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# Latin America: The new energy map

Number **35**





## A future to be redrawn

The Rio Grande is both a physical and ideal boundary. From its banks, marking the southern end of what is conventionally referred to as Anglo-America, spreads a region that for centuries has almost exclusively been a land of conquest. From the injuries inflicted by the history of Latin America and extending over 42 million square kilometers, it has proudly resurrected itself. Its governments and institutions are currently seeking, albeit among thousands of contradictions, to bring about an epochal change that will support the beginning of stable development. The same territories are home to 20 percent of the world's potential oil resources, which, as Moisés Naim states, represent both an energy “supply” and a hostage in a political context subject to continuous, unforeseen changes. A common thread runs through the authors’ analyses in this issue of *Oil* as they focus on South American energy events, not only

from a technical but also from a social and cultural perspective. Over the last twenty years, countries in the region, as Ramón Espinasa of the Inter-American Development Bank explains, have glimpsed the beginnings of global openness, granting state-owned oil companies greater operational independence and establishing clearer and more secure rules on non-public investments in the energy industry. This is a change that Mexico has tenaciously pursued, as Mexico’s minister for Energy, Pedro Joaquín Coldwell, tells us. But this historic reform is at risk

of being thwarted, as Luis Serra remarks, by the outcome of the 2018 presidential elections. Further south, the critical situation of Venezuela, a country struggling amid deep civil dissatisfaction, is described in the chronicles of Francisco Monaldi and Paul Sullivan, a dissatisfaction that contrasts with oil and natural reserves that are unrivalled in the world and which could ensure the country a future of great prosperity. This is a continent that moves between extremes which see Evo Morales’ Bolivia, as pointed out by Deputy Foreign Minister Guadalupe Palomeque de la Cruz, favored by solid economic progress and committed to achieving its goal of becoming South America’s energy hub, focused not only on the gas export sector but also on the development of alternative energies. Equally impressive is former President Correa’s Ecuador, which, in 2013, received foreign investments amounting to approximately \$703 million, one third of which was allocated to the “Pacific Refinery” project. This kind of effort is also being undertaken by Brazil, despite a strong ongoing recession and the possibility of legal punishment threatening institutional leaders. The country, as Lima de Oliveira explains, intends to assume an international role of authority and primacy, including in the energy industry, which it has been denied for too long. Recent political decisions relating to new concessions and the downsizing of the monopoly role of Petrobras, especially concerning the pre-salt fields, intend to promote that new primacy. Another major country is Argentina, which, with Macri’s accession to power, could soon put aside the economic hesitations, mainly linked to the fall in crude oil prices, which have so far hindered the exploitation of the major Vaca Muerta oil field. Overall, it is a scenario in full “revolution,” according to the best historic and civil tradition of this region. Upheavals have regularly traversed Latin American history, with contradictory outcomes. But now a unique and irreversible growth objective has emerged, one that will give these populations an opportunity to compete against a past that was often subordinated to the rest of the world, but which can now turn to a future that finally presents an opportunity of redemption.

# C O N T E N T S

## 6 A SUCCESSFUL BET by Clara Sanna



## 10 THE NEW WORLD by Giulio Sapelli

## 4 Visual LATIN AMERICAN FIGURES AND SCENARIOS

## 6 Exclusive/The Mexican minister of Energy, Pedro Joaquín Coldwell A SUCCESSFUL BET by Clara Sanna

## 10 Intervention THE NEW WORLD by Giulio Sapelli

## 16 Analysis DON'T WAIT FOR A MIRACLE by Ramon Espinasa

## 21 IN THE GREEN CONTINENT by Marisol Diaz de Medrano

## 26 Mexico REFORM THE REFORM? by Luis Serra



## 48 VACA MUERTA, A CHIMERA OR A REAL TREASURE? by Gonzalo Escribano

## 30 Venezuela WHAT WILL IT TAKE TO REVIVE THE OIL INDUSTRY? by Francisco Monaldi

## 35 Venezuela A PARADOX TO BE RECOVERED by Paul Sullivan

## 40 Brazil IS RECOVERY ON THE HORIZON? by Renato Lima de Oliveira

## 44 Brazil LEADING THE WAY FORWARD IN LATIN AMERICA by Tatiana Bruce da Silva



## visual LATIN AMERICAN FIGURES AND SCENARIOS

## 68

## TOWARDS A NEW ERA OF COOPERATION by Ronak D. Desai



## 73 Centers of gravity A CONTINENT THAT INTENDS TO TAKE OFF by Nicolò Sartori

## 74 Point of view LAS VENAS ABIERTAS DE AMERICA LATINA by Roberto Di Giovan Paolo

## 75 Geopolitics TRUMP KEEPS HIS EYE ON THE AMERICAS by Geminello Alvi

## 76 Portfolio FLORIANOPOLIS, EUROBEACH by Sergio Ramazzotti

## 78 Data RUSSIA AND SAUDI, BIG ALLIES prepared by Market Scenarios and Long-Term Strategic Options - Oil (SMOS/OIL) – Eni



## An energy giant chained by politics

Latin America is an energy giant hobbled by its politics. Its energy reality falls far short of its immense possibilities. This gap has many reasons—punitive regulations, lack of innovation, inadequate infrastructure, weak property rights, corruption and more. Latin America’s geology is great for energy production but its prevailing ideology is far less conducive to the adoption of successful energy policies. Indeed, politics underlies many of the obstacles that limit Latin America’s energy performance. From longstanding resource nationalism to the populism common throughout the region, politics has always shaped the way the Latin American nations explore, produce, consume and, in some cases, export energy. The extreme case of Venezuela illustrates the point particularly well: the country has one of the largest reserves of oil in the planet but also the lowest ratio of production to reserves among all oil producing countries. Moreover, its oil production continues to decline due to lack of investment, mismanagement and bad policies. Sadly, while extreme, this is not an isolated example. Oil reserves in Latin America represent 20 percent of the world’s total but the region’s aggregate production is a meager six percent of the total.

The gap between the region’s potential and reality also extends to renewables. Through geospatial analyses, IRENA, the International Renewable Energy Agency, has identified many areas in Latin America that show immense promise as a source of wind and solar power. According to IRENA, developing just one percent of these areas would increase installed wind energy capacity by a factor of 16. That Caribbean countries have much to gain from switching from hydrocarbons to wind and solar energy production is obvious. Yet, over a decade of politically motivated oil subsidies from Venezuela

have slowed down their efforts to adopt energy policies that are less dependent on politics and more sustainable over the long term. In Brazil, the rigid attachment to old-style import substitution policies have led to deterioration of the operational efficiency of its energy industry. And, like many other countries everywhere, most Latin American nations also have a large and intricate set of consumer subsidies that are fiscally onerous, wasteful and highly tilted against the poorer segments of society which, paradoxically, they purport to help. Still, with a production of about 16 million barrels of oil equivalent per day and a daily consumption of 12 million barrels of oil equivalent Latin America and the Caribbean would seem to enjoy a comfortable position as a net exporter of energy. This aggregate picture, however, hides significant differences. Six countries—Brazil, Mexico, Venezuela, Argentina, Colombia and Chile—represent over 75 percent of total energy consumption. Brazil, Mexico and Venezuela have surplus energy, while the rest of the region shows varying degrees of dependence on energy imports. Latin American energy resources are formidable and diverse. Venezuela, Mexico, Brazil and Ecuador are rich in oil and gas but their politics have led to a significant underperformance of their energy industries. Currently, Brazil’s PETROBRAS and Mexico’s PEMEX are engulfed in major corruption scandals, while Venezuela’s PDVSA has been crippled by corruption and politization.

A more speedy and effective development of Latin America’s energy resources will require the modernization of the region’s energy policies as well as the adoption of a more welcoming regulatory framework toward foreign investors. These kinds of reforms are already underway in Mex-

ico and, to some extent, in Brazil. Unfortunately, history shows that foreign investment policies are prone to be reversed when a change in government takes place. This happened in Venezuela in the early 2000s and there is great concern that Mexico’ recently adopted oil policies may be reversed after next year’s presidential elections. Brazil’s current political turmoil may also lead to a punitive revision of its energy policies. The future of energy in the region clearly seems to point to renewables, which already represent 53 percent of electric generation capacity, almost three times higher than the world’s average. Countries such as Costa Rica and Paraguay generate almost 100 percent of their electricity from renewable sources such as hydropower and geothermal energy while last year Uruguay generated 92 percent of its electricity from renewable sources. In 2014, the world’s investment in renewable power and fuels reached US\$270 billion, with a significant share directed to Latin America. The immense resources of solar, wind and geothermal energy found in Latin America may perhaps alter the region’s politics of energy. Renewables may not be as vulnerable to the hindering effects of nationalism and statism that have created the enormous gap that exists between potential and reality in the oil and gas sectors. There are several reasons for this optimism. One is that because renewable energies are more environment-friendly they are more aligned with the stated preferences of the population. In 2015, a Pew Research Center survey found that 77 percent of Latin Americans reported being concerned about climate change—the world’s largest percentage. A second reason is that the development of renewable energies can be undertaken by smaller, nimbler and more diverse energy companies. Oil and gas production tends to be highly concentrated in a relatively small number of large companies and the barriers to entry for newcomers are very high. This

is less true for producers of wind and solar energy. It seems reasonable to expect that renewables will be less capital intensive and present less technological challenges than those needed to find and produce oil and gas. The hope is that this more fragmented industry structure should reduce the tendency of governments to seize the companies and run it themselves as they have been prone to do with hydrocarbons. Another factor that can delay the widespread adoption of renewable energy in Latin America is the recent emergence of the United States as a powerful international competitor. Half of U.S. refined oil product exports already find their way to Latin America. In particular, the U.S. already delivers about 40 percent of natural gas required by Mexico and increasing volumes of LNG are being sent to Argentina, Brazil, Chile and the Caribbean countries. This new U.S. role as an energy provider at very competitive prices could limit the speed at which the Caribbean or the southern cone, for example, are able to build a significant capacity in renewable energies. Low oil and gas prices are hindering the development of renewables everywhere and Latin America is no exception. Nonetheless, the indisputable reality is that this region’s energy resources are significant and financial and technological requirements for their development do not seem to present insurmountable obstacles. The decisive factor will continue to be the willingness of the region’s political leaders to forsake the kinds of energy policies that have historically crippled Latin America’s ability to reach its full potential as a producer of energy.



2015 2040  
847/1,538

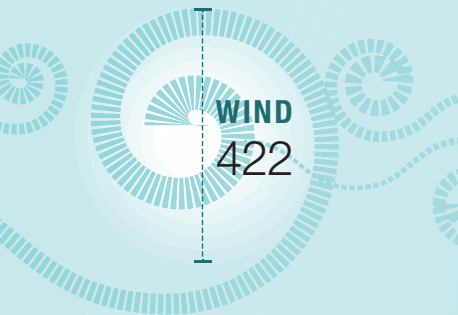
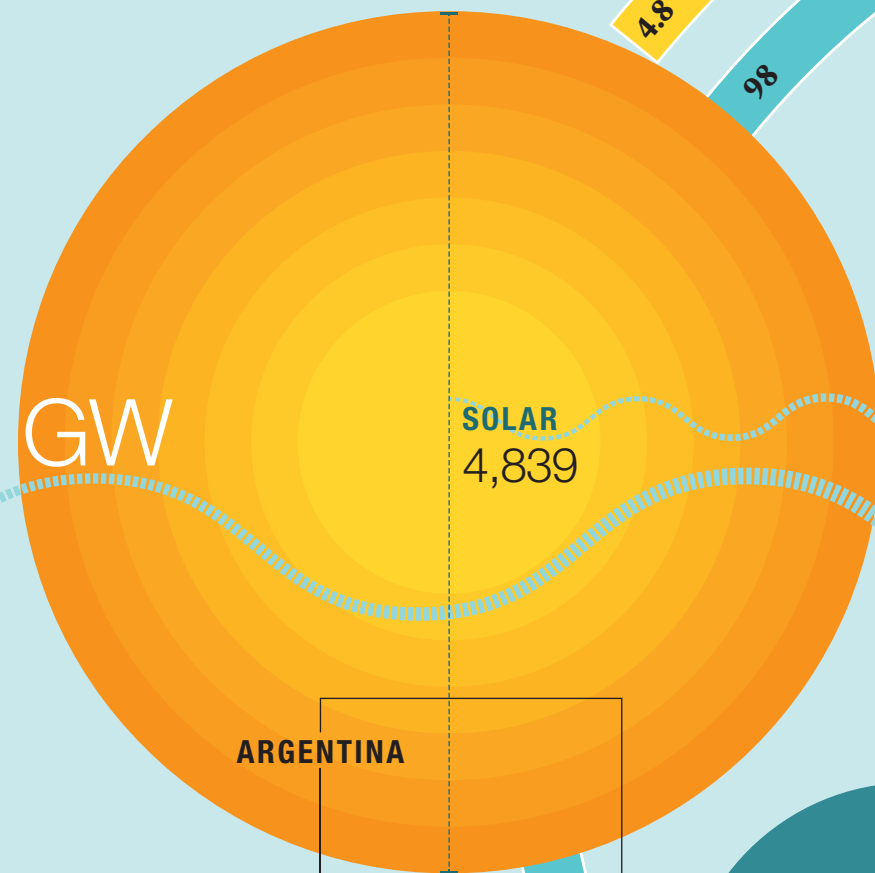
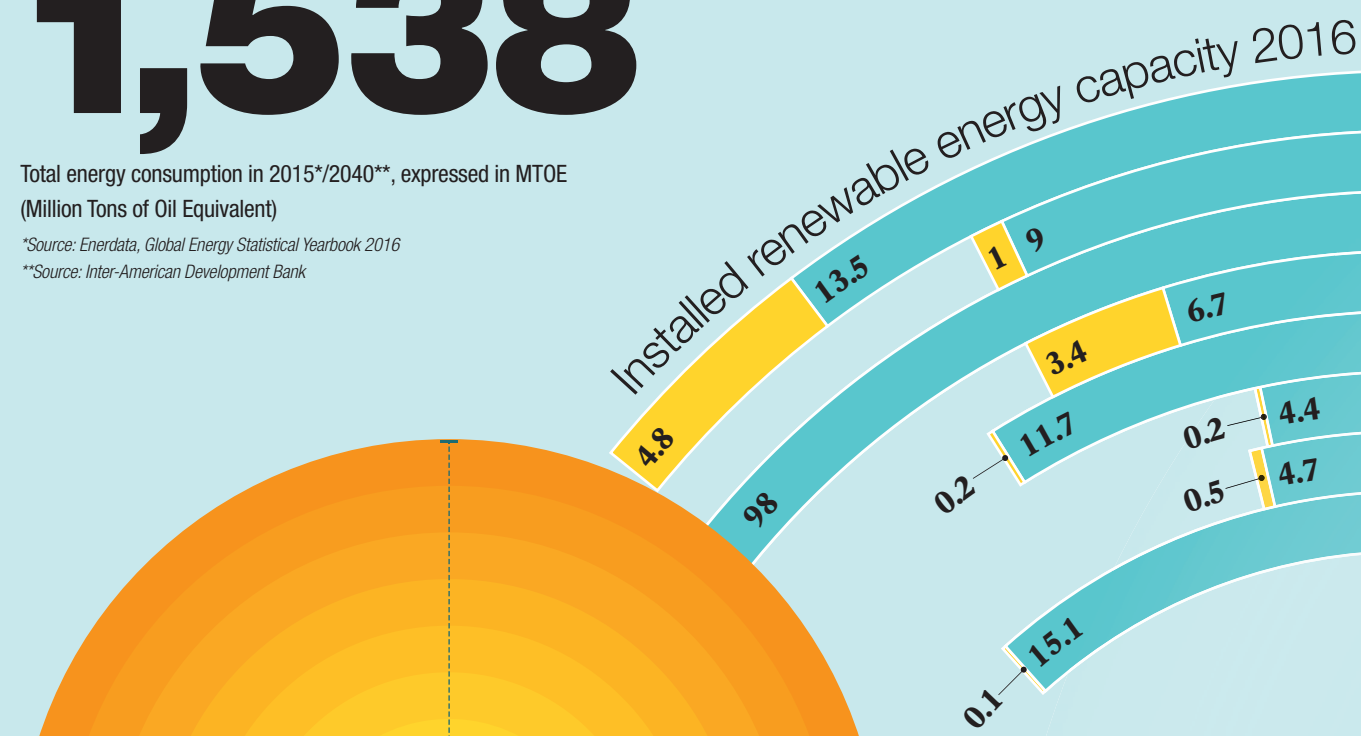
Total energy consumption in 2015\*/2040\*\*, expressed in MTOE (Million Tons of Oil Equivalent)

\*Source: Enerdata, Global Energy Statistical Yearbook 2016  
\*\*Source: Inter-American Development Bank

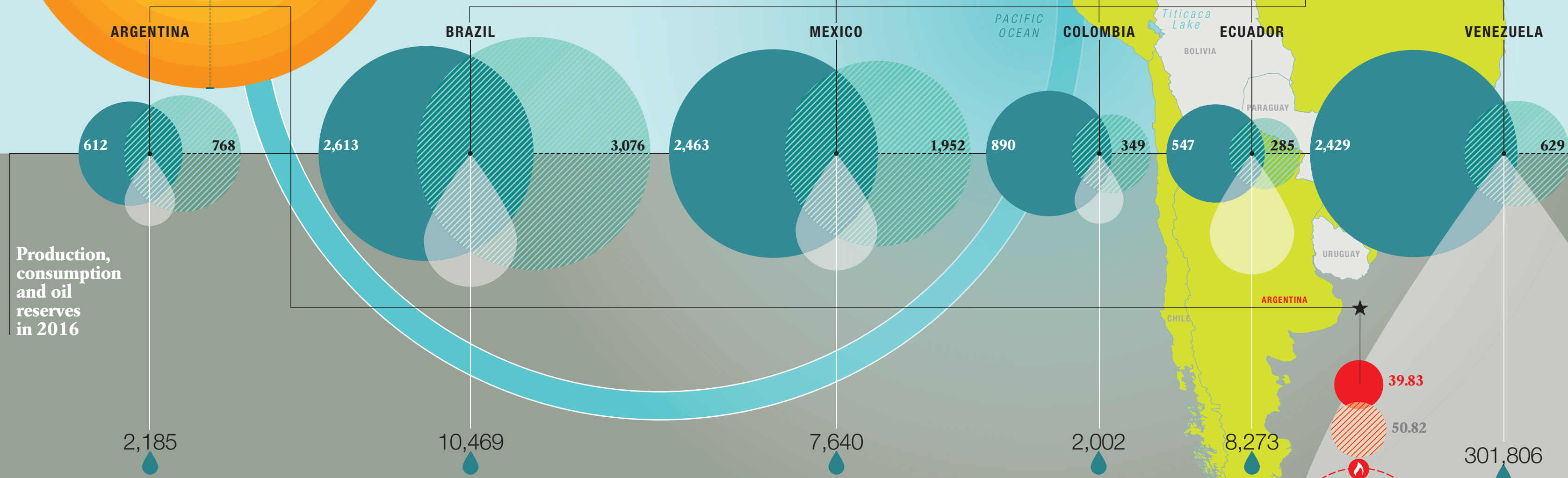
Latin American figures and scenarios.

The area has great energy potential. However, to date, the expectations generated by the discovery of huge hydrocarbon reserves in its subsoil have been disregarded. Great hopes are also placed in renewable sources, to which many incentives have been allocated.

However, as the diagram shows, the installed electrical capacity, with the exception of Brazil, is still low and huge investments will be needed for the continent's technical potential to be fully exploited.



Renewables and technical potential  
Assessed for areas with an eligibility factor exceeding 60%  
Source: IRENA



**OIL 2016**  
● PRODUCTION (thousand barrels/day)  
▨ CONSUMPTION (thousand barrels/day)  
● RESERVES (millions of barrels)

**GAS 2015**  
(billions of cubic meters)  
● PRODUCTION  
▨ CONSUMPTION  
● RESERVES

**INSTALLED RENEWABLE ENERGY CAPACITY 2016 (GW)**  
■ WIND, SOLAR, BIOMASS AND OTHER RENEWABLES  
■ HYDROPOWER

Production, consumption and gas reserves in 2015



Since the Energy Reform came into force, we have made remarkable progress and important achievements in all three energy sectors: hydrocarbons, electricity and clean energy

# hydrocarbons electricity clean energy



**Pedro Joaquín Coldwell**

He has been Mexico's Minister of Energy in President Enrique Peña Nieto's government since December 2012. Pedro Joaquín Coldwell began his political career in 1974 as Chairman of the Congress of Quintana Roo, the State of his birthplace. As Governor of Quintana Roo, Coldwell was a Senator of the Republic of Mexico for two terms, from 2006 to 2012. He also chaired the Commission for constitutional issues and the Commission for the Reform of the State.



## Exclusive/The Mexican minister of Energy Pedro Joaquín Coldwell

# A successful bet

Four rounds of races, 70 percent of the areas of Oil and Gas exploration and production assigned;  
The road map started with the 2013 Reform put Mexico on the path of energetic relaunch

CLARA  
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The economic results revealed by the Mexican Minister of Energy, Pedro Joaquín Coldwell, four years after the launch of the complex provision that revolutionized the country's energy industry and opened the market to foreign companies, have been extremely positive. According to the Minister, the new rules modernized all activities in the energy sector and boosted competition. As for hydrocarbons in particular in the first round of tenders for the exploration and production of oil and gas, 70 percent of the available areas were allocated, with investments totaling 49 billion dollars.

**The complex energy reform, launched at the end of 2013, remains among the countries most important economic initiatives in recent years. What outcomes are already visible and what are the objectives for the medium and long term?**

Since the Energy Reform came into force, we have had remarkable progress and have accomplished important achievements in all three energy sectors: hydrocarbons, electricity and clean energy. In hydrocarbons, we have allocated 70 percent of the areas offered in the four bids of Round 1 for E&P (exploration and production) of oil and gas. Pemex also contracted for its first farm-out to develop Trion, a deep-water field lo-

cated in the Gulf of Mexico. Collectively these agreements have brought a 49 billion dollar investment to the Mexican industrial system. The 48 winners of the bids, along with Pemex, will execute 39 contracts, each designed to achieve optimum economic results for the State.

We have also paved the way for new markets for LP gas and natural gas, the latter requiring the expansion of the national pipelines system to assure fuel supply to the country's industry and power-generation plants at competitive prices. Regarding oil products we are building a new market that will be deregulated at the end of this year, a market that will enable broader fuel storage and transportation capacity while offering final consumers more options. As for electricity the short-term Wholesale Electricity Market is now operating to promote competition and equality among generators, public and private suppliers as well as to offer consumers the best prices and services. Today 21 companies are already participating, including CFE's (Electricity Federal Commission) subsidiaries and 16 other enterprises that are in the process of entering the market.

The long-term Wholesale Electricity Market has successfully carried out two electricity auctions where clean technologies →





**Eni, first well in the Mexican offshore**

Last March, Eni successfully drilled the Amoca-2 well in offshore Mexico, confirming the presence of oil at various levels. It involves the first well drilled by a major international oil company in Mexico since the reform in the energy sector in 2013. It is located 200 km west of the Bay of Campeche, in waters 25 meters deep. The volumes of oil are being evaluated, but initial results indicate a higher potential than original estimates.

brought in very competitive prices. As a result of these contests, which will yield a 6.6 billion dollar investment from now to 2019, 52 clean-energy power plants will be created throughout 15 states in the country. These wind and solar power plants will increase clean energy capacity by 170 percent in only three years, whereas it took 20 years to get where we are at present.

On May 8, we published the legal terms of the invitation to tender for the third auction, where for the first time private companies and CFE will be able to acquire power and Clean Energy Certificates. The electricity auctions prioritize the use of clean energy to boost Mexico's transition towards a more sustainable country and to comply with national and international commitments to combat climate change. This year we will also publish the terms of the call for bids for a transmission line from the Isthmus of Tehuantepec in Southeast Mexico to Morelos in Central Mexico, which will develop power generation in Southern Mexico, where there is significant renewable power potential. Finally, the Universal Electric Service Fund has been created. This is the social side of the energy reform that will install solar panels and distribution grids for over 1.8 million Mexicans who live in rural and poor communities.

The reform opens up a process of modernization in which it is no longer just state-owned companies that can invest freely in hydrocarbons and electricity grids. And this reform seems to have attracted the interest of many international companies that have begun to participate in the first four rounds of bids. What kind of feedback have you had with respect to this new trend?

The results obtained from the four bidding processes along with the outcome of the first Pemex Farm-Out in deep-waters have shown that the energy reform has been successful and competitive. At the end of this first stage, with the best conditions for the State and with impeccable transparency, we managed to award 70 percent of the offered areas, way above regional rates.

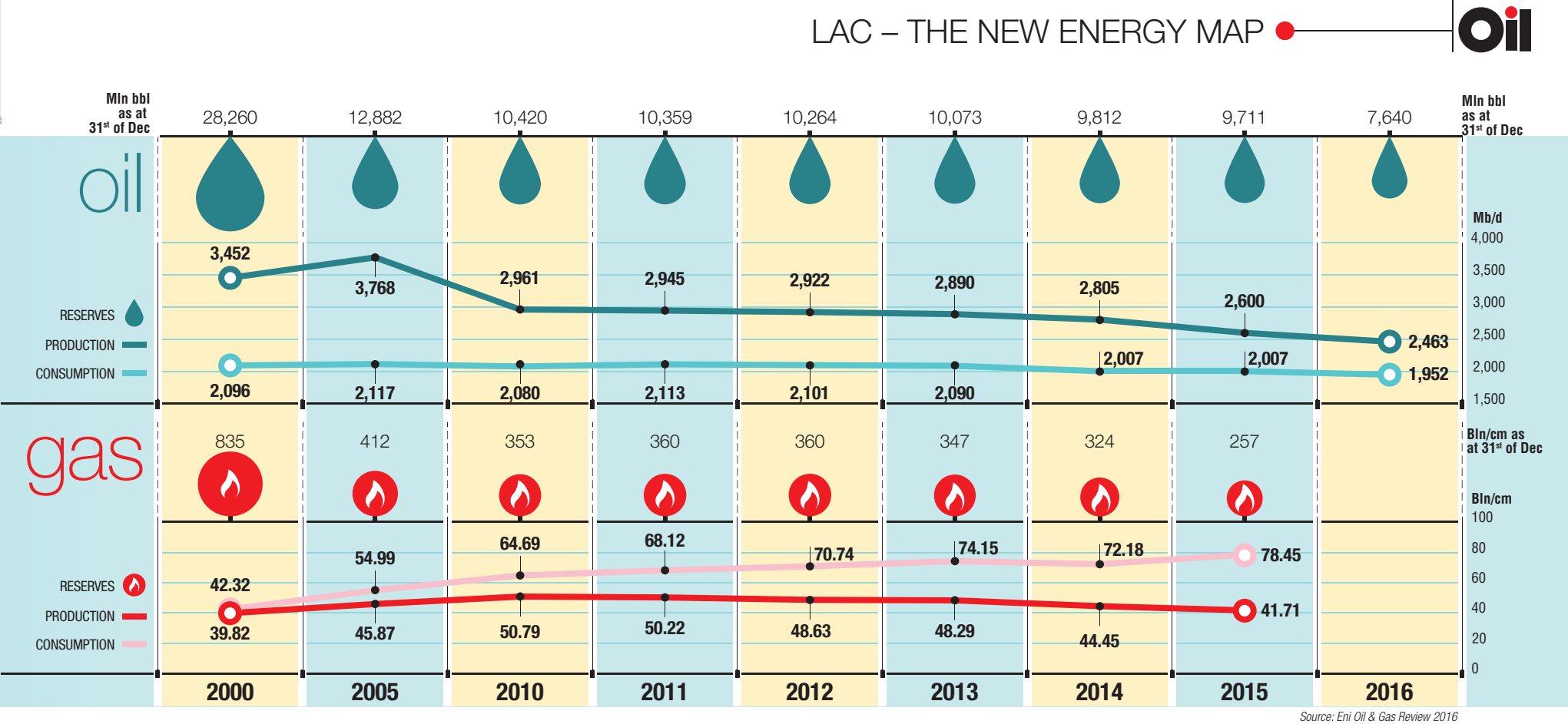
By the end of Round 1 we also consolidated the hydrocarbons industry. Trustworthiness and legitimacy in the Mexican energy sector have been proved by the arrival of 48 new companies from 14 different countries. The certainty derived from the hydrocarbons bids has given these firms reliability and stability in the investment they have allocated in Mexico. We will work to improve and reinforce predictability in the rounds, despite volatility in oil prices and the challenging international

market, in order to attract more investors to our country. In terms of electricity grids the reform will encourage the expansion and modernization of transmission lines in order to reduce costs, minimize congestion, and integrate to the new energy sources with high clean energy potential to the grid. The energy reform eliminates entry barriers to new participants interested in the development of electricity infrastructure in order to create a solid market that enhances quality, trustworthiness and continuity of power supply in the whole country.

How is Mexico preparing itself to meet the need for new specialist expertise in the oil production sector in the face of ongoing development plans?

Upon the arrival of investment on new energy projects, job opportunities and demand for specialized labor have significantly increased and will continue to do so.

The government encourages and supports young Mexicans to participate in this sector. With the help of Energy Funds and The National Council for Science and Technology (CONACYT), we pursue research, technological development and human capital in the energy industry. We designed a program with 60 thousand scholarships for students at all levels, from high school to graduate school, who are interested in an energy-related field. Additionally, we have developed free online courses and provided economic support for institutions to strengthen their infrastructure and update their programs. In applied science, we are developing national and international networks focused on research, new technologies, and



reinforcement of the regulating organisms in the energy sector. Universities and Mexican research centers have the opportunity to collaborate with other experts and sectors in energy projects.

The General Law on Climate Change, which regulates the renewable energy market in Mexico, states that Mexico will increase electricity produced from clean energy sources, including nuclear power, up to a 35 percent share by 2024, and 50 percent by 2050. What are the plans for achieving these goals?

The Mexican Energy Reform is a green reform that provides three mechanisms to foster clean energy to accelerate energy transition to a low carbon economy, achieve renewable generation goals and lower greenhouse gas emissions to mitigate climate change.

They are: Clean Energy Certificates (CECs), long term electricity auctions and modernization of transmission lines.

- 1 | Power generators must fulfill a requirement to produce a certain amount of their power with renewable sources. This requirement will be achieved and monitored through CECs. For the year 2018, this requirement will be at least 5 percent and for 2019, 5.8 percent. The percentage will increase progressively every year and by 2022 will be 13.9 percent.
- 2 | Two long-term electricity auctions have concluded with very successful results to promote new clean energy generation. Auction prices were highly competitive for both solar and wind power. CFE was the buyer of these auctions and allocated 80 percent of its buying offer. The 34 winning companies will construct 52 new power plants representing a total investment of 6.6 billion dollars. These projects will begin operations between 2018 and 2019, doubling existing wind and solar capacity. The third long term electricity auction was announced last April. Unlike the former two, this one will be open to private buyers, not only to CFE. Companies will be allowed to purchase electricity, power and CECs. With this third auction, Mexico expects to triple its renewable installed capacity. The winners will be announced in November 2017.
- 3 | With the expansion and modernization of transmission lines, Mexico plans to connect regions of the country with high potential of clean energy.

Recently, Mexico announced a major energy efficiency plan worth 200 million pesos in collaboration with the University of California. What are the principle aims of this project?

The new energy model requires high-level professionals as well as scientific investment and talent development. In order to do this, Mexico is fostering research and innovation in the energy sector in collaboration with national and international higher education institutions oriented to promote regional scientific and technological development. Moreover, three years ago cooperative initiatives were established with the University of California, including projects to collaborate in energy efficiency, energy regulation and industrial development.

Mexico is trying to design a comprehensive strategy to incorporate cities' requirements, and implement measurements or equipment to reduce cities' and towns' carbon footprint. Together experts from the University of California, higher education institutions, public and private Mexican research centers and associations are invited to participate by presenting their proposals individually or in association with other national and international institutions.

Recently Eni announced an important discovery in the Mexican offshore. What is its significance?

Energy reform was designed as a whole to modernize, under the State's supervision, each activity of the sector and to create competition. In this regard, Eni's discover in shallow waters, announced last March, has a very special meaning within the framework of this new paradigm raised by the reform, since it is the first successful drilled-well by a private company in more than 70 years. This discovery proves that the reform has initiated exploration drilling in the country.

It is to be expected that shortly new discoveries of companies that are currently operating in our country will join this one. In the case that adequate technical and economic conditions exist, these new discoveries will eventually contribute to the production platform of the country and, as time goes by, will help to reverse the declining trend of the past years.



\*With the collaboration of: SERENA SABINO, a journalist, has worked for Oil since its first edition. She has also worked for the AGI news agency and, previously, for the Dire news agency and for Radio24isole24ore.



**Intervention/**Historical excursus from post-war to globalization

# The new world

Latin America continues to be a land of adventures and disorderly, harsh and intense politics. At stake is control of energy sources in nations that are still immersed in the great oil nationalism historical cycle



GIULIO SAPELLI

Full professor of Economic History at the University of Milan and editor of the *Il Messaggero*, Sapelli is one of the most original and contrarian voices of Italian economists.

Approximately 20 percent of the world's hydrocarbon reserves rest in Latin America. They are a fascinating subject for study, due to their jagged and original continental dislocation, from the warm Gulf of Mexico to the cold waters of Patagonian Argentina, Chile and the South Pole, on to the Andean Cordillera. Overall they are a source of continuing geological and seismic surprises. And since the 1930s, they have played a fundamental geostrategic role. South America continues to be a land of adventures and disorderly, harsh and intense politics. At stake is control over energy sources in nations that are still immersed in the great oil nationalism cycle, as I defined this historical era in my studies some thirty years ago.

**It all started in 1938, with Cardenas in Mexico**

This historic and geopolitical cycle was started by President Lazaro Cardenas in Mexico in 1938, the threshold of World War II, when Axis powers sought South American resources to supply wartime needs in both the Pacific and Europe. This is a historic cycle that has never ended. Not even the collapse of the U.S.S.R. eliminated history and geography from the face of the earth, despite the stupid things that have been said during the last thirty years. This cycle, a historic era, continues to this day, with the eruption, on the international scene of the second post-war nationalization in Brazil, Bolivia, Ecuador and Venezuela. The cycle also includes thirty years of glorious growth during the second →





## The influence of Cuba

**Cuba's presence has continuously fueled anti-capitalist that sink their roots into South America's complicated history, a history in which the nationalization of mineral resources has always played a powerful role in political aggregation.**

post-war period and the transformation of *laissez-faire* globalization into an unfolded market. Such globalization is engaged in power games over the industry of instrumental goods, which are dominating once again, and the nation is now outgrowing the economy

### An economic and political power game

These are phenomena that do not belong to the mixed economy cycle as we have historically understood the Keynesian paradigms. Here, the game is all about political and military power, and economic theories have to be silenced.

Everything in South America is out of touch with North American and European growth models, a reality we have been taught by the now forgotten Albert Hirschmann.

The nations named above are human settlements with a remarkable degree of state building, according to the typical South American model that was well described by Luigi Filippi: the state is built first, then the nation. These are also nations that begin the essential cycle of import substitution, but with very different historical times when considered within the context of the international labor division. This is the case because the decline in North America's power to export security and economic models has accompanied the globalization of unregulated and deployed finance.

The South American countries with hydrocarbon reserves have faced globalization in very different ways from those that characterized European and Asian experiences. The role played by Cuba, an undisputed stronghold of a military revolution supported by the U.S.S.R. and then by Russia with impressive continuity, must still be carefully studied despite its ideological deformities. The struggle against the U.S. has never ended and continues to be potent for those who study South American history in depth.

### Cuba's fundamental presence

My thesis is that Cuba's presence has continuously fueled anti-capitalist veins that sink their roots into South America's complicated history, a history in which the nationalization of mineral resources has always played a powerful role in political aggregation. It is a role that we have forgotten for all these years, as the majority of analysts have been bewildered by economicism or even a damaging anti-politics from a hermeneutic perspective.

If we examine essential and more strictly economic facts in this light, we can understand the general historic significance that brings us closer to fully understanding the South American experience in terms of mineral resources.

What is impressive is that in the last

twenty years, all these nations have embarked upon formidable development processes in the exploration and exploitation of new large oil and gas fields.

### Venezuela and Brazil, the creators of change

Venezuela and Brazil are the key players in this transformation that is still under way, players that will continue to follow the unprecedented cycles that globalization has assumed. Venezuela especially is planning massive projects related to the extraction and processing of crude oil. Caracas is about to promote the drilling of 10,500 wells as well as the construction of two refineries and a new export terminal. Venezuelan oil production would then amount to a potential 4.5 million barrels per day, while refining would amount to 3.6 million barrels, this despite the imminent disaster of Maduro's policy and the current crisis.

To increase its export capacity, PDVSA, the state-owned company, has acquired 60 percent of a transport company that owns approximately 300 barges on the Paraná River, which runs through Brazil, Paraguay and Argentina.

Oil production continues in association with Petroecuador, the gas company, along with the Bolivian state-owned company, and exploration activities continue in Argentina and Uruguay. PDVSA is also involved in

two major projects for the construction of refineries in the region: in Manabí (Ecuador), which will refine 300,000 barrels per day, and in Pernambuco (Brazil), with a capacity of 230,000 barrels per day.

At the same time, the company is reducing its investments in refineries in Europe as they have been considered unnecessary. It has just sold two refineries in Germany (in Gelsenkirchen and Karlsruhe) to Russian giant Gazprom.

The aim of the Venezuelan government is threefold: to establish new partnerships, to access new markets and to strengthen OPEC's geopolitical role. Above all, the latter provides the country with a substantial and profound strategy. Therefore, Venezuelan President Hugo Chavez has repeatedly attempted to influence oil production through a regulation that increases the influence of producing countries.

It is an aggressive policy that has long been confronted on the domestic front by the oil workers themselves. However, in 2002 when approximately twenty thousand employees went on strike, PDVSA was nationalized.

It is no coincidence that Argentina is the only country that is completely absent from the transformation of the mining sector. With the privatizations of the 1970s, Argentina has essentially ended the expansive cycle, not only of hydrocarbons, but also of its entire economy.

### The emblematic case of Bolivia

Evo Morales, the first Amerindian president in Bolivia's troubled and fascinating history, having just come into power in January 2006, announced the nationalization of oil and gas with a sort of coup that saw, in an unprecedented form, the strong role of the armed forces. They presided over the wells and plants of the nationalized companies with soldiers of the "Batallón de Ingeniería," a force which occupied the town of Carapari in the heart of Bolivia's historic oil region.

This action was similar to that of the Peruvian government from 1968 to 1975 led by General Juan Velasco Alvarado, who nationalized all oil companies and distributed the land to peasants with resultant violent clashes in the countryside. At the same time Chile was afflicted by a coup that ended Allende's life, and one cause of that event was the Peruvian situation, this despite the nationalist conflict between the two countries. Affecting the fall of Alvarado were militants loyal to Washington: on August 30, 1975, General Francisco Morales Bermúdez, then President of the Council of Ministers, led a coup that deposed Alvarado.

Major Argentine cities from Buenos Aires to Córdoba, as well as most of the industrial regions of southern Brazil and at least half of the homes in the megalopolis of San Paulo were heated with Bolivian gas. It is no coincidence that Morales' most trusted ally has ever since been Cuba.

These were the years under Chavez's Venezuela in which the ALBA (Bolivarian Alliance for the Americas) was founded, an anti-ALCA (Free Trade Area of the Americas) customs agreement.

The nationalization of hydrocarbons was the slogan of protests held by the vast majority of the Quechua and Aymara of the Andean regions and the farmers of the Cochabamba Tropic, who, in the midst of deployed globalization, washed their children with Coca Cola because it was much cheaper than privatized water from the Bolivian Andes.

The interesting question is whether the mediation that the major companies and the U.S. reached with Morales and those following him was related to the successes of Brazil's Lula Da Silva as his left-wing government in 2003 was a political explosion of great importance. Bolivia would never have been able to set up its energy infrastructure after nationalization without international cooperation.

South America experienced a historic energy compromise until Brazil's current crisis.

### Geostrategic significance

Of great importance is Cuba's presence in the geopolitical horizon. That presence is no longer revolutionary in a Guevarist sense, but is specifically geostrategic. A military attack against Cuba is now unthinkable due to the change of a force that, on an international scale, has been consolidated through the presence of China and the creation of South American nations that are no longer prepared, as they were in the past, to follow U.S. guidelines as they have possible alternatives on the international level. China now stands for a new and unprecedented imperial role as does a Russia which, with the rise to power of Evgenij Maksimovič Primakov and, following him, his apprentice, Putin, resumed the great imperial tradition of pre-revolutionary Russian Tsarist diplomacy.

Currently, the collapse of the "nationalist" left-wing South American governments can only take place via the uprising of the social forces that oppose them from within, as evidenced by the cases of Brazil and Venezuela.

The U.S. will certainly support these uprisings, but the strategic axis of the international power relationship has been completely overthrown and



"reduced to its national dimensions." The role of this new balance of power is so impressive that it allows an economic and military dictatorship, before a political one, such as Venezuela's from Chavez to Maduro to remain in power, with incredible suffering of the people and very strong social divisions.

It is no coincidence that, in this context, the issue of North American sanctions against Russia and Iran in the power game take on great importance. The two countries are focused on actions that could weaken the role of the U.S. and increase their strength in relation to the continent, this demonstrated by the very close link between the construction of the Shiite Crescent from Tehran to Beirut and the international energy debate, starting with natural gas and its liquefaction.

South America sees two ways, in the case of mining. One is the classical route of German-origin *laissez-faire* socialism, which aroused, in the Cri- →

## The Amerindian president

**In January 2006, Evo Morales, Bolivia's first Amerindian president, having just come to power, announced the nationalization of oil and gas with an unprecedented coup in which the armed forces played a strong role, presiding over the wells and plants of the nationalized companies.**



## Ecuador

**President Rafael Correa, elected in 2006 and only recently, after two terms, replaced by one of his top advisers, Lenin Moreno will remain one of the most original and incisive leaders in South America.**



tique of the Gotha Program, Marx's anger due to the presence of that state that he could only consider deadly. That critique has guided the Cuban, Bolivian and Venezuelan experiences and is a direct Soviet derivation. In South America, however, there exists a more socialist-Marxist path, one based on the prevalence of civil society and the social self-organization of collective movements which find in the state only the final point of the collective in a social struggle that never sees the military in action, and this is the case in Ecuador and Brazil.

### The Ecuadorian case

President Rafael Correa was elected in 2006 and only recently was replaced by one of his top advisers, Lenin Moreno, who will certainly continue his work. Correa remains one of the most original and incisive leaders in South America. His international preparation and knowledge of global economic mechanisms have allowed him through a close relationship with the International Monetary Fund to reach a default and non-recognition of debt along with a successful policy on reducing poverty and increasing income. Direct foreign investments, which Ecuador has benefited from in recent years,

have been exceptional. Mining and energy policies are a clear example of the geopolitical shift in power in South America. In 2013, the Ecuadorian government received investments amounting to approximately 703 million dollars (up 20 percent from 2012), a third of which was allocated to mining projects under the “*Refinería del Pacífico* [Pacific Refinery]” project. This project plans the construction of an oil refinery and additional related works in the province of Manabí to be carried out by PetroEcuador with the financial support of the Chinese Industrial and Commercial Bank. At the same time, and based on indigenous concerns, Correa attacked the presence of U.S. majors in Ecuador. The increase in taxation on oil revenues and prof-

its gained from the majors has become increasingly essential for the survival of the government itself. The classic subject of price fluctuations is too well known to be mentioned here: it exists and has notorious consequences. Despite the historic victory gained to the detriment of the Chevron-Texaco oil company—which was guilty of environmental damage in the Amazon—it is necessary, for instance, to auction approximately 3 million hectares of forest. The state risks collapsing by 2020 in the absence of new oil discoveries and their more effective exploitation. China is very active in Ecuador and is regarded as the preferred investor in the Amazon region. This is a key issue.

### The issue of Yasuni National Park

Indigenous organizations are increasing their appeals to the international community, hoping to stop this economic penetration that jeopardizes the survival of indigenous cultures. One of the most controversial issues concerns Yasuni National Park. Located in the heart of the Ecuadorian Amazon, the Yasuni reserve is home to various indigenous populations, including the Huaedian, Tagayan and Tãromenan ethnicities. The surface area of the region is divided into blocks corresponding to oil exploitation concessions. Specifically, in the ITT (Ishpingo-Tambococha-Tiputini) block, huge oil field discoveries, an estimated total of 900 million barrels, have led to over a decade of massive exploitation projects carried out first by PetroEcuador and subsequently by Petrobras. The Ecuadorian case is interesting from an anthropological perspective and also provides insight into the challenges that such an economic undertaking poses to the world's mining and energy decisions.

### The Brazilian case

However, from the point of view of purely political, social, and energy implications, the Brazilian case is the most interesting. The creation of a huge major such as Petrobras was only possible with a large financial stake extracted through the tax system from the Brazilian state, a public investment aimed at creating a state-owned company according to the most comprehensive rules of the Montemartian-inspired public enterprise theory. Along with this, the tax base was created by a huge increase in income and aggregate domestic demand, changes caused by the largest land reform ever made in South America and in the world.

The Brazilian route to oil nationalism combines the power of Petrobras with the collective movement of millions of landless, poverty-stricken people, by unionists and PT activists. According to my thesis, it is this unusual neo-statist and civil route towards endogenous growth that is now subjected, in Brazil and throughout South America, to the attack of non-social and political forces, essentially external, but primarily national of the land owners, the social classes associated with the financialization of the economy and the “*Bourgeoisie comprador*.” Even the production sectors themselves, not tied to income but to production, are under judicial and political attack. It suffices to think of what is happening in Brazil in the “*Lava Jato*,” which sees industry leaders sentenced to nineteen

years in prison for administrative corruption!

The land and capitalist oligarchies used the weapon of corruption that has led to the impeachment of Dilma Vana Rousseff Linhares, President of Brazil since 2011, following the two terms of President Lula Da Silva, and imposed a government comprised only of white men. In turn, President Temer, who replaced Rousseff, is under investigation and, with him, a large portion of Brazil's political class. The investigation for corruption, which should center on Petrobras' continental contracts, has already involved Colombia's Nobel prize-winning President, Juan Manuel Santos, and much of the pinnacle of the South American political and economic class under the guidance of magistrates who studied in the U.S. and who have used Italian magistrates as consultants. The goal is the privatization of Petrobras and the limitation of Russian and Chinese penetration in South America.

The internal goals of the ruling classes that have always hindered the programs of the PT and of its leader, Lula, are shared with that sector of South American geopolitical power that cannot support, besides the presence of Cuba, a growth in Russian and Chinese influence on the continent.

### Mexico

Mexico, the other major protagonist in the South American energy scene, has different institutional and political paths and does not fall within the very delicate faults of the region's geopolitical power. Others are still obsessed with internal issues, such as the conflict between Peru, Bolivia and Chile, a never-ending conflict that continues to remind us of the fascinating history of one of the most interesting continents in world history. It is worth pointing out once again the essential point of view of this modest essay.

The geopolitical and geostrategic issues of South American mining and energy cannot be fully understood unless reference is made to the extraordinary political and social transformations that have affected the continent in the last thirty years. South America's inclusion in globalization has not been passive, since, especially in the countries referred to herein as being essential for potential energy equity, anti-liberal and non-populist forces have assumed power. They did not have the anti-elitist support of the disorganized and unmanaged masses. Lula Da Silva's Workers' Party is a classic socialist party that has had to face a very high parliamentary dispersal and crushing of the political classes, a development what would be unthinkable in Europe. Brazil's problems have been fu-



eled by the federal state structure and the huge growth of urbanization in the last twenty years. The same can be said of Ecuador, where the keywords of Correa's movement are very different from those of Peronism or Vargism, those classic populist parties. They are rather united to the great Peruvian tradition of Haja De La Torre and his APRA, a party that no longer exists, following the governments of Alan Garcia and the arrival in Peru of liberal politics.

### The exception of Colombia

The case of Colombia, the fourth country in terms of energy reserves, is different, having had its face transformed by more than oil and gas. This transformation must also be related to the complicated and extremely difficult negotiated peace between the FARC guerrilla and the state, an agreement reached by President Santos after two referendum attempts. This peace and the transformation of the guerrillas into campesinos and political cadres is the real danger that the land and mining oligarchies now see rising before them, due to the social consequences that will inevitably arise.

It is no coincidence that a Nobel

Peace Prize-winner like Colombia's President Santos, has been heavily denounced due to his alleged involvement in what has been presented to the mass media as a continental bribery network created in the wake of the Petrobras case. This case has come to light at the hands of the North American justice system that intervenes whenever elites of local power feel that they have to stop those social change processes that were so dangerously unstoppable in the past. The abstractly sacrosanct fight against corruption lends itself easily to the dismantling of all elites—both political and economic—that such changes have encouraged.

The ongoing division in the South American ruling class is evident. The case of the Obredecht family, whose historic leader was sentenced to 19 years in prison and that of the Lebanese Jewish Saфра family, forced into exile, are exemplary in proving my thesis.

What does remain stable and solid is the energy and mining heritage of a continent as extraordinary as South America.

## Colombia's Nobel Prize

**Colombia, the world's fourth-largest country in terms of energy reserves, has transformed more than just in terms of oil and gas, but also from the very complicated negotiated peace between the FARC guerrilla and the state. A peace which, having been reached after two attempted referendums, earned president Juan Manuel Santos the Nobel Prize.**







## Analysis/Latin America and new oil markets

# Don't wait for a miracle

The drop in oil prices will force the countries of the region to make hard choices, curtailing unsustainable fiscal policies and allowing market forces to operate. If they succeed, the longterm outlook will be much more positive



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### TOMORROW'S CHALLENGES

**The Latin American oil sector has to face major challenges if it wants to ensure long-term sustainability. The first challenge is to exist in a pricing setting where there is little chance of rising prices over the next five years. In the picture, the subway passes in the futuristic San Lazaro station in Mexico City.**

For more than a century, Latin America has been an essential part of the global petroleum market. The region fueled the Allied powers during World War II and later served as a reliable source of oil to the growing economies of the now-industrialized world. Beyond supplying markets, Latin America served as a laboratory for oil governance structures, as a testing ground for industry exploration and production technology and as a stage for foundational discussions on oil production and ownership. Today, while the region is well-established as a key cog in the oil industry, it continues debating, changing, and developing. Broadly speaking, these debates and reforms have recently resulted in a structural shift away from state-imposed and toward market-required rules and modes.

In the past two decades, countries in the region have begun allowing their state-owned oil companies more operational independence and have set clearer rules for non-public investment in the petroleum sector. This shift began in Peru towards the early 1990s and continued in Brazil by the end of that decade. Colombia made similar reforms in the early 2000s and Mexico joined the trend in 2013. This new landscape allows for far more competitiveness, transparency and efficiency, and it has the potential to yield better and stronger benefits to Latin Americans.

This fundamental change in the Latin American oil market, of course, is now facing an immense challenge: a fundamental change in the global oil market itself. Rough estimates show that the value of Latin American oil

production in 2016 was U.S.\$155 billion—higher than Ecuador's gross domestic product (U.S.\$100 billion) and slightly lower than Peru's (U.S.\$189 billion). Yet only 3 years ago, this figure was U.S.\$369 billion.

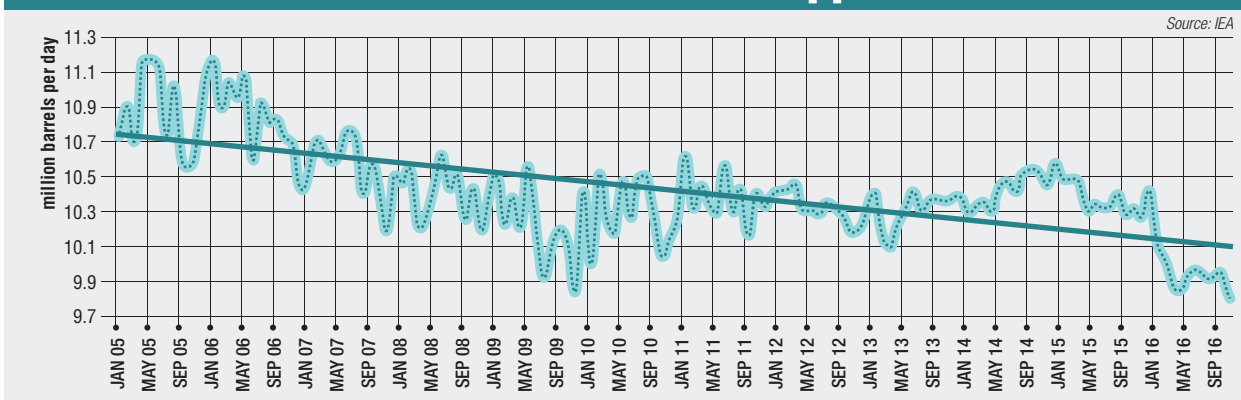
### Oil production has collapsed

This 58 percent decline is explained by two factors. The first is the collapse in crude oil prices from U.S.\$100 per barrel in mid-2014 to a nadir of U.S.\$30 per barrel in February 2016. Current prices are 50 percent lower than their average between 2011 and 2014 and much lower than the peak of U.S.\$140 reached in the summer of 2008.

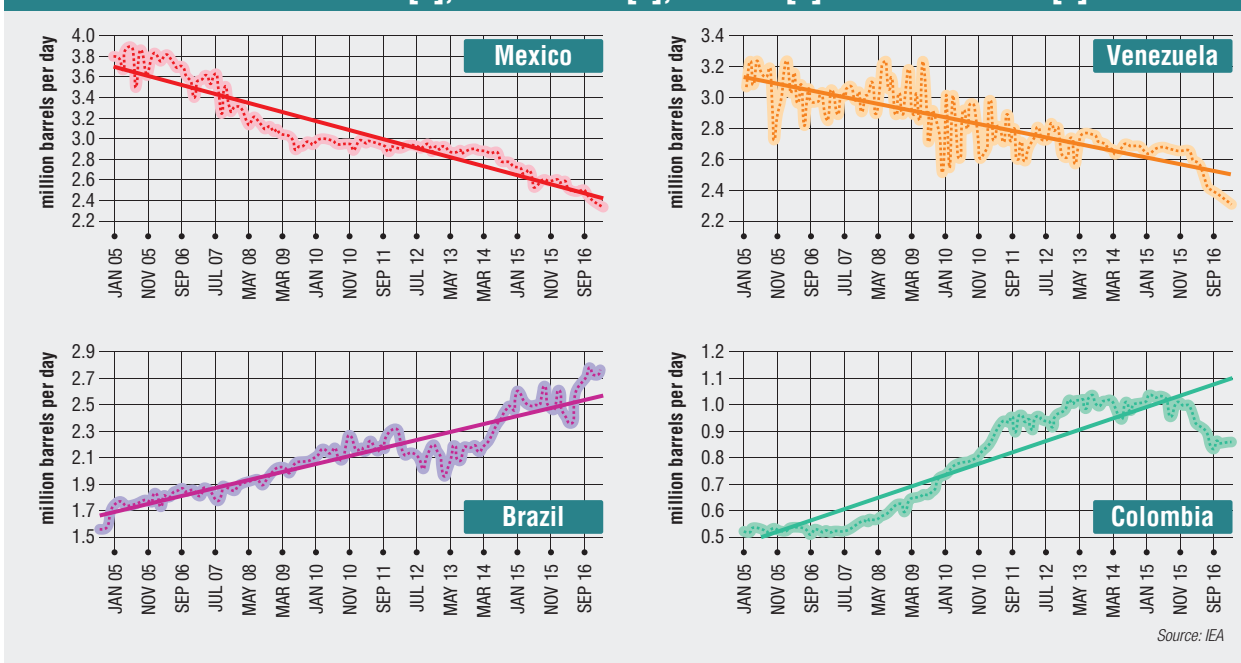
This, of course, has yielded much lower revenues for the region's large petroleum exporters. For Venezuela, for example, oil export revenues—calculated as production devoid of domestic consumption and using West Texas Intermediate as a baseline for price—have fallen by around 70 percent from their peak in 2008. Between 2006 and 2016, oil export revenues in Mexico dropped from U.S.\$47 to U.S.\$8 billion—a full 91 percent. Ecuador's figures dropped 65 percent from their peak in 2008 while Colombia's decline reached 31 percent from 2013. The second factor is the steady drop in regional oil production over the last decade (**Figure 1**). Since 2005, regional production has fallen from 10.9 to 9.9 mbd. This means that, on a regional basis, Latin America did not take full advantage of the oil price boom of 2002-2014. Over this period, the real price of oil averaged nearly U.S.\$80 per barrel. This price nearly quadrupled the previous decade's average real price →



## OIL PRODUCTION IN LATIN AMERICA AND THE CARIBBEAN [1]



## OIL PRODUCTION IN MEXICO [2], VENEZUELA [3], BRAZIL [4] AND COLOMBIA [5]



of U.S.\$32 per barrel and meant enormous revenues streaming into the coffers of large producers like Brazil, Colombia, Mexico or Venezuela. However, these funds did not go towards enhancing capacity to increase production and the result is that the region now produces less crude than in decades prior, despite not having dwindled its considerable reserves in any significant fashion. This decline in production is essentially explained by significant drops in output from the region's traditional oil powers: Mexico and Venezuela (Figure 2 and 3). For mostly below-ground and above-ground reasons, respectively, both countries registered declines in production of similar scales. In 2005, Mexico's output averaged nearly 3.8 mbd while Venezuela stood at 3.1 mbd. By 2016, both countries were producing an average of 2.4 million barrels per day. The drop in the case of Mexico was mostly caused by the geology and subsequent management of the country's largest field, Cantarell. The case in Venezuela is well known to be caused by gross mismanagement of the state-owned company, which has resulted in the loss of highly trained profes-

sionals and in the use of the company's resources for political purposes. There are, however, two trends diverging from the regional pattern: Colombia and Brazil (Figure 4 and 5). Partly because of redesigned governance structures that both countries adopted towards the turn of the century, output has increased dramatically over the past decade. Brazil, based on a more dynamic system which incentivizes investment and the incorporation of massive offshore reserves, increased output from 1.7 to 2.6 mbd. In 2016, Colombia's output reached 0.89 million barrels per day, nearly double its 2005 level of 0.53 mbd. Between 2013 and 2015, however, Colombia's oil production averaged slightly more than 1.0 mbd and output has fallen since then due to decreased investment because of the price decline.

#### A new model based on competition

This overall decline in oil production and in the revenue it yields is taking place at the same time that the global oil market is undergoing a deep transformation from a model dominated by supply-side monopolies to

one where competition establishes the rules of the system. The emergence of this new system was first made clear when the price of crude oil remained stable around U.S.\$100 per barrel from 2011 to 2014, even though the prices for most other globally traded commodities had begun to decline because of slowing growth in emerging markets. This anomalous behavior resulted from a strategy executed by large producers—led by Saudi Arabia through OPEC—to maintain oil prices stable to keep market share. Over this period, this was made evident in circumstances when prices soared because of geopolitical events that disrupted supply lines. Large producers responded by increasing production and stabilizing prices. However, this artificially high and stable price level allowed for previously uneconomical oils to enter the market, particularly from shale oil formations in the United States. Towards the end of the last decade, oil production in the United States began to grow for the first time since the mid-eighties. In 2009, the U.S. reported year-on-year growth in crude oil production of nearly 0.4 mbd and in less than 10 years, the U.S. al-

most doubled production, from 7 mbd to 13 mbd.

This incremental production in the U.S. has largely been carried out by companies in constant competition and consistently looking to gain efficiency and reduce costs. This is especially true in the case of tight oil, which is mostly extracted by hundreds of small, leveraged firms that lack the financial capacity to withstand temporary losses and must therefore be as nimble and economical as possible. In mid-2014 lower-than-expected global economic growth projections were released. As these met continuously increasing production from the United States, the price of oil began to decline in expectation of a potential glut. The collapse began in earnest in November 2014 after OPEC members refused to cut production as they had in the past to respond to the price decline. The market was flooded with more oil and fewer takers, sinking oil prices shortly thereafter.

The logic behind OPEC's action was simple: to challenge non-conventional producers to continue increasing production while facing lower prices. Because of the drop, some producers did shut down operations and U.S. supply growth decelerated in the second half of 2015. However, after dropping to lower growth rates, unconventional oil production has remained stable and U.S. oil production averaged 12.5 mbd in 2016, slightly below its 2015 level. Without a large reduction in U.S. output, the price that had dropped to U.S.\$30 in February 2016 stabilized during the second half of 2016 around U.S.\$50. In November 2016, OPEC countries changed course and reached an agreement to reduce production by 1.26 mbd. Member compliance with terms of the agreement hovers around 95 to 100 percent. Prices, however, have not moved far from a steady level around U.S.\$50 despite the OPEC reduction. The entry into the global oil market of crudes that are produced in a competitive environment has transformed the way in which prices are set. For most of its history, the price of oil was imposed on the market with varying ease by large and powerful supply monopolies. Between the mid-1930s and the mid-1970s, the preponderant monopoly was the International Oil Cartel, also called the Seven Sisters. Following the formation of OPEC in 1960 and a wave of resource nationalism in the Middle East and Latin America, the market came to be controlled by large OPEC-led producers. This pricing mechanism from large producers with monopoly power over oil supply lasted until the mid-2000s. OPEC's ability to control

supply and set prices well above production costs meant huge revenues for the members of the organization and other countries with low costs. However, aside from producing windfalls for producers, these price hikes turned on economic basins that were known but hitherto too costly to develop, like the North Sea or the north slope of Alaska. The incorporation of crudes from these basins over supplied the market and in 1986 the price collapsed by 50 percent, from U.S.\$50.69 to U.S.\$25.71 per barrel in real terms between January and July 1986. The real price of crude would not pass U.S.\$50 per barrel until May 2004, with the one exception from August to November 1990 due to the Persian Gulf War. With the entry of emerging economies like China and India into international markets towards the start of the century, commodity markets experienced a well-documented price super-cycle. Crude oil prices averaged U.S.\$87.07 per barrel between January 2004 and December 2014, almost tripling the norm of the previous twenty years. The effect of this demand-driven price hike was the same as in the eighties: untapped but

oil-rich basins became viable via technologies like horizontal drilling, deep-water extraction, or hydraulic fracturing that, because of high oil prices, became economical to use. These include the tar sands of Canada and the Brazilian pre-salt, but especially the crude trapped between shale rocks in the United States. In the U.S., this has allowed hundreds of private companies to produce high quality oil at ever dropping costs. In addition, shale oil reserves have been estimated at 78 billion barrels, allowing for a very long-term time horizon of extraction. Combining these factors explains how any increase above the cost of producing unconventional crude in the U.S. will encourage the drilling of hundreds of wells in shale formations and a re-increase in supply. In practical terms, a pricing mechanism based on competition, a novelty for oil economics, is being established as the market is using the marginal cost of marginal producers as an equilibrium price, thus eliminating monopoly profits for lower-cost producers permitted by the previous system. The consequence of this for Latin America is grave. The halving of oil prices has had serious

economic effects throughout the region. Towards the brighter end of a gray-tone spectrum, Mexico, the region's least oil-dependent large economy, grew at 2.3 percent in 2014 and in 2016, while Colombia's growth rate dropped from 4.4 percent in 2014 to 2.0 percent in 2016. More worryingly, Brazil and Ecuador moved into recession with growth rates dropping from 0.5 percent to -3.6 percent for the former and from 4.0 percent to -2.2 percent for the latter. Venezuela has felt the price collapse most strongly. The Venezuelan economy had already contracted by 3.9 percent in 2014 when the price drop began. By 2016, the contraction almost quintupled to 18 percent.

#### The challenges of Latin America for a better future

Beyond declining production and reeling under the impact of the price collapse, the Latin American oil industry must overcome other important challenges to its sustainability over the long term. The first is navigating a pricing scheme that is unlikely to pick up over the next five years. This will mean reduced profits for companies and revenues for

**THE RIGHT WAY TO RENEW**  
A new, competitive petroleum economy offers a great opportunity to take the road to a more stable and rational development. To overcome economic obstacles, Latin America will practice balance and long-term vision.



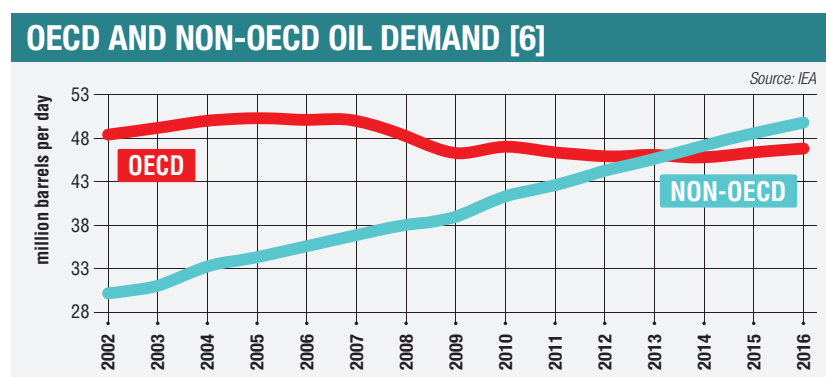




states and will force both to make important adjustments: operators must find savings and cost-cutting measures while states should make up for decreased oil tax revenues from elsewhere. This is an opportunity for companies to improve productivity and focus on profit-generating activities and for states to improve tax collection—generally low throughout the region—and to reduce costly and inefficient subsidies to fuel consumption that are generally regressive. The second challenge is operating within a market structure that is much more competitive than the structure that governed the market for almost 30 years between 1986 and 2014. No longer will state-owned companies like Petrobras, Ecopetrol, or Pemex operate with huge profit margins and little scrutiny, a combination of factors that often incentivizes corruption and mismanagement. Instead, they will be forced to operate much more efficiently and profitably as they are in effect competing with the price-setting marginal producer in the global oil market, the small and nimble shale oil operator in the fields of Texas or North Dakota. Brazil, Colombia, and Mexico have already arranged their institutional frameworks to allow for increased competition and more transparency, and other countries, like Venezuela or Ecuador, would do well to follow a similar pattern. The lower oil price schemes are then but a very strong incentive to deepen the drive towards optimized and competent management. A third obstacle is to continue gen-

erating revenues and profits from a market that will grow at slower rates. The price boom of the 2000s was mostly a result of fast-growing demand from fast-growing economies like China and India. As these countries transition to more mature economies, their growth rates will drop—as they already have in the case of China—and demand for oil will be smaller than the Latin American producers have become accustomed to over the past two decades. With demand for oil in the industrialized world already flat, a slowdown in demand from the developing world will challenge Latin American producers to find and maintain market share for their exports (Figure 6). A related challenge is the continued growth in demand from within the Latin American market that along with declining crude oil production has the potential to turn the region into a net importer for the first time. In 2005, Latin America produced about 3.6 million barrels per day more than it consumed. By 2016, that number had dropped to

1.1 mbd, mostly because the decline in production outlined earlier but also because of continuously increasing demand. Alongside this declining balance is the fact that the region has not added to its refining capacity in any significant way for the past decade, increasing its reliance on extra-regional refining facilities—like those in the U.S. Gulf Coast—that are used by Mexico to refine Mexican crude. More long term, it is essential that we keep in mind that the region remains too dependent on oil for export revenues—reaching nearly 99 percent in the case of Venezuela and surpassing 50 percent in Ecuador and Colombia—this at a time when technological developments in the industrialized world have the potential to upend the transport market, the oil industry's main customer. Finally, the region faces a double-edged challenge: environmental concerns that are largely generated by the same oil that sustains the region's economy. While Latin America is not an historically significant contributor of greenhouse gases, it is vulnerable to



rising sea levels, unpredictable weather, and volatile water basins, which are particularly concerning in a region as reliant on dams for electricity generation.

#### Manage oil markets from a different perspective

In closing, instead of waiting for a miraculous rise in prices, Latin America would do well to accept the price collapse as a structural and permanent change in the international energy market and, based on this, manage its oil markets from a different perspective. Importing countries like Chile, Costa Rica, Uruguay or the Dominican Republic will be able to decide whether to transfer lower fuel costs to consumers or retain the difference as a new, more progressive tax for income distribution and more conducive to energy conservation and the reduction of greenhouse gas emission. The producers face a greater trial: to make structural reforms necessary to adapt to this new oil reality. As argued, they must make fiscal adjustments to accommodate the decline in oil revenues. As it is permanent, this reduction needs to be compensated by structural measures, either through public expenditure or increased revenue from the non-oil sectors. As a counterbalance to this adjustment, cheaper oil creates conditions to eliminate subsidies offered to domestic consumers, which are regressive, as the higher income sectors consume more than the lower income sectors. This new scenario offers another opportunity: it is an ideal time to create savings and stabilization funds. As forward-thinking nations like Norway do, Latin America's oil-exporting countries could put away extraordinary income generated by sudden price increases and use them to compensate for any unplanned drops or invest them for future generations. Far from a threat, this new oil model—one based on competition—offers an excellent opportunity to move towards a more stable and rational development pattern. Surpassing the obstacles we have outlined will required level heads and long-term thinking. The region has taken important steps but it must not rest on its reformed laurels. It must keep an eye on the international oil industry, generally a step ahead of policymakers, to determine how to design structures that will strengthen and maintain Latin America's history as a driving force in the global oil market.

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# In the Green Continent

Below is an overview of the countries of Latin America—their political stability, the directions of current governments, laws and decisions related to the energy sector, and data on crude oil and gas production and renewable energies. Special attention is paid to the prominence of the energy sector in each country, as well to as their relations with other countries regionally and globally.

EDITED BY  
**MARISOL DIAZ DE MEDRANO**



## Mexico



The complex **ENERGY REFORM LAUNCHED AT THE END OF 2013 REMAINS THE MOST IMPORTANT BET** made by President Enrique Peña Nieto on the future of the country's economy. Daily oil production, almost exclusively in the hands of the state-owned oil company Pemex, fell from 2.267 million barrels in 2015 to 2.154 million barrels last year and, for 2017, a further drop is expected, to an average of 1.928 million barrels. These figures are far behind the 3.3 million barrels of 2004 and that, combined with low crude oil prices, is forcing the government to reduce public spending for the third consecutive year. Reform is aimed at streamlining the entire production and commercial chain, as well as reducing the weight of refined product imports, which, in 2015,

slightly exceeded the value of crude oil exports. The energy market is therefore gradually opening up to competition. State-owned company Pemex is abandoning the monopoly it has held for over 70 years and is implementing a useful reorganization to increase its efficiency, while public and private instruments are provided to raise the funds needed to optimize major underground resources, the ownership of which still belongs to the State. In this sense, the positive echo generated in March by Eni's drilling in the offshore Campeche Bay, the first carried out by an international major since the launch of the reform, is significant. Of no less importance are efforts in other energy sectors, such as the launch of a photovoltaic plant in the state of Guanajuato operated by Enel

Green Power. **THE ENTIRE ARCHITECTURE WILL, HOWEVER, NEED SOME TIME TO CONSOLIDATE, AS SHOWN BY SOME UNSUCCESSFUL TENDERS AND POLITICAL UNCERTAINTY.** Controversy over some of the short-term effects of the reform cannot be overlooked, especially ahead of the 2018 presidential elections. Of crucial importance, even for the evolution of the political framework, are the conditions in which the economy finds itself. 2016, according to International Monetary Fund data, ended with a growth of 2.3 percent, while in 2018, the increase is expected to amount to 2 percent. This year, however, a sharp slowdown to 1.7 percent is expected. This is due to a drop in consumption, a slowdown in investments and, especially, fears for future relations with the United States, the Latin country's top business partner. Fears about President Donald Trump's protectionist threats—combined with controversies over migrants and building a wall at the border between the two countries—have dominated the scene especially during his first weeks in office, **THE GOVERNOR OF THE BANK OF MEXICO, AGUSTIN CARSTENS, IS KEEPING CLOSE WATCH OVER MAJOR MACROECONOMIC VARIABLES.**

## Peru

With an average growth rate of 5.9 percent and an inflation rate that has stood still at 2.9 percent, **THE PERUVIAN ECONOMY HAS BEEN ONE OF THE MOST DYNAMIC AND DEVELOPED IN THE REGION OVER THE LAST TEN YEARS.** Peru is rich in resources and has profited from the sale of metals and minerals in major markets such as China and Japan, with copper, zinc and lead, and in Europe, with gold. **A RUN HAS BEEN FUELED BY TWO MAIN ENERGY SOURCES, NATURAL GAS AND HYDROPOWER,** both benefiting from the energy reform of the early 1990s. According to academic reports, in 2015, natural gas accounted for 46 percent of the national energy matrix, a "portion" that becomes 97 percent when hydropower is included. Crucial in this area is the activity of the Camisea deposit, one of the richest in the entire continent. **CRUDE OIL, HOWEVER, HAS HAD LESS GOOD FORTUNE IN A COUNTRY THAT STRONGLY FOCUSES ON**



**RENEWABLE SOURCES,** despite the hopes of major finds and future injections of capital into the sector. From 2010 to 2016, the leaders of the industry announced that production had fallen by 40 percent; it is currently below 100,000 barrels per day. One difficulty is also reflected in the fall of investments highlighted by the *Sociedad Nacional de Minería, Petróleo y Energía* (SNMPE). Since the beginning of the year, the fall in capital invested in the industry has

amounted to 17 percent, while the segment of the analysis on the potential of the deposits recalled that, for 14 months no seismic survey had been carried out on the areas of interest. **THE SECTOR IS AFFECTED BY THE DIFFICULTIES ASSOCIATED WITH THE LOW CRUDE OIL PRICES,** as well as the strains suffered by the *Oleoducto norperuano*, the longest pipeline in the country, with fits and starts of activity and repeated incidents, with repercussions on the environment

and in the courts. Significant in this sense is the debate on the fate of the Talara refinery, a project promised by the previous government of Ollanta Humala, the construction costs of which have risen from the original \$1.3 billion in 2010 to the current level of \$5.3 billion. **INDUSTRY EXPERTS ARE BEGINNING TO DOUBT THE ECONOMIC EFFECTIVENESS OF THE ENTIRE TRANSACTION,** given that the structure was designed to process much higher amounts of crude oil.

## Cuba

**THE 45,000 BARRELS OF OIL AND THREE MILLION CUBIC METERS OF GAS EXTRACTED EACH DAY FROM SHALLOW WATERS ARE NOT ENOUGH TO MEET CUBA'S ENERGY DEMAND,** and it is impossible to launch export activities, which the government would like to pursue, with large production costs of \$13-14 per barrel. Proven reserves as of 2015 amounted to around 125 million barrels, but better investigation is under way and over time there will be more accurate information on the amount of available hydrocarbons and on the industry's growth margins. **TO DATE, THE ISLAND PRODUCES APPROXIMATELY 48**



**PERCENT OF THE ENERGY IT NEEDS.** The rest is bought from others, mainly Venezuela. The key issue in the Cuban energy sector is the

lack of capital and technologies to verify and possibly process the hydrocarbon resources in deep waters. The low profitability provided by oil in the international markets in recent seasons has not helped. In December 2016, the national company Cupet reached an agreement with China's BGP to carry out explorations over twelve months along the 25,000 kilometers of coast to identify the areas with the best prospects. Among these, they will have to enter north-western waters. Havana has recently signed two separate treaties with Mexico and the United States to delimit the maritime borders in the Gulf

of Mexico, an area of great interest due to its resource potential. **WITH WASHINGTON, THE DEAL WAS CLOSED ON JANUARY 19,** the day before Donald Trump took office at the White House, and it still has to get a green light from the Senate. The hope of Castro's government is that this progress, combined with the recent fiscal and financial incentives introduced, especially with the law on foreign investments of 2014, may boost the industry. **IN THE SHORT TERM, HOWEVER, CUBA NEEDS TO INTERVENE IN AN ENERGY BALANCE THAT IS ALSO PENALIZED BY THE INSTABILITY EXPERIENCED BY ITS MAJOR SUPPLIER, VENEZUELA.**

## Venezuela

With reserves estimated at around 300 billion barrels, Venezuela **HAS THE LARGEST OIL RESERVES IN THE WORLD.** However, the political crisis in which the country has long been immersed prevents it from exploiting the national economy's top resource, a resource that for years has guaranteed not only the maintenance of public accounts but also the financing of ambitious social plans. These plans represented for former president Hugo Chavez a tool for maintaining a strong popular consensus. **PRODUCTION FELL PROGRESSIVELY FROM 3.220 MILLION BARRELS PER DAY IN 2000, TO 2.608 MILLION IN 2015, A TREND THAT DID NOT CAUSE CONCERN UNTIL COMMODITY PRICES FELL ON THE INTERNATIONAL**

**MARKETS.** The collapse in oil prices affected the structure of the national energy company, PDVSA, which became increasingly less functional in terms of staff and operating capacity. To meet its energy needs, the country has had to resort to other suppliers, not least of which the United States, and has contracted heavy debts with China and Russia. To secure a loan from Russia's Rosneft, PDVSA offered 50 percent of shares in its subsidiary in the U.S., Citgo, a proposal that raised alarm among U.S. Republicans, as they feared that if the loan is not honored, Moscow may have a gateway to the U.S. national oil market. Weakened by the economic crisis, **PRESIDENT NICOLAS MADURO HAS**



**ALSO LOST MAJOR SUPPORT IN THE REGION, ESPECIALLY IN BRAZIL AND ARGENTINA NOW LED BY LIBERAL-INSPIRED GOVERNMENTS.** Buenos Aires has played an active part in Venezuela's suspension by Mercosur, the free trade area which also includes, Brazil, Uruguay and Paraguay, and is, along with Mexico, one of the most openly critical states of the Caracas government.

## Brazil

After almost fifteen years of sustained growth and two years in heavy recession, Brazil **COULD CLOSE 2017 WITH GROWTH OF SEVERAL DECIMAL PLACES, PUSHING TOWARDS, ACCORDING TO INTERNATIONAL MONETARY FUND ESTIMATES, A MORE ROBUST 1.7**

**PERCENT IN 2018.** The challenge of recovery, however, is made more demanding by the crisis arising from investigations that the judiciary has opened on alleged cases of corruption that have reached the highest levels of politics and entrepreneurship: ministers, governors, parliamentarians and senior business executives, the state-owned energy company Petrobras, or multi-national construction company Odebrecht. Information on plots revealed a weakness that affects the entire region. **THE COUNTRY NEEDS REDEMPTION, AND ENERGY IS AN ESSENTIAL ASSET IN ANY EFFORT TO REVIVE THE ECONOMY.** Brazil has, for several years, been one of the top ten countries on oil production indices (2.61 million barrels per day in

2016), and for crude oil availability in its reserves it is among the top fifteen countries in the world. The energy industry has proved a crucial factor in the national economy's golden age: it has served to fuel foreign demand, starting with China's core business, and has met part of the robust



domestic demand. This has also been essential in supporting its growth. **BETWEEN 2003 AND 2006, OIL REVENUES ACCOUNTED FOR APPROXIMATELY THREE PERCENT OF THE COUNTRY'S GROSS DOMESTIC PRODUCT.** The refineries system needs to be modernized in order to process crude oil within the country, thus reducing the amount of imported oil. This is one reason why **THE GOVERNMENT HAS APPROVED A LAW THAT REMOVES PETROBRAS' MONOPOLY OVER THE PRE-SALT FIELDS,** opening it to the participation of foreign investors. **FOR 2017, THE INTERNATIONAL ENERGY AGENCY (IEA) ESTIMATES THAT THE DAILY PRODUCTION OF OIL IN BRAZIL WILL REACH 2.85 MILLION BARRELS PER DAY,** higher than the national demand, which is stable.

In the  
Green  
Continent



## Colombia



With a wealth of mineral and energy resources, a privileged geographical position and a stable political framework, Colombia has established itself in recent years **AS THE FOURTH LARGEST LATIN AMERICAN ECONOMY AFTER BRAZIL, MEXICO AND ARGENTINA.** Over the

years, the country has reduced its dependence on the sale of hydrocarbons, but **CRUDE OIL STILL ACCOUNTS FOR THE LARGEST PORTION OF TOTAL EXPORTS, WHICH A FIGURE OF 33 PERCENT IN 2016.** The fall in oil prices therefore constitutes a threat to the Colombian economy, as well

as a challenge to U.S. trade policy, as Colombia directs 29 percent of its exports to the U.S., 35 percent of which is crude oil. Daily oil production in 2015 amounted to approximately one million barrels, but the latest surveys mention a quota close to 865,000, the level set by the government for 2017. State-owned energy company Ecopetrol, will go back to distributing profits, which were suspended in 2016 due to poor performance resulting from the sharp fall in oil prices. **THE GOVERNMENT CONTINUES WORKING TOWARDS MAINTAINING AN IMAGE OF STABILITY.** In terms of domestic politics, the greatest efforts have been aimed at solving the multi-year conflict with the FARC (the Revolutionary Armed Forces guerrilla movement), a process that

will take a long time to completely resolve. To boost growth rates—at percentages between 2.3 and 2.5 percent in 2017 and projected to be between 3 and 3.5 percent in 2018—Bogotá has implemented a series of actions, including an ambitious infrastructure investment plan. One such investment is the “4Gs,” a latest-generation highway network to connect various production centers to the main international trade hubs. Ever-defined as the most western South American country, Colombia

has a large number of international trade treaties in place and enthusiastically engaged in the founding of the Pacific Alliance. **THIS IS A TREATY THAT INCLUDES THE DEVELOPED ECONOMIES OF MEXICO, CHILE AND PERU AND WHICH LOOKS NOT ONLY TO THE POSSIBILITY OF REGIONAL INTEGRATION,** but also to the prospects of trade development with Asian countries, partly and especially in light of the disengagement of the United States from the transpacific agreement.

## Bolivia

Strengthened by a GDP rate substantially higher than that of other Latin American countries, but with very low per capita wealth indices, **THE BOLIVIAN GOVERNMENT DECIDED IN 2016 TO LAUNCH A NEW FIVE-YEAR PLAN WHICH, THROUGH INVESTMENTS IN INFRASTRUCTURE AND INDUSTRIAL DEVELOPMENT, MAY CONTINUE THE EXPANSION OF THE ECONOMY** and the reduction of poverty. In order to fund this plan, the government is using the surplus created over the years and the issuance of new public debt. **THE PROGRAM IS BASED ON AN AVERAGE GROWTH RATE OF 5 PERCENT UNTIL 2020,** a forecast that international bodies, led by the World Bank, deem optimistic. They are urging La Paz to keep close watch over the quality of public spending and the profitability of new major works. **THE ENGINE OF THE NATIONAL ECONOMY AND THE MAIN SOURCE OF REVENUE FOR PUBLIC FUNDS IS NATURAL GAS,** a resource that alone guarantees between 40 and 45 percent of revenues from exports. Gas production has been gradually but steadily rising since 2010, and in 2016 it reached an average of 61 million cubic meters per day, a record figure in times of crisis. However,



domestic demand is also higher and, at the end of last year. Bolivia had to pay small penalties to Argentina, its main buyer of hydrocarbons, for partial defaults in supplies. In this sense, **THE DECISION THAT PRESIDENT EVO MORALES MADE AT THE TIME OF HIS TAKING OFFICE OVER TEN YEARS AGO REMAINS CRUCIAL:** the nationalization of natural resources and other strategic sectors such as telecommunications and energy. This operation involved the opening of several international litigations, involving Spanish, Italian and U.S. companies. For La Paz, however, the program has only a positive balance: in January, the government recalled

that, so far, the transaction has cost \$828 million in damages, 24 percent of what was originally demanded by the expropriated companies. In recent times, however, there have been some major signs, such as the return of Anglo-Dutch Shell after eight years absence and investment plans by Spain's Repsol. **THE COUNTRY WILL GO TO THE POLLS IN 2019,** and although it is too soon to say, the time could mark the end of the Morales era. A faithful partner to Nicolas Maduro's Venezuela, the Bolivian president has unsuccessfully attempted to obtain a referendum that would permit his becoming a candidate to lead the country again.

## Ecuador

After Venezuela and Brazil, **ECUADOR HAS THE THIRD LARGEST CRUDE OIL RESERVES IN SOUTH AMERICA, ALTHOUGH PRODUCTION RANGES BETWEEN ONLY 400,000 AND 550,000 BARRELS PER DAY AS AN ANNUAL AVERAGE.**

A member of OPEC, Ecuador has been affected by the collapse in oil prices to the same extent as other producing countries, although the specific weighting of the sector on the national GDP went from 14 percent in 2006 to the current 10 percent, a difficulty exacerbated by the fact that the country, which since 2000 has used the U.S. dollar, has no ability to implement specific monetary policies.

**FOLLOWING THE RECESSION IN 2016, THE CENTRAL BANK IS SPEAKING OF A POSITIVE RETURN THIS YEAR** but according to the International Monetary Fund the crisis will extend, albeit at a slower rate, over the next two fiscal years. **THE APRIL ELECTIONS FINALLY ENDED THE TEN-YEAR TERM OF RAFAEL CORREA,** leaving the country in the hands of Vice President Lenin Moreno. One of the main challenges facing the new government is the gradual elimination of customs duties, which were increased to protect the trade balance, and the development of the “production matrix change” policy: an ambitious program for reconverting the economy to incorporate the range of energy sources, with a



decided increase in renewables and incentives for increased production in agriculture and

manufacturing. Despite its membership to the Alliance of “Bolivarian” countries, **ECUADOR HAS A STABLE RELATIONSHIP WITH ITS BORDERING COUNTRIES,** Colombia and Peru, and it has strong trade relations with the United States—whose currency it shares—and, since January 2017, it has benefited from the entry into effect of a trade agreement with the European Union.

## Chile

High energy consumption against a low availability of fossil fuels makes **CHILE HIGHLY DEPENDENT ON EXTERNAL SUPPLIES,** and as a result vulnerable to fluctuations of the international market. To cope with this situation, the government, led by Michelle Bachelet, has approved **AN AMBITIOUS PROGRAM TO INCREASE THE AMOUNT OF ELECTRICITY GENERATION BASED ON RENEWABLE SOURCES: 20 PERCENT IN 2025, 60 PERCENT IN 2025 AND, IF IT SHOULD ALL GO ACCORDING TO PLAN, 100 PERCENT IN 2050.** However, this agenda may soon be revised. Presidential elections will be held in November, but in terms of energy, no overturns are expected. Throughout 2014, the share of primary energy generated by fossil fuels

amounted to just under 70 percent of the total. 88 percent of coal, gas and oil is purchased from abroad. Considering that Chile, according to World Bank data from 2013, had the highest per capita energy consumption in Latin America, it is easy, therefore, to understand the effect that the price of commodities has on the national



trade balance. For better and for worse some analysts estimate that the fall in crude oil prices in recent seasons offset one third of the losses attributable to the low cost of copper, Chile's leading export product. **IN TERMS OF ENERGY THE MOST PROSPEROUS INDUSTRY REMAINS THAT OF RENEWABLE SOURCES.** The latest estimates allocate 17 percent of primary electricity production to this sector, largely fueled by solar power, given the extraordinary exposure to sunlight of the northern area of the Andean country. In 2015, Chile came in tenth place in the world's ranking in terms of investments in renewable energies, with \$3.4 billion, down from the previous year only to that recorded by South Africa.

## In the Green Continent



The **POTENTIAL FIRST-RATE ECONOMIC STAR OF SOUTH AMERICA,** Argentina decided in December 2015 to begin a new political season, relying on the leadership of an entrepreneur and politician of Italian origin, Mauricio Macri. Having previously been Mayor of Buenos Aires, Macri focuses his neo-liberal training on **SEEKING AN EXIT FROM A RECESSION** that in 2016 contracted the economy by 2.3 percent. The initial prospects are encouraging, an increase to 2.2 percent in 2017, and a projected one decimal point increase for the following year. But there is still a lot of work to be done, as shown by the high percentage of poverty, around 32 percent of the population, and inflation above 25 percent. **ONE OF THE MOST IMPORTANT CHALLENGES IS THE**

## Argentina



**REBALANCING OF THE ENERGY INDUSTRY.** Over the years, the production of hydrocarbons has fallen and the country, pressured by a demand growing since 2007, has reversed its export of natural gas to Chile, and is starting to buy it from beyond its borders, mainly from Bolivia. **THE RELAUNCH OF THE INDUSTRY,** which has been subjected to years of state-subsidized prices and an incomplete distribution network, is **MAINLY DRIVEN BY**

**A PRIVATE INVESTMENT INCENTIVE POLICY,** given the tightening of the public budget. **THE MAJOR EXPECTATIONS ARE FOCUSED ON SHALE GAS,** a sector in which Argentina is the third in the world in terms of proven reserves, and, specifically, on the Vaca Muerta gas field where production should enable the country to resume its natural gas exports. The government has implemented certain detaxation procedures

and interventions on labor costs. In recent months, various projects have also been launched, including the creation of a plant for separating gas from oil by Anglo-Dutch Shell and the opening of wells by Italian-Argentine Techint. Also on the government's agenda is the idea of a robust acceleration in renewables, a sector that currently accounts for 6.6 percent of the energy matrix, but which, in 2025, is expected to reach 14.4 percent. **ENERGY POLICIES ARE PART OF A PLAN ON WHICH MACRI IS WORKING TO BREAK WITH THE PERONIST PROPOSAL** embodied in the policies of his predecessors, Nestor and Cristina Kirchner. On an international level these policy changes translate into an attempt to ease tensions and recover relationships with various capitals that were neglected in the recent past. The clear objective is to give an image of greater stability that will restore investor confidence and return debt creation to markets. The country has major resources, starting with an agricultural industry which, now properly incentivized, is driving recovery, but public accounts are suffering and fresh capital is needed.



**Mexico/Doubts on the future of new energy regulations**

# Reform the reform?

Strongly backed by President Peña Nieto, Mexico's program of energy reform, which has opened the industry to foreigners, has been affected by the crash in crude oil prices and currently seems destined to "freeze" until the 2018 presidential elections



He is Chief Executive of the Energy Initiative at Tecnológico de Monterrey, where he leads the institution's efforts towards strengthening Mexico's energy sector through applied research, talent formation and consulting services. He also leads two major oil and gas international research projects.

Mexico's energy reform stands out as one of the most important institutional rearrangements made in the country in the last seven decades. The participation of several international oil companies and national oil companies from all over the world in the first four bidding processes and the deep-water offshore joint-venture with PEMEX attest that there is appetite for international investors to develop untapped oil & gas potential in one of the most vibrant regions in the industry in the last decade. However, timing has not been an ally for Mexico's energy reform. Political lobbying for the reform started and became stronger when oil prices were above 100 USD per barrel. A few months after the bill was approved by Congress and enacted by President Peña Nieto, prices dropped around 50%, only to decrease even further throughout 2014. International market conditions have thus certainly slowed down potential interest in Mexico's oil & gas resources, which in turn have favored the narrative of current political opposition, especially left-wing. In mid 2018 Mexico will celebrate presidential elections and so far, all polls favor left-wing long-term leader Andrés Manuel López Obrador, a politician who has repeatedly stated that President Peña Nieto's energy reform



is a mistake and should be reversed. The question then becomes: could the Mexican energy reform be reversed? In short, the answer is no. However, the energy reform can undoubtedly be paralyzed by three factors: the prospective political environment due to Mexico's 2018 presidential election, especially if López Obrador wins the election; the inefficacy of laying out the foundations of an institutional framework to eliminate in-

centives for expropriation under certain political and economic conditions; and the inefficiency or lack of public policies devoted to "eradicate ghosts from the past." This article shall explore all possibilities.

## The political starting point

Despite opposition from Mexico's left wing parties, led by PRD, Mexico's energy reform was approved by Congress in mid-December 2013 and en-

acted by President Peña Nieto on the 20<sup>th</sup>. This was considered Peña Nieto's greatest achievement in his then young administration insofar as other four Presidents before him (i.e. Salinas, Zedillo, Fox, and Calderón) unsuccessfully tried to modify the institutional arrangement of Mexico's energy sector. Some of those former Presidents did introduce changes in legislation that started to open certain activities of the energy sector to pri-

ivate investment. Yet, none of them could modify the Constitution to allow for private investment across the whole value chain, particularly in oil & gas. A strong political arrangement made Peña Nieto's energy reform (and some others) possible: The Pact for Mexico. This agreement was signed in late 2012 by Mexico's top three political forces and President Peña Nieto in order to set in motion coordinated actions to increase

## A HISTORIC MOMENT

On December 20, 2013, at the National Palace in Mexico City, Mexican President Enrique Peña Nieto signs a memorable reform project for Mexico sanctioning the opening of the energy market to foreign companies.

crease the country's competitiveness by taking advantage of compelling (unconventional) prospective resources. Unfortunately for Peña Nieto's administration, one year after the enactment of the energy reform, oil prices dropped to a minimum below 20 USD per barrel (i.e. 80% less to the price when the energy reform was conceived). This aspect, coupled with adventurous promises made by several public servants from the government that have not materialized up to date related to lower prices for gasoline, electricity tariffs and gas, gave fuel once again to deterrents of the energy reform.

## Future prospects

Most polls in Mexico show a clear preference with considerable margin in favor of López Obrador to win 2018's presidential election. Given that he has frequently expressed his rejection towards the energy reform, there is a mild concern that the process could be reversed by his potential administration. Allegedly, López Obrador would not revert Mexico's energy reform through authoritarianism, i.e. he has expressed he would not nationalize the oil and gas and power industries or confiscate physical infrastructure and assets. Rather, he would intend to revert the reform through a national referendum. López Obrador strategy to win the presidential elections of 2018 revolves around one topic: eradicating corruption and create better conditions for the poorest sectors of the population. His flagship is clearly to revert the energy reform. While the amount of investments generated by Round 1 (first bidding processes of oil & gas fields in Mexico's history) are considerable—up to 34 billion dollars, tangible results are not perceived by the population and will not happen in the short run. This is precisely the reason why López Obrador will play such card, because he knows there is not yet substantial evidence to make a case against his claim at least in the mind of the average voter.

Should López Obrador win 2018's presidential election, he can somehow "freeze" the advancement of the energy reform. A plausible way to do so is through the National Infrastructure Plan and the five-year plans for the strategic bidding and assignment of oil & gas fields and the development of the natural gas network, plans proposed by the National Hydrocarbons Commission and the Natural Gas Independent System Operator (CENAGAS) but presented by the Ministry of Energy. López Obrador can somehow slow down the implementation of the energy reform simply by validating plans that do not provide adequate incentives for private firms to invest. Another form of





# The stages of the Reform

- EXECUTIVE ACTIONS
- LEGISLATIVE PROCESS
- SENATE
- CHAMBER OF DEPUTIES
- OTHER
- LANDMARK DATE

## A historic energy U-turn

The energy reform launched in 2013 marks a key turning point in the transformation process that Mexico has undertaken to promote the modernization of the country; it is, in fact, one of the most significant constitutional reform laws, which opens up the oil and gas energy market to private, foreign and local investors, for the first time since 1938. The reform provides that the government of Mexico City continues to hold exclusive ownership over the hydrocarbons in the country's subsoil, but allows foreign agreements to be signed to explore, develop and produce hydrocarbons. The task of the Energy Secretariat and the Mexican National Hydrocarbons Commission (CNH) is to control the supply process, ensuring transparency and economic sustainability. In 2015, SENER launched the so-called Five-Year Plan, which presents strategic tender information and promotes new investment opportunities in Mexico's hydrocarbons industry.



“freezing” the implementation of the energy reform is through providing subsidies to energy (e.g. gasolines, electricity bills, and gas) as he has claimed. This would not provide the right signals (i.e. market prices) for investment. Now, regardless of who wins Mexico's 2018 presidential elections, there are public policy issues to be addressed by Mexico's government which might also “freeze” Mexico's energy reform depending on the efficacy it will display in doing so.

### When incentives may create disparities

Another possibility that might jeopardize the smooth operation of Mexico's energy reform is the persistent investment-expropriation cycle that has been observed historically in Latin America. In a very comprehensive article, highly respected scholar Francisco Monaldi, analyzes expropriation cycles in Latin America and reaches the following conclusion. There are high incentives to governments in countries with strong nationalism to generate reforms to allow for private investment in the oil & gas sector when production, reserves and investment fall, prices are low, and there are vast untapped

resources with high-costs of production (e.g. non-conventional or deep water). This traditionally leads to the creation of energy markets with attractive conditions for private firms (e.g. IOCs) and promotes a transition in slow and inefficient NOCs to a more flexible configuration. This new cycle of investment can lead to new reserves discoveries, higher production and the consolidation of an industry. If such is the case, the prevailing fiscal regime is regressive, the country energy status is that of a net exporter and prices of oil are high, nationalism drastically becomes salient and incentives for expropriation become starker. In the case of Mexico, incentives to avoid the so called investment-expropriation cycle are related to the establishment of a fiscal regime less dependent on oil & gas. While it is true this has already been attained with respect to income generated by production, Mexico's budget is still highly dependent on income generated by hydrocarbons, particularly on fuel taxes. Another element relevant to the elimination of incentives to be locked into the investment-expropriation cycle is establishing a genuine institutional framework to

foster and secure economic competition among market agents. As already explained, there is substantial evidence that Mexico's experience since the 1980s in opening markets to private investment while it can be regarded as successful in attracting foreign investment flows, the same claim does not hold in terms of securing economic competition among market participants. The stronger the economic competition a sector has, the more difficult—and politically more costly—would be for the government to engage into the cycle.

### The weak public policy obstacle

Mexico has a vast experience in creating industrial policy through legislation. Certainly, the latter has become more sophisticated at the technical level. However, the level of implementation of reforms in any sector has not matched that of legislative instruments. There are four areas of public policy in which poor implementation performance might strengthen (albeit not necessarily validate) López Obrador's case, or create incentives to trigger and investment-expropriation cycle, or simply freeze the development of oil & gas

projects with increasing costs for firms and the State.

- **Poor fossil fuel subsidies restructuring communication.** This is related to the (responsible) process of removal of subsidies to gasolines that started in January 2017 in order to establish a competitive market. While the measure is by all means sensible, the timing and communication campaign that the government followed with such removal has not quite resembled the international experience of successful removal in other countries. Furthermore, the transition period to a full-blown market that will end in December 2017, has been characterized by convenient manipulation of the Ministry of Finance in order to sustain a good flow of revenue from gasolines while possible and not allowing for the price to drop when international conditions allow it.
- **Transparency.** Cases of corruption in Mexico, as in any other part of the world, are not infrequent. However, it cannot be denied that great efforts have been made to promote transparency and that Mexico's intention to become a member of the International En-

ergy Agency is linked to its adherence to the Extractive Industries Transparency Initiative.

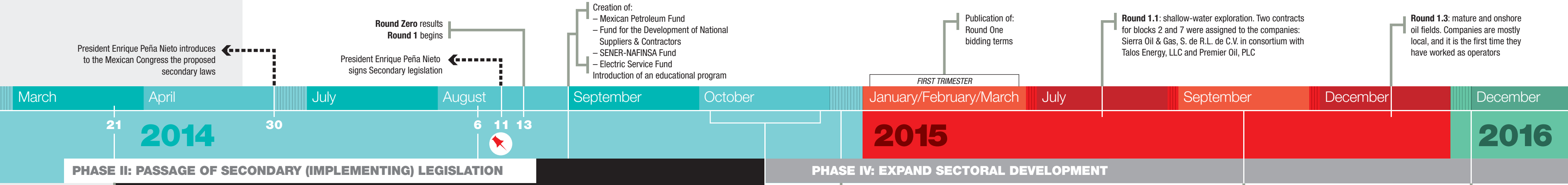
- **Economic Competition.** Mexico's experience in opening markets to competition is not uniformly overwhelming. Take the banking sector for example. At almost thirty years of ending the State control over the banking system, five banks control around three quarters of clients and the cost of credit for individual customers ranks among the worst in the world. In the energy sector, the Federal Commission of Competition (then COFECO) brought PEMEX to court for the anti-competitive practice of tied selling. PEMEX's fine 32 million dollars. Mexico's Supreme Court Justice waived PEMEX from paying the fine claiming the accusation was done at the time when PEMEX was constitutionally a monopoly, thus acting in accordance to law. New regulators of the energy sector have a great deal of work to promote and foster competition amongst market participants in the next years.
- **Land use and social conflicts.** Of all public policy challenges, this stands

out as the greatest, especially for the development of inland oil & gas fields in indigenous communities. These conflicts have represented a major headache for developers of wind farm projects in Oaxaca for years before the energy reform, and have still not found a suitable solution. Several contracts from Round 1 are facing the same type of obstacles in inland projects and blocks to be offered for bidding in Round 2 this year will be subject to indigenous communities' consultation, a highly complicated process that has not actually started yet. In Coahuila, a hub for shale gas projects development, more than half of the territory suffers from the same problem: paperwork is not validated by the public registry of property. This issue has already shown signs of concern among participants of Round 2, insofar as the number of interested private firms have decreased considerably with respect to Round 1.

### The wait for the new tenant of the National Palace

It is highly unlikely that Mexico's energy reform can be reverted regardless of Mexico's 2018 presidential elec-

tion outcome. Irrespective of the identity of the winner, none will have the benefit of majority in Congress. Other legal instruments created to submit to popular consultation relevant aspects within the public realm are excluded from topics related to State income. Hence, López Obrador's narrative of using a referendum to revert the energy reform might prove more profitable to win votes, rather than actually attaining such goal. Yet, the energy reform will face several challenges that might “freeze” it and probably reduce its potential. First, if López Obrador wins, he will surely find a legal way to create obstacles for energy markets development in favor of his own political agenda. But also, slack implementation of public policies and the inherent perverse fiscal incentives faced by the State will ultimately become obstacles of any future administration.



### PHASE III: ROUND ZERO, JOINT VENTURES. CREATION OF REGULATORY ORGANIZATIONS

**Round Zero:** in 2014 SENER (Mexico's Energy Ministry) awarded Pemex 489 assignments, 108 for exploration and 381 for extraction, over a total area of 90,000 square kilometers. The company achieved 100% of its 2P offers, equal to approximately 20 billion barrels of oil equivalent.

Secondary legislation approved and sent to the Executive

Creation of:

- National Energy Control Center (CENACE)
- National Center for Control of Natural Gas (CENAGAS)

Nominations for members of:

- New regulatory bodies
- Boards of CFE & PEMEX

### PHASE IV: EXPAND SECTORAL DEVELOPMENT

90 days from August 11. Creation of: Agency of Industrial Safety and Environmental Protection in the Oil and Gas Sector (ANSIPMA)

Publication of:

- Regulations of the Secondary Legislation
- Guidelines for the issuance of Clean Energy Certificates

Guidelines for the issuance of Clean Energy Certificates



**Venezuela/**From the reorganization of PDVSA to much-needed reforms

# What will it take to revive the oil industry?

A minor facelift won't do—a radical transformation is needed. The goal must be to increase investment in the upstream to get an increase in production over the next twenty years

FRANCISCO MONALDI



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The Venezuelan oil industry is in free fall. Production declined by 12 percent in 2016, and PDVSA, the national oil company (NOC), has severe cash-flow problems. It has accumulated significant arrears with providers and partners and is having difficulty paying bondholders. Although the collapse accelerated with the fall of the price of oil in 2014, the sector has had severe problems for more than a decade, and production has declined by more than a third from peak levels in the late nineties. The country wasted a tremendous opportunity to increase investment and production during the recent decade-long oil price boom. Fortunately for Venezuela, which is heavily dependent on oil exports and fiscal revenues, the industry can recover. The country has the largest unconventional oil resources in the world, the largest conventional proved reserves in Latin America and a very significant natural gas potential. In addition, the experience of its Latin American neighbors shows that institutional changes can attract significant new investments. Brazil, Colombia and more recently Mexico have implemented oil re-



forms with remarkable results. These reforms were geared towards offering credible rules for foreign investors, strengthening the regulatory capacity of the state and restructuring the NOC. Thus, the wheel does not have to be reinvented in Venezuela, as it can learn from the successful regional experiences and adapt them to the Venezuelan realities: its abundant and largely unconventional endowment, its political and social constraints and the change in institutional conditions to be expected when the reform starts.

## The collapsing Venezuelan oil industry

After a successful oil opening in the late nineties, when foreign investment

added more than a million barrels per day (bpd) of oil production, Venezuela's oil industry entered a period of decline. There are multiple causes for the decline, but at least four are particularly relevant:

- 1 | Because of the political conflict between President Chavez and the management of the NOC, in 2003 about half its employees were fired, including a large majority of its executives and technical personnel.
- 2 | During 2005-2007 the government forcefully renegotiated contracts with foreign companies, changed fiscal conditions, and nationalized some of the projects. The arbitrary way in which the expropriation was handled continues

to have a negative reputational effects on foreign oil investment.

- 3 | During 2008-2009 some service companies were nationalized, and the NOC created a very inefficient and corrupt service division.
- 4 | The government systematically extracted excessive resources from the NOC, depriving it of the funds needed for reinvestment even during the high oil price years. The symptoms of the oil industry's decline are not limited to the collapse of its production by more than 1 million bpd since 2008 (according to official figures). PDVSA's self operated production has fallen much more rapidly than total production which has only been partially

compensated by production increases in the joint ventures (JVs) with foreign companies. The fields solely operated by the NOC today produce almost two thirds less oil than at peak levels in the late nineties. As a result close to half of Venezuela's total production is currently produced by joint-ventures. In addition the Venezuelan production basket has become increasingly heavier and thus less profitable, and close to two thirds of current crude production are of heavy and extra-heavy grades. Conventional areas are in rapid decline, and the only area growing is the extra-heavy Orinoco Belt. Exports declined even faster than production until 2013, when the on-

going economic recession started a fall in domestic consumption. Gasoline and other products are massively subsidized, do not cover production costs, much less opportunity costs, and as a result PDVSA incurs heavy losses in about a fourth of its production.

## The issue of exports

In addition, net exports are smaller, since Venezuela has been importing close to 200 thousand bpd of costly products and light crude, both for the domestic market and as diluents for the extra-heavy oil exports. In addition, a significant proportion of the oil exported is committed to repay debt-for-oil loans (with China and Russia being the main creditors), joint-ven-

ture partner loans, and subsidized exports to allied countries, like Cuba (which have been recently cut). As a result, the NOC receives cash-flow from less than 900 thousand bpd from a total production of around 2.2 million bpd. The severe cash-crunch caused by the oil price collapse has worsened an already unsustainable financial path. The foreign financial debt of PDVSA grew from USD\$3 billion in 2005 to \$44 billion in 2015, and debt with suppliers and partners ballooned to over \$20 billion. In 2016 the company had a cash-flow deficit estimated at more than \$8 billion, and that limited its investment capacity. The number of oil rigs in operation declined by 23 percent just in 2016. Very few →



new oil projects have materialized during the last decade. Less than 100 thousand bpd have materialized of the more than one million bpd crude production expansion planned in the new Orinoco Belt projects. The oil industry costs per barrel have significantly increased due to a mix of inefficiency and the overvaluation of the official exchange rate. The number of employees in the NOC increased by almost three hundred percent in a decade, close to 140 thousand workers, while production decreased by a third, dramatically worsening the production per worker figures to less than a fourth of their peak production levels. The tight exchange rate controls, generating massive distortions in the Venezuelan economy, have also been a big burden for the oil sector. In the last few years the dramatic collapse of the industry has led the government to be more pragmatic. Some partners in conventional JVs have negotiated new contracts with PDVSA, ones that offer funding in exchange for more control over the project cash-flow. There have been modest modifications to the foreign exchange regime and a flexibilization of the windfall tax, which has improved conditions for some JVs, and partners in some projects have been given more operational control. A

project to export natural gas to Trinidad has been signed to monetize the significant offshore reserves of Venezuela by taking advantage of its neighbor's LNG infrastructure. However, more than a coherent new strategy to attract investment, these moves often reflect the urgent desperation for cash. As a result, little has been accomplished in terms of actual new investment and production. In fact, some decisions have compromised the future of the oil industry, like the use of all the shares of CITGO, PDVSA's refining subsidiary in the U.S., as collateral for a bond swap and a loan from Rosneft.

#### The needed oil reform

The troubles of the oil sector cannot be solved with cosmetic changes to current policies. They require a significant transformation of the Venezuelan oil industry. The main objective of these reforms should be increasing investment in the upstream to stabilize oil production and reverse its decline, eventually achieving a very substantial increase in production over the next two decades. That objective must be compatible with the fiscal needs of the Venezuelan state; thus, a significant part of the investment effort must be carried by private oil companies, and when feasible complemented with funds raised through project finance and the stock market. In addition the state should

limit the risks it assumes. It should share a larger portion of the riskier projects with qualified partners who are better at managing those risks and can provide technology and know-how. To attract these investments the institutional, contractual and fiscal framework should be flexible, competitive, and at the same time capable of guaranteeing that the state captures any windfall rents. The use of competitive bidding to determine the government take should be generally favored. In addition, the national oil company should refocus on its core business and target its limited investment capacity to the low risk/high return areas, in which no operating partners are needed and service contractors can provide the necessary technology and assistance. PDVSA should be professionalized through investment in human capital, and it should be depoliticized. It cannot continue being a patronage machine of the party in power. The country should strengthen its regulatory capacity to better manage its massive resource potential and provide credibility to investors and its own NOC. The government should devise a specific strategy for each type of hydrocarbon project, e.g. extra-heavy oil, conventional oil, and natural gas, and adapt the institutional framework to the strategy.

#### A new institutional framework

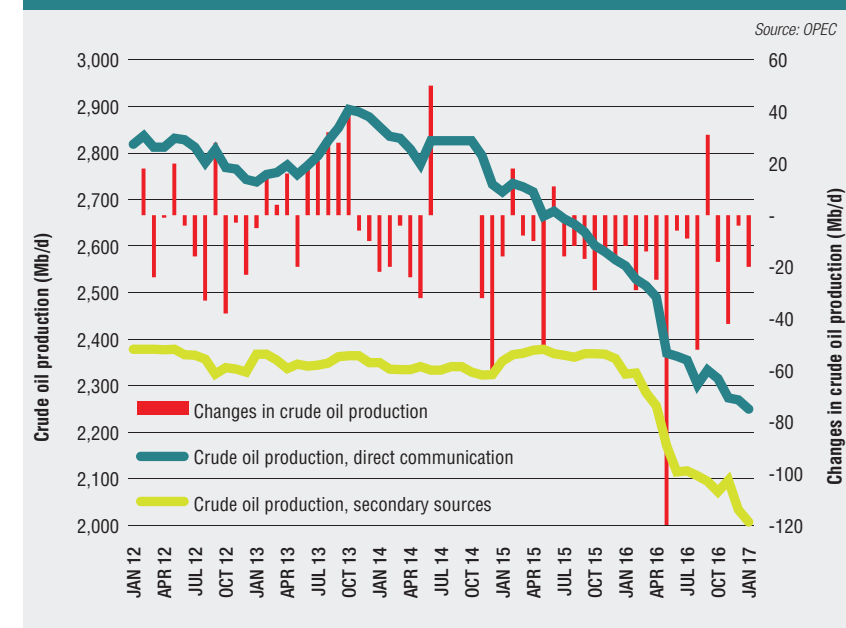
The Venezuelan oil sector badly needs a more effective and credible institutional framework. For many

years, Venezuela has ranked last or nearly last in the Frasier Institute's Global Petroleum Survey in terms of policy perception and quality of the institutional framework. Currently, the Ministry of Oil has very limited capacities to regulate the sector. The NOC de-facto supervises the joint-ventures and foreign partners, serving as regulator and regulated at the same time. For more than a decade the Ministry and PDVSA had the same person at the helm and as a result both entities were de-facto fused into one, greatly diminishing the capacity of the Ministry to hold the NOC managers accountable. In addition, the NOC and the Ministry have been heavily politicized. In the new institutional framework there should be a clear separation of the Ministry and the NOC.

A highly professional and autonomous regulatory agency specialized in oil and gas should be created, following the examples of Brazil, Colombia and Mexico. The agency should aim to guarantee the optimal development of the hydrocarbon resources of the nation within a long-term horizon. For that purpose it should concentrate, organize and expand the geological data available in the country and advise the Ministry on the best options to develop the resource base. They should also collect and publish credible information to the public on key industry variables such as reserves and resources, royalty and tax

payments, worker and environmental safety indicators, among others. The members of the agency's board should be appointed in overlapping fixed terms so that no president controls the board, and their appointment should be approved by a super majority in the legislature. Eventually the agency should take full charge of organizing the assignment of oil and gas blocks using transparent bidding rounds within the joint-venture model (having PDVSA as a partner) or in other contract modalities. The fiscal and contractual framework should adjust to the different characteristics and profitability of the oil fields to make it competitive to attract investment and at the same time to guarantee that resource rents would be captured by the state in different price and field productivity scenarios. To make the framework progressive so that the government-take goes up with the profitability of the project, the royalties should vary with the price of oil, a condition recently implemented in Mexico. Similarly, the contractual government-take should vary with profitability and be a parameter in the competitive bidding process. This would reduce the incentives for the state to force contract renegotiation when oil prices go up. The creation of a national resource fund with a citizens' constituency should also help avoid the cycles of investment and expropriation that have been common in the region. Venezuela has the lowest energy prices in the world, and these indiscriminate subsidies promote waste, inequality, negative externalities, smuggling, disinvestment, and poor quality services. The pricing of oil products, natural gas, and elec-

#### VENEZUELAN OIL PRODUCTION



**In 2016, oil production declined by 12 percent compared to the previous year. The sector is visibly in free fall since 2014.**

tricity in the domestic market should be significantly changed to reflect their opportunity cost. In turn, a significant portion of the revenues obtained by the reduction of subsidies should be used for direct cash transfers to compensate the citizenry in general and the most vulnerable in particular. With this reform, most citizens would be better-off while efficiency and equity would be substantially improved.

#### Restructuring PDVSA

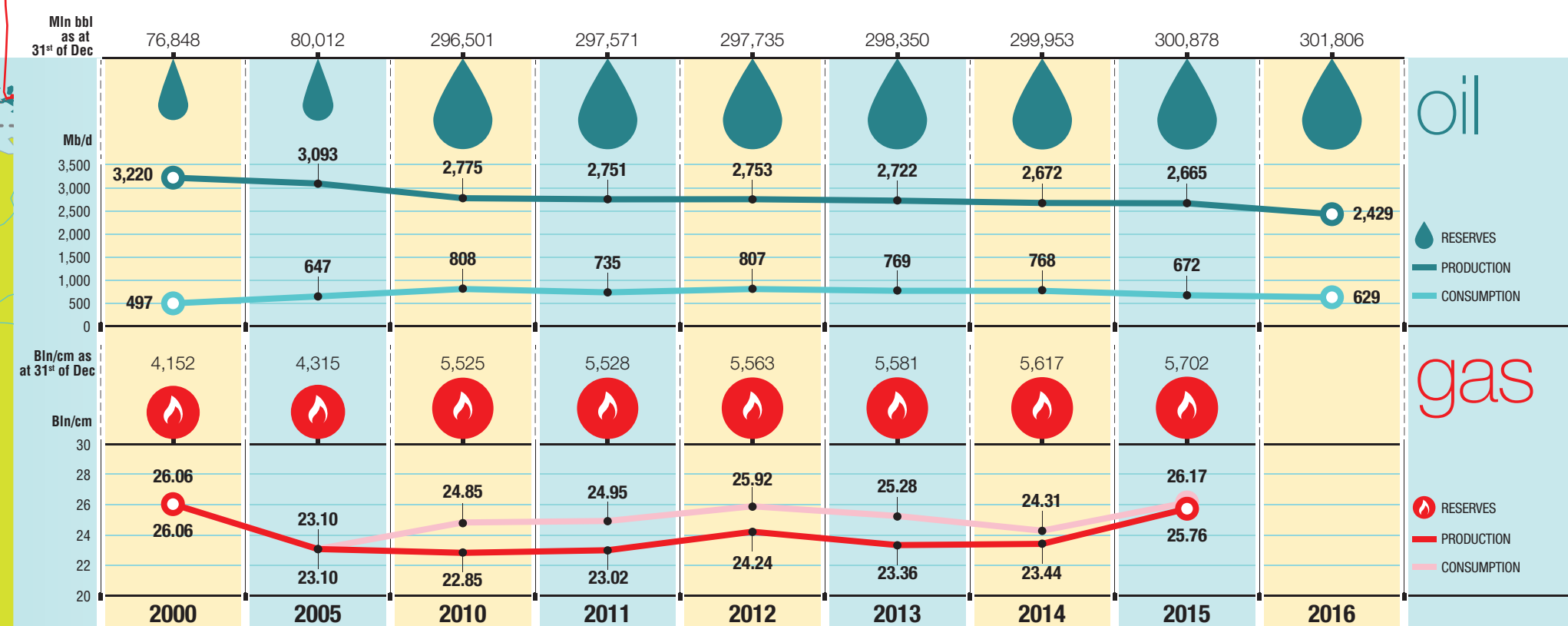
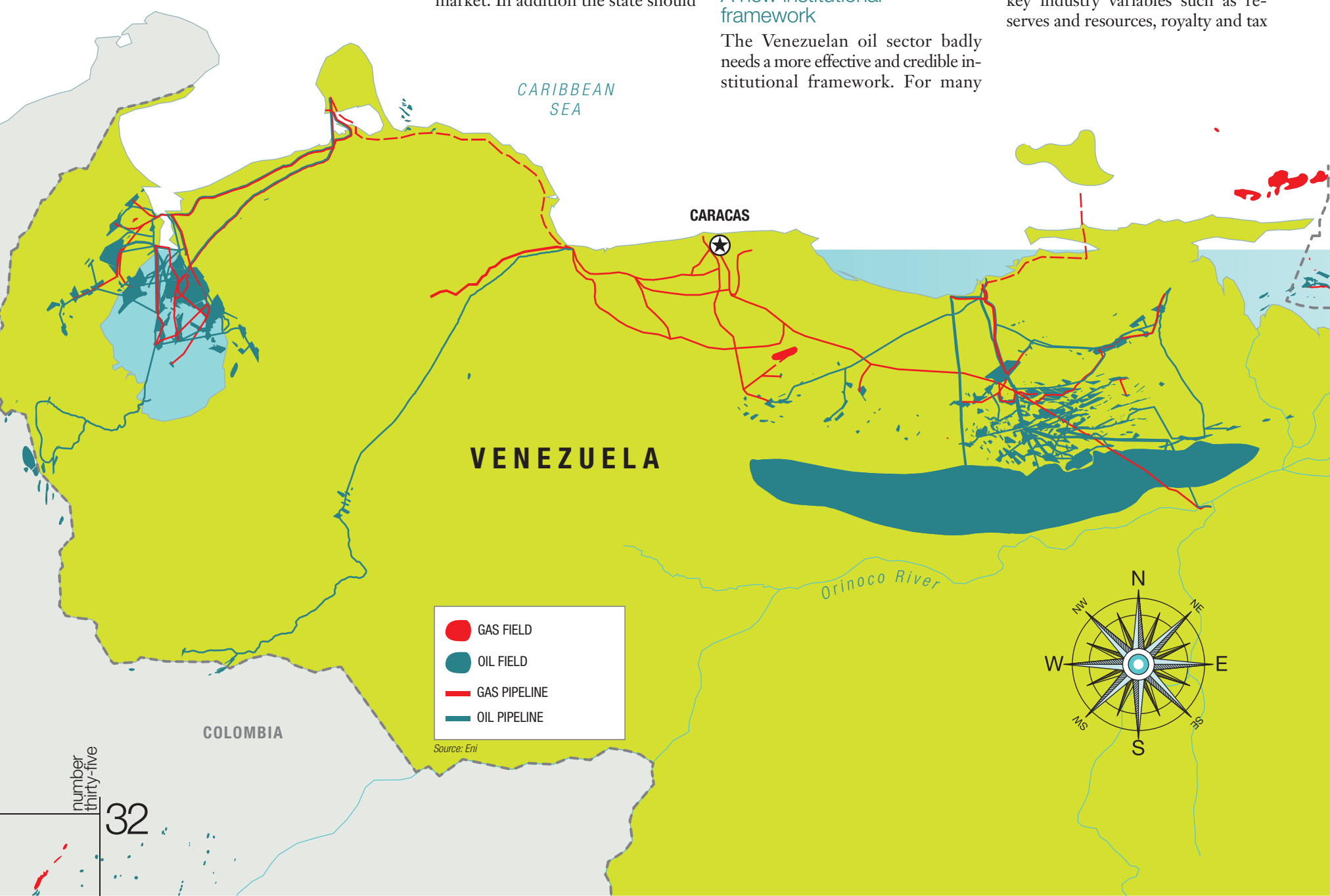
The national oil company should be restructured to focus its investments on its core businesses and on the high-return/lower-risk projects in upstream. The NOC must be professionalized and depoliticized, and

wages should be significantly improved. The company must regain its financial and operational autonomy with very clear rules and objectives. The government cannot extract resources from it at its discretion or force it to execute government programs. The government-take instruments like taxes, royalties and domestic prices, should be designed to provide PDVSA with the right incentives to optimally develop its portfolio. It must be well regulated in order to guarantee its accountability and transparency. The Ministry and Agency should define which areas should be developed by PDVSA. The NOC must fulfill its investment commitments to develop its as-

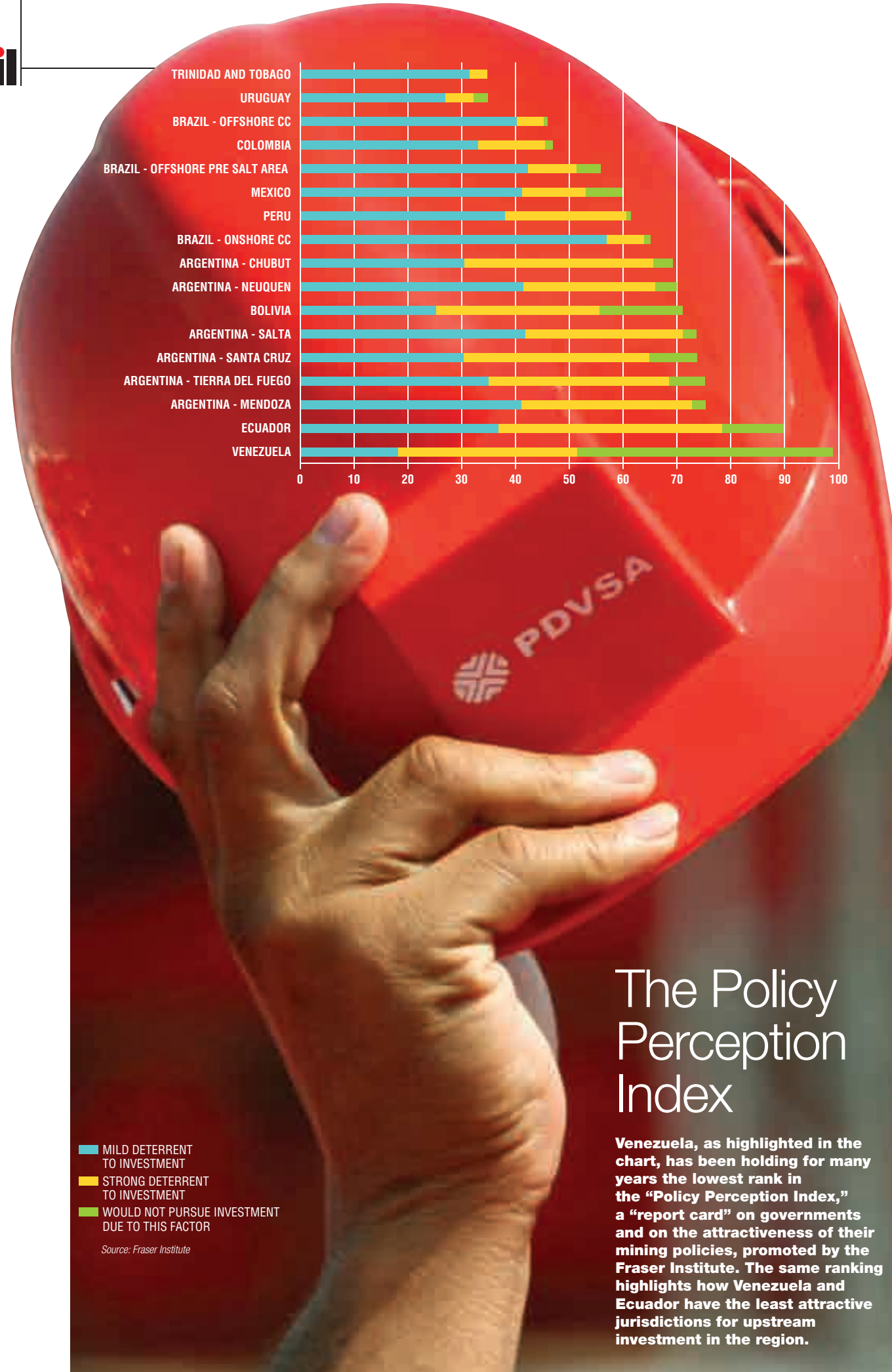
signed fields, or relinquish them to be auctioned by the Agency. The Oil Minister should not be concurrently the CEO of PDVSA. The CEO of PDVSA should be an experienced professional with an impeccable reputation. The Minister should at most be Chairman of the Board with limited duties, or just preside at shareholder meetings. There should be independent board members elected in a way similar to the Agency's.

#### A new strategy

Venezuela should develop new strategies to develop the extra-heavy Orinoco Belt, its conventional resources, and its natural gas resources. During the oil boom days, President Chavez promoted pharaonic projects to develop the Orinoco with very costly investments that were not designed to maximize returns. It is necessary to change the strategy to one which minimizes costs and opens markets for these crudes. Exploration cost in the Orinoco is minimal and extraction costs are low, but transportation is costly due to the high viscosity of the crude. In addition, extra-heavy crudes cannot be transported or sold without some upgrading by blending them with costly lighter crudes or other products that have very low gravity, below 8 API grades. Unless significantly upgraded these crudes are sold at a discount, making them less profitable and thus unattractive in low price environments. Building costly upgraders does not seem feasible under the current circumstances, but that possibility should not be ruled out in the future. For now, an optimal blending circuit must be designed and executed →







ed. Due to the high risks, low margins and need to find markets, these projects should be developed with major partners. The increasing percentage of heavy crude exports make necessary the expansion of refining markets for such crudes. CITGO is increasingly strategic for guaranteeing access to the U.S. market, And the development of other markets like China and India should be continued. Venezuela has plenty of conventional resources, but

most of them are in declining fields which require secondary and enhanced oil recovery techniques. Production in the most profitable fields has been collapsing due both to lack of investment and operational incompetence. In a lower price environment the investment in some of these fields demands efficient companies that bring technology and operational know-how. A new contractual framework must be created to

develop these resources. Some fields could be managed through service contracts, or using risk-sharing operational contracts or production sharing contracts; others could employ existing or new JVs. The key is to ensure that each type of field has a contractual structure suitable for making investment possible, and if a partner is needed for attracting the right type of partner. Finally, Venezuela has very substantial asso-

ciated natural gas resources and has recently made major findings of non-associated gas, especially offshore. In fact the only relevant new hydrocarbon project executed during the last decade is the PERLA offshore project in the Western part of the country, one developed by Repsol and Eni without an equity participation by PDVSA. More recently the government has signed a deal to export offshore gas in the eastern part of the country to Trinidad. The development of the country's gas resources has great economic potential both for exports and for domestic use. Unfortunately, the lack of investment in needed transport infrastructure, the very low regulated domestic prices and exchange rate controls have made it impossible to obtain a positive return on natural gas projects. This must change by making possible the export of gas to Trinidad and Colombia and by developing a profitable and well-regulated domestic market.

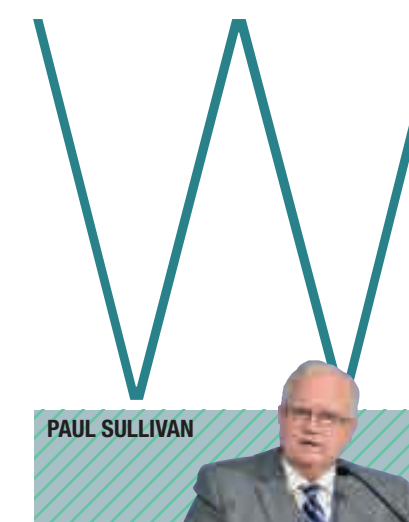
#### The urgent measures of the transition phase

The reform should be implemented in phases. In the transition phase, the current institutional structure can be used to execute pressing changes and in parallel build the foundations for the future structure. Some of the oil reforms discussed above will take time and should be implemented gradually. Some require legislative changes and building new institutions, but Venezuela's oil industry cannot wait for them, and some urgent measures should be taken during the transition to make foreign investment viable. For example, the elimination of the current exchange rate control is long overdue. It is important to stress that without basic political stability and some basic consensus these reforms will not be possible or durable. For that reason, it is important to take advantage of the current institutional and contractual framework to advance in the direction of the needed oil reform and simultaneously try to build consensus for more structural changes. In addition it would be desirable to maintain a relevant role for the state and for the national oil company in any reform, thus avoiding extreme movements in the policy pendulum which often have lead to policy reversion. According to the Constitution of 1999, PDVSA must remain as a fully state-owned company. That is not an obstacle to implement the reform outlined here, as the Mexican reform shows. Joint-ventures could provide all the flexibility required, while keeping an influential role for the NOC, as is the case with most major oil exporters.

## Venezuela/Between relaunch hypothesis and social rebalancing

# A paradox to be recovered

On paper, the country has enough energy resources and potential tourism to regain its prosperity and stability, but political decisions and a lack of economic diversification jeopardize its chance of recovery



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When Christopher Columbus first saw what was to become Venezuela he thought he had discovered paradise on earth. Even today, it is a country of great beauty and abundant resources. Consider Angel Falls, a stunning natural beauty that is the highest uninterrupted waterfall in the world. Then there are the offshore islands, such as Margarita Island, with its crystal blue water, amazing reefs, beaches and tropical breezes. Venezuela also has a savanna, Le Gran Sabana, that has amazing wildlife. It also contains part of the Amazon River with its tropical wonders. If that is not enough, Venezuela also has the Andes Mountains, a part of which goes to the sea. Venezuela is also amazingly rich in excellent, fertile land, and it was an agricultural economy before the discovery of its gigantic oil fields. It also had one of the world's largest fresh water lakes, Lake Maracaibo, but it was opened to the sea to ship oil, and it has been recently described by a Venezuelan scholar as "ruined."

In addition to its abundant natural beauty, Venezuela has fascinating indigenous cultures, some of which have survived somewhat intact. Others have been distorted by exposure to external influences, most particularly when the mining and other companies used indigenous lands for production, transport, and other activities. Drug, fuel and other smuggling gangs have also distorted those cultures and peoples.





**INCREDIBLE ECOLOGICAL DIVERSITY.** Extending across 916,445 km<sup>2</sup>, Venezuela is among the world's leaders in ecological diversity in the world. Since 2010, Venezuela, comprising 23 states and a federal district (currently known as Distrito Capital), has been committed to complying with the Kyôto Protocol and the United Nations climate and environmental agreements. The photo shows a stretch of the Casiquiare Canal.

Venezuela resources include diamonds, gold, coltan, feldspar, silica, nickel, iron, coal, uranium, bauxite, natural gas, and the one that has dominated the country since the early 20th century, oil. Venezuela may have the largest publicly known proved oil reserves on the planet. However, it is hard to tell the extent to which the country has claimed huge increases in reserves estimates that do not seem fully supportable. Much of Venezuela's oil is very heavy oil that needs diluents such as naphtha to make it more usable. Venezuela also imports light, sweet crude from the U.S. via Curacao for mixing with its heavy crude. U.S. exports to the tiny country of Curacao have bloomed since it became legal to export crude to countries other than Canada and a few others.

Venezuela is exporting less and less oil to the U.S., and is in fact relying more and more on refined products from the U.S., mostly from the Houston area and often from its U.S.-owned refineries run by CITGO, a Venezuelan company. Venezuela also imports oil into and exports refined products from the Virgin Islands in the Caribbean. And it has been involved in a project called Petrocaribe, which was started by Hugo Chavez to tie many Caribbean states

to Venezuela and the "Bolivarian Revolution." These countries bought oil and oil products from Venezuela at well below international costs. Lately, however, they have been importing less from this program and more from the international markets, a change due to the relatively low oil prices that now exist in international markets. The largest beneficiary from this very costly project has been Cuba. Oil has been a foreign policy device through such projects.

Historically, oil has been both a curse and a blessing to this astonishing country. It is astonishing because of its natural beauty and promise, but also because of how it has frittered away so much for the sake of political, ideological and economic disputes.

#### Unparalleled crude oil reserves

Venezuela may have 300 billion barrels of proved reserves of oil in the

ground, larger than those of Saudi Arabia. Still, Saudi Arabia produces about 10 million barrels a day compared to Venezuela's approximately 2 million barrels a day. Saudi Arabia's production has been fairly steady in recent times, although it has had drops in production by choice due to an OPEC deal to cut production in recent months. Venezuela's drop in production from 2.7 million barrels a day in 2005 to about 2.3 million barrels a day from 2009 to April 2016 did

not seem voluntary, and its drop in production of over 400 thousand barrels a day from April 2016 to now also seems far from voluntary. These drops seem more the result of political instability, lack of investment in the national oil company PDVSA, poor maintenance, and so many different negative influences on the economy and polity of Venezuela as to make one wonder how anything works in PDVSA or in the country as a whole. Oil production was about 3.5

million barrels a day just a couple of years before Chavez took over in 1998, and it has been downhill since. In 2002, PDVSA had a period when it was not working as the company went on strike and simply shut down. This was in response to what they saw as a threat to the company by Hugo Chavez, and it is also considered a failed coup attempt by PDVSA people and others to oust Chavez. Chavez responded by firing more than 18,000 people from the company, including

some of its best engineers and managers. PDVSA was never the same again. PDVSA, if managed properly, could, according to some experts on the company, produce 6 million barrels a day, but it is still seeing some of its top engineers and managers leave the company and flee the country. Many of the people working in PDVSA today are there because they passed ideological litmus tests, not because they have the necessary skills. Large, complex companies like

PDVSA require the best and brightest in energy, technology, engineering and management, not those who are politically acceptable to politicians.

#### Between economic decline and social divide

In a broader sense, Venezuela has had a Bolivarian diaspora of those leaving because of Hugo Chavez's new constitution and "reforms," which have ruined their hopes. Hundreds of thousands have already left and some took wealth, knowledge and skills with them. The Venezuelan economy and society are in a state of debilitating collapse. Its GDP has precipitously collapsed in the last couple of years due not only to the global drop in oil prices, but also to egregious mismanagement of the economy. Its GDP growth rate is now between -5 percent and -8 percent, and starvation is increasing. The government has allowed people to cross over into Colombia to get food because it is so difficult to find it in Venezuela. Poverty is increasing. Inflation ranges to as high as 1,500 percent according to some sources. The official valuation of the currency has no real connection with the actual valuation, as the official exchange rate gives the currency a value 20 times that of the black market rate. Many markets have taken to weighing the local currency instead of counting it, and many stores, tourism resorts, and others are now asking for hard currency payments. The most desired currency is the U.S. dollar, but most Venezuelans are poor and do not have many dollars.

There are some people who are doing very well in Venezuela, but they are very few. Most people are heartbreakingly desperate in their attempts to get even small amounts of food on the table for their families. Others have been sending cash and other valuables out of the country and buying up properties in the U.S. and elsewhere. For an allegedly socialist state, Venezuela has very sharp class divides.

Some of the main reasons for the initial rebellions by Simon Bolivar and the many coups and counter coups over the last two centuries were inequality, human rights violations, poverty, misuse of resources, and limiting the power of outsiders on the development and politics of Venezuela.

Yet this is how Venezuela ends up. The big companies, and especially Standard oil, and later Exxon, dominated oil exploration and production in the country in the early years of the development of the oil industry. Standard oil and the other big oil companies were emasculated in Venezuela. At first Venezuela got smallish royalties from the big oil →





### THE HEART OF THE ECONOMY

Approximately 30 percent of Venezuela's GDP comes from the oil industry. Crude oil itself accounts for approximately 95 percent of all proceeds from the country's exports. The photo shows the Sambil Shopping Mall of Caracas.



companies. Then in the 1950s, they got about 50 percent or so. Venezuela was one of the original parties to OPEC in the 1960s. After that royalties increased further.

In 1976 the oil companies were nationalized fully into PDVSA. This was, of course, when oil prices were very high due to the 1973 war and oil boycotts. As the oil prices declined rapidly in the 1980s and stayed low in the 1990s, Venezuela was hurting economically—even with massive oil reserves in the ground.

When the government realized the cash cow it had in PDVSA, it spent huge amounts of oil revenues from PDVSA on infrastructure and other projects. The new view Venezuelans had of their country was as a rich one that would continue to get richer. Many assumed that the oil prices would continue to go up and up, and politicians who wanted to be elected or elected again made many expensive promises to the people. As oil prices plummeted and stagnated in the 1980s and 1990s, Venezuela had to take out huge loans and essentially mortgage its future and its oil to pay for the projects that its myopic politicians had promised. This sort of behavior is hardly unusual for a petro-state, and that is what Venezuela became.

### A balance difficult to identify

This economic stagnation, and the political turmoil that resulted, helped produce Chavez's first failed coup in 1992. It also allowed him to continue to build power in the country from his prison cell, which eventually prompted his release from prison because some believed him to be more dangerous in prison than outside. They were wrong, as he was elected president in 1998 and remained president until his death in 2007. He built his power by exploiting the frustrations and fears of the poor and the lower middle classes, by ejecting from power many of those who

threatened him, especially those in PDVSA, and by taking care of the military, the intelligence services and others so they would take care of him. He exploited PDVSA by extracting its profits for his economic and social "missions," and for his regional and international projects, which often brought more trouble than benefits to Venezuela. His economic policies of massive subsidies for food, fuel, housing, health and more led to huge budget deficits and debt when oil prices were low, and slight reprieves from economic and political pressures when oil prices were high. His economic policies made little sense for the long run prosperity of his people, and his international policies also drained the wealth and well-

being of the people. Then Mr. Maduro took over. He vowed to continue the policies of Hugo Chavez even as the politics and economics of the country got more sour and dire. When oil prices collapsed after 2014, Venezuela's slide into economic and social demise picked up pace. Yet the changes in policies that were needed to help slow this problem were not taken. The people got poorer, more upset and less patient with their leadership. The military remains loyal, but one wonders how long this will last. As the song by Bob Marley of Jamaica, an island near to Venezuela, goes: "A hungry mob is an angry mob." And angry they are and the anger is building. It could be getting to the point of another part of Bob

Marley's song: "Cost of living" gets so high, rich and poor they start to cry." Once the rich and the military "start to cry" something quite stunning could happen in Venezuela. Unemployment is rife, especially amongst the youth, and crime is off the charts. Venezuela has one of the highest murder rates in the world, second only to Honduras according to some data series. Venezuela is also considered one of the most important conduits for drug smuggling out of the cocaine fields and laboratories in its region. As the deadly drugs head for the U.S. and Europe, they often go via Venezuela. The country's vice president was just indicted for drugs offenses by the U.S. Gun running, people smuggling and human traf-

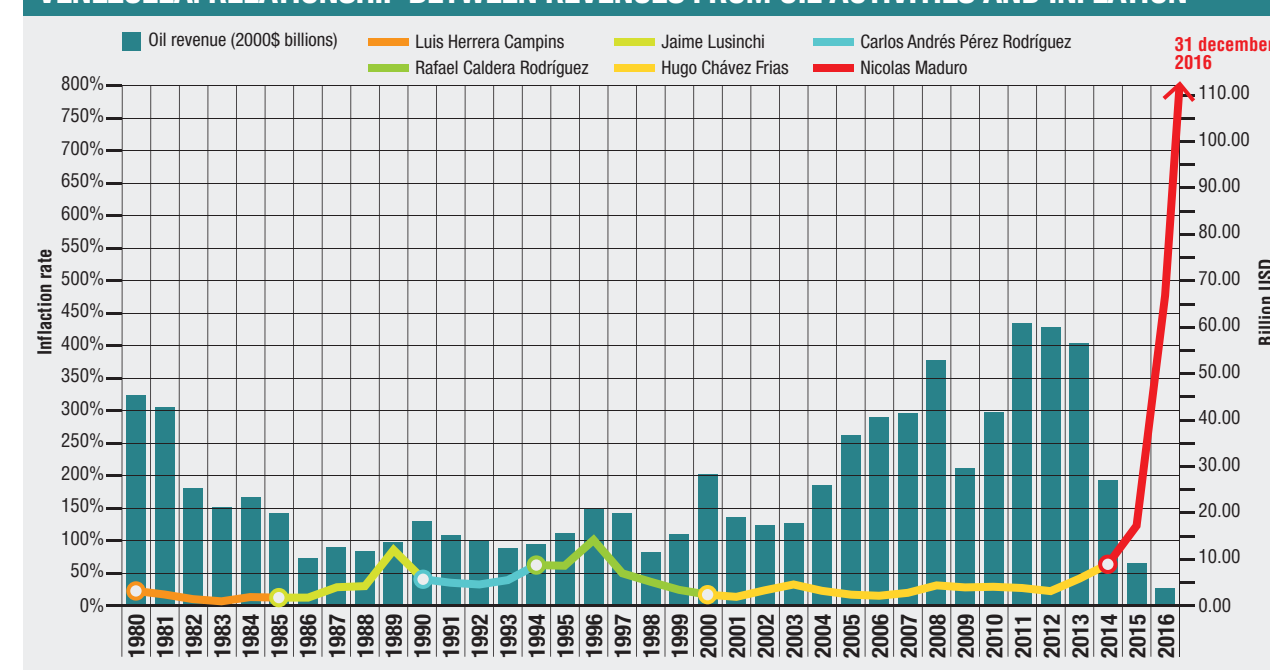
ficking are also big problems in Venezuela.

### A solution in diversification

Venezuela is a country that is twice the size of California with well over 31 million people, and with massive natural resource endowments and natural beauty. It was the major source of oil to the Allies in World War II and was once the largest exporter of oil in the world. It is a country with massive potential and promise. Venezuela should and could become a wealthy, healthy and much happier place. It is a country sitting atop well over 300 billion barrels of oil, yet many cannot find enough bread and rice for the family table. There is a way to turn this around, but this would entail changes in many policies, especially economic policies. Diversifying the economy away from oil might save the country from being whipsawed every time there are oil price shocks. Oil has recently been 90-95 percent of all export earnings and oil and gas create 25-30 percent of its GDP. The revenues and profits of the poorly run PDVSA account for a massive amount of the government budget. Diversifying its export markets in oil could also help because relying mostly on purchases of the U.S., China and India subjects it to the whims of those countries' economies. Diversifying into more value-added uses for its raw materials would not only change some of its export markets, but would also help train new generations on new technologies, methods and management skills in industry and agriculture. The country produces steel and aluminum, but it could produce much more from its raw materials. It could also rely much less on imported refined oil products and petrochemicals.

Venezuela could have a world-class competitive petrochemicals industry. It could also move, with the right education, training and investments into car parts and other parts into making more sophisticated technological goods. Oil and gas are not particularly labor using industries. Getting more people to work in good jobs will likely require a reform of the economy in many ways. Venezuela could be a brilliant place for tourism. It has a lot to offer. However, crime, corruption and other problems would have to be addressed before tourism could really take off. Venezuela could have millions of tourist visits if it had a better legal, social and political environment. Recently, tourism has dropped by 20 percent year on year; the current level is roughly 800,000 tourists per year. Even internal domestic tourism has dropped given the perilous state of the economy for Venezuelans. Some po-

### VENEZUELA: RELATIONSHIP BETWEEN REVENUES FROM OIL ACTIVITIES AND INFLATION



Consumption prices in Venezuela have risen dramatically in recent years, reaching 800 percent on an annual basis in December 2016. The graph shows the trend in inflation which, from 1973 to date, has averaged 32.47 percent, with a fall in revenues caused by oil activities, and the change of various heads of state, from 1980 to date.

litical changes that would also help include moving away from its self-destructive defiance of the world. Such behavior and the sanctions that come with it have damaged Venezuela's potential for the foreign investment and other economic activities that would help it greatly.

### Unstrategic international alliances

Venezuela is the largest arms importer in Latin America. It has spent enormous amounts of money on defense and security. This often enriches those in the military more than making the country more secure. A poor and unstable country is not a stable and secure one. Relying on Russia, a country that is just 2.3 percent of the world economy to help bail it out from debts is surely a short-term move given the increasing fragility of the Russian economy. China could help more than Russia on foreign direct investment, aid, trade and more, but that might also push Venezuela into the orbit of defiance that has caused it so much grief. PDVSA will need to have a serious remake of the way it works, its infrastructure, training, management and more. It is one of the crown jewels of Venezuela. Recently it has been a damaged, heavily indebted and poorly run crown jewel. The entirety of Venezuela could benefit from the professionalization of PDVSA, and this professionalization could also be applied to other companies and industries. For example, it has brilliant soils and very good climate zones for certain crops that were developed historically in the country, crops like cof-

fee, cocoa and yucca. Many of the agricultural lands were taken by the government, yet the government has not developed these lands sufficiently to take care of the food and other agricultural needs of the people. Also, much of the land is still owned by a few owners. Venezuela also has only tiny amounts of agricultural exports, yet imports massive amounts of rice, wheat, soybean meal, meats, and milk. It is a country with great land resources that imports much of its food. Lately it cannot afford to import some of the food it needs. Imports of meat are down about 65 percent, bread is down over 90 percent, and fruits are down 99 percent or so since last year. Agricultural processing companies are shutting down due to a lack of inputs to production so more people lost jobs. The answer the present leadership has for this? It would be to force Venezuelans to work on the land although that would increase instability. It may be that Venezuela could learn a lot from the Saudi plan for economic and government reform towards 2030. So far, Venezuela does not seem to have a plan other than a repetition of past mistakes. It is time for the country to move towards serious changes for the betterment of its people, not just a few politicians, business people and military officers. Otherwise, not only its region, but also the Western Hemisphere and beyond could feel the fallout from a total collapse of the country. Oil markets may have already calculated the short to medium effect of this, but have they taken into consideration the possibility of Venezuela being partly or mostly offline for years

as oil demand starts to increase again? Obviously debt markets will feel the effect if the country does not pay what it owes. There may also be some strategic concerns if Russia ends up owning CITGO due to the large loans Venezuela owes Russia. Venezuela is in a strategic location at the northeast tip of Latin America near the Caribbean not far from Central America and bordering Colombia, Guyana, and Brazil. It also has allies and trading partners in China and Russia, competitors of the U.S. Its crime, drugs, corruption, and other social issues could fan out into the region and beyond with a total collapse. There could also be significant internal strife that may spill over into international strife. Yes, it is a lot better to have a peaceful, prosperous, and socially developed and stable Venezuela than to have an unstable, violent, poor, socially fractured and angry Venezuela. Let us all hope that Venezuela can move to a better future. And it surely can if the right decisions are made by development-oriented leaders with long-term vision focused on the wellbeing of the people.

It is about time.



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**Brazil/**The oil and gas industry between euphoria and despair

# Is recovery on the horizon?

Recent political decisions indicate that the country has made the right steps toward recovering its competitiveness with new bidding rounds and more flexible local content legislation

RENATO LIMA  
DE OLIVEIRA

He is concluding his Ph.D. at MIT. His research analyzes innovation and industrial (local content) policies in the Oil and Gas (O&G) industry in Brazil, Mexico and Malaysia.

**THE WORST SEEMS TO BE OVER** The euphoria aroused in 2007 by the discovery of the pre-salt field off the coast of Brazil gradually turned into despair. The economy has gone through two years of deep recession, oil production has not reached the targets set and barrels are less profitable than expected. Now the worst seems to be over and a slight sense of optimism is returning.

When in 2007, Petrobras, Brazil's National Oil Company (NOC), and the Federal Government announced the discovery of a large ultra-deep offshore oil province, the pre-salt, the country became euphoric. The new resources would be Brazil's passport to the future, claimed the then-president Luiz Inácio Lula da Silva. The pre-salt would provide revenues to be channeled to education and science as well as increase industrial demand for the drilling rigs and platforms which would be manufactured mostly in Brazil due to stringent local content laws. Almost ten years later, euphoria has been replaced by despair.

The overall economy endured two years of deep recession, and the forecast for the oil sector has disappointed. Rather than the close to 5 million barrels per day (mmbd) of production by the end of 2017 predicted by the government in 2010, Brazil will finish the year with 3.4 mmbd. Worse yet, with the fall of oil prices, each barrel generates lower rents predicted when many of the "go ahead" investment decisions were taken, decreasing both the profitability of companies operating in Brazil and the government's finances. On top of that, Brazil's supply chain, particularly the shipyards, proved unable to fulfill the high local content targets that had been projected. This shortfall resulted in higher capital costs (CAPEX), delivery delays that affected the cash flow of projects, and fines for failing to reach minimum local content contractual clauses.

By themselves, all of these issues would be challenging, but the discovery of a major corruption scandal involving Petrobras drove Brazil's oil industry to a "perfect storm" situation, one that resulted in 2016 in the impeachment of President Dilma Rousseff, a former Minister of Energy and Lula da Silva's handpicked successor.

Now the waters have calmed, the worst has passed, and a cautious optimism is in the air. Recent policy decisions signal that Brazil wants to be back in business, with new bidding rounds, the end of Petrobras' legal monopoly in the pre-salt fields, more flexible local content legislation, and a stronger corporate governance against corruption in the country's leading oil company. Petrobras' own financial troubles led it to a divestiture program that is strengthening the domestic competitive environment, both upstream and downstream. This article reviews recent key decisions designed to attract new investments and put Brazil's oil sector back on track to being a hot spot for the global oil and gas industry.

**Petrobras' divestment will strengthen the competitive environment**

Petrobras had the monopoly on upstream operations in Brazil from its creation in 1953 up to 1995, when Congress passed a constitutional amendment that introduced competition into the industry. However, the opening of the oil sector became effective only after a new legal framework was passed in 1997 and the National Petroleum Agency (ANP), a new regulator, conducted the first bidding round for exploratory areas several years later. Notwithstanding that its monopoly legally ended almost 20 years ago, Petrobras still dominates Brazil's oil sector with 81 percent of the national oil and gas production, according to ANP's latest statistical yearbook. Petrobras' longstanding investment program in deep offshore capabilities and intimate knowledge of Brazil's geology gave the national oil company (NOC) a natural advantage in open bids. Private competitors frequently preferred to associate with Petrobras rather than try to outbid it during oil auctions. Petrobras' leading domestic position may have been achieved by merit but had the unwelcome consequence of perpetuating a relatively closed market with a government-run company with monopsony power. Without strong competitive constraints, and driven by a political agenda intent on boosting investments in Brazil and subsidizing gasoline prices (the latter during Rousseff's tenure), Petrobras accumulated an unsustainable level of debt, about \$100 billion by 2015, making it the world's most indebted oil company. The new administration has speeded efforts to raise capital to pay its debt through a sizeable divestment plan, one that aims to raise an additional \$19.5 billion between 2017 and 2018 alone (as disclosed in the Petrobras Business and Management Plan 2017-2021). The most significant deals have been the selling of Petrobras' share (66 percent) in the pre-salt Carará area (block BM-S-8) to Statoil for \$2.5 billion and a substantial strategic alliance with Total, with a value of \$2.2 billion, that includes the transfer of 35 percent of its stake and the operation of the Lapa field (block BM-S-9) to the French company. The divestment program also includes selling assets in the mid-stream and downstream, and Petrobras is eager to find partners to share the cost of completing two of its refinery investments, Comperi in Rio de Janeiro and Abreu e Lima in Pernambuco, projects that were plagued by cost overrun and corruption scandals. Currently, Petrobras completely dominates the downstream in Brazil by having 100 per-



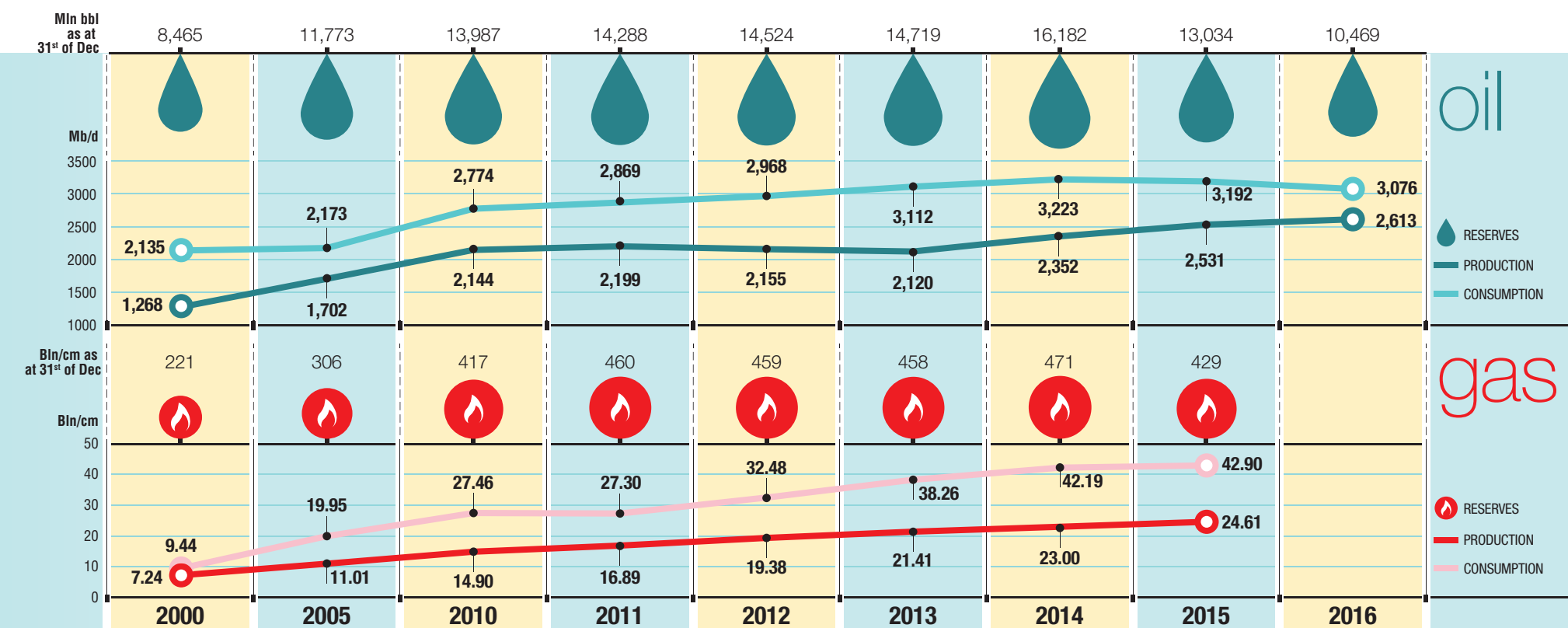


cent ownership of all refineries. This monopoly position made the company more vulnerable to politically determined price setting during Rousseff's administration, as all losses were borne by the state company.

### New investment rounds under more attractive conditions

Following the discovery of the pre-salt, the government crafted specific legislation applying to fields located in this large formation, introducing production-sharing agreement contracts where Petrobras had the monopoly on operation and a minimum 30 percent stake. The changes were heavily criticized by industry stakeholders, including the Brazilian Institute of Petroleum (IBP), an association that represents oil operators. Only one field was ever auctioned following this arrangement, Libra, which was acquired at the minimum price by a consortium of Petrobras (40 percent), Total (20 percent), Shell (20 percent), CNPC (10 percent) and CNOOC (10 percent) in 2013. Oil companies will now be able to operate in the pre-salt, and last November, President Michel Temer (who rose to power after Rousseff's impeachment) sanctioned a law (13365/2016) which ended Petrobras' legal monopoly. The law still grants Petrobras preferential treatment as

the NOC will have the option to say, for each block offered in the pre-salt, if it wants to be an operator with a minimum 30 percent stake or not. This political compromise effectively allows the government to put pre-salt areas out to bid again, as Petrobras' investment and operational capacity have been a major limitation. In the old model Petrobras would have been forced to pay, even if it did not want to, 30 percent of a signature bonus and all the investment in exploration and development. Another key recent change was a modification to the local content requirements in bidding rounds. Local content clauses have been adopted since the first bidding round and are part of Brazil's strategy of using the growth of the oil industry to stimulate the development of its supply chain. However, due to the industry lobby and a strong industrial policy mindset during the Worker's Party (PT) tenure, local content became one of the points of contention in Brazil's oil industry. It moved from an incentive to become mandatory, with high minimum targets and hefty fines when companies failed to comply. Furthermore, local content requirements became more rigid over time, with a schedule of 90 items (from cathode protection to wet Christmas tree), each with its own national requirement percentage. For example, in a notable case, BG drilled a dry well in the block S-M-508, in the Santos Basin, and had to pay an additional R(Reais)\$192 million in 2015 (approximately \$64U.S. million) as a fine for using only 15.42 percent of local content in its total investments when the contractual minimum was 55 percent. In addition to fines, another direct cost of the policy comes in the form of delivery delays when pro-



duction is postponed because FPSO platforms are still being finished in Brazilian shipyards, an issue that has hit Petrobras hard and resulted in its failing to reach production targets. A peripheral issue at first, IBP and consultants linked to oil operators started to see in Brazil's local content requirements a barrier for the future growth of the sector. Even among Petrobras' executives there was a sense that Brazil's local content policies went too far and imposed a heavy burden on the NOC. After more than a year of deliberations that involved multiple ministries and governmental agencies, an Executive committee decided on March 29, 2017 to cut local content requirements by half, make it no longer a bid criterion, and simplify the compliance process. Now, rather than having to follow a detailed list of about 90 items, oil operators will have targets divided by "macro-segments." For offshore fields, exploration was set to 18 percent and the development phase was divided into well construction (25 percent), subsea equipment (40 percent), and production platform (25 percent). The decision was met with strong criticism by business associations such as the Brazilian Machinery Builders' Association (Abimaq) and the politically powerful Federation of Industries of São Paulo (FIESP), but this action signals the government's intent to attract new upstream investments in the coming rounds. For the current year, the Executive is preparing to hold four bidding rounds, with an initial forecast of raising \$3 billion in signature bonuses. The 14th Round, following the concession system, will put to bid 291 exploratory blocks from 9 different sedimentary basins including 10 ultra-deep offshore blocks in the San-

tos Basin. The 4th Marginal Fields Round, also in the concession system, will offer 9 onshore areas and is targeted to medium and small operators. For the pre-salt, following the production-sharing regime, 2 rounds have been announced. The first is a unitization round that will be made of 4 areas in the pre-salt region that border previously awarded fields where discoveries have been made. Finally, in November, the government wants to put to bid 4 prospects located in the broader pre-salt polygon. The National Energy Policy Council, a committee headed by the Ministry of Energy, also announced last April 11 a calendar of future bidding rounds totaling 10 between 2017 and 2019. The intention is to bring predictability to the Brazilian oil and gas market and a steady flow of investments in exploration.

### Cleaning up the house

This ambitious calendar of bidding rounds seems to be overly optimistic considering challenging oil prices and Brazil's own political issues, particularly the ongoing corruption investigations. Widely reputed to be one of the best NOCs in the world, Petrobras was at the center of a major corruption scandal that sent to jail many of its former directors and senior managers, executives of supply companies, and the elite of Brazil's political class, including the former Speaker of the House (Eduardo Cunha) and minister of Finance (Antonio Pallocci). In short the scandal, known by Brazilians as Petrolão, was a kick-back scheme that used Petrobras' investment program to fuel political campaigns and private bribes to politicians and Petrobras' executives. Operationally, the scheme worked by a collusion of suppliers, oil company

executives and politicians responsible for selecting employees for senior management positions within Petrobras. First, suppliers got together in a cartel that held regular meetings to bid rig the oil company. Corrupt executives of Petrobras would accept having to pay overcharged prices in their procurement activities in exchange for kickbacks that varied from 1 percent to 3 percent and were paid in the form of transfers to offshore bank accounts in Switzerland and campaign donations to parties of the ruling coalition, led by the Worker's Party (PT). More than \$2 billion exchanged hands in the form of bribes originating from contracts of Petrobras. It is important to note that the scandal was centered on the procurement practices of Petrobras and did not include the regulator's activities (ANP), bidding rounds or private oil operators. The Petrolão has been a watershed moment in Brazilian politics. The scandal was first discovered during the course of a money laundering investigation led by the Federal Police which got momentum with the wide use of plea bargains to gain the collaboration of those involved in the scheme. The first to cooperate with the Justice was a former downstream director of Petrobras, Paulo Roberto Costa, opening a Pandora's box to the business and political class. The extent of damages to Petrobras is now well documented. Many employees were purged (with some former directors still in jail), and the company is receiving back part of the money illegally deposited in offshore bank accounts. Just one former senior executive, Pedro Barusco, returned to Petrobras \$100 million he had accumulated in a Swiss bank account. More recently, 77 executives from the large Brazilian business

group Odebrecht struck a deal with prosecutors and provided testimonies about the illegal activities of the company with politicians in Brazil and abroad. The full effects of the revelations on Brazil's political system are still hard to predict. Within Petrobras, the current government strengthened the corporate governance of the company to reduce the potential for corruption and the role of political pressure in the appointment of directors. Another key decision was to adopt a clear and predictable price-setting policy, with monthly adjustments to the price of its refined products. Perhaps more effective in the long-run, a more competitive Brazilian oil and gas industry may be a more resilient and long-lasting mechanism to check government interference and recent changes are moving Brazil in this direction. The revelations made in the Petrolão scandal may also help politics in Brazil become cleaner and the country institutionally stronger, a key factor in turning resource wealth into a blessing.



Read on [www.abo.net](http://www.abo.net) the reportage "An Energy Sample for South America" entirely dedicated to Brazil.





## Brazil/Policies, challenges, and opportunities

# Leading the way forward in Latin America

Brazil is experiencing a profound transformation in its energy industry, which has tremendous potential. The government is implementing a series of measures to improve its management and attract new investment



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Brazil is the largest country and economy in Latin America. Those facts alone explain the country's relevance in the world energy arena. Moreover, Brazil is rich in energy resources, from fossil fuels to renewable energy. In the last few years, however, the country has experienced the worst recession in its history, a recession that has also affected its energy sector. Although the economic crisis is still ongoing, prospects for the country's energy sector are optimistic since policy makers are implementing a set of measures that have the potential to improve the sector's management and attract investments.

### The energy potential

In order to better understand how Brazil got here, it may be helpful to examine the country's energy potential. Brazil and Latin America have substantial energy resources. The region is responsible for 21.3 percent of oil recoverable reserves—

behind only the Middle East and North Africa regions. Within the continent, Brazil is home to the second largest oil reserves. Regarding natural gas, Latin America accounts for around four percent of recoverable resources worldwide (not including pre-salt reserves potential). Without the pre-salt reservoirs (not certified until now), this amount is not very substantial, especially taking into account that natural gas is the transition fuel to a lower carbon economy, the principal goal of the countries that have signed and ratified the Paris Agreement in 2016. On the other hand, Latin America is rich in renewable resources. The map below illustrates how well suited Latin America is for solar generation. Additionally, the continent is rich in potential for biomass, wind, and hydropower generation. In Brazil, renewables' participation in the energy mix accounted for around 41 percent in 2015, while

worldwide this participation is 13 percent, placing the country ahead when it comes to energy transition.

Considering these factors, Brazil has it all: oil to explore and supply, and renewables to accomplish its energy transition. With the discovery of oil in the pre-salt layer in the mid-2000s, the country was very optimistic about the potential for revenue from royalties and special participation from exploration in this area. However, due to the pre-salt low geological risk, the government at the time made some controversial managerial decisions.

The regulatory framework chosen for exploring only the pre-salt layer was production sharing, while exploration in other areas remained in the concession regime. This confusing hybrid system contributed to uncertainty regarding how the area was going to be explored, which is not good for business. Moreover, still in the pre-salt area, Petrobras, the Brazilian National Oil Company, was required to be the operator in all exploration contracts, with a minimum participation of 30 percent. This obligation meant that Petrobras had to invest in areas even if they were not interesting to the company, while other companies had to adjust to Petrobras' pace if they were interested in exploring an area.

Furthermore, requirements for local content—the amount that foreign companies must hire locally in order to explore oil and gas in Brazil—were copious and unclear, and in some areas, the Brazilian industrial sector was not ready to fulfill the explorers' demands. Finally, Petrobras was the de facto decision maker in the oil and gas sector, a task that should be the responsibility of the Ministry of Mines and Energy, the policy maker for the Brazilian energy sector along with the National Council on Energy Policy (CNPE). Petrobras controlled gas pricing policy, following the government's directives, when it should have been just another market player. Contrary to what one might think, dictating prices was not an advantage for Petrobras: when gas prices were too high, the company had to keep them at a lower level, chipping in to maintain this subsidy to the population, a scheme that helped increase the company's debt. Further, oil prices plummeted in 2014, and Petrobras got involved in one of the worst corruption scandals in Brazil's history.

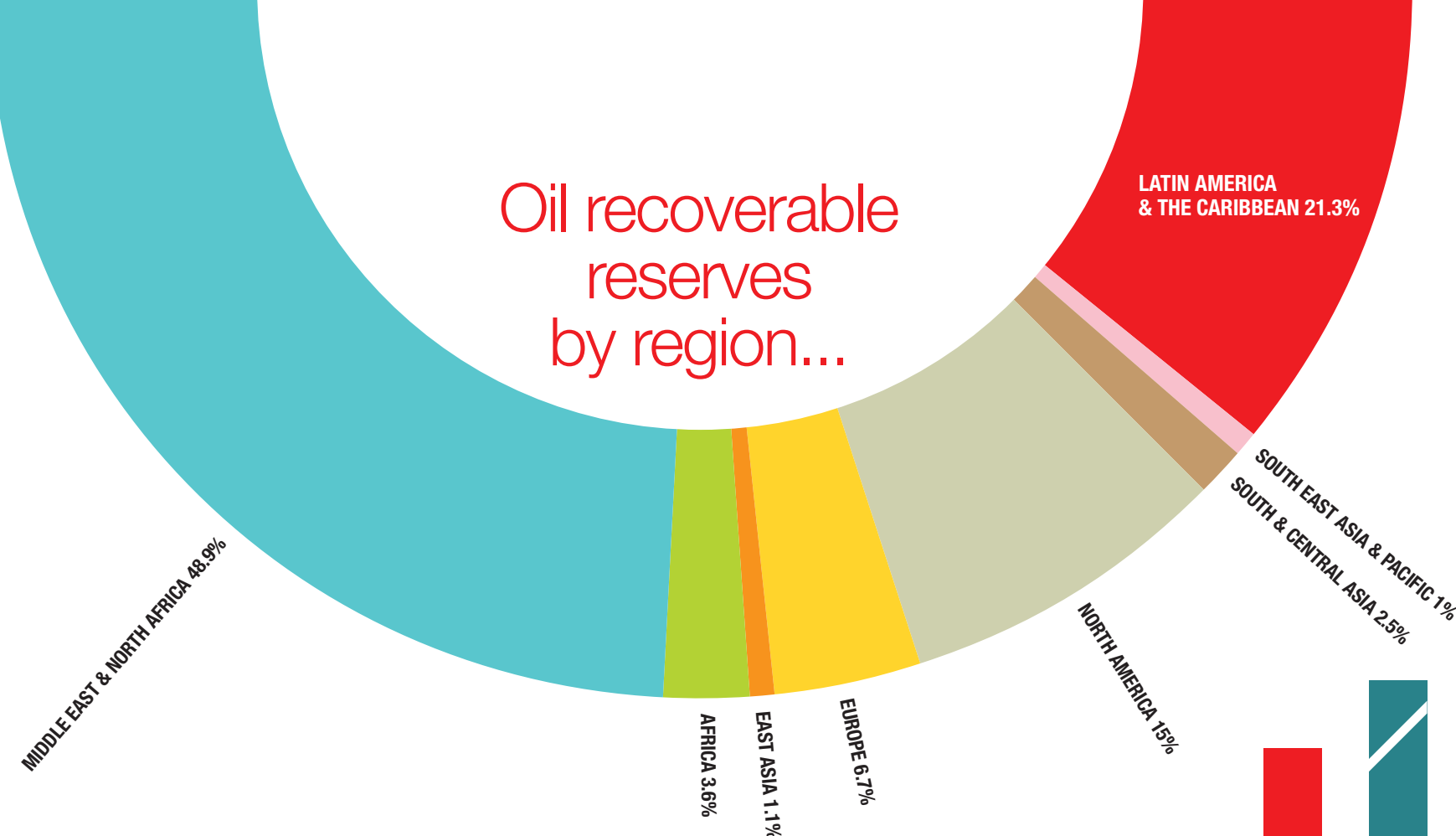
Since 2015, there has not been a single auction in the sector. In fact, the last auction for exploration in the pre-salt area was in 2013.

Mismanagement also affected the power sector. In 2012, the government passed legislation to reduce electricity prices. In the end, howev-





## Oil recoverable reserves by region...



## ...and by country



Latin America and the Caribbean hold 21.3 percent of the world's recoverable oil reserves. The area ranks third, behind the Middle East and North Africa. Brazil enjoys recoverable oil reserves amounting to 1.89 billion tons, ranking second in terms of volume in Latin America, exceeded only by Venezuela.

Source: World Energy Council, 2017

er, it created a mismatch between power offered by independent generators and hired by regulated utilities. As a result, utilities had to buy power in the spot market in order to be able to fulfill their demand, losing money in the process. Moreover, the Brazilian power sector relies heavily on hydropower, and droughts have occurred in the last few years, thus thermal power plants, which are more expensive, are being used to fulfill demand.

Therefore, electricity prices have increased and will probably increase even further since consumers will eventually pay for the subsidies given in 2012. After all, there is no free lunch in economics, and structural problems were already in place in the Brazilian energy sector when the economic downturn started.

For the power sector, the recession has actually contributed to provide some relief since electricity demand shrank with the decline in economic activity. For the oil and gas sector, the long period without auctions proved to be damaging in a sector where reliability and foreseeability are crucial. Last year, a political crisis to which the decline in commodity prices and the economic crisis contributed greatly, ousted the federal administration.

### A more market-oriented government

The new government is more market-oriented and is implementing a series of reforms to bring the energy sector in that direction. In the oil and gas sector, a series of measures aimed at bringing stability were put in place. The local content rules have been revised to become less complicated and to better reflect the Brazilian industry's capacity to provide goods and equipment needed for exploration. Petrobras is no longer under obligation to be the operator in all pre-salt contracts, which will help to improve its financial situation, and the company is restructuring its portfolio, divesting, and cutting costs in order to reduce its debt. The auctions schedule has been resumed, with ten auctions planned between this year and 2019. The areas to be auctioned are onshore, offshore, and in the pre-salt layer (participating in six auctions). A program to develop mature oil fields called REATE is under development. The natural gas market is also being redesigned, targeting greater competition and liquidity. Market and energy analysts are welcoming these changes, which are expected to attract foreign investment and resources. Meanwhile, government intervention in the power sec-

tor has declined, and the government is adjusting its rules and regulations to incorporate new technologies that are already under fast development in other parts of the world, new technologies such as smart grids, electric vehicles, and distributed energy resources (distributed generation, demand response, energy efficiency, and energy storage). Hydropower is becoming more unreliable due to several reasons – change in rain patterns, deforestation on the rivers' banks, and other issues may be affecting hydropower generation and it is difficult to isolate which one is really causing this observed unreliability. In fact, because of the reduction of storage capacity in the National Grid System, hydropower is turning into an intermittent power source in Brazil. Increasing hydropower production by building new hydro plants is not feasible anymore since the frontier in hydropower generation is in the Amazon region, where reservoirs cannot be built. Building run-of-the-river hydropower plants is too costly and not a solution to the intermittency issue when it does not rain. Since expanding this source is not possible, and the power sector is very dependent on it, fossil fuel thermal power plants are being repeatedly

dispatched in order to satisfy the country's electricity demands. Using more fossil fuel thermal power plants to account for hydropower's variability will potentially give rise to another problem: an increase in greenhouse gas emissions—an issue that the Brazilian power sector does not need to worry about excessively today. Unlike in other countries, electricity and heating emits only eight percent of Brazilian greenhouse gases—in China, the United States, and the European Union, emissions in this sector amount to, respectively, 42 percent, 38 percent, and 35 percent (according to data from the CAIT Climate Data Explorer, World Resources Institute, 2017). In its Nationally Determined Contribution (NDC), under the Paris Agreement, Brazil has committed to reduce greenhouse gas emissions below 2005 levels by 37 percent in 2025 and by 43 percent in 2030. In order to be able to reach those values, amongst other measures, the share of sustainable biofuels and renewables (other than hydropower) in the energy mix must increase to 18 percent and 45 percent by 2030. Hence, using more fossil fuel thermal power plants will contribute to further emissions and may undermine Brazil's efforts to decarbonize its economy. The alternative would be to increase wind and solar power production, while using the existing hydropower as “batteries” to compensate for these sources' variability—along with some smaller amount of thermal power plants to guarantee supply. Investing more in energy efficiency would also be a valid option to decrease power load and the need to build new power plants. This increase in alternative power sources and energy efficiency brings another potential for private sector investments, both from within the country and abroad.

### The race of foreign investors

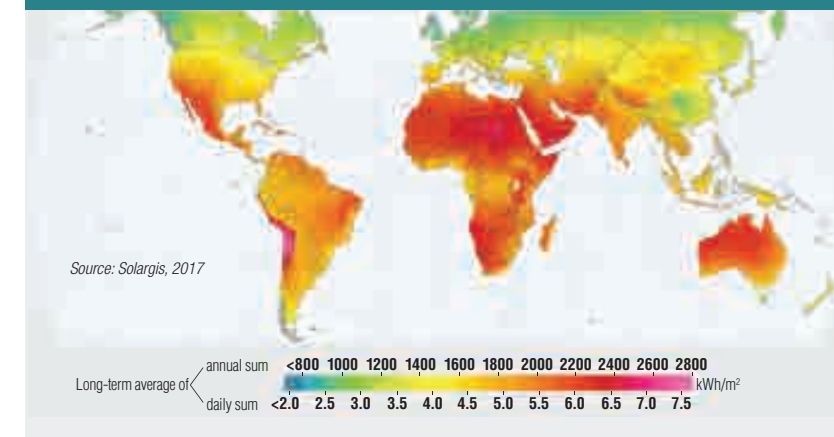
All these changes in the Brazilian energy sector are attracting investors from many countries. Because of the recession, Brazilian state companies like Petrobras and Eletrobras, are selling their participation in energy projects. BNDES, the Brazilian development bank that has historically funded many infrastructure works has had to reduce its financial support for energy projects. Moreover, many Brazilian construction companies are involved in corruption charges, so they are also selling their shares in existing energy plants in the power and oil and gas sectors. Their involvement in new future auctions will be reduced as well.

Among those moving to invest in Brazil are Chinese companies, which have already invested in the pre-salt layer in 2013—CNPC and CNOOC

hold 20 percent of the shares in the consortium that is exploring the Libra area. In the power sector, China Three Gorges (CTG) is the largest private power generator, while State Grid owns more than seven thousand kilometers in transmission lines and has also acquired a utility company. By the way, although electricity demand declined because of the recession, investments in transmission lines to connect new renewable power plants to the national grid are much needed. A recent transmission auction, in April 2017, was considered a success by the government, and other auctions are expected in the future: two more will probably take place this year, and another one in the first half of 2018. Other countries, like Canada, Japan, France, and Italy are also investing in the Brazilian energy sector. The Italian company Enel Green Power is investing in many wind and solar projects – for instance, the company is responsible for the largest solar plant being built in Latin America, with 292 MW of installed capacity. In order to reduce its debt, Petrobras is selling some of its oil and gas assets, which are attracting several foreign investors. A consortium led by the Canadian asset management company Brookfield purchased gas pipelines in the southeast region, the most populous area of the country, where São Paulo and Rio de Janeiro are located. Other Petrobras' assets, like gas pipelines in the northeast region, thermal power plants, and the fuel distribution company, BR Distribuidora, are also being considered for future sale.

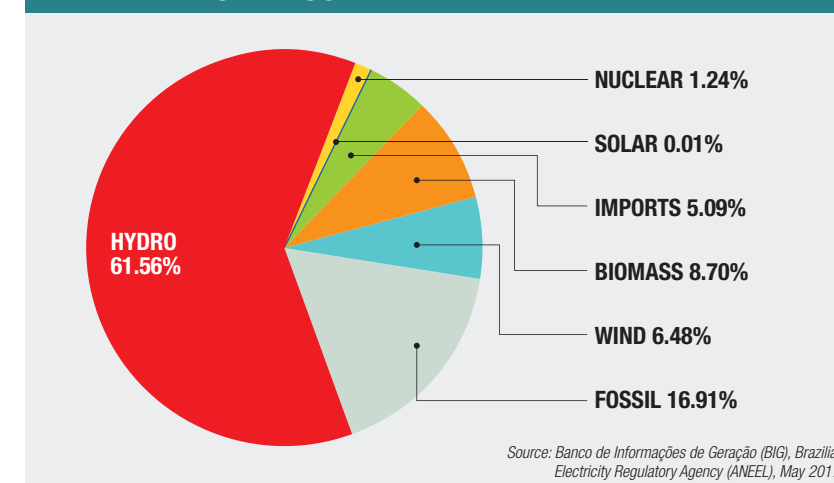
All the changes underway in Brazil are occurring at a moment when the world energy arena is also experiencing a transformation. With the ratification of the Paris Agreement, most of the world has consented to modify the way it generates and consumes energy in order to reduce greenhouse gas emissions and fight climate change. Investing in renewable energy is also good for energy security. Every country has access to sun and wind energy. This joint effort is unprecedented, and points to a future where energy integration can become a reality—after all, it makes sense to integrate if goals are similar. In Europe, the Energy Union is taking the continent in this direction. In Latin America, however, countries face individual challenges that make it difficult to focus in a broader plan for integration. The case of Brazil, discussed in detail in this article, exemplifies this dilemma. Political and economic issues must be addressed before the country is prepared to deal with sustainability and energy transition. That is the case for Argentina as well: after years of economic crisis, auctions that include renewables

### THE POTENTIAL OF SOLAR POWER



Latin America's high level of annual sunshine makes it especially suitable for solar power production.

### BRAZILIAN POWER SUPPLY



Hydroelectric power, which accounts for over 61 percent of the country's energy needs, is becoming increasingly unreliable for several reasons, including the change in rainfall and deforestation.

projects took place last year. More auctions, that also include transmission lines, are planned in the future. On the other hand, both countries have recently discovered large reserves of fossil fuels—the pre-salt oil and gas layer in Brazil and the unconventional natural gas reserves in Vaca Muerta, in Argentina. Exploring these reserves can generate income and jobs in countries where they are much needed. Hence, even though emerging countries have potential to dictate trends in the future of energy worldwide—as is the case for China and India—in Latin America other social and economic priorities may come before energy transition.

### Future prospects

Prospects for development of the sustainable energy sector in Latin America are positive. Latin American countries may be a few years behind in this energy transition process to a cleaner energy matrix, but they will eventually get there. Most of the countries in the region are young democracies, where citizens are still learning their roles, rights, and what to demand from their governments.

There exist some free trade agreements and other diplomacy treaties in the area, but because of economic and institutional problems in the last few years they are not very active. Overall, corruption is still a widespread problem in Latin American countries, wasting income resources in a region where they are scarce. Nevertheless, potential is also immense, especially in the energy arena. Exploring these energy resources sustainably is the next great challenge for Brazil and Latin America, but great opportunities will come from it as well. And, as one of the biggest economies in the area, Brazil is well suited to lead this process.

\*In partnership with: **Fernanda Delgado**, and **Bruno Moreno** – Researchers at FGV Energia, Center for Energy Studies at Getúlio Vargas Foundation.



**Argentina/**The fickle energy policies of the last fifteen years

# Vaca Muerta, a chimera or a real treasure?

The Macri government has to decide whether it is appropriate to develop hydrocarbon deposits at all costs, or to focus on more valid long-term solutions



GONZALO  
ESCRIBANO

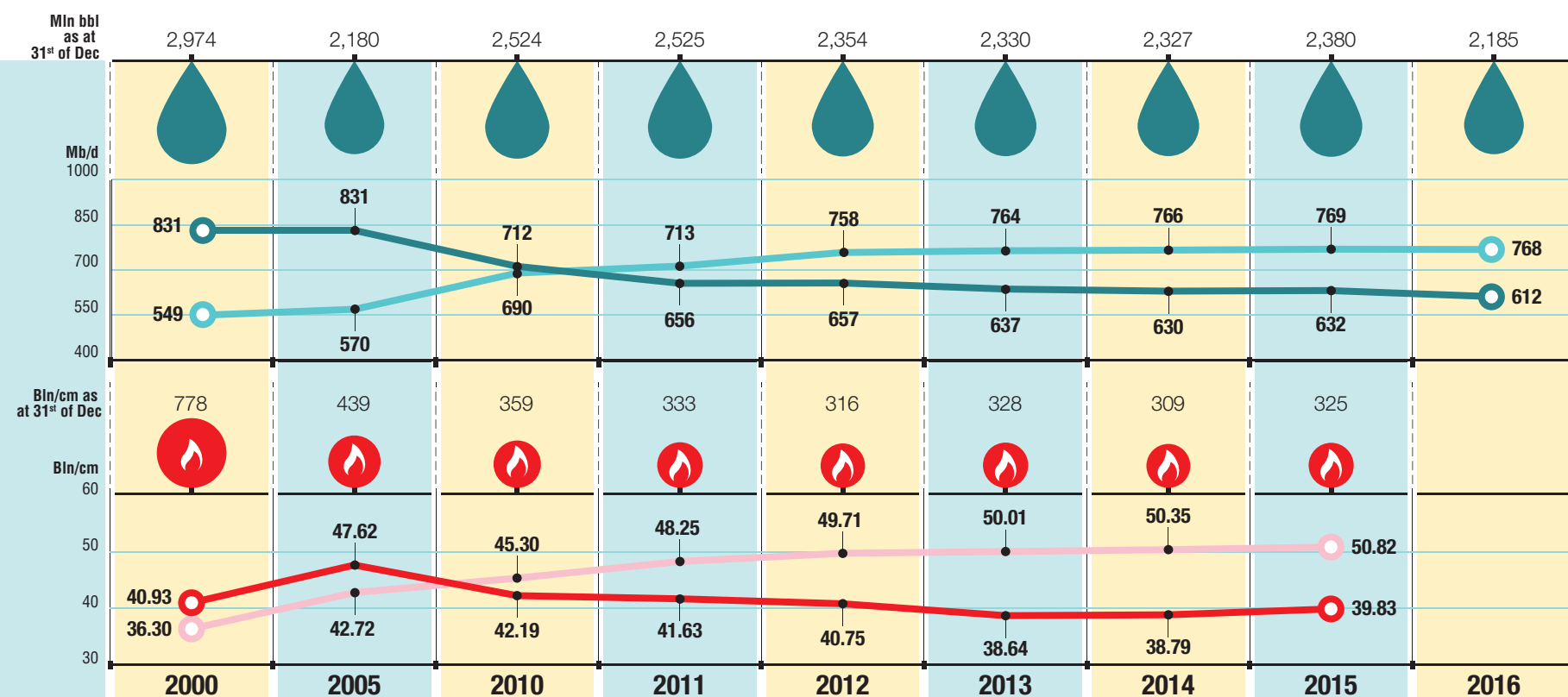
He is the Director of the Energy Programme at the Elcano Royal Institute for International Studies, and professor of applied economics at the Spanish Open University (UNED). His research agenda focuses on the international political economy of energy, the external dimension of Spanish and European energy policies, the geopolitics and geo-economics of energy in the Mediterranean and Latin America.

Since the first oil discovery in 1907, Argentina has suffered from volatile energy policies determined by domestic politics. Populist energy policies during the Kirchner-Fernández presidencies (2003-2015) culminated with the 2012 expropriation of Repsol-YPF, which had discovered the vast Vaca Muerta shale play. However, the promises of rapidly increasing unconventional oil and gas production failed to materialize and the imbalances of the energy sector became economically unsustainable. The Macri presidency has made energy reform the hallmark of its economic policy, addressing simultaneously supply and demand weaknesses. While during the last year his government has delivered an impressive set of policy measures, including a reduction in consumer energy subsidies and an agreement to foster the development of Vaca Muerta, the only partially successful efforts to accelerate the slow development of the Neuquén basin risk disappointments on the delivery of promises in the short term.

## Vast unconventional reserves

In 2011, Repsol-YPF confirmed the existence of vast unconventional oil and gas resources in Vaca Muerta, an oil and gas formation in the Neuquén basin, southern Argentina, with a shape and size similar to Belgium. Vaca Muerta is the second-largest shale gas and fourth-largest shale oil reservoir in the world, and since its discovery it has raised the expectations of successive governments to replicate the shale revolution going on in the United States and Canada. While the country holds other conventional and unconventional reserves, Vaca Muerta plays the dual role of compensating declining conventional production and pioneering shale exploration and production that can be extended to other areas of the country. At the time of its discovery, oil and gas production had been falling for almost a decade and energy imports were rapidly increasing for the first time in 20 years. The president Fernández cabinet saw the development of shale gas as a simple solution to a serious energy crisis without having to adopt unpopular measures to harness energy demand growth, like the reduction of high consumer subsidies. However, in spite of generous subsidies to oil and gas production, both continued to decline. Oil production was still falling in 2016 to 1991 levels, while gas production only started to increase in 2015 and by 2016 had reached 2000 levels. Unconventional exploration proved more demanding than expected, and while Argentina is arguably the third country after the United States and

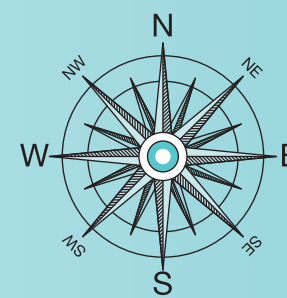




oil

RESERVES  
PRODUCTION  
CONSUMPTION

gas

RESERVES  
PRODUCTION  
CONSUMPTION

PACIFIC OCEAN

tend to increase over the next years while local producers will be able to reduce production costs, thus allowing the full elimination of support prices. It has also launched several initiatives to increase competition and transparency in the retail market, like fostering information on gasoline prices among consumers. Perhaps more importantly in terms of policy time consistency, the agreement was designed in an inclusive manner, with the participation of the federal government, the Neuquén provincial government, as well as the oil and gas companies and labour unions. It includes the “flexibilisation” of labor conditions in the costly Vaca Muerta non-conventional fields, as well as other measures to improve productivity and converge towards North American exploration and production costs. Such a concession from a powerful oil workers’ union has been interpreted as a promising sign of a more attractive labor environment that could be extended to other basins and the whole energy sector. For instance, a similar agreement is being negotiated for the San Jorge basin, home of Cerro Dragón, the country’s largest oil field. The agreement also includes the commitment of the Neuquén provincial government not to increase taxes and to invest in transport infrastructures to improve logistics and factor productivity. If successful, the government could even project energy reform as an institutional template for other structural reforms.

#### Vaca Muerta: dead or alive?

The ambitious and comprehensive energy reforms adopted by the Macri presidency to attract foreign investment in the oil and gas sector, especially the Vaca Muerta agreement, →

Canada to have developed unconventional exploration and production, it lags well behind in terms of wells drilled and, more importantly, production costs. Vaca Muerta is compared to such a prolific play as Eagle Ford, but production costs roughly double those in the United States. The players are mainly YPF and a few international oil companies, that are waiting for better domestic (production subsidies) and global conditions (a rise in oil prices) to improve before intensifying the pace of final investment decisions. This has no similarity to the myriad of small and medium companies that developed the United States’ shale basins in a much more competitive ecosystem and that initially benefitted from high oil and gas prices. High production costs in a global low price environment and domestic political uncertainty explain the reluctance of foreign companies to scale up investments in Vaca Muerta. Until recently, final investments have been modest, with shale oil and gas production slowly increasing but unable to compensate for the decline in conventional fields with the exception of gas during the last two years. However, the election of a new president committed to economic reform has changed the Argentinean energy landscape and has renewed interest in developing the country’s vast unconventional oil and gas reserves.

#### Volatile energy policies

Hydrocarbons constitute 85 percent of the energy mix in Argentina, and are key to electricity generation, representing around two thirds of electricity generation and installed capacity. Like in other economic policy areas, energy policies have been historically subjected to political in-

terests and radical shifts in their orientation from one presidency to another. In the 1990s, president Menem adopted market friendly measures, including the deregulation of the energy sector, privatization of state-owned energy companies like YPF, and the liberalisation of foreign energy trade. These measures were reversed during the severe 2001 economic crisis: public utility tariffs were frozen, dollar contracts with utilities converted to devalued pesos and export taxes re-enacted. These and other interventionist measures were intended to be temporary, but the Kirchner-Fernández presidencies maintained and even extended them during the fast economic recovery that followed the crisis. During their mandates, the energy sector became the largest recipient of subsidies. Consumer electricity subsidies, initially intended to reduce poverty, were not reduced but increased with economic recovery, becoming the hallmark of Kirchners’ Peronist energy policies. On the supply side the principal measure was the 2012 expropriation and nationalization of Repsol-YPF after its Vaca Muerta discovery. By that year economic growth had stalled and, representing around 3 percent of GDP, energy subsidies were no longer fiscally sustainable. In order to accelerate oil and gas production, the government introduced another policy swing, easing some restrictions like export controls and setting wellhead oil and gas prices above global market prices. A special plan, “Plan Gas,” was devoted to develop gas exploration and production through subsidized prices until 2017. In 2015 a support price for oil companies was introduced to offset falling international oil prices, the so-called “barril criollo.” The period of low

prices in global oil and gas markets continued longer than expected, making these measures increasingly costly. Aware of the need to attract foreign investment to develop the country’s unconventional resources, the Congress also agreed to compensate Repsol with US\$5 billion in bonds for the expropriation of YPF. Nevertheless, the nationalization of Repsol-YPF demonstrates how Argentinean politics had led in the recent past to a lack of respect for the rule of law and property rights.

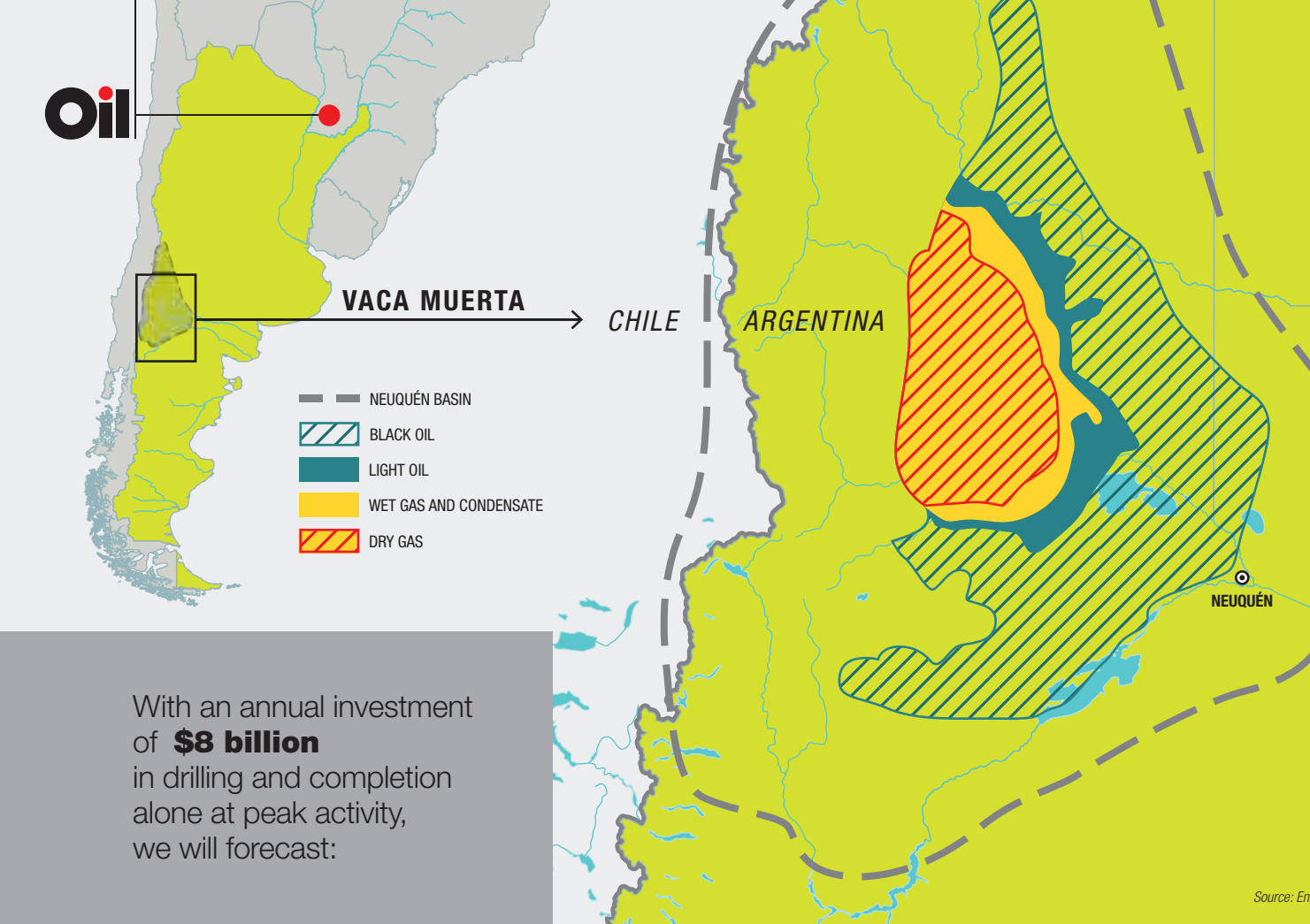
#### Shifting politics

This lack of consistency in Argentinean energy policies goes beyond the political will of different governments, and remains an obstacle to a sustained and incremental development of the country’s shale oil and gas resources. The volatility of economic policies in the country has been related to the characteristics of its political system: hyper-presidentialism, competitive federalism, delegative democracy and powerful trade unions make a complex institutional mix. This uniqueness has led the country to pendular economic policy-making and to alternate cycles of accelerated development followed by periods of prolonged stagnation. In particular such an institutional configuration raises the question of whether the deep energy reforms initiated during the first year of the Macri mandate will be politically sustainable over enough time to unleash the potential of Argentinean unconventional reserves. Since his election in December 2015, president Macri has made energy policy one of the drivers of economic reform. The energy minister, Mr. Aranguren, is a respected energy sector professional. Until 2015 he was the president of the Ar-

gentinian branch of Royal Dutch Shell and one of the most vocal critics of Peronist energy policies. A few months later having entered office his department enacted an abrupt reduction of consumer gas and electricity subsidies to arrive at “sincere” prices (“sincerar precios”), the euphemism the new government is using to avoid the unpopularity of price increases. The measure was criticized by the opposition, and even partially suspended by the courts. However, minister Aranguren has persevered, and has been quite successful in reducing subsidies and their fiscal burden. The substantial decrease in electricity and gas demand experienced in recent months is the first sign of the effectiveness of governmental policies in balancing the energy market. From the supply side, Mr. Aranguren’s department has also been very pro-active. His main achievement has been a comprehensive agreement announced last February to foster the development of the country’s hydrocarbon reserves. First, it has extended the “Plan Gas” until 2020, but restricted the minimum price offered to producers to US\$7.5 per mBTU, still above global market prices but available only to new wells in the Neuquén basin and setting a roadmap for a progressive price reduction. The agreement also provides for the gradual elimination of the “barril criollo,” setting a starting price of US\$59.4/barrel for oil from the Neuquén basin and US\$48.3 from the San Jorge basin, with prices decreasing monthly to converge with international (WTI) prices by the end of 2017. The export taxes on crude oil and products in place since the 2002 devaluation are lifted. The government hopes that oil and gas prices will







out that Argentinean shale gas could be able to supply domestic demand by 2040, with exports being more difficult to envisage but also possible under sustained optimal policies.

In particular, the report finds that Vaca Muerta gas is more attractive than oil, suggesting break-even prices below the "Plan Gas" price of \$7.50 per mBTU, especially in the most prolific areas. It also highlighted, however, that to materialize, such a scenario requires an annual investment of US\$8 billion until 2040, a challenging amount for a country that received less than US\$5 billion in foreign investments for the whole economy in the first nine months of 2016, a total 50 percent less than in the same period a year earlier. While promising, the outcome will not replicate the United States' shale revolution. There will be no Saudi Argentina. On the other hand, several policy measures implemented by the new presidency, namely the support to wellhead prices, depend upon the international price context. The recovery of the oil price could take longer than expected by the government, increasing the burden of supporting wellhead prices and therefore complicating the fiscal and political sustainability of energy reforms. If the increase in unconventional exploration and production turns out to be slower than expected, restrictive demand-side policies are to remain a key element of Argentinian energy policy to contain consumption and maintain convergence towards international energy prices. These are politically costly measures and the current president needs to prove they will be sustained over time. His government stance has been pragmatic, negotiating inclusive agreements and sequencing adjustments in a gradual manner. In this way, it has been able to revive interest in Vaca Muerta, where to date production increases have been elusive and modest. There is no doubt that these are the kind of policies that attract foreign investors, but the Macri presidency could learn from his predecessors about the risks of raising expectations and failing to deliver on the promises of a shale windfall. A realistic and incremental approach could be more credible and effective over the medium term than a premature shale rush under a yet inadequate domestic and global environment. Perhaps more importantly, the Macri government will have to decide whether it is advisable to develop Vaca Muerta at any price (literally) or concentrate on more efficient measures in the long term than continue to subsidize wellhead prices.



## Colombia/Ready to become a regional energy power

# The peace dividend

The signing of the agreement between the Santos government and FARC at the end of 2016 will boost economic growth, including in the hydrocarbon and renewable sectors. But this progress is not without difficulties

It was one of those days when spring glistens in all its splendor. For this reason, there was no lack of observations on how the pleasant temperature recorded in Washington on April 18, 2017 was the perfect natural setting for the International Monetary Fund's disclosure of more positive forecasts for the world economy. At the height of optimism for the planet's progress, the contrast with the situation in Latin American clearly emerged. Far from improving, the region's prospects are currently grimmer than they were at the beginning of the year, although the red figures now seem to belong to the past. In addition, in terms of per capita income, the situation worsens. "The region will record another year of recession in per capita GDP in 2017," said Alicia Bárcena, Executive Secretary of the Economic Commission for Latin America and the Caribbean (CEPAL), an organization linked to the United Nations and based in Santiago, Chile. Of course, the fates of the countries in an area that extends south from the Río Grande to Patagonia vary greatly. Alongside the defeats in Venezuela there are success stories such as that of Peru, the country that recorded the best performance in the past century, or Colombia, which is no longer considered a "failed state," but a nation with great potential.

### The end of the longest internal conflict in history

With a population of over 49 million people and a territory of over 1.1 mil-



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lion square kilometers, Colombia's present reality is profoundly different from that of ten or twenty years ago. Drug cartels belong to the past, leaving a trail of blood and death behind them, and the longest internal conflict in world history has been overcome. The signing of the peace agreement between the government of Juan Manuel Santos and FARC guerrillas at the end of 2016 was a reason for celebration on many levels, but Colombian public opinion is divided, as evidenced by the outcome of the referendum in October 2016. However, despite political controversy is expected to boost economic growth. "Peace will deliver a dividend," said the Finance Minister, Mauricio Cárdenas. Moderate cal-

culations indicate a growth of 0.3 points in Colombia's GDP, although the Minister is among those who believe that the results will be rosier. "The main reason is the increase in investments in additional areas and sectors," said the Minister. Energy is one of the sectors that should benefit. Hydrocarbons, biofuels and electricity production depend on the expected presence of minimum conditions of tranquility in rural areas. To this must be added the country's huge potential in terms of renewable sources such as wind and solar power. However, this progress is not without attendant difficulties. Although the FARC fighters have abandoned their weapons, active violent groups remain, some of which are linked to the production of illegal



## Vaca Muerta

The area is located in the Neuquén basin in the southwest of the country, and covers an area of 30,000 square kilometers, of which over 12,000 are in concession to the Argentinean YPF company. From a geological point of view, volcanic activity and associated ash beds that developed during the Vaca Muerta shale deposition led to the development of interbedded bentonite layers, which may cause problems for drilling and fracture stimulation of reservoir intervals. The basin is filled by a predominantly clastic succession of sediments up to 7,000 metres (22,966 feet) in thickness at the basin center. Thermal maturity in this region is also potentially increased by the presence of a heat flow anomaly associated with volcanism.

have renewed the interest of some companies in developing its reserves. An increase in investment in exploration and production over the next years is likely to follow such policy improvements. In exchange for the above-mentioned facilitating measures, the agreement includes the commitment by the main players (state-owned YPF and Pan American Energy (PAE) from Argentina, and international companies like Chevron, Shell, Dow and Total) to increase investments in Vaca Muerta to US\$ 5bn in 2017 and US\$ 15bn annually thereafter. Since then, new investments have been announced. YPF has subscribed three agreements over the last months: in February a US\$ 300m project with Shell; in March another US\$ 500m MoU with PAE, Wintershall and Total; and in April a third one with Schlumberger for US\$ 400m. But the most significant project announced to date is the one by the Italian-Argentinian Techint Group to invest US\$ 2.3bn between 2017-2019. However, and notwithstanding the last reforms, the development of the country's unconventional oil and gas reserves faces several challenges: low oil prices in a con-

text of tough competition over market shares; a slowly evolving oil and gas domestic regulatory framework with structural productivity problems (lack of infrastructure, competition and labor flexibility); and the sustainability and consistency of the current policies over sufficient time to allow incremental investment to unleash the country's shale oil and gas production. It is no coincidence that in spite of the recurrent announcements of big investment projects in Vaca Muerta since the expropriation of Repsol-YPF and the enormous potential of the field, until now just two out of 17 concessions have started production. In fact, most of the infrastructure and activity is concentrated in Loma Campana, the first play to be massively exploited in Vaca Muerta by YPF and Chevron since 2013. In order to reduce costs, most of the new investments are concentrated there, or in contiguous areas like Bandurria Sur. In any case, the development of Vaca Muerta is an incremental process that will require time. A recent and optimistic report by IHS (Vaca Muerta Insight Series: Supply Scenarios for Argentina's Energy Future) pointed



drugs. In addition, communities are increasingly reluctant to permit an energy project in their territory, a reluctance due to fear of irreversible environmental damage. Although the legal consequences are unclear, a growing number of municipalities have decided to prohibit mining in their area with an accompanying tightening of laws and reduction of permits. Climate change adds to this. While in some expressions of public opinion doubts continue regarding global warming, severe droughts and persistent rainy seasons seem to have intensified, increasing risks for people and infrastructure. It should be recalled that the Andean Cordillera is divided into three ranges in Colombia. The main water resources that make this country one of the top five water-rich states in the world come from the mountain peaks, but deforestation is increasing the likelihood of major changes in the way water presents itself, possibly in a more harmful manner. For this reason the equation of the development of the energy sector in Colombia must include the reported variables if it intends to continue in a sustainable manner. The possibilities are there, but now the situation has changed, as several experts interviewed for this article maintain.

#### Hydrocarbons on the horizon

While it shares a border of over 2,000 kilometers with Venezuela, Colombia's oil wealth is comparatively very low. Proven crude oil and gas reserves are less than 2,000 million barrels, far less than the almost 300,000 million barrels estimated for Venezuela. Nevertheless, there is a positive dynamic that is expressed through a rate of production of almost

800,000 barrels per day, investments aimed at new deposits and the improvement of the percentage of recovery of existing fields. Thanks to these positive factors, the country has managed to be a major exporter, a key aspect for an economy in which oil accounts for half of its exports. The investment forecast in 2017 is \$4,700 million according to the Colombian Oil Association, an association that represents companies in the oil industry. This figure is double that recorded in the previous year and this improvement has resulted from the increase in international prices, the improvement of the security climate and better prospects in certain areas. At the beginning of May, for example, state-owned company Ecopetrol announced that the drilling of a well in the deep waters of the Caribbean Sea, in partnership with Anadarko, proved positive. Although months of testing are required, the discovery confirms the existence of a major gas field with reserves equal to over 800 million barrels of crude oil. Research has focused on an area measuring 14,900 square kilometers, but experts say that the area with potential for further discoveries amounts to 49,000 square kilometers. "We are very optimistic because the tests carried out show that our forecasts on the presence of hydrocarbons were well founded," says Juan Carlos Echeverry, President of Ecopetrol. The potential of Colombia's reserves is important, both on land and offshore. According to the Agencia Nacional de Hidrocarburos [National Hydrocarbons Agency], over 120,000 million barrels of natural oil are expected to be in place. Transforming these possibilities into reality, however, is not

easy. For months, industry spokesmen have confirmed that current legislation has weakened the country's competitiveness compared with other Latin American countries. In response the government argues that there are incentives for exploration that increase the internal rate of return of a successful project and reward the discovery, addition or inclusion of reserves. The emphasis is also on improved oil recovery, which includes techniques such as the continuous injection of steam, on-site combustion, and the injection of water and gas. The overall aim is to reduce the viscosity of the remaining crude oil present to optimize the amount of oil that can be extracted from a mature field. All this demonstrates that there is ample room for the private sector. Both in partnership with Ecopetrol and on an individual level, there is a long tradition of foreign countries involved in Colombia's petroleum business. It is appropriate, however, to mention certain difficulties. In addition to the logistical challenges typical of a complex topography and poor communication pathways, the management of local communities has become a very complex activity. "The presence of the State in Colombia is weak, especially in isolated areas. When a company arrives to carry out a project, pressure is exerted, not only for the recruitment of local staff, but also for the maintenance of roads, the construction of libraries or the improvement of health care conditions," explained expert Francisco Miranda. "Technically, there is no obligation to intervene in the local scene, but experience shows that ignoring these local desires can result in blockages or alterations and that it

is usually better to be receptive to these local issues." On the other hand, security conditions have significantly improved compared with the past, although risks are still present. To cite a case, plants such as coca are cultivated in areas close to some oil fields, attracting the presence of criminal gangs linked to drug cartels. "The advice is to know the territory. Working in Colombia can be very profitable, but it's not like working in a developed country," concluded Miranda.

#### The resistance of coal

The challenges faced by coal production, Colombia's second largest export material, are different. With deposits of 6,746 million tons that could last over seventy years at the current rate of exploitation, the South American country is one of the top five exporters in the world. In 2016, 90.5 million tons of coal were produced, a historic record. Most of the mines are located near the ports of the Atlantic coast and supply thermal plants in various countries around the world. In the Colombian hinterland there is a type of coal with a higher calorific value used in the iron and steel industry, but it is promoted for national consumption, to less sophisticated fields. There are more appropriate export programs, but that use would require the construction of a railway line and that seems economically impractical at the present time. For this reason, future plans focus on the performance of two major projects located in the north of the country, projects involving over 30 million tons each. These are open-air mines that incorporate exclusive rail and port transportation and have

competitive costs on an international level. This cost factor is crucial for the long term, as, due to limitations imposed on greenhouse gas emission, coal is used less and less, especially in Europe. If global consumption remains unchanged over the next 15 years, as projected by the International Energy Agency, it is difficult to consider growth scenarios for coal. The closure of less productive mines is a reality, in Great Britain, China, and Colombia. Commitment is necessary if coal is to continue to play an important role. "We have a natural competitive advantage," said Santiago Angel of the Colombian Mining Association. "However, we cannot ignore the economic pressures on the consumption and production of coal that oblige us to limit costs while keeping efficiency standards high," he concluded.

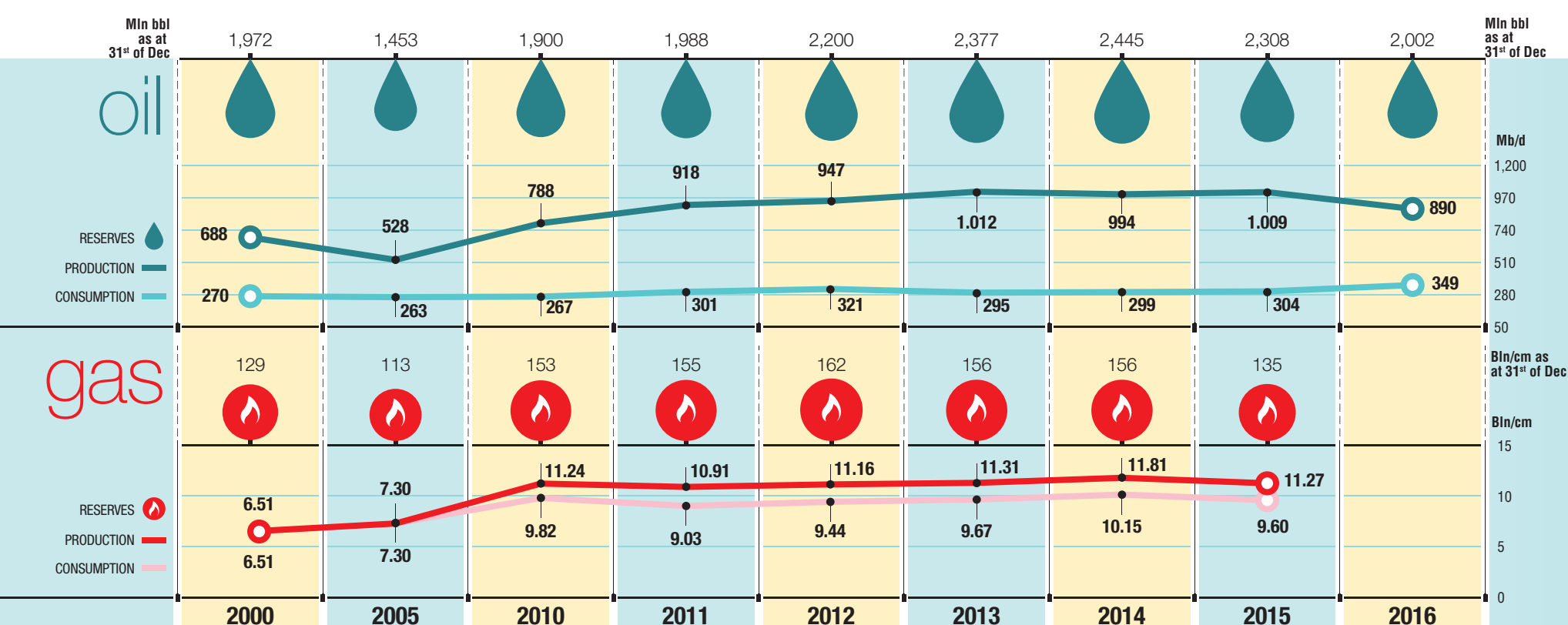
#### The future lies in hydropower

The three branches of the Andean Cordillera form an obstacle to communication and transportation for the Colombian economy. Assessments prepared by the World Economic Forum indicate that the costs of moving a container from Colombian ports to the main consumer centers greatly exceed the costs found in Chile and Peru. However, Colombia's combination of mountains and abundant precipitation provides advantages in other sectors. One of these is the production of energy based on hydropower, which, in installed power, amounts to 70 percent of Colombia's total power output. This is why Colombia insists that it is a regional energy power, since much of the energy used by Central American and Caribbean countries comes from

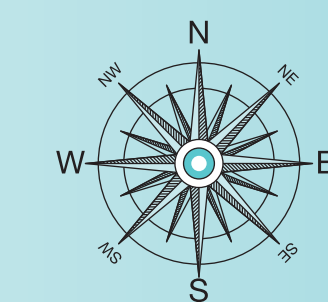
here. There is, in fact, a network interconnection plan with Panama that should be developed in the future. In the planned expansion to 2030, hydroelectric resources will have the largest impact on the additional installed power. A study conducted in 2015 by the Mining and Energy Planning Unit (UPME) of the Colombian Ministry of Mines revealed the potential for 56 gigawatts of power through water generation, more than five times the current capacity. Nonetheless, the effects of climate change have affected future development programs. The presence of the "El Niño" phenomenon as a result of the increase in occasional temperatures in the intertropical convergence zone in the Pacific Ocean has dramatically increased episodes of drought. Without going too far back, in the first half of 2016, a hypothesis was reached on the rationing of electricity that was eventually avoided. This problem is in addition to the pressures of communities opposed to the construction of dams. The costs for compensation and environmental management constitute an increasing burden on projects, greatly affecting the internal rate of return and creating political turmoil in the region. According to the calculations of the UPME, additional installed power of between 4,090 and 5,760 megawatts will be required by 2030, the level depending on the cases used for these scenarios. Most of the increase will be beneficial to hydrogeneration, but proportionally slightly less when com-

pared with the current level. In turn, there will be new gas and coal thermal plants that will exploit local supply. The most significant aspect, however, is the emergence of other renewable alternatives, such as wind and solar power. In the most aggressive scenario, wind could provide up to 3,131 additional megawatts, while photovoltaic panels could contribute 130 megawatts. A much smaller amount would be expected from biomass (such as bagasse from sugar cane) or geothermal power. The projection on wind power is linked to ideal natural conditions in the Guajira Peninsula, located in the north of South America. Several studies confirm that the area's potential is unique, although the management of indigenous communities that reside in the area, whose rights are protected by the Colombian Constitution, is a source of uncertainty. There are, therefore, no clear signs for identifying projects for expanding the electricity generation park. However, the operating system is recognized by entities including the World Bank, as it operates through energy supply contracts in exchange for the payment of an availability commission. The bottom line is that Colombia is a privileged country in terms of energy. This is proven by its hydrocarbon re-

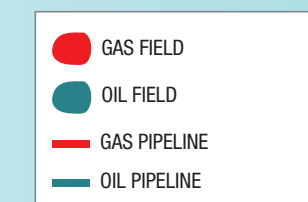
sources and its major coal reserves, combined with the presence of sources that contribute to the expansion of its electricity generation park. Added to this is the presence of a biofuels industry which, thanks to diesel obtained from palm oil and ethanol obtained from sugar cane, has a weighting of just under 10 percent in the mix of gasoline consumed. The international price scenario is not advantageous at present, but what matters are the opportunities for growth in this area if circumstances change. Undoubtedly, there will be difficulties, but the bottom line is optimistic. "Colombia's natural riches lead to suggest that the country will consolidate itself as a regional energy power, if the right decisions are made," said former Minister Guillermo Perry. "There is still a lot of work to be done. It is also important to be able to do it because we have the resources to grow," he concluded.



Source: Eni Oil & Gas Review 2016



Source: Eni







## Guadalupe Palomeque de la Cruz

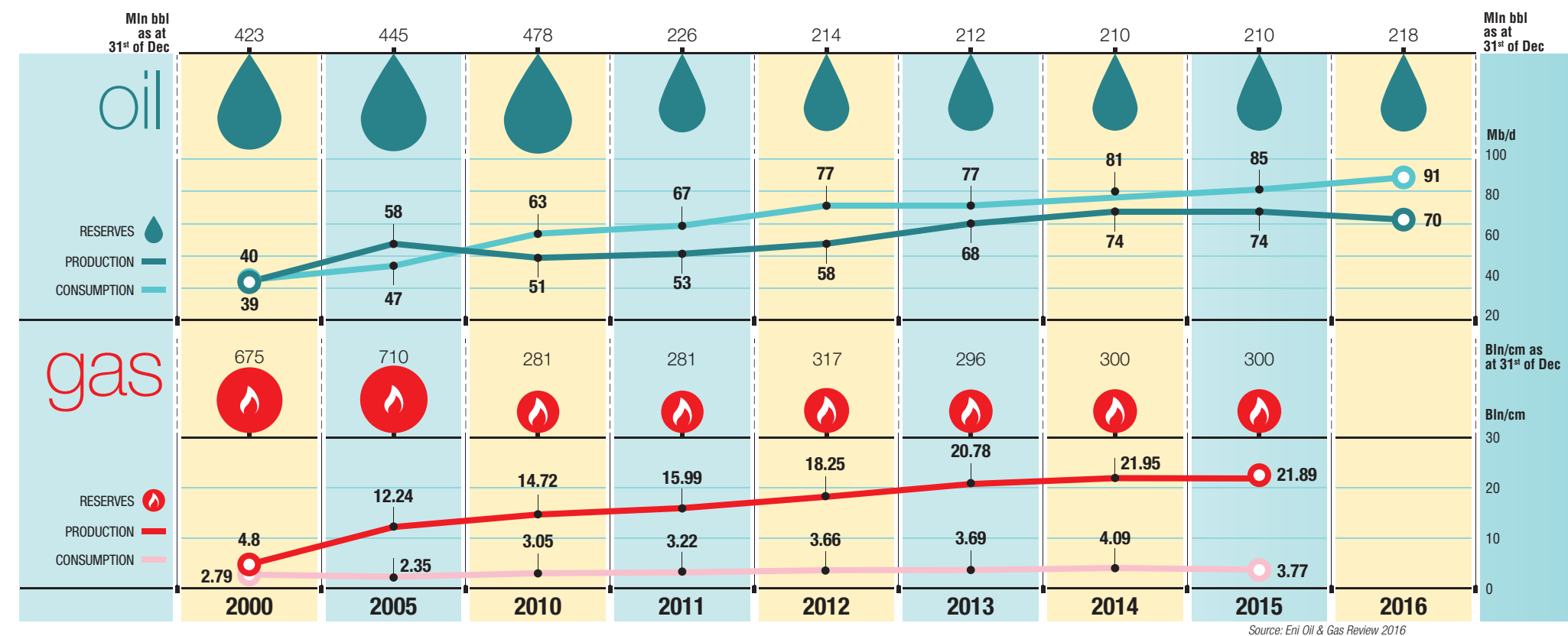
She was ambassador to South Korea and Director General of Bilateral Relations of Bolivia's Ministry of Foreign Affairs. She has fought for maritime claims, the decriminalization of cocaine and multilateral integration. As a lawyer, the Deputy Minister specializes in International Trade and Development Sciences. A diplomat with 26 years' experience at the Bolivian Diplomatic Academy, she has worked with representatives of her country in Mexico, Brazil and Switzerland.



## Bolivia/Interview with Guadalupe Palomeque de la Cruz, Deputy Minister of Foreign Affairs

# South America's energy center

President Evo Morales' goal is to focus his country's energy strategy not only on gas exports, but also on the development of alternative energies. One of Bolivia's most important projects is the production of fertilizers through the use of natural gas



FABIO SQUILLANTE

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olivia, partly due to its remarkable exports of natural gas, is a country with great economic potential, which benefits from enviable growth rates. Its President, Evo Morales, who has been in office for over 10 years, intends to make the country Latin America's "energy center" by focusing on new sectors such as alternative energy sources and infrastructural networks.

This is what Guadalupe Palomeque de la Cruz, Deputy Foreign Minister of Bolivia states, recalling that in 2016, the country's economy grew by 5 percent, while this year is already close to 4.5 percent.

The La Paz government is also working on new infrastructural plans to strengthen the country's internal connections, such as the "two oceans" train: a mastodontic project for the construction of a four-mile long rail line that should lead from the port of Ilo, Peru, the Pacific Ocean, to Santos, Brazil, on the Atlantic Ocean, crossing the Bolivian territory. A project that sees Germany in the foreground as a financing country.

### What are the government's plans for developing the national economy?

Since 2006, the Plurinational State of Bolivia, as the country has been officially known since 2009, has been led by President Evo Morales. Over these years, major goals have been achieved. The Bolivian economy proudly takes first place in South America and is still growing. In 2016, the economy grew by over 5 percent, and this year we are already close to 4.5 percent. It is not only about figures, however. The public policies developed over the last few years have enabled solid results to be achieved, including a substantial reduction in extreme poverty, better distribution of wealth and greater development, not only of the country's central axis, but in all nine departments.

Over the last few years, efforts have been made to improve internal territorial connections through road infrastructure. We have recently promoted what is probably the largest infrastructural project in South America, the so-called "Bi-Oceanic Railway," a four thousand-kilometer railway line that will connect the Port of Ilo, in Peru, on the Pacific Ocean, to the Port of Santos, in Brazil, on the Atlantic Ocean, crossing our country's territory to achieve that connection. Germany is at the forefront for financing this project.

### What is the energy industry's role in Bolivia's economic development?

Our goal is to become South America's energy center. We are working towards this, not only in the industry for which the country is known, gas exports, but also in the development of alternative energies, with the support of other countries. One of the most important projects is that of Bulo Bulu, a development in the Cochabamba region for the production of urea and ammonia fertilizers through the use of natural gas.

That project is being developed in partnership with South Korea's Samsung, which aims to export production to countries in the region.

### Which countries are you collaborating with most, in addition to South Korea?

In the energy industry there is extensive cooperation not only with countries in the South American region, but also with Asian and European countries. One of these is Italy, and there are a diverse array of Italian companies in many sectors of our economy.

### Are there plans for the exploration and development of new deposits in the country?

Bolivia's territory is expansive, over one million square kilometers, and there is still much to explore. The Bolivian state-owned company, Yacimientos Petrolíferos Fiscales Bolivianos (YPFB), is open to greater investment. As President Evo Morales says, we are looking for new partners, and we are open to collaboration.





United States/Trump and fossil fuels

# Renewed interest in the Gulf of Mexico

Crude production reached record levels in 2016. And the Trump administration aims to open more federal lands and waters for drilling. Could the U.S. reach its goal of energy independence?



MOLLY MOORE



She is a Senior Vice President of Sanderson Strategies Group, a Washington, D.C. media strategies firm, and a former *Washington Post* foreign correspondent.

Oil production and exploration in the Gulf of Mexico has suffered a double blow in recent years: The precipitous decline in oil prices made the expensive deep-sea operations even less attractive to petroleum companies, and the fallout of the 2010 BP explosion and spill further dampened interest, if not the potential for profits. But those trends are starting to show signs of changing. U.S. crude oil production in the Gulf of Mexico is increasing and set an all-time annual high of 1.6 million barrels per day in 2016, exceeding the previous record set in 2009 by 44,000 barrels per day (bpd), according to the U.S. Energy Information Administration (EIA), the government agency that tracks energy trends.

Gulf operations provide about 15 percent of the U.S. daily oil production. This year, production is continuing to climb, hitting 1.7 million barrels per day. The EIA forecasts that annual production will continue to rise through next year, boosted by eight offshore projects completed last year and seven more scheduled to come online. In other Gulf waters, the combination of reforms and struggling state-run oil operations are opening up Mexican and Venezuelan waters to international exploration and drilling. Venezuela has opened more offshore blocks to global corporations, and Mexico conducted its first offshore auction this past December.

Energy analysts say increased activity in the Gulf of Mexico is on the leading edge of renewed interest in a return to deepwater exploration and drilling around the world.

## Changes in the oil markets

The shift is due to a confluence of changes in oil markets, oil production and the political landscape in the United States and the other oil-producing nations of the Gulf of Mexico. Oil prices are slowly increasing at the same time that improvements in technology and operational management are making offshore drilling more cost effective.

The political fallout from BP's Deepwater Horizon explosion and spill—the worst maritime oil disaster in history—is receding seven years after the incident. Back-to-back events in March fueled cautious optimism in the industry. First, a lease sale in New Orleans drew almost USD275 million in high bids on 163 U.S. tracts spread over 913,542 acres on the Outer Continental Shelf off Louisiana, Mississippi and Alabama. Exxon, Chevron and Shell were among the 28 companies submitting bids. Those bids represented a 76 percent increase over last year's USD156 million.

However, that was only about half of the USD539.8 million received in 2015. U.S. Interior Secretary Ryan Zinke said the “strong sale reflects continued industry optimism and interest in the Gulf's Outer Continental Shelf, a keystone of the nation's offshore oil and gas resources.” Some analysts were more guardedly optimistic in their assessments. G. Allen Brooks, author of the energy newsletter “Musings from the Oil Patch,” wrote: “While the results didn't set records, the USD275 million in high bids and USD315 million in total bids submitted by 28 oil

companies reflected the growing optimism that an offshore sector recovery is coming. This comes after last year's sale for this area was marked by historically low returns.” Those sales came just days after Interior Secretary Zinke announced that the U.S. government plans to begin offering 73 million acres for offshore oil and gas exploration and development. That will

cover all available unleased areas in U.S. territorial waters.

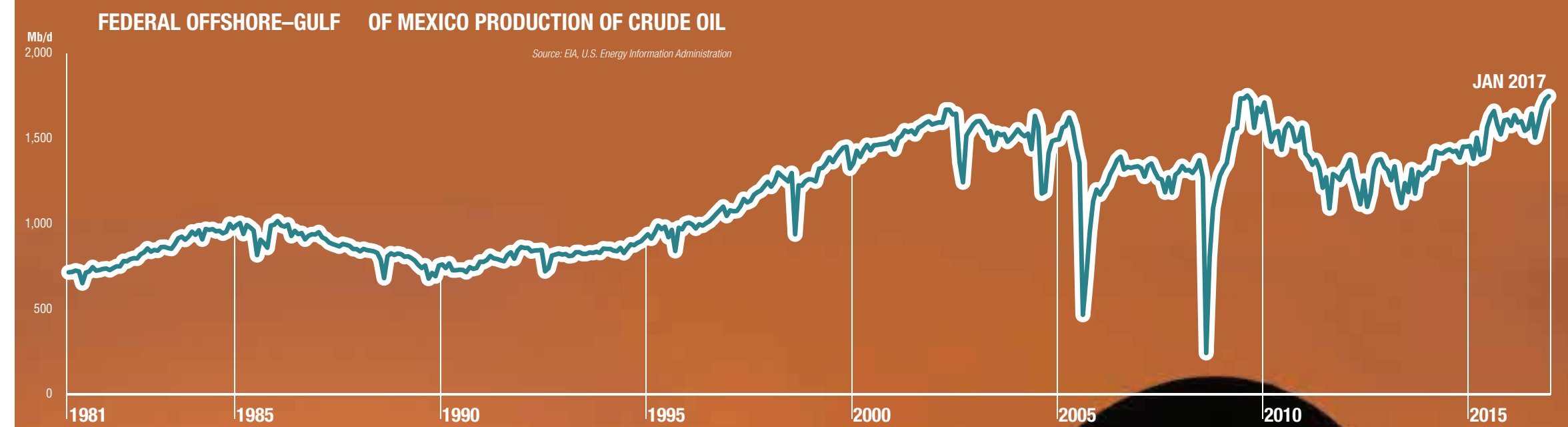
In addition, the Trump administration is considering a request from BP to extend the length of time for oil leases. “Opening more federal lands and waters to oil and gas drilling is a pillar of President Trump's plan to make the United States energy independent,” Secretary Zinke said. “The Gulf is a vital part of that strat-

egy to spur economic opportunities for industry, states, and local communities, to create jobs and home-grown energy and to reduce our dependence on foreign oil.”

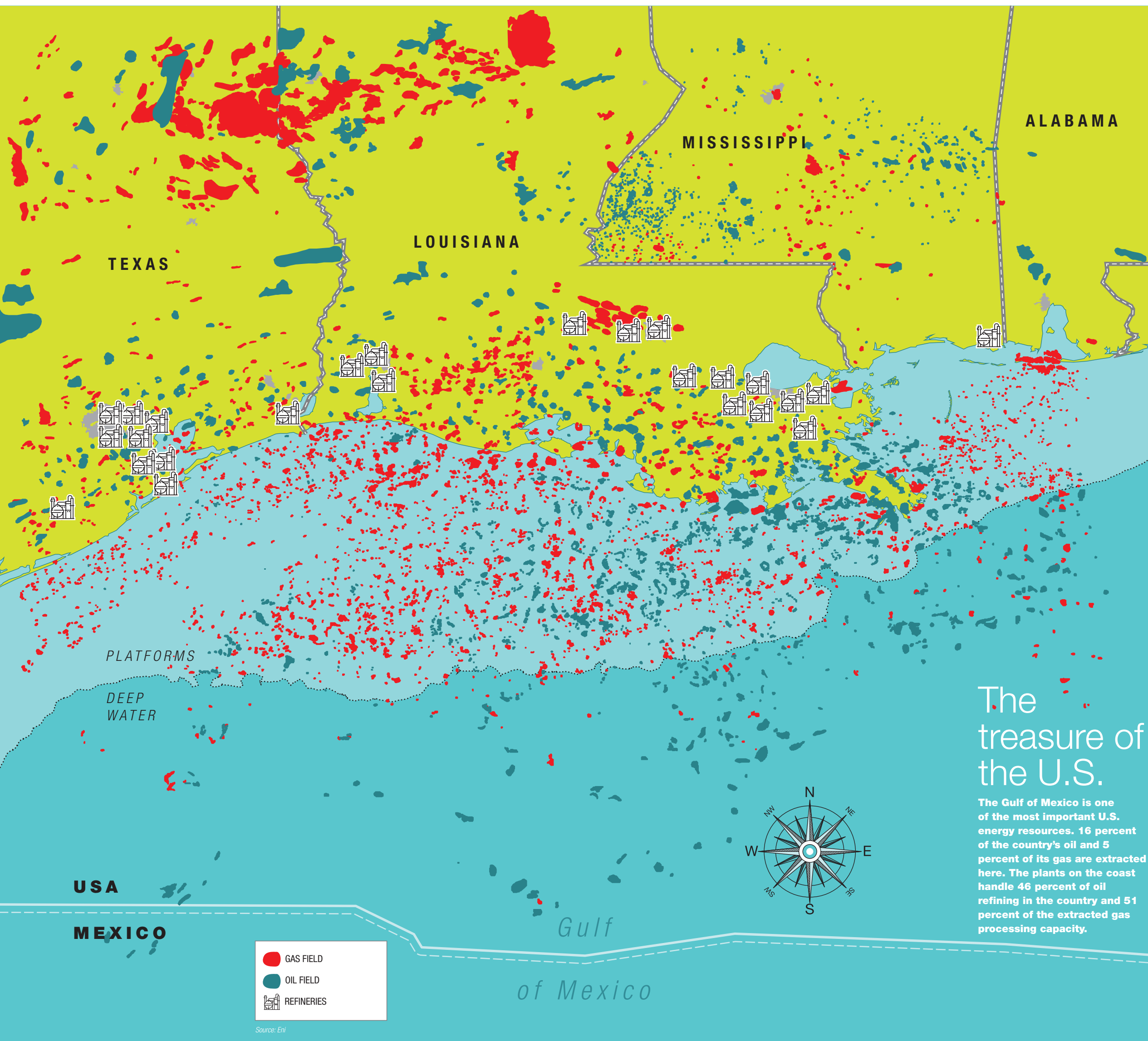
The administrations plan would allow 10 different sales—two each year for five years. It would cover about 14,000 unleased blocks from three to 230 miles offshore. The U.S. Bureau of Ocean Energy Manage-

## A RISING TIDE

**U.S. crude oil production in the Gulf of Mexico is rising and reached its highest ever annual value of 1.6 million barrels per day in 2016, exceeding 44,000 barrels per day in the previous record set in 2009. The activities in the Gulf of Mexico provide about 15 percent of U.S. daily oil production.**







ment estimates the Outer Continental shelf has 90 billion barrels of recoverable oil and 327 trillion cubic feet of gas.

The Trump administration is also looking to open new areas in the Arctic and off the Atlantic Coast to exploration and drilling, actions likely to be contested vociferously by conservation groups.

#### The biggest question is whether the price is right

Deepwater exploration and drilling has been particularly hard-hit by plunging oil prices in recent years. It is expensive, requires long lead-times from exploration to production and was dealt a devastating setback to its public image by the blowout on BP's Deepwater Horizon seven years ago. It didn't help that a Hollywood movie by the same name—"Deepwater Horizon"—released last year focused on the dangers and financially driven decisions of offshore drilling. Deepwater wells can cost more than USD100 million, require depths of about 30,000 feet and are usually at least 150-200 miles offshore. As a result, companies are reluctant to consider operations unless oil is selling for at least USD60 a barrel. With the surge in cheaper, faster-turn-around tight oil technology, companies and investors have had even less incentive for offshore operations. But the industry has been changing with the times and market conditions. Companies have been developing more compact offshore facilities and leaning on improved technology and better management, factors which have combined to reign in some of massive costs of deep-water exploration and drilling. Energy consultants Wood Mackenzie issued a recent report projecting a moderate recovery in global deep-water oil and gas projects, saying lower drilling costs are making them more attractive to investors and companies. A new study by the Norwegian analyst firm Rystad Energy found that for every dollar invested in the North American shale market this year, a dollar is also earmarked for the development of new offshore resources," Eric Smith, associate director of the Tulane Energy Institute in New Orleans wrote in The Advocate newspaper. "Both will receive approximately USD70 billion in capital expenditures in 2017, an equivalence not seen since 2013."

#### Eyes focused on the Gulf producing countries

Political changes in the oil-producing countries that ring the Gulf of Mexico are also creating new opportunities for international operations. The election of a more fossil fuel-friendly administration in the United



**The opening up of more waters and federal land to oil and gas drilling is a pillar of President Trump's agenda to make the U.S. energy stand-by.** U.S.

Secretary of State Ryan Zinke said it after announcing that the U.S. government plans to offer 73 million hectares for exploration and development of oil and gas offshore, all areas in territorial waters of the United States which has not yet been granted a concession.

has not stopped a slide in production that has hit its lowest levels in thirty seven years. However, Mexico is hoping deepwater crude development in the Gulf by private producers could help boost its production in coming years. Eni SpA, which won rights to develop a Gulf field in 2015, earlier this year announced Mexico's largest offshore find by a foreign company in more than seven decades. Mexico conducted its first Gulf deepwater auction this past December. Companies submitted bids on eight of 10 blocks offered. Winning bidders included China's Offshore Oil Corporation, Australia's BHP Billiton, France's Total teaming with ExxonMobil, Norway's Statoil in partnership with BP, Malaysia's PETRONAS, Chevron and Japan's INPEX. Most of these projects will likely take more than a decade to begin production. Mexico is expected to conduct three more auctions over the next two years for shallow and deep waters. Venezuela, the globe's 12th largest oil producer, also has been struggling under the sharp decline in oil prices. Financial analysts fear its troubled PDVSA oil company could default in the next year. It currently doesn't have sufficient funds to adequately maintain its refineries, production operations or ships. PDVSA has been awarding exploration blocks to international oil companies in its offshore waters including Total, Statoil, Chevron, and Gazprom. Venezuela's offshore gas went untapped until Eni and Spain's Repsol began production in the offshore Perla field in 2015 in the Gulf of Venezuela. Eni made one of the largest natural gas discoveries in the history of the country. Elsewhere in the Gulf, numerous international oil and gas companies have been attracted to the prospect of oil in the deep waters off Cuba's northern coast. The EIA reports, however, "as a result of the geological and technological challenges, offshore deep-water exploration activity has so far yielded no results." Analysts, investors and petroleum companies are cautiously optimistic that oil and gas exploration and production will pick up across the Gulf of Mexico in the coming months and years. The oil and gas is there. The biggest question is whether the price is right.



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#### INCREASINGLY CLOSE

In recent years, China has acquired an increasingly important role in Latin America, both in terms of international trade, especially as regards raw materials, and in terms of direct investments. The photograph above shows Chinese President Xi Jinping and his Chilean counterpart Michelle Bachelet, during the signing of the bilateral agreements at La Moneda Palace in Santiago, on November 22, 2016. Chile was the final stage of Xi's tour of the continent.

panies have more than 40 projects in Latin America, covering areas of exploration, development, refining and oil and gas pipeline construction. In terms of energy trade Venezuela was China's seventh largest source of oil import in 2012. China imported 15.2903 million tons of crude oil from Venezuela, 5.6 percent of total crude oil imports. But due to reduced production in Venezuela, China's import of crude oil dropped 12 percent in 2014.

"Loan for oil" is the most distinctive form of energy cooperation between the two sides. This cooperation model dates back to 2007, when China and Venezuela jointly founded the "Co-financing Fund." China invested 4 billion dollars in the fund, while Venezuela took increasing crude oil exports to China as repayment guarantee. In May 2009, China and Brazil officially signed the first "loan for oil" agreement between China and a Latin American country: China provided Petrobras, Brazil's national oil company, with a 10 billion dollar loan for ten years, while Brazil agreed to a daily supply of 150,000 barrels of crude oil to China in 2009 and 200,000 barrels from 2010 to 2019. Later, China also inked a 1 billion dollar "loan for oil" agreement with Ecuador in 2009 and two agreements with Venezuela in 2010 and 2014 valued at 20.6 billion and 4 billion dollars respectively, making the "loan for oil" project worth more than 30 billion dollars.

Apart from oil and gas cooperation, the two sides' cooperation in hydropower is on the rise. By 2013, China had eight completed or ongoing hydropower projects in Latin America, including those in Belize and Honduras, countries that haven't established diplomatic ties with China. ➔

## China-LAC/Difficulties and advantages of energy cooperation

# The Rise of the Dragon

Latin America offers both a means to diversifying China's sources of imported crude and a way for its oil companies to connect with the global market. At present the total Chinese investment, mainly in oil projects, has reached 35 billion dollars

In 2016, trade volume between China and Latin America amounted to 216.6 billion dollars, 16 times higher than the level in 2000, accounting for about 6 percent of China's foreign trade volume, up from 2.7 percent. Now China has become the largest trading partner of many Latin American countries. In 2016, China's non-financial direct investment in Latin America stood at 29.8 billion dollars, an increase of 39 percent over 2015, with large merger and acquisition projects continuing to emerge.

In the traditional energy field, cooperation in oil and gas is still the principal factor for the relationship between China and Latin America. Latin America serves not only as an important source ensuring the diversity of crude oil imported by China, but also as a key and strategic re-

gion for China's oil companies to "go global."

#### Status quo of China-Latin America energy cooperation

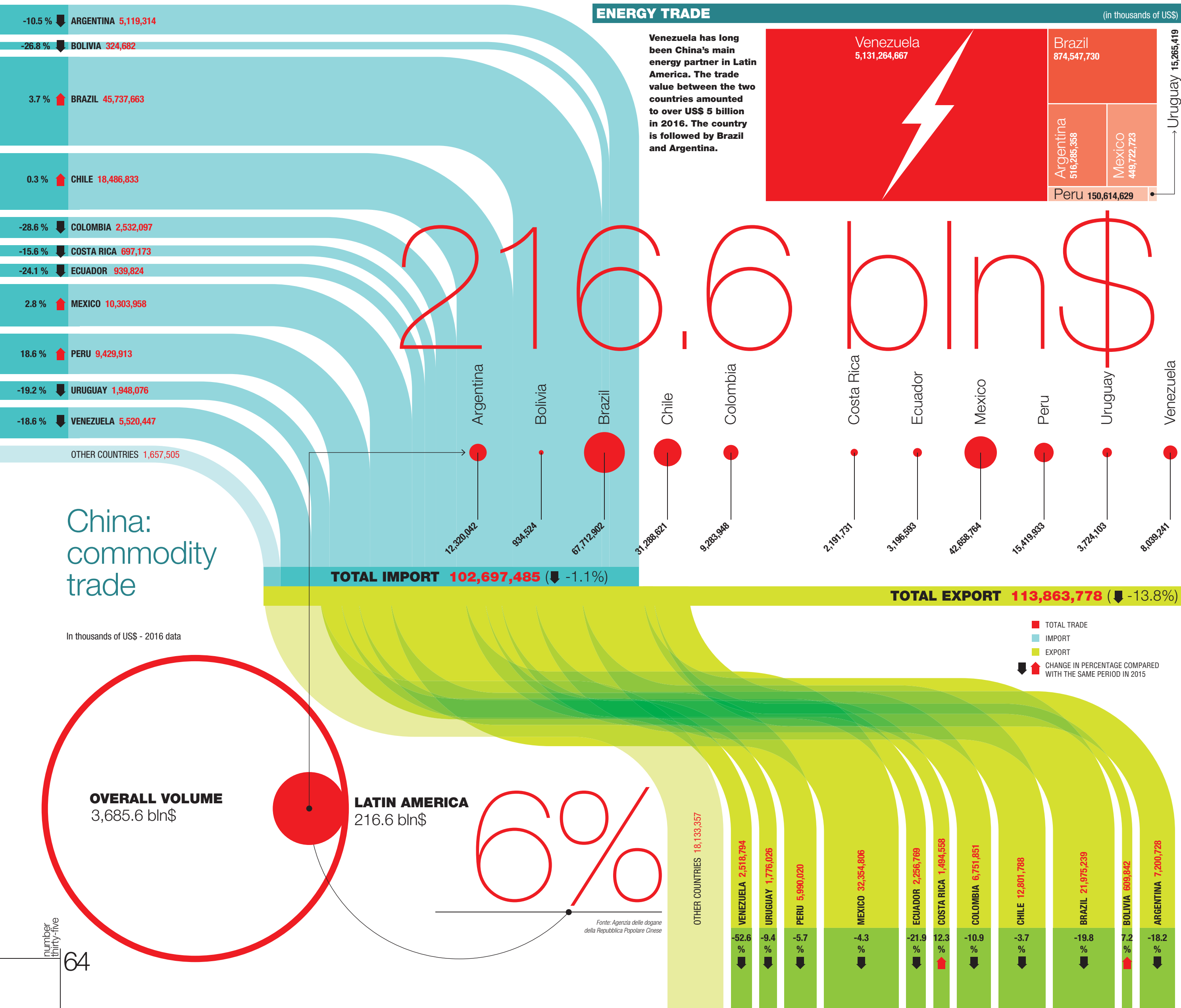
China and Latin America enjoy various forms of energy cooperation with bilateral oil and gas projects as the focus. At present China has participated in 28 oil and gas projects in Latin America, and the total investment, mainly in oil projects, has reached 35 billion dollars, of which China National Petroleum Corporation (CNPC) claims 71 percent of the equity.

Sino-Latin America oil and gas cooperation started with Peru in 1993, and now has covered the whole industrial chain. Regarding oil and gas exploration and engineering technical services Chinese oil com-

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In addition, 12 hydropower projects worth over 4.5 billion dollars in total are under planning, with six in Ecuador, two in Honduras and one each in Guyana, Peru, Costa Rica and Argentina. Sino-Latin America cooperation in oil and gas has made an enormous contribution to the development of the oil and gas industry, economic growth, employment, environmental protection and community building in the region, laying a solid foundation for deepening Sino-Latin America cooperation. Recently, the two sides' cooperation in renewable resources has been growing by leaps and bounds. With its strong financial strength, China is seizing the opportunity to export technologies and products in this field to Latin America, exports which will become a "growth point" for future economic and trade exchanges and investment between the two sides.

Regarding solar energy, Chinese companies have carried out a number of projects in the region. SkySolar, a private-owned Chinese enterprise, entered the Latin American market in 2011 by building solar photovoltaic power plants in Sobral, Ceará, Brazil. In 2012, it invested another 900 million dollars to build an 18-megawatt photovoltaic power plant in Chile, the first large ground grid-connected solar-power station in Chile. In October 2012, Yingli Solar received its largest photovoltaic order from Latin America to exclusively supply 40-megawatt components for a Peru power station project. In July 2013, Suntech Power announced that it would supply components for a solar power station in Baja California Sur, currently the largest such station in Mexico.

In terms of wind power, Sinovel entered the Brazilian market in September 2012 by supplying 23 sets of wind turbines for the wind farm in Sergipe; Goldwind developed four projects in the region in 2012, of which two are in Chile, one in Ecuador and the other in Panama. In terms of new energy vehicles, BYD's E6 electric cars were launched in 2013 in Bogota, the capital of Colombia, becoming South America's largest taxi fleet composed entirely of electric cars.

It is estimated that from 2013 to 2030, at least another 350 billion dollars are needed for investment in renewable energy. Relying on its strong financial strength China is seizing the opportunity to transport its technologies and products concerning this field to Latin America. Among the over 50 billion dollar planned investment in Brazil announced by Premier Li Keqiang in 2016, over 40 billion dollars will be devoted to new energy and infrastructure projects, while only about

10 billion will be used for traditional energy projects.

#### Major problems faced by Chinese enterprises

Sino-Latin America energy cooperation still faces great challenges.

#### 1 | LONG DISTANCE AND HIGH TRANSPORT COST

Energy has to be transported through the Pacific, resulting in high transport costs. China and Latin America are not endowed with geographical advantage in energy cooperation. In particular, energy powers such as Venezuela and Brazil are located in South America, even farther from China. Due to distance and high transport cost, oil and gas imports from Latin America are more costly when compared with those from Central Asia and Russia.

#### 2 | IMBALANCE AND INSTABILITY IN ECONOMIC AND SOCIAL DEVELOPMENT IN LATIN AMERICA

Latin America and China are considerably different in customs, religion, political systems and laws and regulations. Economic and social development in Latin America are hindered by uncertainty, and the region's economic structures are often unreasonable. Meanwhile, the region is plagued with political instability, leadership change, strikes and unexpected political events, all of which seriously affect regional economic development and hinder Sino-Latin America energy cooperation.

#### 3 | RISING ENVIRONMENTAL COST

As the planet is getting warmer, the issue of low-carbon economy has attracted attention. Latin American countries are increasingly aware of the significance of environmental protection and have successively promulgated environmental protection laws and regulations. Higher environmental cost will lead to increasing cost of energy investment in Latin America. For example, Ecuador has launched a plan to protect tropical rain forests, requiring foreign oil companies to strictly comply with the rules and compensate for damages. This measure and similar measures in other countries have driven the environmental cost of Sino-Latin America energy cooperation to rise.

#### 4 | MASS PROTESTS IN ENERGY FIELD IMPEDING NORMAL INVESTMENT

Severe protectionism in Latin America and increasing strikes in recent years have led to significant uncertainties in trade cooperation. Over the past two decades since the entrance of Chinese companies in the Latin America market, a number of projects have encountered complaints, strikes and protests. According to incomplete statistics, four projects have suffered from demonstrations with large number of participants and significant impact. →





#### THE OBSTACLES TO CHINESE INVESTMENTS

The important role played by syndicates and NGOs in national policies in Latin American countries has often been an obstacle to investments from Chinese companies, which, due to protests, have been excluded from more than one project. Other difficulties for the energy cooperation between the two regions are the large distances and resultant high transport costs, the imbalance and instability of South America's economic and social development and increasing environmental costs.

They are: a. Peru Block 1AB / 8 Oil Project (located in Andoas, Datemdel Mara Province, Peru) which was confronted with seven large-scale anti-China movements and caused huge losses to CNPC; b. Anaco Natural Gas Project in Venezuela, which is jointly developed by Petróleos de Venezuela, S.A. (PDVSA) and CNPC and managed by CNPC, suffered from three

strikes; c. Agua Zarca Hydroelectric Project in Honduras where in the end, SinoHydro terminated the contract with the Honduras Company and withdrew from the project on August 24, 2013; d. Libra Deep Sea Oil Field Project in Brazil. As Brazilians opposed the sale of concession to foreign oil companies, the joint venture that included CNPC, gave an 8.56 percent pay raise to staff to quell opposition.

#### 5 | LOCAL UNIONS AND INTERNATIONAL NGOS BECOMING THE "HEEL ROPE" FOR CHINESE ENERGY COMPANIES' INVESTMENT IN LATIN AMERICA

As a political force, unions in Latin America play an increasingly influential role in national politics. During the period of military regime or one-party rule, government usually takes two kinds of measures towards work unions: suppressing them or ruling over them in the form of corporatism. Due to the support and protests by several international NGOs including Amnesty International and Rights Action, the Chinese company dropped out of the project. Work unions and NGOs have developed into an important source of votes in electoral politics. Therefore, Chinese companies are left with no choice but to shift the focus of

management to negotiation with work unions and NGOs.

#### Suggestions on development

##### 1 | PROPERLY HANDLING RELATIONS WITH THE UNITED STATES

As Donald Trump has come into power and the shale gas revolution in the U.S. has massively increased domestic production, U.S. oil imports from Latin America have dropped sharply, creating new opportunities for Sino-Latin America energy cooperation. However, America's energy investment climate is clearly superior to that in the Latin American market, although in terms of cost benefit, the Latin American market enjoys greater advantage. While deepening energy cooperation with Latin American countries, China should cautiously deal with its relations with the U.S.

##### 2 | ACTIVELY EXPLORING NEW MODES OF COOPERATION

In their localization development, energy companies should seek greater acceptance by local public, avoid cooperation barriers and explore new modes of cooperation. For example, China has signed the loan-for-oil agreement with Brazil. China can facilitate Sino-Latin America energy cooperation by purchasing stakes of local oil companies and investing in

new petrochemical factories in the region. The cooperation not only will provide more jobs to local people and increase government tax revenue, but also protect the local environment. In addition China should build smelting and processing projects acceptable to local conditions, work to upgrade the Latin American economic system and actively explore a new cooperation model based on both sides desire to maintain stable and long-term energy cooperation.

##### 3 | ESTABLISHING AN EMERGENCY MECHANISM

China and Latin America are physically far apart and have different cultural, political and economic backgrounds. China must enhance its study of the politics, laws, and social customs of Latin American countries, acquaint themselves with local investment climates in a sophisticated way, strengthen risk awareness, and build an emergency mechanism. Meanwhile, we should fully respect local customs and religion, thus creating mutually beneficial and win-win cooperation.

##### 4 | INCREASING INVESTMENT IN RENEWABLE ENERGY

In 2013, 54 percent of energy in the region as a whole came from renewable energy while 90 percent of Uruguay's energy is renewable. How

**AN EXPANDING MARKET**  
Renewables are set to become the real focus of China's investments in Latin America. In recent years, almost all countries in the continent have launched new energy policies to incentivize the inflow of capital into the alternative sources markets and promote sustainable development.

can we take full advantage of new energy policies issued by Latin American countries to increase our investment in this field? China and Latin America can intensify cooperation in solar energy, which enjoys a great market in Argentina, Chile, Peru, Costa Rica and other countries. Recent years have seen greater national guidance on renewable energy. Two-thirds of the countries of Latin America have formulated clean development mechanisms, and one-third have issued renewable energy development strategies. For these reasons renewable energy will be the focus of investment by China.

#### 5 | REINFORCING ENTERPRISES' SOCIAL RESPONSIBILITY AND IMPLEMENTING THE HUMAN-RESOURCE-LOCALIZATION STRATEGY

Investment in Latin America must go hand in hand with improving local people's livelihoods, thus reducing the impact of negative reports by western media and NGOs. China should adopt policies such as tax relief to encourage energy enterprises to allocate appropriate amount of profits to give back to local communities and give financial aid for infrastructure construction, livelihood projects, and charity and welfare undertaking, all of which urgently need to be done by the Latin American governments and the public. By hiring local talent, Chinese companies can accomplish the localization strategy to the highest degree, reduce cultural barriers with local communities, and effectively ease the impact of social risks generated by security problems, ethnic conflict and class contradiction on Chinese companies.



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India-LAC/Historic affinities and converging interests

# Towards a new era of cooperation

Over the last 15 years, business relations between the two regions have developed rapidly. Now, New Delhi imports more than 20 percent of its crude oil from Venezuela, Colombia, Mexico, Brazil and Ecuador

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The past fifteen years have witnessed a rapid transformation in India–Latin America relations. After more than five decades of relatively limited economic and diplomatic engagement, establishing deeper ties with Latin America has become a top priority for decision makers in New Delhi. India has embarked on a campaign to deepen its economic outreach to the Latin America and Caribbean (LAC) region, particularly in the energy arena. In fact, trade and energy cooperation constitute foundational pillars of India–Latin America ties and could expand even further if current trends affecting both regions continue to persist. In this realm, as in so many others, the two are moving quickly to make up for lost time after more than half a century of lackluster relations. On the surface, India and Latin America historically have shared several important similarities. Both were colonial prizes of powerful European powers that later faced serious development challenges after earning independence. After World War II, both adopted socialist systems before serious economic crises moved them to implement more durable liberal regimes. These reforms fundamentally transformed their respective economies and laid the foundation for future engagement by generating large-scale prosperity, creating an ever-growing middle class and increasing consumer demand. Given their shared historical experiences, one would have expected India and Latin America to have forged closer ties much sooner than they actually did. But a host of factors precluded them from doing so. These included the immense geographical distance separating India, other domestic and international prerogatives that were accorded higher priority and the absence of cultural, linguistic and diaspora links in Latin America that connected India to nearly every other region of the world.

A change occurred more than fifteen years ago as a congruence of economic and commercial interests between the two regions made Latin American a much more compelling destination for Indian attention and investment.

## Building closer economic ties

Forging closer cooperation with Latin America holds immense economic potential for India. According to the most recent estimates, the region's GDP totals more than \$5 trillion and boasts a combined population of more than 610 million, nearly half of whom are younger than thirty. Unsurprisingly, India has focused its efforts on strengthening economic ties with Latin America. With a burgeoning population, the resource-rich

## TWO DYNAMIC REGIONS

With a rapidly growing population and an abundance of resources, Latin America is experiencing strong economic growth and the democratization process is accelerating, albeit with some exceptions—a dynamic that recalls the extraordinary journey of growth travelled by India. The photo shows the Mexico City Stock Exchange.



## A growing relationship

**\$50 billion**

is the current value of **trade between India and Latin America**. Fifteen years ago, this amounted to less than \$2 billion

**60%**

of the sub-continent's trade with Latin America concerns **the Gujarat region**

**20%**

of the crude oil imported by India comes from **Venezuela, Colombia, Mexico, Brazil and Ecuador**

**2012**

India became **Venezuela's top oil buyer**, surpassing China

**2014**

India ranked **second among** the target companies of **Colombian oil exports**



region is experiencing rapid economic growth and increasing democratization, some obvious exceptions notwithstanding. The dynamic echoes India's own remarkable growth story. Against this backdrop, India has realized that Latin American represents a huge export opportunity, capable of further fueling India's economic growth. Those factors previously regarded as barriers to closer engagement—distance, culture and language—are no longer seen as insurmountable obstacles to fostering cross border trade and investment. New Delhi views Indian and Latin American economic interests as increasingly aligned. The numbers illustrate just how

much progress has been achieved in recent years. India's trade with the region has grown from less than \$2 billion fifteen years ago, to more than \$50 billion today. This trade is primarily occurring in the mining, automobiles, agriculture, information technology (IT) and pharmaceuticals sectors. Indian Prime Minister Modi's home state of Gujarat comprises nearly sixty percent of total trade between India and Latin America. India's biggest and most prominent companies have also flocked to the region, reflecting the deep interest Latin America has generated among India's potent private sector. The Aditya Birla Group currently generates more than \$2 billion in revenue from the region through a host of di-

verse endeavors that spans the spectrum from yarn manufacturing to aluminum production. The Indian agribusiness giant UPL Limited derives larger revenues from Brazil than its other operations around the world combined excluding India itself. Tata Consulting Services has established extensive operations in Uruguay, while more than 35,000 Latin Americans are now employed at Indian IT consulting services across the region.

### Energy cooperation

Energy cooperation, however, remains the cornerstone of India-Latin America relations. India's immense energy demand is driven by its 1.2 billion citizens and swiftly growing

economy. But with limited reserves of its own, India is one of the biggest net importers of crude oil in the world, with more than 80 percent of its reserves imported to the country from abroad. The country is confronting a serious energy crisis with chronic shortages having become the norm. The magnitude of the problem was put into sharp focus in 2012 after India experienced the largest blackout in human history and more than 600 million of its citizens were plunged into darkness. Latin America, with its massive petroleum reserves, has emerged as a key contributor to India's energy security. The South Asian country is increasingly relying on LAC to fulfill its energy needs. India now imports

more than 20 percent of its crude oil from Venezuela, Colombia, Mexico, Brazil and Ecuador collectively. During the first 8 months of FY 2016-17, Venezuela accounted for 7.7 percent of India's total crude oil imports. India's imports of Venezuelan petroleum are the defining feature of bilateral ties between the two countries. With its political and economic instability currently worsening, Venezuela is increasingly dependent on oil trade with India to generate revenues for its government coffers. Plummeting oil prices, however, have created a windfall for India, which imported \$13 billion worth of crude from Venezuela in 2013 but spent less than half that amount for the same volume of oil last year. In

**DIVERSIFYING SUPPLIERS**  
**Latin America, with its huge oil reserves, has turned out to play a key role in India's energy security. The country is increasingly relying on the region to meet its oil needs, freeing itself from dependence on its traditional suppliers.**

2012, India surpassed China as the largest Asian purchaser of Venezuelan oil.

In 2014, India became the second largest destination for Colombia's oil exports. Colombia has doubled its oil production in the last five years and is one of just four Latin American countries to register substantial surpluses for export abroad. In addition to oil, Colombia and Bolivia account for 10 percent of India's gold imports. Colombia is the largest destination for India's motorcycles and third largest destination for Indian exports overall which totaled more than \$880 million last year.

Energy trade and economic ties between Mexico and India are also flourishing. India is the third largest purchaser of Mexican crude oil in the world. India's second largest private oil company, OVL, has opened offices in Mexico aimed at bidding for rights to explore and develop oil and gas fields in the country. The move comes at a time when Mexico has begun to increasingly turn its attention to India as its traditional trading partners like United States are experiencing their own energy boom and reducing their reliance on foreign oil as a result.

Certain governing geopolitical realities have also prompted Mexico to cultivate economic ties with countries beyond the United States. The election of Donald Trump to the American presidency has compelled leaders in Mexico to rethink their country's economic relationship with its northern neighbor. Trump's persistent attacks on Mexico were one of the hallmarks of his presidential campaign. His calls for the construction of a border wall financed by Mexico, for imposing tariffs on imports on goods from Mexico and for NAFTA to be abrogated because it was the "worst trade deal in human history" has predictably created alarm and outrage in Mexico and prompted decision makers in the country to look for other countries with which to deepen ties. The European Union presents an equally unattractive prospect with its rising populism, anti-immi-

grant sentiment, economic nationalism and proliferating trade barriers. Viewed from this perspective, India appears to be an attractive alternative. The focus on India appears to be paying off. Mexico overtook Brazil this past year as the top destination for Indian exports for the first time. Trade between India and Brazil dropped more than 50 percent last year compared to prior years, a reflection of the political and economic turmoil roiling India's BRIC counterpart. But the two nations have still sought to maintain strong trade. India's exports to Brazil in 2014-15 were more than its exports to Japan, Korea, Malaysia, Indonesia, Thailand, France, Italy and Spain.

Latin America's growing role in India's energy security is part of a conscientious effort by India to diversify its oil suppliers, which have traditionally been dominated by countries in the Middle East, including Saudi Arabia and Iran. Several years ago, India learned the dangers of failing to reduce its dependence on West Asia for crude as its oil trade with Iran demonstrates. For several years, Iran was India's second largest exporter of crude oil with most of India's oil refineries constructed to process Iranian oil exclusively. But beginning in 2012, India was obligated to curtail its crude imports as the result of U.S. and U.N. sanctions targeting Iran's profitable oil industry over Tehran's suspected nuclear program. Consequently, New Delhi was compelled to locate other energy supplies to overcome the shortfall. Latin America and its abundant energy reserves helped fill the gap and became permanent fixtures of India's energy security matrix.

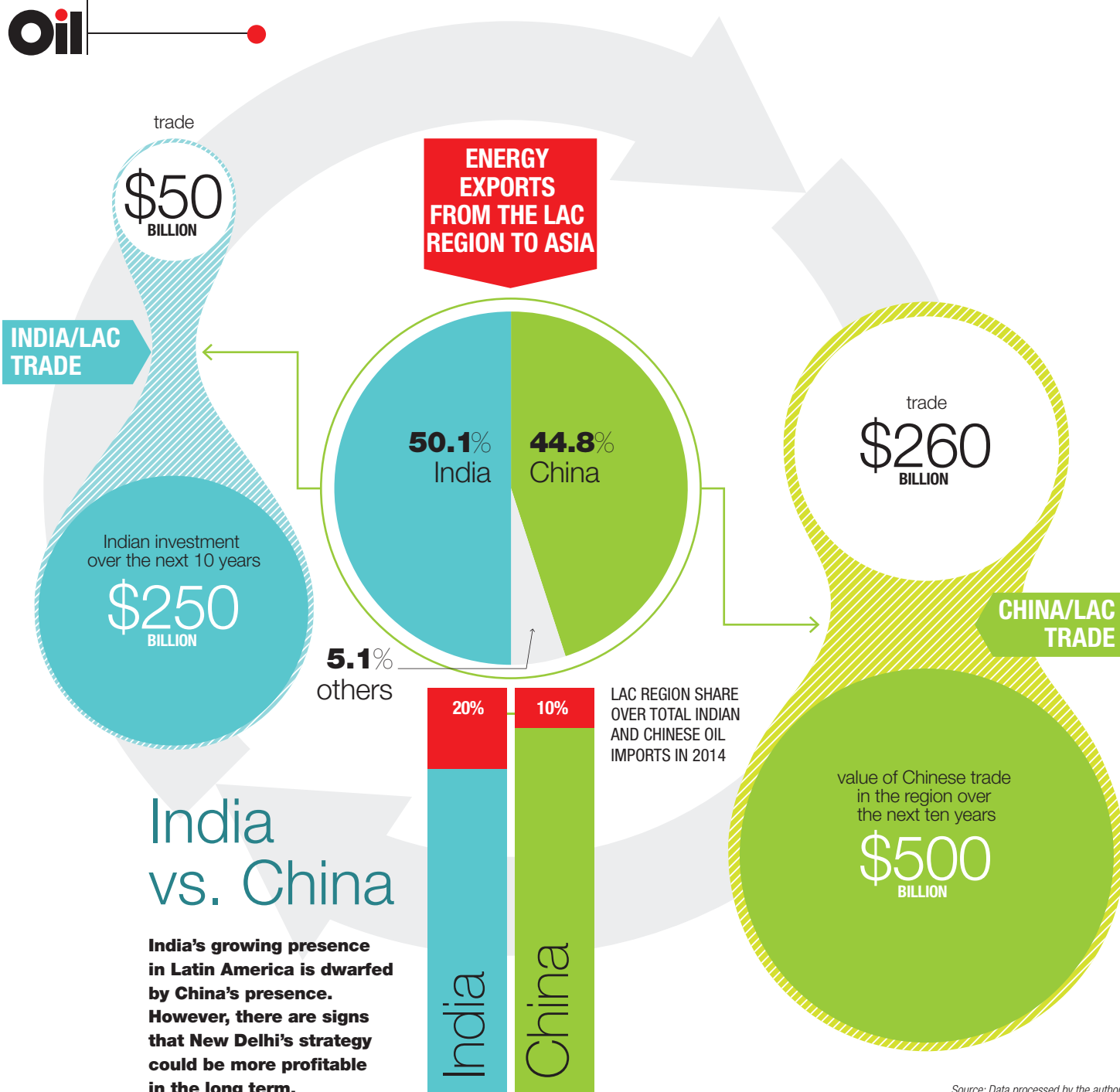
Beyond fossil fuels, Latin America is also home to one of the cleanest energy matrixes in the world. Given India's own ambitions in this realm, green energy is potentially another area of potential collaboration.

### The China factor

India's growing presence in Latin America, however, is still dwarfed by China's own expansive footprint in the region. China's \$260 billion trade with Latin America stands in stark contrast to India's \$50 billion trade during the same period. Moreover, Chinese trade in LAC is projected to reach \$500 billion over the next ten years, while India's investment is predicted to hover around \$250 billion during that period.

Nevertheless, India has captured a higher share of Latin America's energy market than China. According to the Inter-American Development Bank, India accounted for 50.1 percent of LAC's energy exports to Asia in 2013, compared with 44.8 percent for China. Additionally, LAC's share →





of India's total oil imports increased from 4.5 percent in 2003 to 20 percent in 2014, while LAC accounted for only 10 percent of China's total oil imports in 2014.

China has adopted an aggressive approach in Latin America, spending billions of dollars across the region to finance infrastructure projects, provide credits and export a plethora of goods to scores of different regional markets. To be sure, Beijing has surpassed India in its engagement with LAC by virtually every measure. Officials in New Delhi are acutely aware of the ongoing disparity and understand the necessity of maintaining some influence in the region even if it cannot match China at a commensurate level. India's primary objective is to preclude Beijing from garnering a complete monopoly in the region while still recognizing the limits of its ability to compete. To many, India's approach to Latin America is too restrained and cautious.

But there is growing evidence that India's strategy in Latin America may be more fruitful than that of its Chinese counterpart in the long-term. Beijing's forceful, multibillion-dollar strategy

in Latin America has generated backlash in some quarters. Many Latin Americans resent the deluge of ultra-cheap Chinese imports flooding markets and undercutting local businesses, while many Latin American governments are increasingly suspicious of the onerous conditions upon which Chinese money is invested in their respective countries. By contrast, India trade and investment is viewed as uncontroversial in Latin America and less exploitative. New Delhi invests relatively little in extractive industries in the region. India's investments in the region generate employment, hire almost exclusively local talent, and go through great lengths to cater to local markets and culture. India is also mindful that further enlarging its presence in the region could make it vulnerable to the same difficulties facing China. As a result, India's current strategy may confer it with an unexpected competitive advantage over China in the region in the long run.

#### Challenges

Despite the unprecedented progress achieved so far and the immense potential for future growth, formidable

challenges persist in the India-Latin America economic relationship. At the most fundamental level, these include India's lack of knowledge of local markets relative to other regions in the world, as well as an ongoing shortage of adequate financing for project development in LAC. Additionally, while the huge distance separating India and Latin America is no longer the limiting factor it historically once was, the absence of direct shipping routes has inevitably impacted trade and the overall commercial relationship, with lead times still averaging between 1 to 2 months.

India also finds itself at competitive disadvantage with respect to trade agreements in the region. Many of Latin America's fastest growing countries, including Mexico, Chile and Peru, enjoy free trade agreements with some of the world's largest and most prominent economies, including the United States, the EU and China. By contrast, India does not have a free trade agreement with a single Latin American country. New Delhi's recent decision to initiate negotiations for one with Peru is welcome news and a step in the right direction that will hopefully lead oth-

er countries in the region to pursue free trade agreements with India in the future.

Moreover, although the scores of Indian companies operating in Latin America have become powerful symbols of the robust India-Latin American commercial relationship, it has not always been smooth sailing. India's Jindal Steel & Power, for example, made global headlines after investing \$2.3 billion in Bolivia's El Mutún mine, the largest foreign direct investment project in the country's history. Unfortunately, the project has become mired in a series of disputes for the past several years and the company is fighting a protracted legal battle to rescind the contract and leave the country. Other smaller Indian companies have also jettisoned their stakes in the region after failing to realize any profit from their respective endeavors. The divestitures demonstrate the extent to which Latin American still remains challenging terrain for Indian investment.

#### Future perspectives

The change in India-Latin America economic ties, particularly in the energy arena, is nothing short of transformative. Part of the change can be attributed to a transformation in attitudes in both India and Latin America. India traditionally regarded Latin America as an undemocratic region plagued by political instability, hyperinflation and currency devaluation. From the perspective of many Latin American countries, India's abject poverty and uneven growth confirmed its status as a Third World country. But as both India and Latin American began experiencing a surge in economic growth, attitudes changed along with their GDPs.

Overall, trend lines are moving in the right direction. With energy trade at the forefront of cooperation between India and Latin America, progress has been steady, even and significant. But the two should not become complacent with what has been achieved so far. With the full promise of their relationship still yet unfulfilled, these countries have only begun to scratch the surface of what is possible, particularly in the energy arena. Leaders in both regions should enumerate a vision for the future that takes advantage of the opportunities created by governing geopolitical realities that will help propel their relations to the next level. By capitalizing on these opportunities and on the growing momentum and budding progress between them, India and Latin American can build a strong, sustainable energy and trade partnership that will herald a new era of cooperation.



NICOLÒ SARTORI



## A continent that intends to take off

During President Obama's second term, Latin America ended in the spotlight as the driving force behind an integrated and self-sufficient "western hemisphere" in energy terms. Thanks to the huge oil reserves in Venezuela, the potential of the pre-salt fields off the coast of Brazil, and unconventional prospects in Argentina, Latin America could significantly contribute to the American continent's energy emancipation, one presently driven by the shale revolution underway in the United States and the exploitation of bituminous sands in Canada. Despite these prospects, this important growth of the region is held back by political and economic uncertainties in certain key countries and the nationalist tendencies of the main South American players that are chronically reluctant to embrace energy cooperation.

#### Majors at a crossroads

Venezuela's serious problems are clear to everyone: the top country in the world for oil reserves could soon have to deal with a serious debacle. A daily output of just over 2 million barrels per day—in steady decline since 2014—is not only insufficient to avoid a third consecutive year of recession, but even fails to guarantee domestic supplies of oil products. The risk of paralysis of the Venezuelan oil industry not only represents an element of major uncertainty for global markets, but also hinders any attempt at energy integration on a regional level. Albeit in much less dramatic terms, the political scenario in Brazil is also concerning. Despite the problems that have partly characterized the oil industry, in recent months the production of Brazilian crude

oil and natural gas has recorded major progress (3.36 million barrels of oil equivalent at the end of 2016, up eleven percent compared with the previous year). However, due to the financial difficulties of the industry, difficulties aggravated by the collapse in crude oil prices, the development of Brazilian pre-salt resources has not met the initial positive expectations of the IEA (International Energy Agency), postponing the expected success of the country and limiting its influential role on a regional level. The prospects for Mexico, however, are different. Thought to be destined to sink into a fate of energy anonymity (in light of the 32 percent reduction in output compared with its peak in 2004), Mexico appears to have countermeasures that trace back to China. Thanks to the enthusiasm generated by the shale revolution over the border, and active investment attraction policies that overcome the multiple-decade monopoly of Pemex, Mexico has regained its stride. The results are substantially less than those of the early 1990s, but they are a positive example for a region rich in resources, but one still searching for a way to exploit them appropriately.

#### A potential yet to emerge

Alongside Venezuela, Brazil and Mexico—which, with a total of 9 million barrels per day constitute the

majority of South American output—a group of countries are attempting to develop an energy profile that will enable them to emerge in the regional and global energy scenario. Peru and Trinidad and Tobago are active in natural gas, which, for several years, they have exported in the form of LNG to European and Asian markets. Ecuador and Colombia are operating mainly in the oil market; the former is a traditional exporter and member, albeit second-tier, of OPEC, while the latter has experienced a substantial increase in production in recent years, supported by more favorable exploration activities. Argentina is also worth mentioning. Traditionally a producer and exporter of hydrocarbons, despite the great potential of shale resources and the first extraction activities launched in the Nequen basin in 2015, Argentina has become a net natural gas importer. Despite potential availability and some major complementarities among the regional players, Latin America is still underachieving in terms of energy. 22 million citizens still have no access to electricity, with an electrification rate of 85 percent in the rural areas of the continent, and despite abundant crude oil reserves, in recent years imports of products from the United States have doubled with an attendant cost of approximately \$50 billion per year due to an inadequate refinery industry.

#### Nationalism and fragmentation

The tendency towards energy nationalism that is still widespread on a regional level continues to fuel this situation. Although crude oil prices have contributed—as in the case with Mexico—to making

matters worse, too many governments are still barricaded behind their protectionist positions. On the other hand, the adoption of excessively liberal policies by national governments risks exposing the Latin American energy industry to the growing volatility of the international markets. A balance between these two extreme positions may be reached through greater convergence and regional energy integration, which overcomes fragmentation and enables the complementarities between the various players on the Latin American chessboard to be fully exploited. A process of integration—physical, legislative and regulator—which, on the one hand, would guarantee greater levels of energy security, especially in the gas sector, and a more competitive and sustainable access to energy, and, on the other hand, would ensure greater economic returns for the exploitation of local resources. These are, however, strategic choices that guarantee positive returns in the medium-long term only, unfortunately, some populist South American leaders do not seem to have either the option or desire to consider.



Nicolò Sartori is Senior Fellow and Head of the Energy Program of the IAI, where he coordinates projects on the issues of energy security, with a focus on the external dimension of Italian and European energy policy.





ROBERTO  
DI GIOVAN  
PAOLO

## Las venas abiertas de America Latina

**L**as venas abiertas de America Latina, the open veins of Latin America Latina, is a symbolic book written by intellectual, academic and, at the same time, "man of the street" Eduardo Galeano. Galeano was an Uruguayan journalist, Catholic, sought after by the Argentine and Uruguayan military, who sublimated a story created from exploitation, revolutions thrown to the wind, low, second-rate populism and haughty indolence. Our topic is a continent that, excluding Mexico and Central America, concerns over 370 million people who live in 18 million square kilometers, approximately 13 percent of the earth's land surface. *The Open Veins of Latin America* is the book that Hugo Chavez gave to Barack Obama during the summit of the two Americas in 2009 in Trinidad and Tobago. It is unknown whether Obama read the book. The book is certainly more interesting nowadays, but it can be ruled out that President Trump will ever read the book. Yet it will be Trump himself who will have to deal with the new course of the South American nations which, following the era of dictatorship and "Operation Condor," have already gone through at least two phases in their history: that of the democratic "drunkenness," namely, the return to governments elected by the people that did not necessarily stop the process of personalization and leadership in progress in both South America and throughout the world, that period followed by a phase of economic recovery. This democratic and economic recovery phase lasted a very short time and did not really affect the economies of the individual



**Hugo Chavez, Venezuelan president who died in 2013, gives Barack Obama a copy of *Las venas abiertas de America Latina* by Eduardo Galeano during the Pan-American meeting of 2009.**

states, as they had suffered for too long from low GDP, unsatisfactory budgets, corruption in public administration, few truly national companies and, above all, no large capital investment.

### A future of mandatory choices

South America is currently facing a number of choices, in terms of economy, energy, and the environment, which will produce long-term effects and which will be truly decisive in its ever-existing confrontation with the U.S. Environmental and sustainable development issues linked to various treaties and the latest COP21 in Paris. Despite first world countries not seeing the South American countries as key players in diplomatic politics, they find in South America's social, economic and environmental condition (as well as in Africa) a ground for the success of the objectives of the Treaties themselves. Only taking into account the territory of Latin America and the Caribbean, it demonstrates problems from the decay of coral reefs

in the Amazon Region, the drastic decrease in cultivable land for coffee, the reduction in water resources that threatens the territories as well as the extinction of various types of animals by 2050. It can now be said that along with Trump, these are phenomena read in a pessimistic and catastrophic way, but the questions still remain. There still is a need for a better environmental balance in Latin America, one which would require a better organization of the state and public administration, a growth of positive sustainable development actions, and a census and use of natural and environmental resources (which also means precious minerals, refining materials and productions that favor the energy cycle) which would, perhaps, favor a more social and democratic market than the current one. It is the only way to deal with poverty and build a rough middle class, which only Argentina has known in its recent history.

### The key role of the Pope

Along this path from a social and pastoral point of view, travelled a gentleman from

Buenos Aires who played a role for South America that often seems to contrast with his origins, namely Pope Francis. The Pope currently speaks to the whole world, and speaking to his South American brothers often invites them to become part of the world. However, he does not forget his origins. In September, he will be in Colombia to seal the path of peace in that battered country and to talk about equality and respect for civil society. There he will meet with various NGOs (often of European origin) working in the area to renew the agri-food sector, encourage sustainable economic development or to urge the alternative or cooperative microcredit on the major international development and aid banks in the region. It is no coincidence that those from afar have greater clarity when turning towards a continent that with Central America and Mexico is more than one continent and that this economy and environmental and energy standards could become an unforeseen lesson for the world. The veins of Latin America still remain open, but that book closed a secular history in 1986. Its epilogue could change the world.

**Roberto Di Giovan Paolo, a journalist, has written for, among others, ANSA, *Avvenire* and *Famiglia Cristiana*. He was Secretary General of the Italian Association for the Council of European Municipalities and Regions, and he is a lecturer at the University of International Studies of Rome.**

GEMINELLO  
ALVI



## Trump keeps his eye on the Americas

**D**onald Trump's positions on Mexico and the North American Free Trade Agreement (NAFTA) are often judged as paradoxical symptoms of the decline of the United States, a decline accompanied by a populism similar to that in Latin America. However, despite Trump's direct appeal to the people, his continuous disregard for norms and institutions, and his ruthless style, U.S. institutions remain clearly different from those in Central and South America, as they are both more solid and more resilient. Recent events should be judged calmly and informed by historical context. The definitive turning point of the United States towards globalization started with the severe Mexican economic crisis of 1994/95. To prevent that currency crisis from affecting the United States, President Clinton promised 40 billion dollars to save U.S. funds that had invested in peso bonds. However, he did not manage to obtain support from Congress, and Fed chairman Alan Greenspan had to resort to the exchange rate stabilization fund and was able to commit only \$20 billion. Foreign central banks learned from their newspapers that the International Banking Regulations (IBR) and the International Monetary Fund (IMF) would compete for the remaining sum. The United States was unable to manage a crisis related to one of its peripheries. It was a financial acknowledgement that it was necessary to change the trade framework, to focus on China and the balance of payments, thereby subverting the usual bonds of dependence between the United States



and the countries of Latin America.

### U.S. indifference to Latin American politics

The United States' indifference towards even extreme political events in the rest of the Americas and the approval of the increased integration in world trade of this area originate from this context. Under Clinton, the usual connections that had been one of the constants in U.S. foreign policy ceased to exist. During the Depression FDR still considered Latin America's raw materials part of the United States' indispensable self-sufficiency circuit, but under Clinton the relationship to the Americas had instead developed into a non-crucial element in a globalized world view. Trump cannot return to the past with Mexico, as that option was ended by Clinton. However, neither can he limit himself to the issue of the wall, as his policy must cover the various changes introduced by the Clinton era. It should also be noted that Trump's ideas also reflect those of the book published in 2004 by Samuel Huntington *Who Are We, The Challenges to America's National Identity*. This book is as important as his "The

Clash of Civilizations," at least for the United States. This book argued that white English and Protestant culture were the wellspring of civilization in North America and continued to be so. Huntington was pleased to mention the demographics according to which, in 1990, 49 percent of Americans descended from settlers and slaves of 1790. He was also very concerned about the effects of immigration and globalization on the essential nature of the United States. Yet here is the paradox: in order to avoid ending up like Latin America, Trump, with his Latin Americas ways, went against the elites, who, in the United States, support Clinton-like globalization, a viewpoint not limited to Democrats. Suffice it to think that Bush senior, from 1974 to 1975, was locked up in a tiny office of U.S. representation in Beijing, persuaded, as he would later write, that "it was inevitable that China would evolve as a power broker not only in the Pacific, but in the world. China was quite simply the place where it was supposed to be." Here the discussion has returned to China, which has pursued in the Americas its geopolitical game, not only commercial, of breaking the

circle, supporting Communist regimes and more. However, Chinese imports from the area have now been downsized; the revolutions are not in good health; of the states that acknowledge Taiwan, the majority still belongs to Latin America and the Caribbean; the United States purchases the goods in the area that have the greater added value than those purchased by the Chinese; the trade in the area remains much higher. Powerful facts and Trump's pragmatism cannot escape the interdependence between China and the Americas.

### A reformed and unexpected U.S. policy

In conclusion, the wall with Mexico and NAFTA must perhaps only be judged as episodes of what will be an inevitable reformation of America's relationship with this area, generated by demographic growth in Latin America and the interests of the traditional industrial sector in the United States, which is with Trump. The form and intensity of this reformulation will reflect, among other things, the undesirable outcome of globalization launched in the area by Clinton, which is replicated. Emigrations, tariff agreements, the Chinese issues and the crises of social experiments will be issues of a reformed United States policy that could be unexpected.

**Geminello Alvi has worked at the Bank for International Settlements in Basel, he has collaborated with *Espresso* Group and with *Corriere della Sera*. He has also been Councilor of the Ministry of the Economy.**



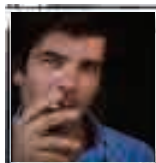
Florianopolis, also known as Floripa, is the capital of the state of Santa Catarina, South Brazil. It is located approximately 500 km from Porto Alegre, with almost half a million inhabitants and an enviable record: it has the best quality of life and a higher growth index than any other Brazilian city. It is located partly on the continent and partly on an island: this gives the city an unmistakable style and geography, and produces a rich variety of businesses in the territory. It could be in Europe, and the reason for this first impression given by the city and its beaches to visitors comes from history. Colonized since the beginning of the 19th century by Italians, Portuguese from the Azores and Germans, the state of Santa Catarina is still the most European state in the Federation in terms of its appearance and the lifestyle of its inhabitants. According to the Brazilians, Floripa, with its island, is one of the most chic and desirable holiday destinations.



## Florianopolis, Eurobeach

### Sergio Ramazzotti

Born in Milan in 1965, he has written and photographed hundreds of stories for most of the leading magazines of the world. His photographs have been exhibited in several personal exhibitions in Italy and abroad. He was one of the eight Italian photographers featured in the 8-documentaries series "Fotografi" on photojournalists, produced and broadcast in 2012-2013 by TV channel Sky Arte. He won the International Photography Award (Los Angeles) in the 'Editorial' category in 2005, twice (in 2005 and 2010) the Enzo Baldoni Prize for Journalism of the Province of Milano, and in 2015 the Magna Grecia Awards for Literature under the patronage of Italy's Ministry of Culture and Education.



- 1 | Santa Catarina Island, Praia da Joaquina.
- 2 | Ribeirão da Ilha, old colonial houses.
- 3 | Praia Mole, paragliding.
- 4 | Pântano do Sul. Detail of a boat on the shore.
- 5 | Florianopolis, the new part of the city with Hercilio Luz bridge, built in 1926.
- 6 | Rock formations in Praia Mole.
- 7 | A small cart along the road near Ribeirão da Ilha.



## MARKET DEVELOPMENTS

## Russia and Saudi, big allies

Prepared by Market Scenarios and Long-Term Strategic Options – Oil (SMOS/OIL) – Eni



## OIL PRICES

## Markets still wary, despite the extension of the agreement

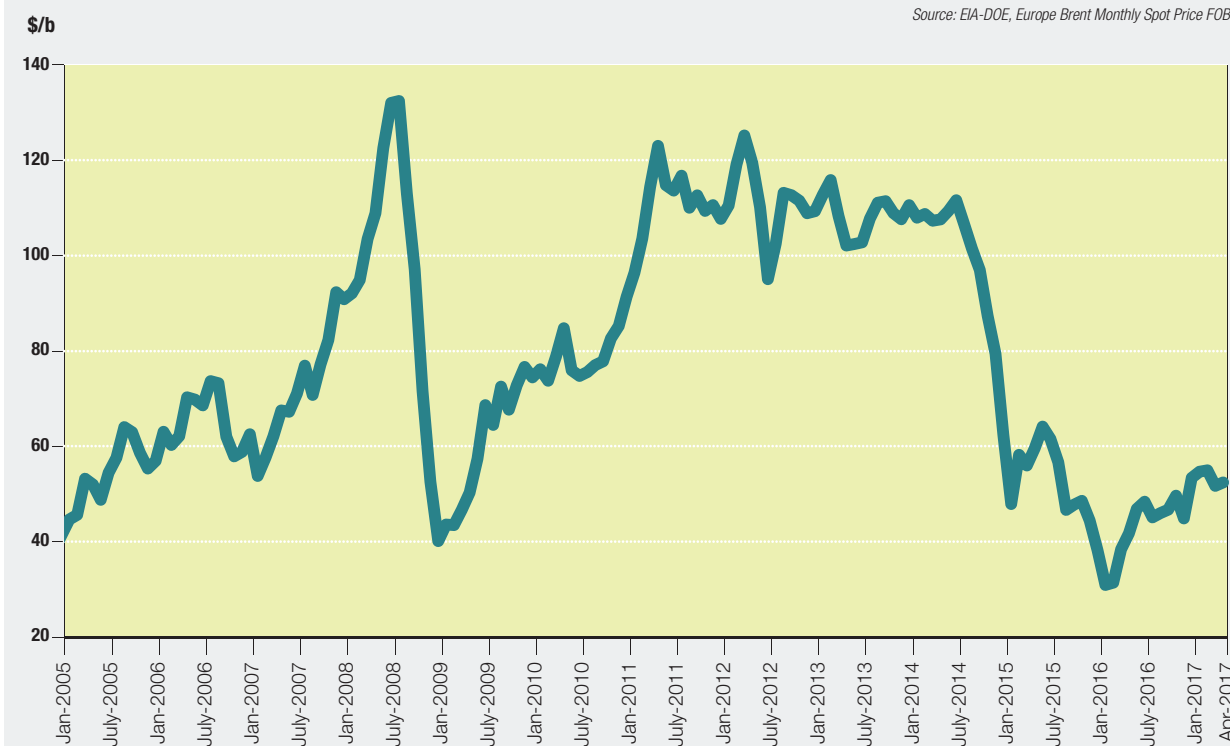
2017 opened with Brent at around \$55/b, consolidating the growth of the end of 2016 following the Vienna agreement. Crude oil finds support in the cuts applicable to major producers which has already achieved high levels of compliance: OPEC at around 100 percent and non-OPEC at over 50 percent. Disruptions have contributed towards reducing volumes by approximately 1 Mb/d since the beginning of the year: over half concern the temporary suspension due to the fire in Canada, while the remainder result from the critical situations of Nigeria and Venezuela. The Q1 financial statements show a gradual realignment of the supply and demand curves with a significantly lower surplus at the end of the year. Countering the bullish boom, however, are concerns regarding the speed of recovery in U.S. production and high stock volumes that are still above the peaks of the last five years, along with the recovery of Libya.

In the first months of the year, high crude oil arrivals also have an impact and the sale of floating stocks. As of March, uncertainty has increased, in parallel with price volatility. The slow rebalancing process reduces the influence of OPEC's decisions on the market and financial operators, who had been betting heavily on a price rise, have drastically dropped their buying outlook since mid-April, fueling a downward trend.

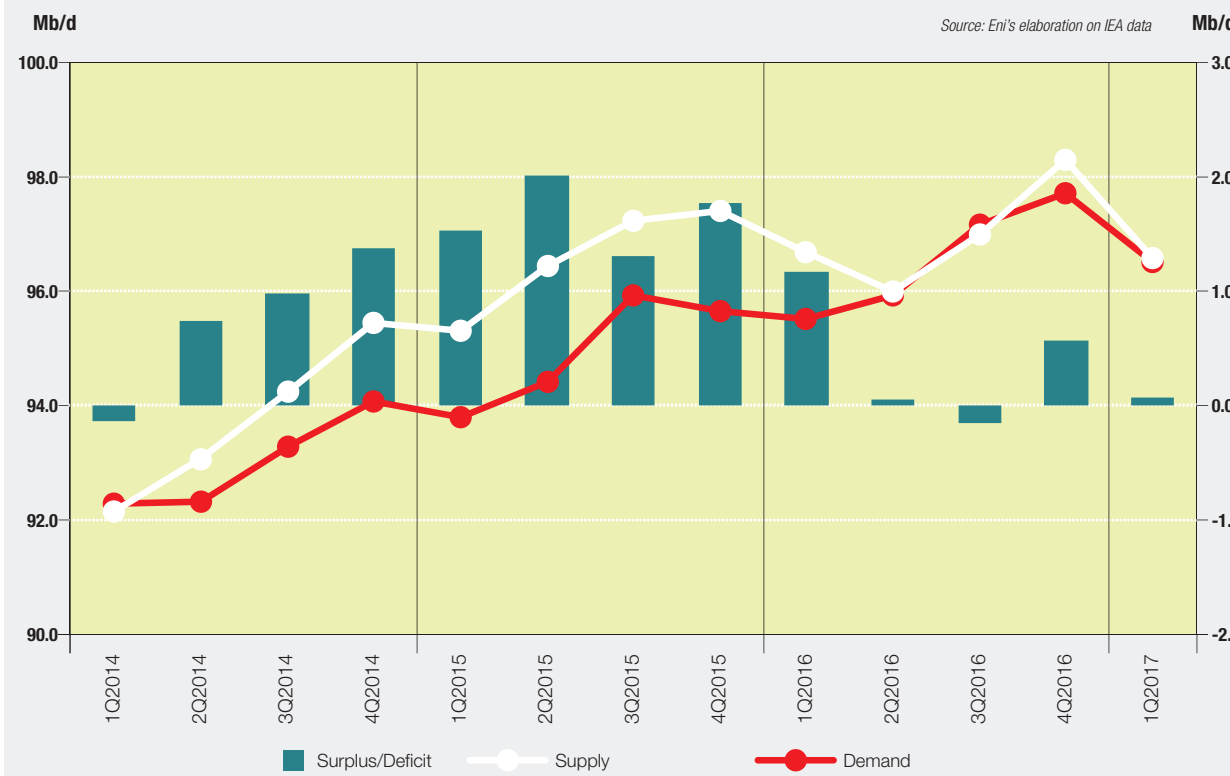
The skeptical reaction of the market is again forcing Saudi Arabia and Russia to join forces to prolong the cuts, which is again strengthening the price at \$55/b. The meeting of May 25 ended with the OPEC/non-OPEC decision to extend the agreement until March 2018, keeping cuts unchanged, in an attempt to bring global stocks back within the historic range. Although the immediate reaction of the markets was "lukewarm", cuts and seasonal growth in demand will still accelerate the destocking process in the second half of the year. The strengthening of the price fuels the expectation of a change in the backwardation price structure, promoting the rebalancing process: lower futures prices disincentivize the accumulation of stocks and financial investments, especially in support of tight oil developments.

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## BRENT PRICE



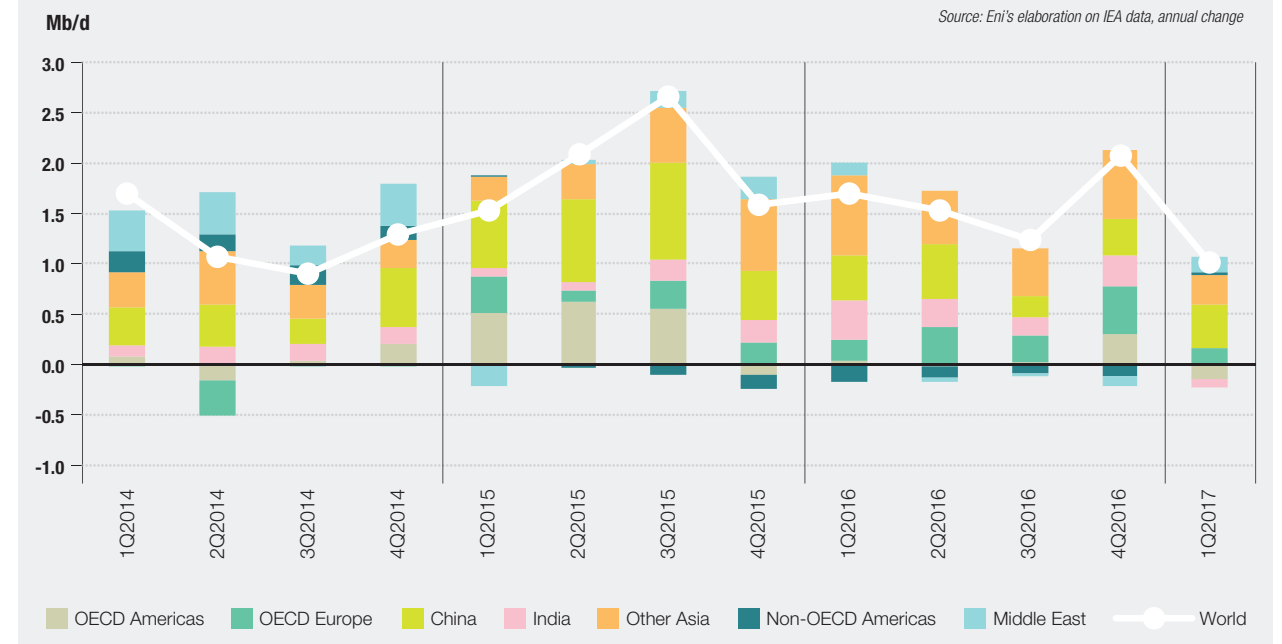
## SUPPLY/DEMAND BALANCE



## OIL DEMAND

In Q1 2017, global oil demand grew by 1 Mb/d, slowing down significantly compared with the final quarter of 2016 (+2.1 Mb/d). The growth in OECD consumption was nullified (-0.03 Mb/d) while non-OECD growth remained stable, at over 1 Mb/d. In OECD countries, the demand for gasoline fell for the first time since Q3 2014 due to the reduction in the U.S. (-2 percent YoY). Higher final prices, shrinking consumer confidence, the slowdown in car sales and the improved average efficiency of the fleet contributed to the decrease in U.S. gasoline consumption, amounting to approximately 40 percent of the world's gasoline demand and 10 percent of the world's oil demand. In Europe, however, the picture remains positive, with nine consecutive quarters of growth after almost a decade of structural decline. In contrast is Germany, where consumption has dropped, especially that of diesel, due to higher pump prices (approximately one-fifth higher in February, compared with last year). In non-OECD countries,

## ANNUAL DEMAND CHANGE BY SELECTED AREAS



a slowdown in consumption was recorded in India, offset by higher growth in the rest of Asia. In India, the negative impact on the consumption of demonetization is temporary and a recovery in consumption is expected throughout the rest of the year. In China, for the first time since the end of 2014, consumption revealed an increase in all

products, thanks to consolidation of the macroeconomic framework. The strength of car and air transport consumption, along with the rapid expansion of the petrochemical industry, form the basis of the 4 percent increase in demand, which reached 12.2 Mb/d in Q1 2017. The recovery of industrial activity has brought diesel back to

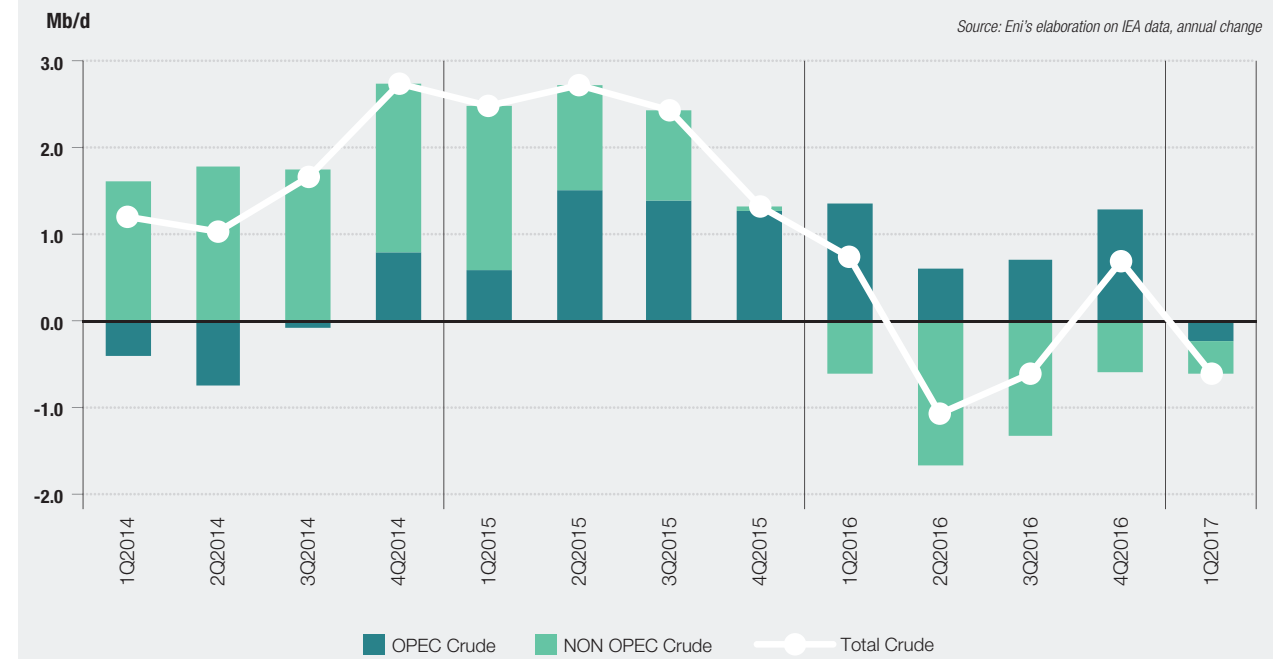
positive ground after three years of decline. In March, electricity production, a key indicator and closely related to industrial production, increased by over 7 percent. In the Middle East, consumption fell in Saudi Arabia, where austerity measures, lower public spending and a fall in construction industry activities had a negative effect.



## OIL SUPPLY

In Q1 2017, the world's oil supply fell to 96.6 Mb/d, with a decline of just 0.1 Mb/d compared with the same period in 2016, despite the OPEC cuts. The OPEC/non-OPEC agreement of the end of 2016, which set a total cut of 1.8 Mb/d in the first six months of the year, is being implemented by major producers, aimed at eliminating the surplus supply in order to drive the price up. Saudi Arabia is therefore returning to its historic role as swing producer, driven by budget constraints and the failure of the previous free-ceiling strategy. OPEC crude oil production has declined (-0.2 Mb/d) after over two years of continuous growth. Saudi Arabia and the UAE are cutting more than agreed and OPEC compliance is much closer to 100 percent, also taking into account the less "disciplined" countries. Voluntary cuts add to the disruptions in Nigeria (-0.3 Mb/d), which is exempt from the cuts but penalized by continuous rebel attacks which had led to the lowest production levels in the last 30 years. In contrast, Libya is continuing its slow recovery (+0.3 Mb/d), albeit continuously threatened by political instability. Venezuela is

## ANNUAL CRUDE SUPPLY CHANGE



facing an unprecedented economic and political crisis: production has fallen to 1990 levels (2 Mb/d), with a small chance of recovering in the short term. Non-OPEC crude oil production in Q1 2017 continued to fall (-0.4 Mb/d), although at a less sustained pace than in 2016. The U.S. slowed down, but began to grow again as of April to levels

above those of last year. Chinese production continues to decline yielding its position to Canada as the third largest non-OPEC producer. Russia, which, at the end of 2016, had driven production up to a historic peak of 11.2 Mb/d has waived its expansion plans and is gradually reducing its output (-0.2 Mb/d as at April, vs.

its target of -0.3 Mb/d). Azerbaijan, Mexico and Oman are also committed to cutting approximately 0.2 Mb/d from the market, respecting the decisions made in Vienna. Although less disciplined than OPEC, in April, the 11 non-OPEC countries adhering to the agreement achieved a total compliance of 66 percent.





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