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**Comparison between the VAT of the State of  
Rio de Janeiro and American Taxation in the  
Oil and Gas Industry**

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## **ACKNOWLEDGEMENTS**

**To my mother and my wife for the support,  
reliance and fondness.**

## **ABSTRACT**

Nowadays, oil is one of the most important raw materials we have. Every day we use hundreds of things that are made from oil or gas. For this reason, Brazil and The United States consider this sector one of the most relevant part of their economies. In Brazil, for instance, the oil and gas activities account for the biggest part of the primary energy production in the country, with oil accounting for 49.1% of the production and natural gas, 8.7%. In the United States, oil and gas demand account for 62% of U.S. energy.

At the same time, in both countries the oil and gas sector owns one of the largest tax collections becoming an important revenue source for government. Either in Brazil or in The United the tax regulation in the oil and gas industry is significantly different. Both taxation systems have uncountable laws which seek to reflect each phase of the production chain. In fact, this paper presents a comparison between the Brazilian and American taxation systems specifically in the oil and gas sector enhancing mainly the State of Rio de Janeiro (Brazil) and Texas (USA) both the largest oil and gas producers in their countries. Additionally, it was described an overview of this segment in both countries in order to identify the positive and negative aspects for each burden tax. Actually, every day government make efforts to simplify and to improve the own taxation system.

Key words: taxes, taxpayers, government.

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## **1 - INTRODUCTION**

Oil is a vital source of energy for the world and will likely remain so for many decades to come, even under the most optimistic assumptions about the growth in alternative energy sources. Most countries are significantly affected by developments in the oil market, either as producers, consumers, or both. As The International Energy Agency (IEA), in 2008, oil provided about 34% of the world's energy needs, and in the future, oil is expected to continue to provide a leading component of the world's energy mix.

For this reason, this industry became very relevant to many countries such as the United States, the top three world producer and Brazil the 13th. At once, in both countries this industry has been a significant revenue source for government resulting to one of the largest tax collections. Their tax regulations are very complex and both governments have demanded efforts in order to improve this taxation system as much as possible.

In fact, the main goal of this paper is to describe both Brazilian and American taxation systems and make a comparison between them identifying their positive and negative topics. This research seeks to reflect the actual situation relating interesting points and possible difficulties that taxpayers can find.

This paper is broken down into nine chapters and starts with overviews about the Brazilian and American oil and gas sectors. Thereafter from the chapter two until chapter five, it shows with more details the Brazilian Taxation System especially in the State of Rio de Janeiro for being the largest oil and gas producer in the country. It consists to present the ICMS tax, the only one state tax charged along the production chain, its main characteristics such as generator factor, rates and calculation basis. At the chapter five, it is related a system called Substitution Tax Regime (Substituição Tributária) in which simplifies the tax collection from the government reducing the volume of ICMS payments.

The chapters 6 and 7 describe the American Taxation system with their own taxes related to each phase of the production. Texas was used as example because it is the largest oil and gas producer in the United States. Further, it also cites all taxes that are involved with oil and gas activities, showing their generator factors, rates and calculation bases.

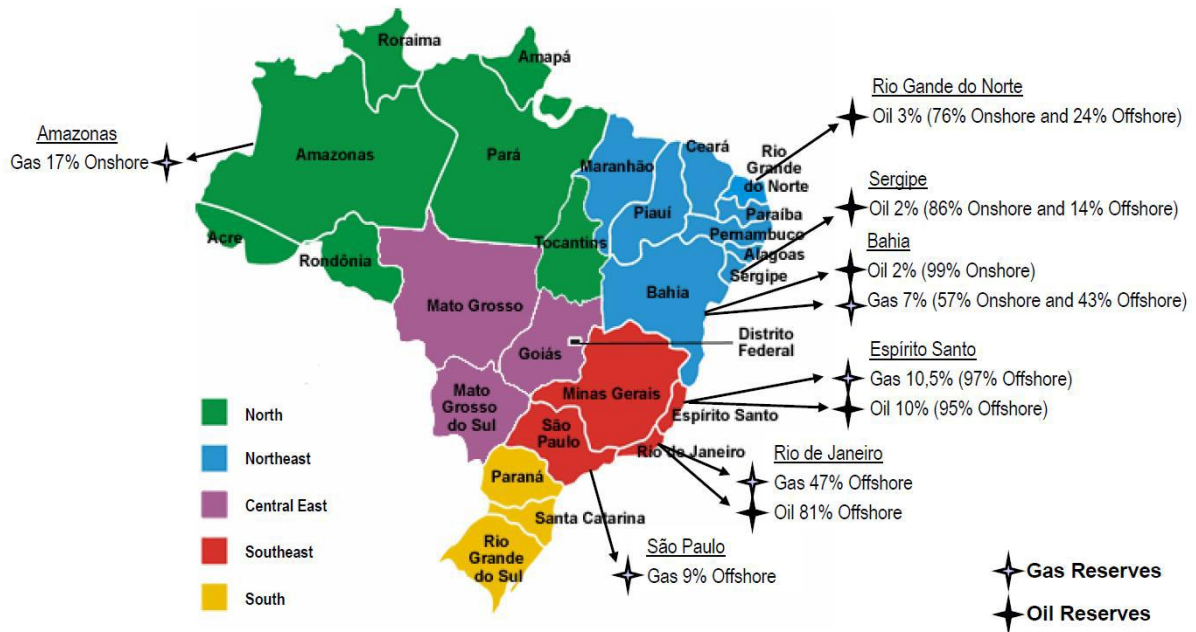
At the chapter eight it was made a comparison between both taxation systems demonstrating their main topics. Finally, the chapter nine reveals the conclusion with the positive and negative aspects from their burden taxes relating interesting points and their differences.

## **1.1 - Brazil Oil and Gas Sector**

The first explorations of oil in Brazil began in the 1930's, with the first discoveries of onshore oil fields in the State of Bahia. Despite of the small scale of the early discoveries, the Brazilian government took a series of measures to manage the industry's development, such as determining that the oil deposits belonged to the Union (thus being under the scope of the Federal government) and the creation of the CNP – the National Petroleum Council, which gave directives to the oil-related activities. In 1953 the State established a monopoly over oil-related activities and the Brazilian Petroleum S.A, commonly known as Petrobras, was created. During the 1960's, the state company begun its offshore activities, off the coast of the State of Sergipe. In 1974, the Campos Basin, located in the State of Rio de Janeiro, the largest deposit so far, was discovered. Over the years, Petrobras became one of a few companies in the world to master deepwater drilling technology. Its monopoly of the oil-related activities continued until 1997, when, as part of a privatization program, other companies were allowed in the market. Today, most international oil companies are active in Brazil, although Petrobras still holds a major market share. In 2006, the early pre-salt oil fields were discovered off the coast of Rio de Janeiro. In 2007, the country reached self-sufficiency, becoming an oil net exporter.

Most of the country's oil and gas production is located in the south-eastern region, although there is also production in the Northeast, and some natural gas in the Amazon. Brazil relies on gas distribution from neighbouring Bolivia, but there have recently been some important discoveries of gas fields in the Northeast (Maranhão and neighbouring States).

### Main reserves of oil and gas per state in %

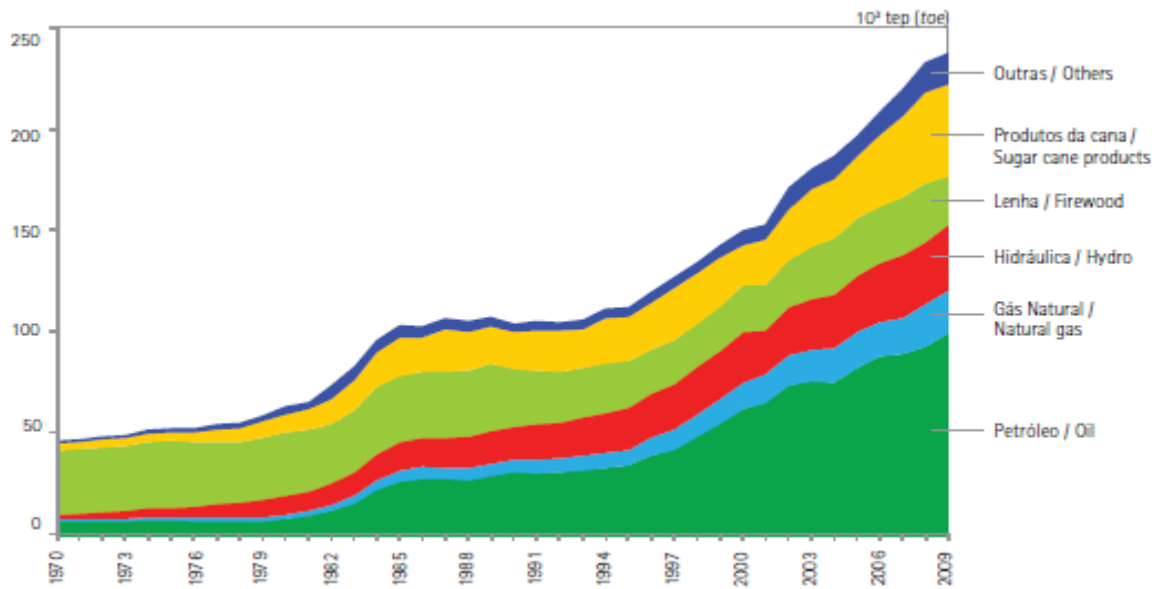


Source: ANP

The State of Rio de Janeiro has the largest oil and gas reserves, and therefore is where most major companies are located. Due to the pre-salt discoveries, this State is expected to deserve extra attention.

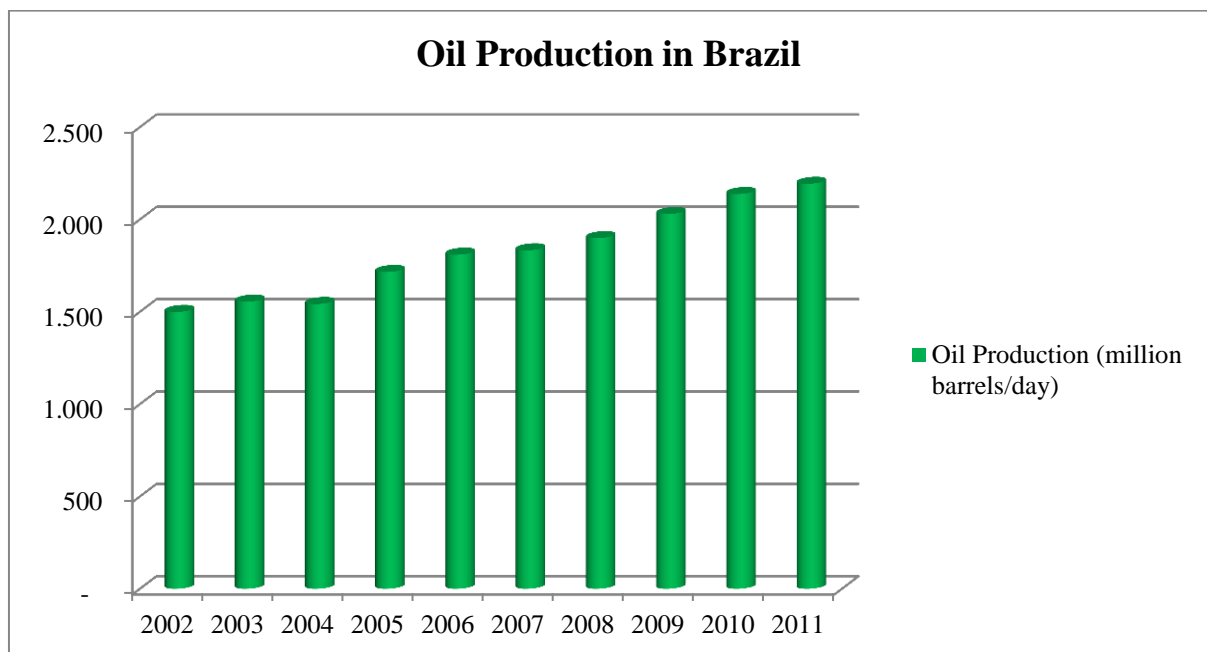
Rather, Brazil has one the greenest energy matrices in the world: Renewable sources of energy account for 46.8% of Brazilian energy production, including hydraulic resources, biomass, and ethanol, besides wind and solar energy. Still, Oil and Gas account for the biggest part of the primary energy production in the country, with oil accounting for 49.1% of the production (101,033 .103 toe) and natural gas, 8.7% (20.987 .103 toe), as the chart below shows:





Source: Brazilian Energy Balance, 2010

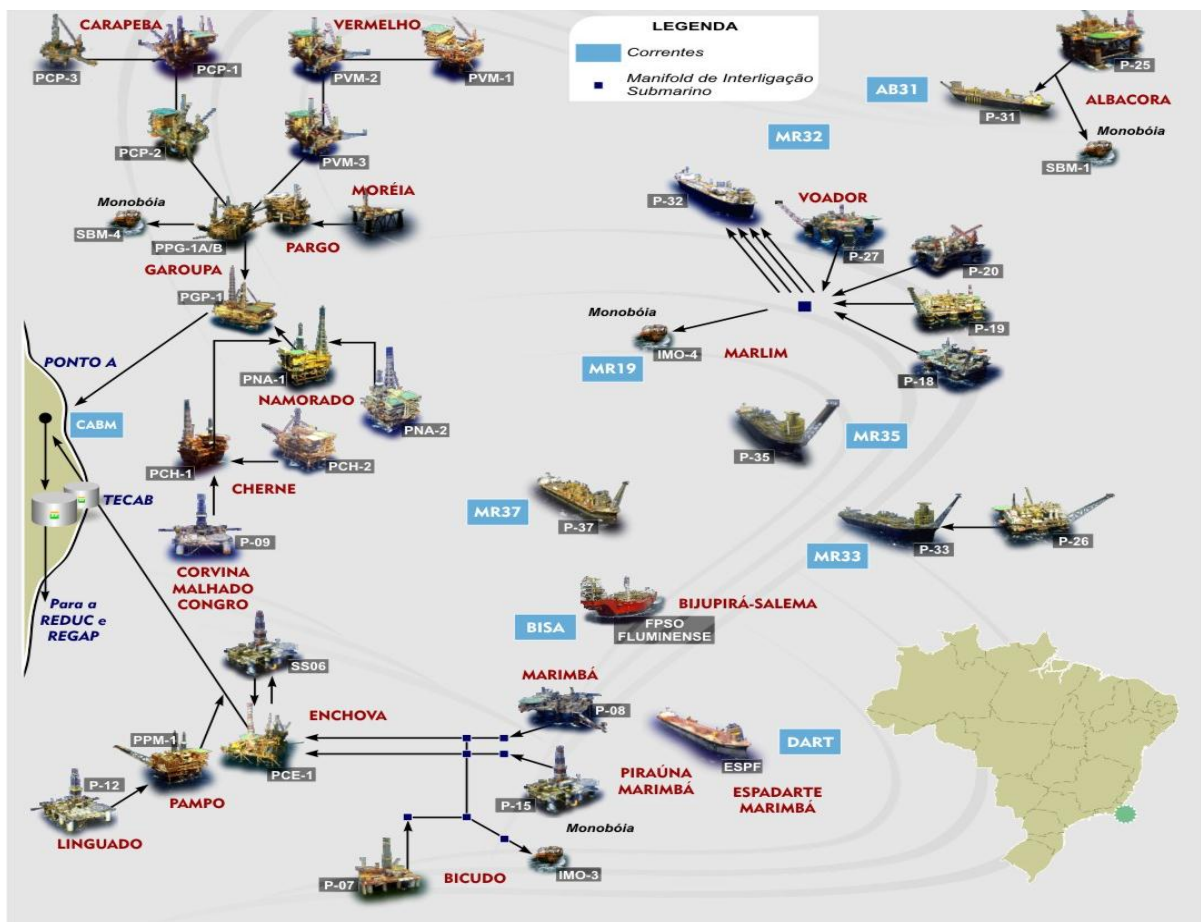
In 2011, as Petroleum National Agency (ANP), Brazil was listed as the world's 13th largest oil producer with 2.2 million barrels per day (bbl/d). In the last ten years, its oil production has experienced average growth about 4.4%. Brazil presented 15 billion barrels of proven oil reserves, the second largest in South America (after Venezuela).



Source: ANP

The oil national production in 2011 was about 768 million barrels. From this total, 91.4% accounted for offshore production (about 702 million barrels) where the State of Rio de Janeiro was responsible for 81% of this production and 74% of the total production. The Campos Basin is the main area of the oil production located specifically in the north of the State of Rio de Janeiro. Since 2010, this state production has been presenting less production, but in the last ten years its average growth was 2.9%.

### Production Framework - Campos Basin



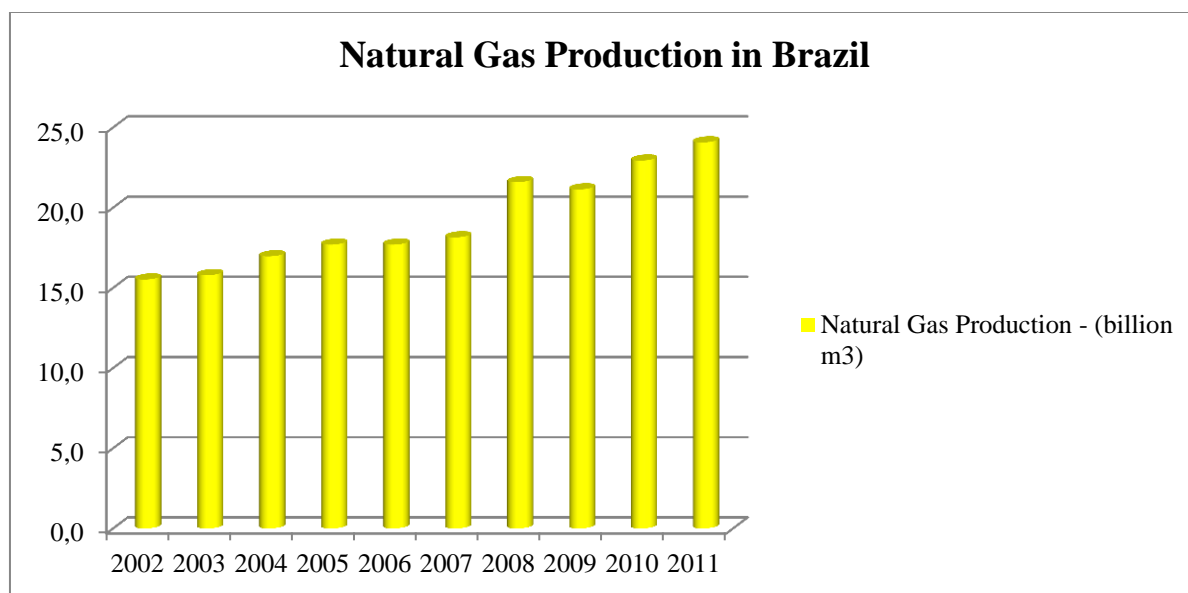
Source: Petrobras

In the last ten years, as ANP, the national natural gas production presented an average growth of 5% per year, reaching 24.1 billion m<sup>3</sup> in 2011 i.e. 5% more than 2010.

The offshore production accounted for 17.9 billion m<sup>3</sup>, 74.3% of the natural gas produced in Brazil. The onshore production also increased 2.1% (6.1 billion m<sup>3</sup>).

Despite of decreasing of 7.4%, the State of Rio de Janeiro was the most producer with 9.4 billion m<sup>3</sup>, comprising 39% of the national total and 52.5% of the offshore total.

From the total of the natural gas produced in 2011, 73.3% or 17.7 billion m<sup>3</sup>, were gas associated to the oil, where the State of Rio de Janeiro was the most producer with 9.4 billion m<sup>3</sup>. The proven natural gas reserves are about 460 billion m<sup>3</sup>.



Source:ANP

It is worthy to consider that in the first half of 2008, Petrobras announced the discovery of oil in the Pre-salt layer (under a geological layer of salt two kilometers thick) in Santos Basin (between the States of Rio de Janeiro, São Paulo, Paraná and Santa Catarina).

The potential of this own production and further Pre-salt discoveries places Brazil at the same level of reserves as the major world producers. For this reason, oil

exploration and production are expected to grow even stronger in the coming years. This development requires heavy investments in state-of-the-art technologies and therefore represents enormous opportunities for suppliers, too.

## **1.2 - American Oil and Gas Sector**

The modern petroleum industry in the USA began in 1859 near Titusville, Pennsylvania, where George Bissell and Edwin L. Drake made the first successful use of a drilling rig on a well drilled especially to produce oil. This happening was not in being the first well to produce oil, but in attracting the first great wave of investment in oil drilling, refining, and marketing.

After the American Civil War, the petroleum industry made continual technological advances that allowed it to emerge as society's major source of energy and lubrication during the twentieth century. The immense potential of petroleum resources and applications became evermore apparent, attracting the interest of one of the most effective businessmen in history, John D. Rockefeller. Working within the South Improvement Company for much of the late 1860s, Rockefeller laid the groundwork for his effort to gain absolute control of the industry, covering each phase of the process. Rockefeller formed the Standard Oil Company of Ohio in 1870. By 1879, Standard controlled 90% of U.S. refining capacity, as well as the majority of rail lines between urban centers in the northeastern U.S. and many leasing companies at various sites of oil speculation throughout the country. Due to Rockefeller's efforts and developments, petroleum became the primary energy source not only in the U.S., but for societies around the world. In 1901, a huge gusher blew at Spindletop, a hill located in eastern Texas, foreshadowing that state's future as the main oil producer in the United States.

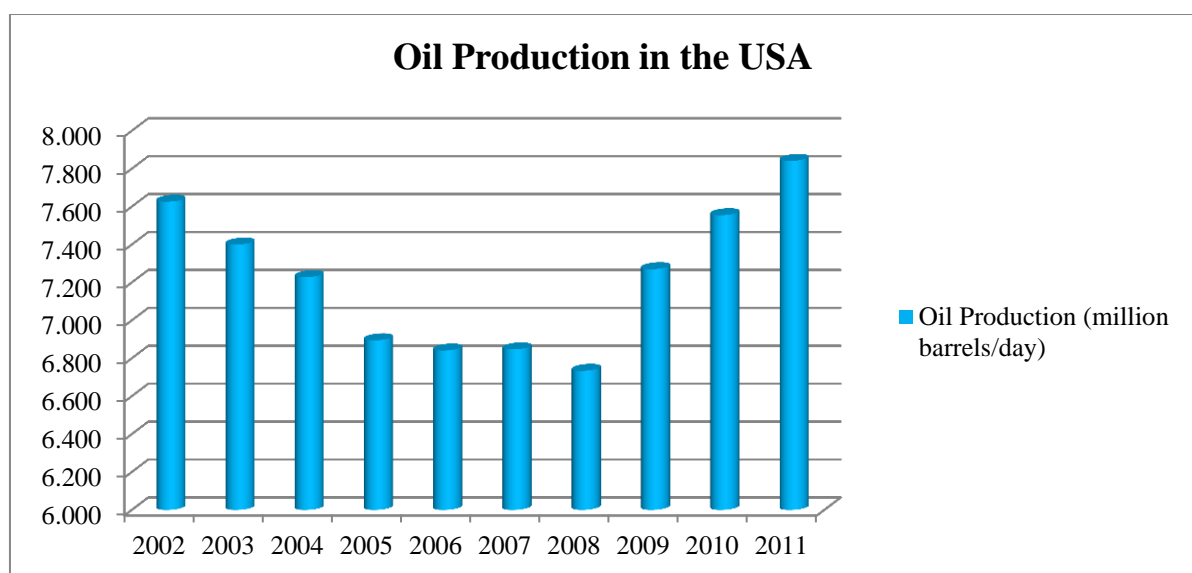
Nevertheless, at the same year, the President Theodore Roosevelt led the Progressive Party's interest in involving the federal government in the monitoring and regulation of the business sector. He used information in Tarbell's book to enforce anti-trust laws, eventually resulting in Standard Oil's dissolution in 1911. Rockefeller's company had

become so large, that when broken into subsidiaries, the pieces would themselves become giants — Mobil, Exxon, Chevron, Amoco, Conoco, and Atlantic among others.

Even after Standard Oil's dissolution in 1911, the image of its dominance continued. Standard had led the way in international oil exploration, suggesting that national borders need not limit the oil-controlling entity.

For much of the 19th and 20th centuries, the USA was the largest oil producing country in the world; but the oil industry has changed significantly over the past century. As worldwide deposits have been identified, American influence on the global oil market has greatly diminished. In 1934, the United States accounted for 60% of total world oil production.

In 2011, the USA is the 3rd largest producer. As ANP, the USA produces 7.8 million barrels per day (bbl/d) just running behind the Saudi Arabia (11.1) and Russia (10.3). Since 2008, the USA has been presenting an annual average growth about 5.2%. About their proven oil reserves, The United States presented 30.9 billion barrels, the 11th largest in the world.

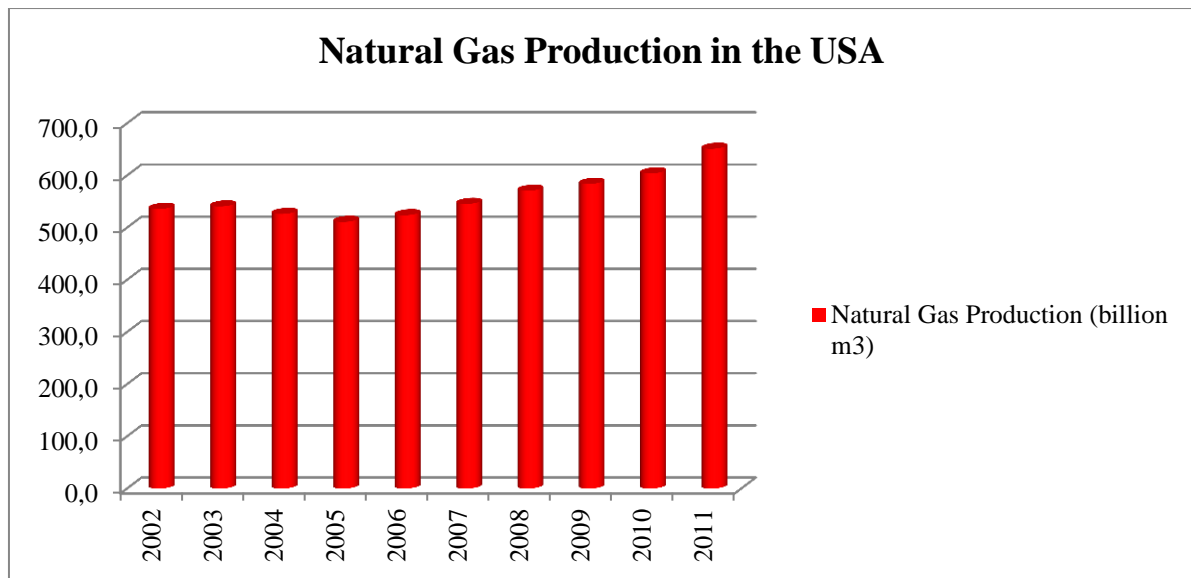


Source:ANP

This production is dominated basically by independent exploration and production companies. For this reason this market is very sensitive to price. Both the upstream (exploration and production) and the downstream (refinement) are extreme competitive. As a result, an important feature about this industry, especially in the North America, is that most companies usually work from short-term plans focused on relatively smaller natural gas projects. On the other hand, international oil production is dominated by the supermajors and national oil companies, which tend to work from long-term plans focused on large projects.

As The US Energy Information Administration (EIA), The United States owns more than 500,000 producing wells and approximately 4,000 oil and natural gas platforms operating in their waters. The top three oil producing states are Texas with 1.5 million barrels per day, followed by Alaska with 561 thousand barrels and California 538 thousand barrels.

About the natural gas, as ANP, The U.S. has been the world's largest producer since 2009. Use of renewable sources of energy, such as wind and solar, is still relatively small but has doubled since 2008. As EIA, the largest state producers in the USA are in the first place Texas with 6.1 billion cubic followed by Wyoming with 1.9 and Oklahoma 1.7. It is also worthy to mention that The United States owns 8.5 trillion m<sup>3</sup> of proven natural gas reserves.

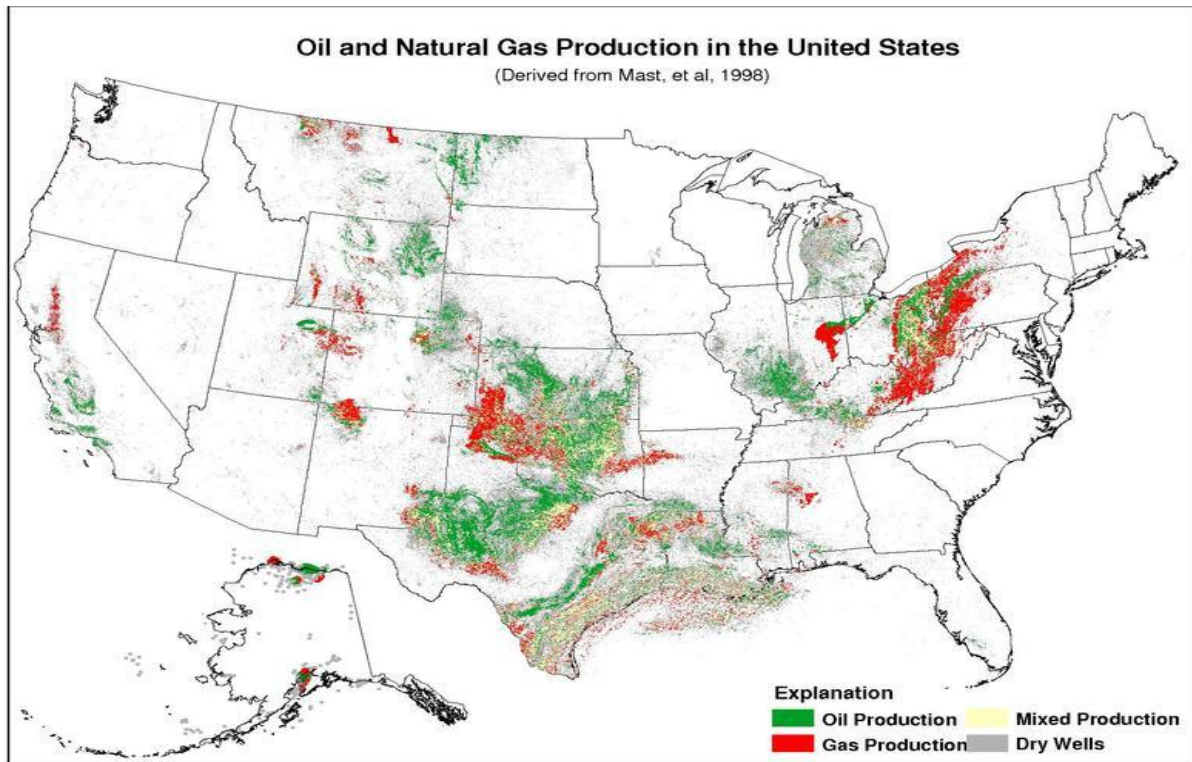


Source:ANP

As American Petroleum Institute (API), currently, approximately 25% of U.S. oil and natural gas production comes from offshore areas. Technology has enabled the industry to explore deeper waters in the Gulf of Mexico and to make many new discoveries while minimizing impact on the environment.

The Gulf of Mexico area, both onshore and offshore, is one of the most important regions for energy resources and infrastructure. Gulf of Mexico federal offshore oil production accounts for 23% of total U.S. crude oil production and federal offshore natural gas production in the Gulf accounts for 7% of total U.S. dry production. Over 40% of total U.S. petroleum refining capacity is located along the Gulf coast, as well as 30% of total U.S. natural gas processing plant capacity.



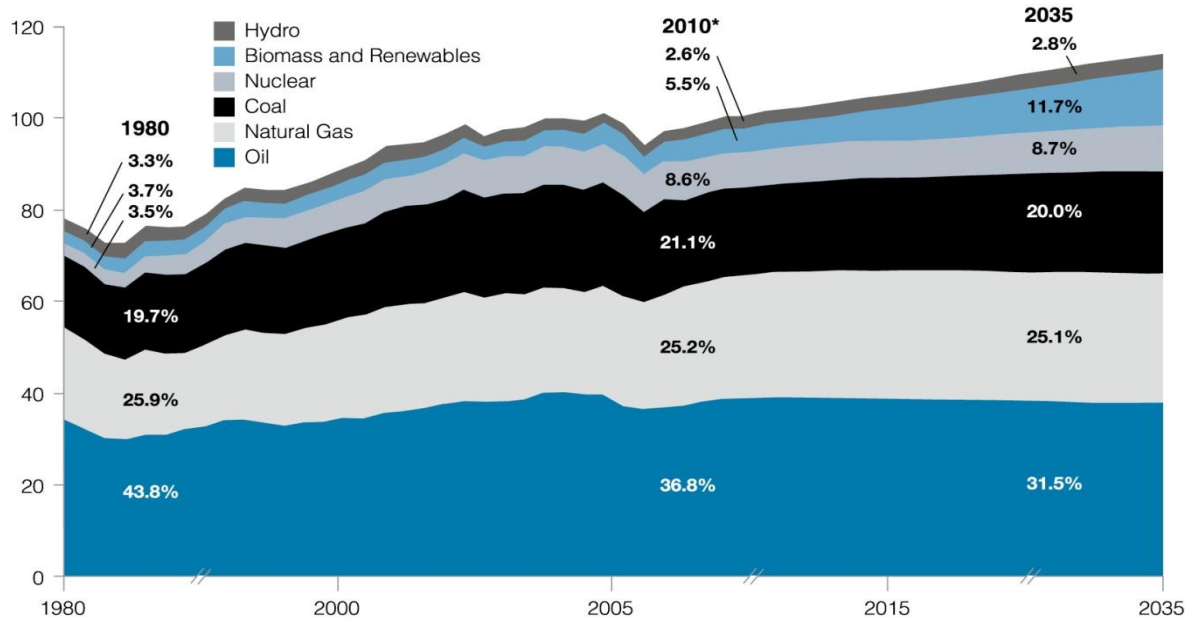


Source: United States Geological Survey (USGS)

The energy landscape is undergoing dramatic structural changes, driven by new engineering technology, which has enabled the discovery and development of new sources of unconventional oil and gas, and by new and proposed environmental legislation, which are intended to address global warming concerns and reductions of greenhouse gas (GHG) emissions.

Nowadays, together, oil and gas demand account for 62% of U.S. energy. For this reason, the government has presented many efforts, especially in the automobile, aviation and power generation sectors where it suggests the use of cleaner and more efficient technologies. For instance, the transportation sector is projected to continue to dominate the demand for liquid fuels, but we expect strides as vehicle efficiency standards and the penetration of biofuels and hybrid and electric vehicles reduce the need for refinery-sourced gasoline and diesel. Forecasts by the EIA indicate that natural gas, renewables, and nuclear power will be increasingly preferred.

## Future U.S. Energy Demand (Quadrillion Btu)



Source: EIA, *Annual Energy Outlook 2012*, Tables A1 and A17

## **2 – Overview of the Brazilian Taxation System**

The current Brazilian taxation system was introduced by the 1988 Constitution, which granted power to Federal, State and Municipal Governments to collect taxes. Due to the several regulations enacted by each of these governmental instances, Brazilian taxation system is very complex, leading to an environment in which taxpayers are requested to comply with many obligations, both comprising tax collection and reporting (accessory obligations). The three institutions that collect taxes in Brazil are Secretariat of the Federal Revenue of Brazil (Federal level), State Secretariat of Treasury (State level) and Municipal Secretariat of Treasury (Municipal level). In the table below, it is provided a brief summary of the Brazilian Taxes related to the oil and gas activities, mentioning the government levels, the main taxes and the corresponding calculation bases plus rates.

<b>Taxes - Oil and Gas Industry *</b>				
<b>Tax</b>	<b>Government Level</b>	<b>Purpose</b>	<b>Rate</b>	<b>Calculation Basis</b>
Social Contribution on Gross Revenues (PIS and COFINS)	Federal	Revenues/Sales	1.65% and 7.6% (respectively)	Calculated on gross revenues, however (respectively) subject to a “non-cumulative” mechanism in which some credits calculated upon inputs
Corporate Income Tax (IRPJ)	Federal	Profit/Net Income	15%	Taxable Income, understood as the accounted for net income (profit or loss) as per financial statements as of the end of the tax period (quarter or year), and exclusions provided adjusted by add-backs by the tax legislation. It is possible 10% surtax on annual taxable income exceeding R\$ 20.000
Social Contribution on Profit (CSLL)	Federal	Profit/Net Income	9%	Similar to the IRPJ’s calculation basis
Federal Tax on Industrialized Goods (IPI)	Federal	Operations with products	Variable by Product	Price of the on Industrialized product industrialized Goods (IPI) (Note that there is a credit mechanism that, to a certain extent, may be compared to a VAT system)
Contribution for Intervention in the Economic Domain (CIDE)	Federal	Oil, derived products and gas	Varies according to the product	quantity of products expressed in a unit set for each product
Import Tax	Federal	Operations with goods	Varies according to the product	transaction and/or service rendering starts in another country, including import operations
ICMS	State	Operations with products	Varies according to the Operation	the petroleum reference price (the most value between weighted average price of the concessionaire and minimum price set by ANP)
ISS	Local	Services	Maximum 5%	Price of Services

\* Information based on October, 2012

Source: Secretaria da Receita Federal do Brasil, Federal Constitution, Statutory Law # 2.657/96 and Supplementary Law # 116

### **3 - State VAT on the Circulation of Merchandise – ICMS**

The Brazilian Constitution granted authority to the states to collect the value-added tax (VAT) on the circulation of goods and interstate and intermunicipal transportation and communication services (ICMS), even if the transaction and/or service rendering starts in another country, including import operations. Therefore, the ICMS comprises a non-cumulative tax and its calculation involves a system whereby in each payment period the taxpayer has to check the amount of ICMS debits (generated on the circulation of goods and services) and ICMS credits (generated on the acquisition of goods); if there are more debits than credits, then the taxpayer will have to pay the tax on the difference. The credits are computed when the goods enter the taxpayer's premises and the debits are computed at the time the products exit the establishment. Taxpayers are not allowed to account for credits on materials purchased that will be used on goods that will not be taxable when they exit the company. In addition, taxpayers are not allowed to account for credits on materials purchased that will be used as consumption goods. ICMS credits related to the acquisition of goods booked as fixed assets have to be recorded on the taxpayer's books in 48 consecutive monthly installments. The ICMS calculation basis is the value of the transaction or service carried out by the taxpayer. The tax calculation basis includes the value of the tax itself (gross-up method) – itemization of the tax separately is only for control purposes. Regarding imports operations, the ICMS calculation basis would consider the value of the goods (CIF) plus the II and other customs expenses; plus IPI; plus the PIS and COFINS due upon importation and the ICMS itself (gross-up method).

About the ICMS rates, the Federal Senate is responsible for setting the interstate rates and the range of the internal rates, in other words, it sets the maximum and the minimum rates that

the states can adopt. As a result, the government tries to avoid the “fiscal war” among the states.

In general, Oil and Gas operations are subject to ICMS taxation in a manner similar to other usual operations. The ICMS is levied by most states at the rate of 17%, except for the states of São Paulo and Minas Gerais, where the tax rate is 18%, and Rio de Janeiro, where the tax rate is 19%. It is worthy to note that, actually the internal rate in Rio de Janeiro is 18%, but this state charge 1% more because of the Poverty State Fund (Fundo Estadual de Combate à Pobreza – FECF – Law # 4.056/02). This increase about 1% rate related to FECF will always happen when intrastate or import operations occur.

According to the Brazilian Constitution and Complementary Law # 87/96, interstate operations involving petroleum and its derivatives are not subject to ICMS. The rate applicable to interstate sales of natural gas is the normal rate – either twelve per cent (12%) or seven per cent (7%), the latter applicable to shipments to states located in the nation’s Northern and Northeastern regions. It should be noted that some operations with gas, oil and its byproducts might be subject to the tax substitution system. In short, the tax substitution system involves one company taking on the responsibility for calculating and paying over the ICMS on behalf of the entire supply chain, based on an estimated final price for the product.

Any State Non-taxpayer Internal rate of shipper’s state ICMS legislation provides certain incentives, such as exemptions. However, it should be noted that since Brazil is constituted as a federation, it has 27 different ICMS tax authorities and regulations, each one of which provides a series of distinct benefits.

#### **4 - State of the Rio de Janeiro – ICMS Statutory Law # 2.657/96**

The oil and gas production in Brazil rose sharply during the last years. This growth is associated with large offshore oil and gas discoveries in Campos Basin (near Rio de Janeiro), which began with the discovery of the Garoupa field in 1974, initiating exploration in ever deeper waters. In the years between 1980 and 1990 several giant fields were discovered in the Campos basin located in Rio de Janeiro.

Nowadays, the State of Rio de Janeiro has the largest oil and gas reserves, and therefore is where most major companies are located. For this reason, the State of Rio de Janeiro, in this industry, owns the largest tax collections in Brazil.

The Secretariat of Treasury of the State of Rio de Janeiro (Secretaria de Estado de Fazenda do Estado do Rio de Janeiro) is responsible for imposing taxes. In 2011, this institution collected about US\$ 1.6 billion related to ICMS from the oil and gas industry. It is worthy to mention that in Brazil ICMS is the only state tax charged along the oil and gas production chain. Conversely, in the United States there are taxes for each part of the production.

In 1996, the State of Rio de Janeiro approved its own ICMS Statutory Law # 2.657/96. The table below will show how this law breaks down this tax into the main aspects relative to the Oil and Gas activities.

<b>ICMS Statutory Law # 2.657/96*</b>		
<b>Chapter</b>	<b>Subject</b>	<b>Oil and Gas Aspects</b>
I	Generator Factor	<p><b>The tax incises over:</b></p> <ul style="list-style-type: none"> <li>a) oil extraction operation</li> <li>b) the interstate operations when the liquids or gas lubricants or fuels get in the state for consumption</li> <li>c) the petroleum extraction when the material pass through the Production Measurement Point (as ANP, the place where it can measure the quantity of petroleum)</li> </ul>
II	Calculation Basis	<p><b>The tax calculation basis is:</b></p> <p>As item c above, the petroleum reference price (the most value between weighted average price of the concessionaire and minimum price set by ANP)</p>
III	Rate **	<p><b>The tax rate is:</b></p> <ul style="list-style-type: none"> <li>a) diesel oil operation - 12%</li> <li>b) oil burned in the land state public transportation and water state public transportation - 6%</li> <li>c) gasoline and ethanol operations - 30 %</li> <li>d) oil extraction operation - 18%</li> <li>e) Vehicular Natural Gas (when burned by the concessionaire of the land state public transportation and of the water state public transportation) - 6%</li> <li>f) kerosene aviation operation - 12 %</li> <li>g) transaction and/or service rendering starts in another country, including import operations – 15%</li> </ul>
IV	Taxpayers	<p><b>The taxpayers are:</b></p> <ul style="list-style-type: none"> <li>a) oil extractor and producer</li> <li>b) the consumer of liquid and gas fuel and lubricant derived from petroleum coming from another state</li> </ul>
VI	Operation and service locations	<p><b>The operation place is:</b></p> <ul style="list-style-type: none"> <li>a) where the consumer is located in the interstate operations with oil, lubricant and fuel operations</li> <li>b) where oil have been extracted</li> </ul>
VII	No incidence of	<p><b>The tax does not incise:</b></p> <p>when the oil, lubricants and fuels derived from petroleum are sent to another state for industrialization and commercialization</p>

\*\* Information based on October, 2012

\*\* As Decree # 36.112/04 the total rate of ethanol operations is 24% + 1% (FECP) = 25%. All these rates cited on this table must be increased by 1% related to the FECP.

Source: ICMS Statutory Law # 2.657/96



## **5 - Substitution Tax Regime**

Tax substitution is a legal method of collecting taxes for products that typically have few producers, but many customers such as products derived from petroleum. In order to simplify tax collection the government created a process that comprises a much reduced volume of ICMS payments. In fact, it consists in the possibility of giving the other person, the condition responsible for payment of tax on taxable event practiced by others.

In this sense, basically, in the oil and gas industry, a company refines the petroleum to produce diesel oil and sells it to a reseller, who in turn sells it to the final customer. Instead of both the producer and the reseller submitting ICMS payments to the tax authorities, the tax authorities transfer the right to collect taxes to the first company that participate of this chain. The producer, called the substitute taxpayer (Substituto Tributário), is obligated to submit ICMS tax to the tax authorities, including the tax incurred when it sells to the reseller and the tax on the presumed resale surcharge that it collects from the reseller. The system calculates the surcharge for the product by applying a percentage rate or a fixed price per unit both divulgated by the government. In case of the following operation does not occur, the government refund this taxpayer by the substitution tax paid initially.

For example, if an oil company refines petroleum and sells it for US\$ 10, the government states that, while the product trade passes through the chain, the price of the product will be incorporated into the profits and other costs for each phase of the chain in the order of 50%. Therefore, when these goods reach the final consumer, its price will be US\$ 15. This company, therefore, despite selling the goods for US\$ 10, pay taxes on US\$ 15. This amount of tax will be charged to your bill when it sells and product will charge US\$ 10 plus the value of the tax, and this even when the buyer will sell product and so on, until you reach

the final consumer. Between this company and the consumer end, there will be no tax calculation, because the company has already paid the tax due on the chain.

Some advantages derive from the system of Substitution Tax, for taxpayers, the tax substitution centralizes the collection of the tax due on the taxpayer by a third party replacement, facilitating the monitoring and encouraging equality in taxation and preventing unfair competition between taxpayers who collect and those who do not regularly collect their taxes. With this process, business operations earn agility and simplicity in the issuance of tax documents and bookkeeping, and mitigate distortions and competition between taxpayers in the same field of activities. Additionally, for society, the system of tax substitution is an important tool used by the state to broaden its revenue base, facilitating the monitoring, reducing tax evasion and generating revenue through benefits to society.

Nevertheless, in the oil and gas industry, especially in the State of Rio de Janeiro, this regime is regulated by the Decree # 27.427/00, book 4. Therefore the article # 1 of this book says that is attributed to the Petroleum refineries or to the Industry owner located in the State of Rio de Janeiro, in the intrastate operations, and to the sender located in another state, i.e. interstate operations, the condition of substitute taxpayer related to the ICMS on these operations involved with fuel, lubricant, derived or not from petroleum, since the first operation in the chain until the final consumer operation.

Additionally, the same decree cites that in the intrastate operations with ethanol, fuel oil and aviation kerosene, the responsibility of collection this tax related to the following operations is attributed to the fuel distributors. Concessionaire of Gas distribution is responsible to collect the tax in the following operations with vehicular gas natural. In the import operations of fuel derived or not from petroleum, the tax should be paid by the importer. In case of the first company located in the chain do not collect the tax the receiver will have to pay it.

There are two examples below involving gasoline in both interstate and intrastate operations. These will describe thoroughly how it can calculate the tax from the substitution tax regime.

As Statutory Law # 2.657/96, the gasoline rate is 31% (30% of ICMS and 1% of FECPE). In the interstate operation, the calculus is:

At first, it multiplies the quantity of the product in the receipt by the Weighted Average Price to the final consumer (Preço médio ponderado a consumidor final - PMPF) divulged by the Government. After that it applies 31% gasoline rate. The result must be decreased from the own tax showed in the receipt. As mentioned before in the chapter four, the interstate operations involving oil and their products do not incise ICMS. For this reason the own tax showed in the receipt is zero.

<b>ICMS Substitution Tax Calculus - Interstate Operation</b>								
Quantity (1)	Unit Product Value (R\$) (2)	Total Product Value (1) x (2) = (3)	Interstate Tax Rate (4)	Own tax showed in the receipt (3) x (4) = (5)	PMPF Value (6)	Calculation Basis of Substitution Tax (3) x (6) = (7)	Gasoline tax Rate (8)	ICMS Substitution Tax (7) x (8) - (5)
5.000	1,5	7.500	12%	-	2,2730	17.047,50	31%	5.284,73

By contrast in the intrastate operation the methodology continues the same but there is one difference in the calculation of the ICMS Substitution Tax. Because of the own operation is not exempt, the own tax showed in the receipt should be decreased by the ICMS Substitution Tax.

<b>ICMS Substitution Tax Calculus - Intrastate Operation</b>								
Quantity (1)	Unit Product Value (R\$) (2)	Total Product Value (1) x (2) = (3)	Intrastate Tax Rate (4)	Own tax showed in the receipt (3) x (4) = (5)	PMPF Value (6)	Calculation Basis of Substitution Tax (3) x (6) = (7)	Gasoline tax Rate (8)	ICMS Substitution Tax (7) x (8) - (5)
5.000	1,5	7.500	31%	2.325,00	2,2730	17.047,50	31%	2.959,73

## **6 - Overview of American Taxation System**

The federal, state, and local tax systems in the United States have been marked by significant changes over the years in response to changing circumstances and adjustments in the role of government. The types of taxes collected, their relative proportions, and the magnitudes of the revenues collected are all far different than they were 50 or 100 years ago.

The federal political system consists in a federalism where the state and local governments are autonomous. Therefore, there are taxes levied at each of these levels. These include taxes on income, payroll, property, sales, imports, estates and gifts, as well as various fees. Nevertheless, in the oil and gas industry, the fiscal regime is defined by the combination mainly of corporate income tax (CIT), Severance tax, royalty payments and indirect taxes.

It is worthy to mention that USA does not have a Value Added Tax (VAT) or Goods and Services Taxes (GST) tax regime. These two systems are defined by which each trader in the chain of supply is charged. As a result, the related sales are entitled to deduct from this amount the VAT paid on his or her purchases. Along the production, each supplier puts its value added to the product and collects its own tax that is remitted to the government at this time. In other words, the sales tax is like VAT or GST. Nevertheless, the only difference is that the sales tax is collected and remitted to the government only once, at the point of purchase by the end consumer.

There are entities that collect taxes in the United States related to these three levels of government. Internal Revenue Services refers to the federal government and The Comptroller's Office related to the state level that remits to each local jurisdiction its share of sales tax collections for the period. About the local level, there are tax entities that levy taxes according to the location (cities, counties, Special Purpose Districts and Transit Authorities).

In the table below, it is provided a brief summary of the American Taxation System connected to the oil and gas activities including their main taxes and characteristics.

<b>Taxes - Oil and Gas Industry *</b>			
<b>Tax</b>	<b>Government Level</b>	<b>Rate</b>	<b>Calculation Basis</b>
Income tax rate	Federal	35%	Taxes levied on taxable income that consists in the gross income (all taxable ordinary and capital income) less deductions (expenses to the extent incurred in producing gross income) . There is also an alternative minimum tax (AMT) regime with 20% rate. This affects companies that contain large Intangible Drilling Costs (IDC) deductions.
Import duties	Federal	Varies according to the products	Applied to the goods, equipments and materials that enter the United States. The rates could be ad valorem (%), a specific amount (rate per unit or quantity) or a combination of both.
Capital gains	Federal	35%	Determined by deducting the adjusted cost basis of an asset from the proceeds (money received or receivable and the market value of any property received or receivable).
Excise tax	Federal/ State	Varies according to the products	Applied to the petroleum products manufactured in the USA. It imposes on gasoline (aviation fuel and gasoline blend stocks), diesel fuel, emulsion, kerosene used in aviation, compressed natural gas and fuels used in commercial transportation on inland waterways. Besides that, one kind of excise tax is the oil spill liability tax that applies to crude oil received at a US refinery and to petroleum products entering into the US for consumption, use or warehousing.
Severance tax	State	Varies according to the state	Levied on the extraction of natural resources such as oil, coal and gas. This includes onshore and offshore waters. Calculated by the flat amount per volume produced or as a percentage of gross receipts.
Income tax rate	State	0% to 12%	Based on the income of companies that do business within the state. Calculated by certain state-specific additions and subtractions to federal taxable income. It could be also calculated by taxable income based on gross receipts, subject to state-specific definitions and modifications. Taxable income is apportioned to an individual state based on factor that compares property, payroll or sales activity within the state to those same factors within outside the state. Apportioned income times the state income tax rate determines the tax due.

<b>Taxes - Oil and Gas Industry *</b>			
<b>Tax</b>	<b>Government Level</b>	<b>Rate</b>	<b>Calculation Basis</b>
Franchise tax	State	0.15% to 1.0%	Applied to companies organized and qualified to do business within the state. Companies that exercises or continues the corporate charter within the state or owns or uses any of the corporate capital, plant or other property in the state are able to pay the franchise tax. This tax is calculated by multiplying the value of the apportioned assets, capital stock or net worth employed in the state by the franchise tax rate.
Sales taxes	State / local	Varies according to the state	Sales taxes are applied at the final point of sale to a consumer of a taxable good or service, except on sales for resale. The taxable base generally includes the total amount for which the tangible personal property is sold, including any services rendered by the seller in connection with the sale.
Use taxes	State / local	Varies according to the state	Use taxes are applied to goods and services purchased outside of state but used within the state. It has the same concept of Sales tax. The use tax is typically assessed at the same rate as the sales tax and applies when sales tax has not been charged. Purchases made over the Internet are the most common transactions subject to a use tax.
Petroleum tax	State	Varies according to the state	Applied to the petroleum products delivered within the state if the company sells these products to a purchaser in a state that is not a licensed distributor or does not hold a direct payment certificate. Based on the gross earnings derived from the sale of these products.
Property taxes	State / local	Varies according to the state and local	Taxes imposed on the ownership of property and measured by its value. The rate is ad valorem on real or tangible personal property located in the jurisdiction.
Inspection fee	State	Varies according to the state	Inspection on petroleum products distributed, sold, offered or exposed for sale or use, or use or consumed in a state. It can be imposed on fuels removed from a terminal using a terminal rack.
Registration fee	State	Varies according to the state	It imposes on the transfer of title of tangible or real property.
Other fees	State	Varies according to the state	Some states levy taxes based on the gross receipts of companies that transport natural gas by pipeline for hire, sale or use. Others impose fees on underground storage tanks under the hazardous waste control law.

\* Information based on January 1st, 2012

Source: Ernst and Young Oil & Gas Tax Guide 2012

## **7 – Taxation System in Texas**

Texas' oil and gas businesses have brought together technology, manpower, and investment to keep this State number one in energy production. For this reason, this industry is a major source of state and local tax revenues and has an important role both economically and fiscally in Texas.

No other industry is as heavily taxed and at so many separate points, as the oil and gas industry. As a matter of public policy, the State of Texas taxes every phase of oil and gas exploration, production, transportation, refining and the sale of gasoline.

The Comptroller's Office published a financial report based on revenue by source for the fiscal year 2011 containing the major taxes collected and the result was about US\$ 39 billion. Out of this total, the main taxes from oil and gas activities that contributed were motor fuels tax that accounted for 3.2% (approximately US\$ 3 billion), oil production tax with 1.6% (approximately US\$ 1.5 billion) and natural gas production tax with 1.2% (approximately US\$ 1 billion).

The oil and gas production chain starts with exploration and finishes with sales of their products. It is worthy to mention that while exploration and production represents the largest component of oil and gas industry activity and taxes paid in the state, other oil and gas sectors are also significant sources of economic output, employment, and tax revenues. Oilfield machinery and equipment manufacturing, petroleum refineries, pipeline transportation, natural gas transmission and distribution, and petroleum products wholesaling are integral parts of the process of retrieval, conversion, and transport of crude oil and natural gas for ultimate consumption.

In the table below, it is provided a brief summary of the American Taxation System in Texas connected to the oil and gas activities including their main tax rates and aspects.

Taxes in Texas - Oil and Gas Industry			
Tax	Government Level	Rate	Main Aspects
Excise tax	Federal / State	US\$ 0.20 per gallon of Diesel fuel	Also defined as Motor fuel tax. Both federal and state impose this tax. For instance, in Texas the price of diesel contains excise tax charged by the federal government (US\$ 0.244) plus the portion from the state government (US\$ 0.20). The tax is collected from fuel distributors and interstate trucking companies and is paid ultimately by the person using or consuming the fuel for the purpose of propelling a vehicle upon the public highways of this state. Texas levies only the excise tax on motor fuels. Besides the charge from the federal government (US\$ 0.244), most other states levy state sales or other state taxes on motor fuels, in addition to motor fuels excise tax. For instance, in Oct/2012, California imposed excise tax on the price of diesel US\$ 0.10 + US\$ 0.427 (other tax).
		US\$ 0.20 per gallon of Gasoline	Also defined as Motor fuel tax. Both federal and state impose this tax. For instance, in Texas the price of gasoline contains excise tax charged by the federal government (US\$ 0.184) plus the portion from the state government (US\$ 0.20). The tax is collected from fuel distributors and interstate trucking companies and is paid ultimately by the person using or consuming the fuel for the purpose of propelling a vehicle upon the public highways of this state. Texas levies only the excise tax on motor fuels. Besides the charge from the federal government (US\$ 0.184), most other states levy state sales or other state taxes on motor fuels, in addition to motor fuels excise tax. For instance, in Oct/2012, California imposed excise tax on the price of Gasoline US\$ 0.36 + US\$ 0.145 (other tax).
		US\$ 0.15 per gallon of Liquefied Gas (prepaid users based on mileage and registered gross weight of vehicle)	Also defined as Motor fuel tax. Both federal and state impose this tax. For instance, in Texas the price of liquefied gas contains excise tax charged by the federal government (US\$ 0.243) plus the portion from the state government (US\$ 0.15). It is imposed on the use of liquefied gas (i.e., butane, propane, compressed natural gas) as a motor fuel. Motor vehicles licensed in Texas and equipped with a liquefied gas system are required to prepay the tax by purchasing a liquefied gas tax decal. Motor vehicles licensed in other states, Mexico, or licensed under the IFTA pay the tax at the retail pump to a licensed dealer. Texas levies only the excise tax on motor fuel. For instance, in Oct/2012, besides the charge from the federal government (US\$ 0.243), California only imposed the excise tax US\$ 0.06 per gallon as well.
Severance tax	State	4.6% of the market value of oil	This severance tax is essentially a tax on gross income. The oil production tax is levied on 4.6 percent of the market value at the wellhead of crude oil produced in the state. This tax is an occupation tax imposed on each producer of oil in the state. Enhanced Oil Recovery Exemption (EOR) 2.3% (.023) of market value of oil; Incremental Production Exemption 2.3% (.023) of market value of oil; Co-Production Project Exemption 2.3% (.023) of market value of oil; Three Year and Two Year Inactive Well Exemptions 0.0% (.000) of market value of oil. Regulatory Tax: 3/16 of a cent (\$.001875) per barrel. Regulatory Fee: 5/16 of a cent (\$.003125) per barrel for report periods prior to September 2001. For report periods September 2001 and later, 5/8 of a cent (\$.00625) per barrel.
		7.5% of the market value of gas and 4.6% of market value of condensate.	This severance tax is essentially a tax on gross income. The natural gas production tax is imposed at 7.5 percent of the market value of natural gas produced and saved in the state. The tax applies to casing head gas produced from oil wells as well as to gas produced from gas wells. Natural gas that condenses to liquid form when brought to the surface (condensate) is taxed at 4.6 percent of value (the same rate as for the oil production tax). Liquid hydrocarbons recovered from gas other than condensate are subject to the 7.5 percent tax rate. The tax is an occupation tax imposed on each producer of natural gas in the state. You can lower your taxes owed if you qualify for a Certified Exemption. Incremental Production Exemption 3.75% (.0375) of market value of gas; 3 Year and 2 Year Inactive Well Exemptions 0.0% of market value of gas; Co-Production Project Exemption 0.0% of market value of gas; High-Cost Gas Exemption 0.0% of market value of gas. High-Cost Gas Reduced Tax Rate 0.0% to 7.4% (.000 to .074) of the market value of gas, the rate varies by well depending on how the well's drilling and completion costs compare to the median cost of all High-Cost gas wells (previous State fiscal year). Flared Gas Exemption 0.0% (.000) of market value of gas. Regulatory Fee: For report period prior to September 2001, 1/30 of a cent (.00333) for thousand cubic feet of gas produced. For report periods September 2001 and later, .000667 for thousand cubic feet of gas produced.



Tax	Government Level	Rate	Main Aspects
Oil and Well Servicing Tax	State	2.42% of taxable services	This tax is imposed on the gross receipts from performance of oil well service. Deduction is allowed for the reasonable value at the well of material used, consumed, or expended in or incorporated into the well. This type of service means cementing the casing seat of an oil or gas well, shooting, fracturing, or acidizing the sands or other formations of the earth in an oil or gas well, or surveying or testing the sands or other formations or their contents in an oil or gas well by using instruments or equipment at least a part of which are located in the well bore when the survey or test is made. The tax does not apply to drilling or reworking an oil or gas well or to a service incidental to the business of drilling or reworking. The tax is an occupation tax payable by providers of oil and gas well services. Some states can impose sales tax rather than the oil and well servicing tax.
Sales and Uses Taxes	State	State - 6 .25% City - 0.25% - 2% , depending on local rate County - 0.5% - 1.5% , depending on local rate Transit - 0.25% - 1% , depending on local rate Special Purpose Districts - 0.125% - 2% , depending on local rate	Sales tax is imposed on all retail sales, leases and rentals of most goods, as well as taxable services. Texas cities, counties, transit authorities and special purpose districts have the option of imposing an additional local sales tax for a combined total of state and local taxes of 8.25%. The seller must be located within the state. On the other hand , the use tax is applied to goods and services purchased outside of state but used within the state. It has the same concept of Sales tax. The use tax is typically assessed at the same rate as the sales tax and applies when sales tax has not been charged. It is worthy to mention that Texas applies the Origin-Based sales tax in which the sales tax is charged at the seller's place. Only ten states adopt this concept. The remaining states use the Destination-Based sales tax which matter is the consumer's location. Most equipment and supplies used in minerals exploration and production are taxable, including drilling rigs, items to be installed at the well including pipe, pumps, machinery, storage tanks, industrial chemicals, drilling fluids, lubricating oils and greases, valves and pipe fittings, drill bits and reamers, and measuring and controlling instruments and devices, et al. Use tax has the same concept of sales tax however it is imposed when all retail sales, leases and rentals of most goods, as well as taxable service take place out of the state.
Income tax rate	State		Texas does not levy an individual income tax.
Franchise tax	State	1.0% for most entities 0.5% for qualifying wholesalers and retailers 0.575% for those entities with \$10 million or less in Total Revenue (annualized per 12 month period on which the report is based) electing the E-Z Computation	A taxable entity is primarily engaged in retail or wholesale trade only if: the total revenue from its activities in retail or wholesale trade is greater than the total revenue from its activities in trades other than the retail and wholesale trades; less than 50 percent of the total revenue from activities in retail or wholesale trade comes from the sale of products it produces or products produced by an entity that is part of an affiliated group to which the taxable entity also belongs (this does not apply to Eating & Drinking Places described in Major Group 58 of Division G); and the taxable entity does not provide retail or wholesale utilities, including telecommunications services, electricity or gas.
Petroleum Products Delivery Fee	State	Varies according to the net total gallons of all petroleum products withdrawn: \$2.75: Less than 2,500 \$5.50: 2,500 but less than 5,000 \$8.65: 5,000 but less than 8,000 \$11.00: 8,000 but less than 10,000 \$5.50: Each 5,000 gallon increment on 10,000 gallons or more	This fee is collected by bulk facility operators (rail, pipeline, barge, or refinery terminals) upon the withdrawal of petroleum products into cargo tanks and on petroleum products imported into Texas. For gasoline deliveries of at least 7,000 but less than 8,000 gallons (whether single product type or split load), special rules apply: If the gasoline portion of the delivery is less than 7,000 gallons, the fee is \$8.65. If the gasoline portion of the delivery is at least 7,000 gallons, the total load is presumed to be at least 8,000 gallons and the fee is \$11.00.
Automotive Oil Sales Fee	State	One cent per quart of automotive oil imported or sold in Texas	This fee is levied on the first sale of automotive oil delivered to a location in Texas and sold to a purchaser who is not an automotive oil manufacturer or distributor; and on automotive oil imported into Texas for sale, use, or consumption. Oil manufacturers, distributors, and importers are liable for the fee.

Source: Internal Revenue Service, Texas Comptroller of Public Accounts, American Petroleum Institute and Federation of Tax Administrators

## **8 - Comparison between both Taxation Systems**

The objective of this section is to show the main issues about the Brazilian and American taxation system in which will be made a comparison identifying the key differences between both systems.

Considering the 1988 Constitution where basically the Brazilian taxation system had its origin the ICMS legislation is very recent. It is based on the principle of strict legality in which was defined three jurisdictions and tax collection levels. Thus, taxes may be levied by the federal, state and municipal governments.

Referring to the oil and gas industries, the state government from Brazil imposes only the ICMS on the entire production chain i.e. on the every phase of oil and gas exploration, production, transportation, refining and the sale of product. For this reason, its legislation is very wide and complex besides to vary according to the state. Its mechanism about debits and credits helps to complicate more its understanding. Additionally, tax rates may be higher depending on the local legislation and type of operation. In many aspects, it operates like a value-added tax. In general, ICMS taxpayers are entitled to a tax credit in the amount of the tax paid in the previous transaction. The tax credit may be offset against future ICMS payables. If the purchaser is not an ICMS taxpayer, and depending on whether its sales are subject to this tax, ICMS may become a cost and will not be recoverable as a credit.

Moreover, two aspects about its incidence that are important to mention, first of all, the ICMS is exempt when the oil, lubricants and fuels derived from petroleum are sent to another state for industrialization and commercialization and secondly the ICMS is related to the Destination-based i.e. it is only charged on the destination place. This model of ICMS taxation has raised several discussions in the past in regard to tax leakage for the State where the oil was produced.

In this industry, the main characteristic in order to apply the tax is the Substitution Tax Regime (Substituição Tributária). This method consists to collect the tax only at the beginning of production. In this case, the company that refines the oil or the gas producer is the responsible for paying the tax. Despite both producer and the reseller remit ICMS payments to the tax authorities, the government transfers the right to collect taxes to the first company that participates of this chain. The producer is called the substitute taxpayer (Substituto Tributário).

As the triggering event is deemed, the price of the future transaction is still unknown, which means that there is no taxable basis to calculate the ICMS charged in advance. Thus, the criteria to be used in order to fix the deemed taxable basis of the ICMS to be paid in advance shall be as close as possible from the actual value of the deemed transactions.

On the other hand, in the United States, its old taxation system reflects the federalism applied over the country and especially over the 50 states. The federal, state, and local tax systems in the United States have been marked by significant changes over the years in response to changing circumstances and changes in the role of government. The types of taxes collected, their relative proportions, and the magnitudes of the revenues collected are all far different than they were 50 or 100 years ago. The changes were more gradual, responding to changes in society, in our economy, and in the roles and responsibilities that government has taken unto itself.

With the exception of the United States and parts of Canada, where there is a combination of public and private ownership of mineral resources, oil and gas resources in Brazil are owned by the public. Depending on the institutional framework within each jurisdiction, the right to explore for and develop oil and gas resources is granted by the government through the

ministry of energy, a government agency established to administer mineral rights, or through the national oil company (NOC).

In the USA, the tax legislation diverges widely in the states. In the oil and gas industry, each phase of the production chain the state level can impose different taxes and fees. This way, there are taxes along the whole chain such as severance tax, Oil and Well Servicing Tax, Sales and Uses Taxes, Franchise tax, Petroleum Products Delivery Fee and Automotive Oil Sales Fee.

Basically, the calculation basis is simple in which the taxpayer applies the rate and finds his amount to pay. Finally, it is important to mention that about the sales and use taxes only ten states (Arizona, California, Illinois, Mississippi, Missouri, New Mexico, Pennsylvania, Texas, Utah and Virginia) adopt the Origin-Based sales tax that consists the charge is where the seller is placed, conversely, the remaining states use the Destination-Based sales tax in which the relevant aspect is the consumer's location in order to impose taxes.

## **9 – Conclusion**

Nowadays, both Brazilian and American taxation systems are characterized by the presence of several laws acting into the three levels, federal, state and local.

In Brazil, the burden tax, especially related to the ICMS, is very complex where it can see positive and negative aspects. In the oil and gas industry, ICMS is the only state tax charged on the entire production chain since exploration until the sale of product. For this reason, its legislation is very extensive and difficult to the taxpayers apply it, especially the different generator factors and the calculation basis related to the debits and credits system. Due to the 1988 constitution, not only the legislation of ICMS varies to each state but also the rates that provoke a fiscal war among them. Actually, it is an important concern that government faces every day affording laws in order to maintain the fiscal equilibrium over the country.

Additionally, according to the constitution, the Origin-Based is applied to the ICMS that consists to levy tax on the seller's place but only in the oil and gas activities. Destination-Based is more used i.e. the consumer's location is relevant to impose the tax. In fact, it has been causing many losses to the economy of the State of Rio de Janeiro.

On the other hand, the legislation related to the oil and gas industry imposes an interesting system called Substitution Tax Regime (*Substituição Tributária*) in which its mechanism seeks to simplify and improve the fiscal control and avoiding the fiscal evasion. The tax substitution eases the collection of the tax and the related operations become more agile and simple decreasing the volume of tax documents.

In the United States, there are the same problems faced in Brazil such as the dense legislation about taxes in the oil and gas industry. It is important to mention that for each phase of oil and gas production it has a specific tax such as franchise tax, severance tax,

oil and Well Servicing Tax and others. The same taxpayer can pay different taxes, but their calculation bases are easier to apply.

Because of the federalism the laws are different in each state. For this reason, it is possible to imagine that many consumers look for regions where they can purchase products with lower taxes. For instance, as the Tax Foundation, there was a research that “strong evidence exists that Chicago-area consumers make major purchases in surrounding suburbs or online to avoid Chicago's high sales tax rates. At the statewide level, businesses sometimes locate just outside the borders of high sales tax areas to avoid being subjected to their rates. The State of Delaware actually uses its state border welcome sign to remind motorists that Delaware is the "Home of Tax-Free Shopping." Because of that state and local governments should be cautious about raising rates too high relative to their neighbors in order to not lose revenues from these products.

In fact, this paper seeks to describe the Brazilian and American fiscal regime in the oil and gas industry and their characteristics. It breaks down since the overview of this sector in both countries to the running of both systems. Besides that, it identifies the main differences not only by the tax outlook such as which taxes are imposed on both countries but also by the political outlook for instance the american oil and gas market where exists a combination of private and public companies differently the brazilian environment where prevails the only public company (Petrobras). Each phase of the production chain is detailed on this paper and which tax is charged by the state government.

Additionally, the main goal of this paper is not to show which system is better or over the economic efficiency aspect which regime owns the best perspective. The purpose of this paper is to emphasize and to show clearly how both systems work in general at the state level. It is not a concern to reflect about the two systems and to offer or to launch any more analysis or ideas.

This way, due to the complexity of these issues, I believe that it would be very interesting a paper in which it could enhance these topics. By the way, another worthy subject for a paper would be to approach anything in the U.S. tax system that might be transplanted to Brazil or vice-versa.

As matter of fact, every day the Brazilian and American governments make efforts in order to provide a better legislation to the own country. To focus on possible adjustments to the current tax system that would make tax filing simpler, to have less of an adverse impact on behavior, or to shift the distribution of tax burdens are important points to include in the both country agendas. For taxpayers and government, in other words, for the whole society a fair tax system is the main goal, however, there is no perfect taxation regime. In both countries, what it can realize that each system presents its advantages and disadvantages.

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