The expiration of the U.S. tariff on imported biofuels was a step in the right direction, and more can be done to develop biofuels industries in Latin America. The development of new industries, clean energy research centers and government policies incentivizing the use of renewable technologies for power generation will help to build long-term, sustainable industries in the Hemisphere. Regardless of the power source used, energy efficiency is a worthwhile goal for Latin America. The IEA noted in the World Energy Outlook 2012 that while energy intensity is not particularly high in Latin America, it is primarily because high energy intensity in energy producing nations is offset by low energy use in energy importing nations. Improving energy efficiency, particularly in energy producing nations, will permit more efficient use of energy resources, allowing them to stretch farther. Existing forums like the ECPA already have energy efficiency as an issue of focus and can aid in connecting companies that represent successful and proven efficiency technologies with partners in Latin America.

2. Propagate Advanced Production Technologies Abroad

Latin America has significant reserves of oil and gas, including potentially huge unconventional resources. One of the fastest, and perhaps easiest, ways for the U.S. to ensure diversification of energy supplies is to help other nations take advantage of the unconventional energy revolution. This will mean sharing technology, building regulatory regimes, improving environmental safety standards and possibly even developing infrastructure in nations with shale gas and tight oil reserves. The U.S. should continue to expand upon the work that the Department of State and partner agencies are attempting to achieve through UGTEP, offering technical, regulatory, geological and other support to countries that want to develop their shale oil and gas resources. There are also roles for companies to play, sharing their technology and technical expertise through partnerships, investment opportunities or service contracts. Helping other nations develop their domestic resources will increase global energy security by increasing and diversifying global supply. Natural gas is also, as far as fossil fuels go, a relatively low-carbon source of energy, and the expansion of the shale gas boom may offset global coal consumption and carbon emissions, serving as a boon for climate goals as well. By helping other nations, such as Colombia, Brazil and Mexico, adapt to changing energy markets and complex new sources of energy, the U.S. will be simultaneously ensuring its own energy security.

3. Research Ways to Encourage Gas Penetration in the Caribbean

With abundant natural gas supply a short distance from the Caribbean, the US should look for ways to back out fuel oil and gasoline as a feedstock for power and transportation. While these nations are trying to maximize renewable energy, they still need a non-intermittent source of power generation. But short driving distance makes CNG or other natural gas technologies a real possibility. The key challenges are moving gas to small islands, ensuring storage or other means of security of supply, and identifying the right forms of vehicle technology. How to make this transition economically is a question for engineers as well as policymakers. The U.S. should design ways that private foundations, in tandem with our national laboratories and perhaps the OAS, can look for near-term, practical ways to increase natural gas utilization. Combined with a permissive policy on natural gas exports to the Caribbean, this could be major step forward for climate and national security for the Caribbean.

4. Reconsider the U.S. Policy Regarding Oil and Gas Exports and Swaps

In light of the unconventional revolution, the U.S. will have surpluses of natural gas and even light oil, given that the domestic refining system is primarily configured to process heavy oil. Large price differentials also exist for U.S. resources, largely as a result of infrastructure and policy constraints that keep them trapped in the U.S. Current U.S. policy only permits the export of crude oil in highly limited circumstances. A careful reconsideration of U.S. export policy, particularly towards oil, may be warranted. Allowing some exports or swaps of light oil produced in the U.S. for the heavy oil needed for refineries would enable us to supply our hemispheric neighbors, increase export earnings, and sustain domestic job growth. Granting an additional avenue for sale of energy resources, either oil or gas, will also ensure that artificial barriers to export don't lead to decreased production, high domestic prices and lost value to the economy, while simultaneously adding to global energy supply stability and security.

The hemisphere can also benefit from additional exports of natural gas. Mexico imports costly LNG at oil-linked prices. The Caribbean is dependent on fuel oil for power generation and Brent prices gasoline for transportation. These exports could present a political advantage as well as an economic one, granting the U.S. with another tool to use in the Western Hemisphere, where Venezuelan influence is cemented by subsidized sales of crude oil and products.

5. *Complete the U.S.-Mexico Transboundary Agreement*

On February 20, 2012, the U.S. and Mexico signed a transboundary hydrocarbons agreement that allows for the joint development of oil and gas reservoirs that cross the international maritime boundary between the two countries in the Gulf of Mexico.³⁰ If implemented, the agreement would end the current moratorium on exploration and production in the border area. While the Mexican Senate ratified the agreement on April 12, 2012, the Obama Administration has not formally submitted the agreement to the U.S. Congress for passage. The entry into force of this agreement would render significant benefits for both the U.S. and Mexico.³¹ It would provide a means for Pemex to collaborate with private companies in the Gulf of Mexico border area, which would give Pemex a crucial opportunity to gain expertise in deepwater activities that could be applied to the firm's operations throughout Mexico. This would serve U.S. interests by boosting Mexican production and reducing U.S. dependence on imports from more politically troublesome regions, which have replaced lagging Mexican exports in recent years.³² Conversely, U.S. reticence to implement the agreement may send the wrong signal to Mexico and dampen enthusiasm for energy sector reform at a time when the stage may be set for historic change. Indeed, competent implementation of the agreement could demonstrate to Mexico that its interests can be protected in joint production regimes with U.S. companies and bring about an impetus for broader Mexican energy reforms.

6. *Revive Energy Diplomacy and Commercial Engagement*

Energy diplomacy and commercial advocacy should be vital components of U.S. energy policy in the coming decades. The global energy system is projected to remain dependent upon fossil fuels for the foreseeable future, and as a result, having access to reliable, affordable sources of energy will remain important, as will the stability of energy markets. Energy diplomacy should center on ensuring that the U.S. has good working relationships with the countries that produce and consume energy. Successful energy diplomacy can serve a critical role in managing tensions over energy development, transportation, investment, and other issues.

The Department of State has significantly increased its capabilities to conduct energy diplomacy through the establishment of the Energy and Natural Resources Bureau, led by Ambassador Carlos Pascual. Its programs should be robustly funded. We should also deepen the international energy diplomacy capacity of the Department of Energy. The Department of Energy's relationships with civil servants in ministries across the globe provide a bridge across changes in government here and there. They can talk when the politics of non-energy issues obstruct dialogue among the foreign ministries. It is easier to get Energy Ministers together for regular meetings than Secretaries of State. Their staff should be expanded and serious program budget established to make our cooperation more than rhetorical. For true reform to be achieved, foreign ministers and heads of government will have to be involved, as this will be the key to integrating energy security into foreign policy.

The three countries that need robust attention at this time are Mexico, Brazil and Venezuela. Mexico is considering major reforms and we have much we can share at a technical level on gas

³⁰ Department of State Fact Sheet, "U.S.-Mexico Transboundary Hydrocarbons Agreement" February 2012 <http://www.state.gov/r/pa/prs/ps/2012/02/184235.htm>

³¹ Neil R. Brown and Carl E. Meacham, "Oil, Mexico, and the Transboundary Agreement," December 2012 www.foreign.senate.gov/publications/download/oil-mexico-and-the-transboundary-agreement

³² Ibid

markets, unconventional oil and gas technology, safe regulation of the deepwater, and energy efficiency. We should create a quiet bilateral mechanism for sharing this information with Mexican ministries, its nascent regulator and PEMEX. Changing global markets also impact Brazil, and we should ensure that the Strategic Energy Dialogue is reactivated as soon as new officials are on board at the Department of Energy. Venezuela is trickier because it is in political transition and there is a great deal of rhetorical hostility. But the US had a technical dialogue with Venezuela that lasted over 30 years. We need to know the new officials at the Ministry and PdVSA and to share our view of market realities, even if we may not agree on them. Sometime in 2013, after the Venezuelan elections, this technical dialogue should be revived, perhaps at the Assistant Secretary, or Deputy Assistant Secretary level.

Conclusion

Mr. Chairman, the ties between Latin America and the Caribbean and the energy security of the United States are numerous. Here I have addressed only a few of the possible avenues for improving U.S. energy security, and there are undoubtedly more, but the overarching conclusion is that energy security goals in the Hemisphere can be achieved through improved dialogue and relations with allies and adversaries alike. As I stated in 2008, it will require new approaches to energy and foreign policy. It will require fresh policy approaches, money, and creative diplomacy. But more than anything it will require leadership. As a citizen I thank the committee for its leadership on this critical issue.