Statement of Lynne Hackedorn
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Testimony for the House Natural Resources Energy and Minerals Resources Subcommittee Hearing
"American Energy Jobs: Opportunities for Women and Minorities"
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Thank you Chairman Lamborn, Ranking Member Holt and Members of the Subcommittee for the opportunity to testify before the Subcommittee today. I believe this hearing will shed additional light on how the expansion of American energy has provided and will continue to provide jobs and opportunities to people of all backgrounds, including women and minorities.

My name is Lynne Hackedorn. I am the Vice President, Government and Public Affairs for Cobalt International Energy in Houston, Texas. As part of my duties, I am a member of Cobalt's Executive Management Team, and I appreciate the opportunity to: describe some of the opportunities I have personally had in the growing energy sector, tell you a bit about the company that I work for, Cobalt International Energy, and explain the important role independent producers play in the Gulf of Mexico.

I am very fortunate to have had a fulfilling and rewarding career in the upstream oil and gas industry for over thirty years. However, my career in the oil and gas business started a long way away from the senior management position I hold now. I began working in this industry in 1979 as a Secretary in the Government Relations Department of Atlantic Richfield Company (ARCO) in Dallas, Texas. Soon after joining the company, I transferred to the Land Department as a Land Secretary. In this role, I supported the company's Dallas office Landmen. As I learned more about the Landman position, I became very interested in becoming a Landman myself; however, I didn't have a college degree, which was a requirement for the position.

In 1980, I enrolled in a nearby college and attended college classes in the evenings after work. Two years later, I moved to Houston, where I continued my college education. In 1984, I graduated Magna Cum Laude with a Bachelor of Science degree in Petroleum Land Management, and was fortunate to have been re-hired by ARCO as a Landman in their Houston office. During my first six years at ARCO, I worked as an Onshore Landman, working the South Texas region. An Onshore Landman is responsible for researching the ownership of the mineral rights under the acreage where the company wants to drill an oil or gas well. Once the mineral rights are determined, the Landman contacts each mineral rights owner and enters into negotiations for leasing those rights so that the company can drill the well. In addition, they negotiate agreements with other oil and gas companies to jointly participate in wells, if so desired.

In 1990, I was assigned to ARCO's Offshore Gulf of Mexico region, where I worked as an Offshore Landman. The role of an Offshore Landman is quite a bit different than an Onshore Landman, since the offshore mineral rights are owned by only one "landowner," the Federal Government. Therefore, oil and gas leases are acquired through a sealed bid process at Federal OCS Lease Sales. The Offshore Landman spends more of his or her time negotiating agreements and trades, such as joint operating agreements, acquisition agreements, and other types of arrangements with other oil and gas companies. In addition, the Offshore Landman ensures that the company is in full compliance with the terms and conditions of its leases and its agreements.

I left ARCO in 1994 to accept a position at a small independent Gulf of Mexico-focused exploration and production company. In 1999, the company was acquired by a much larger company and in mid-2001 I accepted an Offshore Landman position with another very successful small independent Gulf of Mexico-focused exploration and production company. As fate would have it, in late 2005, that company was acquired by another very large oil and gas company. Soon thereafter, in early 2006, just two months after Cobalt International Energy was formed, one of Cobalt's founding executives contacted me to interview for Cobalt's Land Manager position. And while I wasn't planning to leave the company for whom I was working, I was quite impressed with Cobalt's Executive team and business plan and also found the opportunity to work for a company from its beginning to be quite intriguing. Therefore, in April, 2006, I started working for Cobalt as its Land Manager, and was the fifteenth employee of the company. In 2009, I was promoted to Vice President, Land and in 2010, I transitioned into my current role of Vice President, Government and Public Affairs.

Cobalt International Energy was formed in November, 2005 out of the vision of Cobalt's Chairman and Chief Executive Officer, Joseph Bryant to form a unique deepwater exploration and production company whose business model would leverage the best investors, human talent, technology, data and partners in the world in order to create one of the most successful new energy enterprises in the 21st century. Bryant brought together a small team of highly experienced executives to partner with him in forming Cobalt, and obtained funding from well-established private equity companies, including Goldman Sachs, Carlyle Riverstone and First Reserve Corporation. Cobalt's areas of focus are the below-salt basins of the deepwater Gulf of Mexico and deepwater offshore Angola and Gabon, West Africa. In December, 2009. Cobalt became a public company through an Initial Public Offering that resulted in being the largest exploration and production company IPO up to that time.

Since its inception, Cobalt has acquired interests in over 250 deepwater Gulf of Mexico leases. These leases were acquired predominantly through bidding in the Federal OCS Lease Sales, although a number of Cobalt's lease interests were obtained through joint ventures with other lease holders in the Gulf. Cobalt is the Operator of 85% of its Gulf of Mexico leases, and holds an average 50% working interest in these leases. Cobalt has drilled a number of exploration wells in the deepwater Gulf of Mexico and has made three significant discoveries to date. These include the Heidelberg, Shenandoah and North Platte fields. Cobalt and its partners sanctioned the Heidelberg field in 2013 and anticipate production to begin in 2016. Shenandoah

and North Platte are in the appraisal phase and we look forward to learning more about the size and resource capacity of those fields as we move through the appraisal process. Of interest is the fact that the Cobalt-operated North Platte field was named the Best Discovery of 2012 by Oil and Gas Investor Magazine.

Cobalt is an independent exploration and production company. Independent companies play a significant role in the Gulf of Mexico, including the deepwater. According to IHS Global Insights' study, The Economic Impact of the Gulf of Mexico Offshore Oil and Natural Gas Industry and the Role of the Independents (attached), "In the deepwater portion of the Gulf of Mexico, independents are the largest shareholder in 52% of all leases and in 46% of the producing leases. They operate over half of the developing and producing deepwater fields."

In West Africa, Cobalt is operator of and holds a 40% working interest in three very large deepwater offshore Angola licenses. In addition, Cobalt holds a 21% non-operated interest in a very large deepwater offshore Gabon license. The company has enjoyed tremendous success offshore Angola, having drilled five consecutive oil discoveries on five separate prospects on our Angola licenses. This is a near unprecedented track record of success in oil exploration, and we look forward to moving these discoveries through the appraisal phase. Cobalt's first offshore Angola discovery, which we call Cameia, is on track to be sanctioned in late 2014, and we anticipate the start of production from this field as early as 2017. One of Cobalt's subsequent offshore Angola discoveries, the Lontra #1 exploratory well, was named the top discovery of 2013 by both Tudor, Pickering, Holt & Co. and the American Association of Petroleum Geologists.

From Cobalt's inception in 2005, its management team has always set bold objectives to achieve industry leading results in all of its operations. This uncompromising pursuit of excellence drives everyone at Cobalt, it is one of our core values. In total, our values define Cobalt's culture and are standards for conducting our business with the highest level of integrity and an unwavering commitment to the health and safety of our employees and stakeholders with absolute resolve to protect, and improve the environment where we can. We know that these exceptionally high standards are key to attracting the industry's best talent. And on that score our results confirm that Cobalt's team is among the most talented in the industry. Great people are the reason that we have achieved industry leading exploration and operational results.

Cobalt has offices in Houston, Texas and in Luanda Angola. Cobalt's staff consists of approximately 180 employees and an additional 115 or so contractors and consultants worldwide. Employing these nearly 300 highly experienced personnel has allowed Cobalt to successfully compete with some of the world's largest exploration and production companies in technically-challenging basins.

Cobalt is proud of the diversity of its highly skilled staff of professionals. In fact, nearly 30% of Cobalt's U.S. professional positions are held by women. These positions include drilling engineers, reservoir engineers, geologists, geophysicists, accountants, commercial advisors,

health, safety, security and environmental management and staff, treasury management and staff, offshore scout, human resources management and staff, business analysts, land analysts, IT advisors, exploration, drilling and investor relations technologists, and government and public affairs management and staff.

At the executive level in Cobalt, women represent over 18% of the executive team, including the position of Vice President, Human Resources and my position as Vice President, Government and Public Affairs. Also, Senator Kay Bailey Hutchison joined Cobalt's Board of Directors in late 2013 as the first woman on Cobalt's nine-member Board.

In addition to these positions held by women at Cobalt, it is important to note that over 17% of Cobalt's U.S. professional positions are held by minorities. These positions include drilling manager, IT specialists, human resources advisor, health, safety, security and environmental management, reservoir engineer, geophysicist, financial and accounting professionals.

We are proud of our efforts to continue to promote diversity at Cobalt. My own career reflects the dynamic nature of our nation's energy portfolio, I have moved from focusing onshore to working with a company that is focused on exploration and production at depths not even contemplated when I entered the workforce. For example, last year Cobalt drilled the deepest and most technically challenging deepwater well ever drilled. Areas once thought to be limited in resources have become major success stories. Because of technological innovations associated with exploring in the deepwater and Congress's allowing access to such areas, more opportunities have been presented to me and countless others, and I think that is an issue that is often overlooked when debating the benefits of a vibrant energy industry. It is vital that our nation's young people, including young women and minorities, are encouraged to consider the abundant and diverse career opportunities that our industry provides so that they can prepare themselves for these exciting career opportunities. This industry offers a bright jobs future and it is important for all of us to share this message with our nation's young people.

Thank you again, and I would be happy to answer any questions you may have.

The Economic Impact of the Gulf of Mexico Offshore Oil and Natural Gas Industry and the Role of the Independents

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I. INTRODUCTION

This study presents the economic significance of the Gulf of Mexico (GOM) offshore oil and gas industry—today and in the future. It does so in terms of jobs, economic value, and government revenue. The analysis also demonstrates the importance of the independent operator sector to the overall offshore Gulf of Mexico oil and gas industry and, specifically, to the future working of the deepwater, which is the growth engine of U.S. oil production. In so doing, this analysis seeks to provide a framework for assessing important policy choices ahead.

U.S. offshore exploration and production are growing components of domestic oil production, both for the United States and for the world. The U.S. offshore, primarily the Gulf of Mexico, produces 30% of U.S. oil and 10% of U.S. natural gas. As such, it is a central element to U.S. energy security.

Although less well-recognized, the full significance of the offshore extends beyond the physical output and the contribution to energy security. The offshore GOM oil and gas industry generated almost $70 billion of economic value and nearly 400,000 jobs in 2009. The jobs generated from industry activity in the Gulf range from the mechanical engineer on the offshore platform, to the pipefitter at the equipment supplier, to the waitress at the neighborhood restaurant. In 2009, the industry also provided about $20 billion in revenues to federal, state, and local governments through royalties, bonuses, and tax collections. This analysis suggests that the Gulf of Mexico offshore oil and gas industry could generate almost $300 billion of revenues for federal, state, and local governments over the next 10 years.

The Gulf of Mexico region is also the epicenter for a very large, technologically innovative industry. The United States currently has global leadership in this industry but faces growing competition from other countries.

In response to the BP Deepwater Horizon tragedy that occurred during the drilling of the Macondo well, a number of regulatory and policy changes stand to be implemented. The overall aim of such changes is twofold: (1) to prevent such accidents from occurring in the future; and (2) to ensure that new technologies and procedures are in place to mitigate the scope and damage should any future spill occur. Meeting these two goals will enable the United States to continue to benefit from the critical source of energy supply that is the U.S. Gulf of Mexico oil and gas complex.

Some regulatory and policy changes are being implemented as quickly as possible, such as strengthened safety regulations. Some broader proposals, however, need to be considered in terms of how well they actually meet national objectives and in fully assessing the risks they carry for unintended and costly consequences. Before implementing any particular system or policies, it would be constructive to consider proposals that could achieve the desired policy goals without the potential large economic losses that would result from excluding certain categories of companies currently participating in this market. Given the requisite profile for investment, the need for innovative technology, and the desire to recognize the potential of the GOM as a natural resource, the consequences of excluding independents could be significant. It could create a large vacuum for oil and gas exploration and production in the Gulf of Mexico that would greatly reduce activity, and thus, its value as an asset to the United States.

The resulting vacuum would likely be filled only marginally by the major oil companies, if at all, and the loss of the independents could actually precipitate a decline in activity by the majors. The reason for this is the structure of the offshore industry, the integration between majors and independents in exploration and production, and the large role that the independents play—particularly in how the industry deals with the likelihood of finding oil.[1]

[1]The U.S. "majors" include ExxonMobil, Chevron, and ConocoPhillips. Non-U.S.-based majors include Royal Dutch Shell, BP, Total, ENI, Statoil, and Petrobras. "Independents" generally describes companies whose primary business is exploration and production, although some independents are integrated companies, with both upstream activities and downstream (refining and gasoline stations). Independents themselves are often large companies. The average market capitalization of the five largest independents is approximately $23 billion.

Typically, only about one in four exploration wells finds hydrocarbons in commercial volumes, which is why they are called "exploration" wells. The oil companies deal with these odds by spreading their capital over a large number of projects. The participation by other industry players, including a large number of independents, substantially increases the population of projects, and thus, means that companies diversify their portfolios of prospects. The end result is a substantial increase in the amount of oil and gas that is discovered and produced.

The independents also bring technological diversity to the Gulf and, in particular, to the analysis and interpretation of the vast amounts of geological and geophysical data that precede drilling. With this wider participation, companies can test their analysis against that of other companies, improving the understanding of the various opportunities, and thus, leading to more success and efficiency in exploration.

The participation of independents also increases the range of reserves that can be commercialized. Because of the demands on the majors by institutional investors for reserve replacement, those companies need to find reservoirs of a certain size to meet their targets for reserve replacement. For independents, smaller reservoirs can be of commercial significance, which would not be the case for the majors.

Currently, the shallow water is dominated by independents because the size of the projects does not often meet the scale requirements for the majors. It is unlikely this condition would change with the elimination of the independents.

The offshore Gulf of Mexico is only one oil and gas province among many in the world. The majors work with a global agenda, and there are constraints on how much of their capital budget and organizational focus they would concentrate on one province, given competing opportunities for investment around the world.

Finally, from government's point of view, substantially reducing the number of participants in the offshore would mean fewer bids for new leases, and therefore, less competition and less revenue.

How Big an Impact?

In this study, we analyze the economic contribution of the independents and potential loss as a result of policies that effectively prevent them from participating in future development in the offshore Gulf of Mexico and, in particular, in the deepwater. Our analysis for the 2009–20 forecast period indicates that the exclusion of the independents from the offshore GOM would mean:

- The following lost jobs in the four-state Gulf region (Alabama, Louisiana, Mississippi, and Texas)—direct, indirect, and induced:
    - 2009 – 202,502
    - 2015 – 289,716
    - 2020 – 300,974
- Additionally, 40,777 construction-related jobs would be lost in the four-state Gulf region during 2009–20. This activity includes construction of rigs, platforms, pipelines, and production facilities.
- The following lost taxes and royalties to the federal government:
    - 2009 – $7.34 billion
    - 2015 – $10.13 billion
    - 2020 – $9.98 billion

- The following lost state and local tax revenues in the four-state Gulf region:
    - 2009 – $3.18 billion
    - 2015 – $4.59 billion
    - 2020 – $4.68 billion

Altogether, more than $147 billion in federal, state, and local revenues would be lost in a 10-year period if independents are excluded from the Gulf of Mexico. These estimates only include revenues collected from the four-state Gulf region.[2]

Within the deepwater, the exclusion of the independents would mean:

- The following lost jobs in the four-state Gulf region—direct, indirect, and induced:
    - 2009 – 121,298
    - 2015 – 230,241
    - 2020 – 265,113
- The following lost taxes and royalties to the federal government:
    - 2009 – $3.64 billion
    - 2015 – $7.26 billion
    - 2020 – $8.33 billion
- The following lost state and local tax revenues in the four-state Gulf region:
    - 2009 – $1.63 billion
    - 2015 – $3.35 billion
    - 2020 – $3.94 billion

Altogether, more than $106 billion in federal, state, and local revenues would be lost in a 10-year period if independents are excluded from the deepwater.

Overall, the exclusion of the independents would significantly shrink offshore oil and gas activity, reduce the dynamism of the industry, and dilute U.S. technological and industry leadership.

The reason for all these effects is that independents represent a much larger share of total activity than is generally recognized. Independent producers are an integral part of shelf, as well as deepwater, drilling and discovery.

- Independents are the largest shareholder in 66% of the 7,521 leases in the entire Gulf of Mexico and in 81% of the producing leases.
- In the deepwater portion of the Gulf of Mexico, independents are the largest shareholder in 52% of all leases and in 46% of the producing leases. They operate over half of the developing and producing deepwater fields.
- Independents have drilled 1,298 wells in the deepwater, and they currently account for over 900,000 barrels a day of oil equivalent (oil and natural gas together).
- Independents are responsible for an average of 70% of the "farm-ins": the partnerships formed following the original lease agreement that enable prospects to be drilled and oil and gas produced.

[2] These do not include tax revenues collected elsewhere in the United States (outside the four-state Gulf region) as a result of offshore oil- and gas-related activities. These activities range, for instance, from the manufacture of steel pipe and helicopters in other states to dividend income flowing to non-Gulf-region shareholders.

The Development of the Offshore Oil and Gas Industry

The modern U.S. offshore industry began in 1947 off the coast of Louisiana. By the end of the 1980s, the offshore was already a dynamic global industry. Leadership was centered in the U.S. Gulf of Mexico and in the North Sea, where oil production began in the mid-1970s. By 1990, Britain and Norway were together producing over 4 million barrels per day in the North Sea. In the United States, the offshore Gulf of Mexico oil and gas industry was concentrated for several decades in what today would be considered the "shallow" waters of the shelf.

The beginning of the deepwater industry in terms of large-scale production began in the mid-1990s in the Gulf of Mexico.[3] Today, it is a recognized, established part of the world's energy industry. Over 14,000 deepwater wells have been drilled globally. In the deepwater GOM, over 3,191 wells were drilled prior to the Macondo disaster. Of those wells, over 1,108 were drilled to greater total depths than the Macondo well.

According to the U.S. Department of Interior, between 1970 and 2010, the total barrels spilled in U.S. waters as a result of blowouts were 1,800, or an average of 45 barrels per year.[4]

Since 2000, deepwater production worldwide has risen from 1.5 million barrels per day (b/d) to 5.0 million b/d, largely centered off West Africa and Brazil as well as the Gulf of Mexico. To put this into context, were the deepwater around the world a single "country," it would be the fourth-largest oil-producing nation in the world after Saudi Arabia, Russia, and the United States. The global deepwater output today is more than the combined production of Venezuela and Nigeria.

The deepwater is seen as an even greater growth engine for future production. Since 2006, nearly half of total oil and gas reserves added worldwide have been in the deepwater, and 70% of the significant new finds have come from deepwater. The estimates of the resource and projections for growth are both very large in terms of newly identified reserves. The significance is indicated by the difference in the size of discoveries: In 2009, the average deepwater discovery was 150 million barrels compared with 25 million barrels for onshore discoveries.

In 2009, the United States, for the first time since 1991, recorded an increase in domestic oil production. The increase is attributable to developments in the deepwater and contributed to the decline in U.S. oil imports last year. The 2009 production increase was equivalent to about 4% of U.S. oil imports.

All of this highlights the growing role of the deepwater development in the Gulf of Mexico and the critical role of the independents in exploration and production activity. This study measures the total economic contribution of independents to offshore activity, including contributions associated with deepwater activity. It seeks to do so by presenting a context for understanding the economic significance of the offshore Gulf of Mexico, both on the shelf and in the deepwater, and the expected costs that would result from independents withdrawing from the sector.

The economic analysis has been conducted by the regional economics team from IHS Global Insight, recognized as the most consistently accurate economic forecasting firm in the world. It draws on the oil and gas expertise and data of IHS Cambridge Energy Research Associates (IHS CERA) and on the oil and gas databases of IHS, the most extensive and comprehensive in the world. The integration of these capabilities provides the framework for understanding the economic significance of the independents' role in the Gulf of Mexico, both on the shelf and in the deepwater, and the large regional and national negative effects that could result from their exclusion from exploration and production activities in this important region.

[3] Deepwater is defined by IHS as 200 meters (650 feet). Other definitions range from 500 to 1,000 feet.

[4] U.S. Department of the Interior, *Increased Safety Measures for Energy Development on the Outer Continental Shelf*, May 27, 2010, p.6.

II. APPROACH

The total economic impact of an activity is separated into three distinct parts: direct, indirect, and induced. The *direct* impacts represent the value added of those economic activities that interact directly with the sector under study. The *indirect* impact represents the benefit to suppliers to those direct sectors. This would include, for example, steel tube suppliers to a drill operator. The *induced* impact adds the effect of spending from wage and other income derived from the direct and indirect sectors.

In assessing the economic contribution of the Gulf of Mexico offshore oil and gas industry in general, and the contribution of the independent producers to both the overall industry, and the deepwater segments in particular, IHS Global Insight has utilized the following measures:

- The total number of jobs **directly** attributable to offshore oil and gas. These jobs involve exploring, producing, transporting, and delivering oil to downstream elements or provide critical supplies or onsite services to the offshore oil and natural gas industry.
- The total number of jobs **indirectly** involved in offshore oil and natural gas. Indirect employment is defined as the employment in other industries that supply material and labor to the offshore industry.
- The total number of jobs **induced** by the expenditure of direct and indirect workers' income.
- The economic value of the offshore oil and natural gas industry as measured by **value added** and labor income associated with these direct, indirect, and induced jobs.

The total economic impact incorporates the sum embedded in each of the aforementioned elements, so that total employment (direct, indirect, and induced), corresponding total labor income, and total value added are the most precise measures of the economic contribution of this industry.[5]

These measures form the foundation of the IHS Global Insight economic impact assessment. We fully describe the estimated economic contribution during the 2009–20 period of (1) the entire offshore industry, (2) the offshore activity of the independents, and (3) the deepwater activity of the independents.

The first analysis involves an assessment of the entire industry for 2009 (the most recent year for complete data), as well as for 2015 and for 2020, under current legislative conditions. The analysis is then extended to include the composition between independents and majors, and the economic contribution of the independents to the industry and to the Gulf economy. Finally, a separate examination is provided of the economic contribution of the independents in the deepwater Gulf of Mexico. Again, the three dimensions of employment and value added (as well as labor income) are presented on an individual basis and in total. All aspects of the offshore oil and natural gas industry are incorporated in our analyses, including exploration, production, drilling, support services, and related construction and pipeline activity.

The study presents information on estimated tax receipts by type: (1) federal, state, and local personal income taxes; (2) federal, state, and local business taxes; and (3) federal royalty payments.

[5] IHS Global Insight used the IMPLAN model to quantify the contribution of the Gulf of Mexico offshore oil and natural gas industry to the four-state Gulf region economy. The IMPLAN model closely follows the accounting conventions used in the U.S. Department of Commerce Bureau of Economic Analysis (BEA)'s definitive 1980 study, Input-Output Study of the U.S. Economy, and is flexible enough to evaluate the change via the value of output or employment from the source industry. (Additional details related to this modeling approach are presented in Appendix C).

III. RESULTS

A. Total Industry Impacts—Independents & Majors

The Gulf of Mexico offshore oil and gas industry in total—inclusive of shallow and deepwater segments and comprising independents and the majors, under baseline conditions—will exhibit strong growth from 2009 through 2020. Direct employment in the industry is expected to increase 43% in that period, increasing from 91,173 employees in 2009 to 130,510 employees in 2020. Very importantly, indirect employment totals are 120,675 in 2009, or 132% of direct employment. This reflects the importance of the supply chain in the offshore oil and gas industry.

The induced effect, which reflects the employment generated by the spending from workers' income in the general Gulf economy, will result in 170,402 additional employees. Thus, the total employment effect for the Gulf region in 2009 is 382,250, a ratio of more than 4 to 1 relative to direct employment. This total employment effect reaches 518, 760 jobs by 2020.

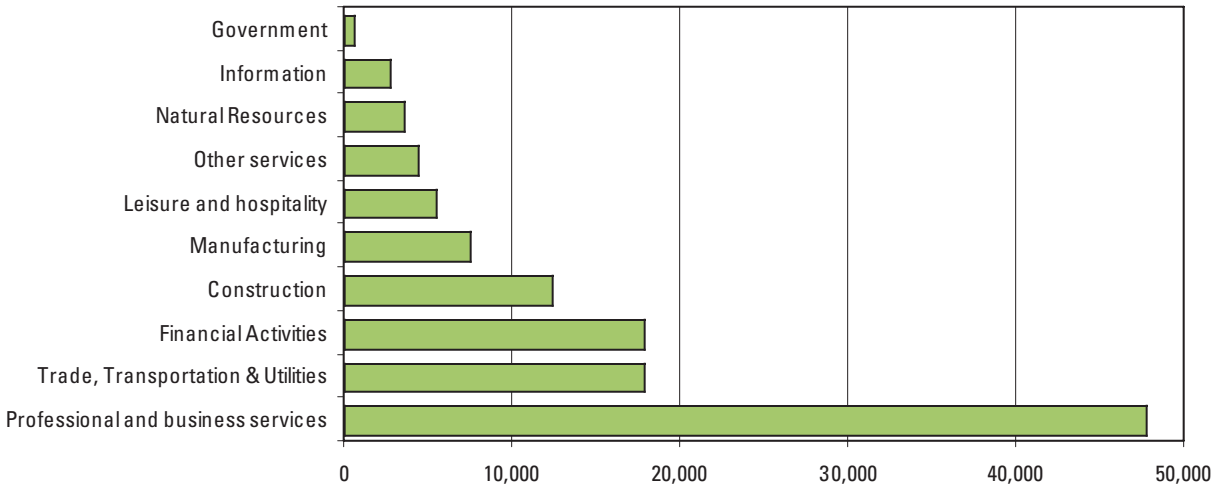
Value added provides a measure of the contribution of all input factors in the oil and gas offshore industry. On a direct basis in 2009, value added was $42.6 billion, reaching almost $68.0 billion by 2020. Inclusive of indirect and induced effects, value added was almost $70 billion in 2009 and is expected to be more than $113 billion in 2020. The labor income component of value added on a direct basis was $15.5 billion in 2009, reaching more than $25.0 billion by 2020. In total, our estimate of labor income is $30 billion in 2009, reaching more than $50 billion by 2020.

Total Offshore Oil & Gas Industry Economic Impact on The Gulf of Mexico

	Direct	Indirect	Induced	Total
Employment (Average annual workers)				
2009	91,173	120,675	170,402	382,250
2015	120,192	155,814	219,308	495,313
2020	130,510	163,348	224,902	518,760
Value Added (Billions of dollars)				
2009	42.61	14.64	12.53	69.78
2015	61.53	21.44	18.44	101.40
2020	67.97	24.27	20.88	113.12
Labor Income (Billions of dollars)				
2009	15.49	7.88	6.70	30.07
2015	22.79	11.58	9.86	44.23
2020	25.62	13.31	11.17	50.11

Source: Results generated by IHS Global Insight from IMPLAN model

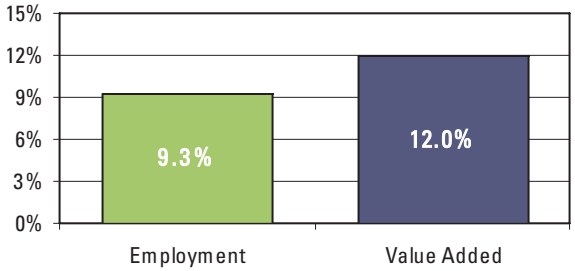
2009 Indirect Employment Impact of the Offshore Oil & Gas Industry in the Gulf of Mexico
(Top 10 sectors)



Source: Based on IMPLAN model indirect employment results for 2009

This chart illustrates the role of the GOM offshore oil and gas industry in the metropolitan areas (MSAs) of the Gulf Coast economy.[6] In terms of employment and value added, the offshore industry accounted for 9.3% and 12.0%, respectively.

Offshore Oil & Gas Industry Contributions to the GOM Coastal Economy in 2009



Source: IHS Global Insight Regional Service & IMPLAN model results

Finally, presented below are estimated federal, state, and local taxes as well as federal royalty payments for 2009 and expected payments in 2015 and 2020. As a result of all related economic activity, total taxes collected would be approximately $19 billion in 2009, $27 billion in 2015, and $29 billion in 2020. During 2011–20, approximately $275 billion in taxes and fees would be collected under baseline conditions (inclusive of federal, state, and local taxes and federal royalty, bonus, and rent payments). Federal royalty payments in 2011–20 are estimated at $81 billion.

Estimated Tax Receipts from Offshore Oil & Gas Operations in the GOM
(Billions of dollars)

	2009	2015	2020	Total (2011-2020)*
Federal Taxes	7.15	10.46	11.78	104.64
Personal Taxes	*4.80*	*7.07*	*8.04*	*70.68*
Corporate Taxes	*2.36*	*3.40*	*3.73*	*33.96*
State and Local Taxes	5.74	8.34	9.11	83.36
Personal Taxes	*0.38*	*0.56*	*0.63*	*5.57*
Severance Taxes	*0.34*	*0.49*	*0.53*	*4.90*
Other Business Taxes	*5.02*	*7.29*	*7.95*	*72.89*
Total	12.89	18.80	20.89	188.00
Federal Royalty Payments	6.00	8.16	8.13	81.63
Bonus and Rent Payments				5.68**
Grand Total	18.89	26.96	29.03	275.31

**The total column is estimated by multiplying the 2015 figure by 10*
***MMS projects that bonus and rent payments over FY2010-FY2015 will equal $2.84 billion. The total for the entire 2011-2020 time period was estimated by multiplying the FY2010-FY2015 numbers by two. These payments cannot be allocated to Majors and Independents, nor can they be allocated to the Deepwater segment.*
Source: Federal, state & local tax estimates generated by IHS Global Insight from IMPLAN model. Federal royalty payments based on IHS Global Insight estimates from MMS data.

[6] The following MSAs were combined to form the Gulf of Mexico Coastal metro economy: Brownsville-Harlingen, TX, Corpus Christi, TX, Victoria, TX, Houston-Sugar Land-Baytown, TX, Beaumont-Port Arthur, TX, Lake Charles, LA, Houma-Bayou Cane-Thibodaux, LA, New Orleans-Metairie-Kenner, LA, Gulfport-Biloxi, MS, Pascagoula, MS, Mobile, AL. These metropolitan areas represent approximately 85% of all economic activity in the Gulf Coastal economy.

B. Total Industry Economic Impacts—The Independents' Share

To provide additional detail with regard to this analysis in terms of the role of the independents in the Gulf of Mexico, the employment, value added, and labor income measures are presented for the independents in relation to the total industry. For both direct employment and total employment in 2009, the independents' share is slightly more than 50%, approximately 47,000 of 91,000 employees on a direct basis, and 203,000 of 382,000 on a total basis. By 2020, those shares are closer to 60%—62% on a direct basis and 58% on a total employment basis.

On a value-added basis, a similar pattern is discernable, with over $23 billion of almost $43 billion on a direct basis in 2009, and $38 billion of $70 billion on a total basis. By 2020, we expect the independents' share of value added to remain above the 50% mark—$36 billion of $68 billion on a direct basis and $62 billion of $113 billion on a total basis.

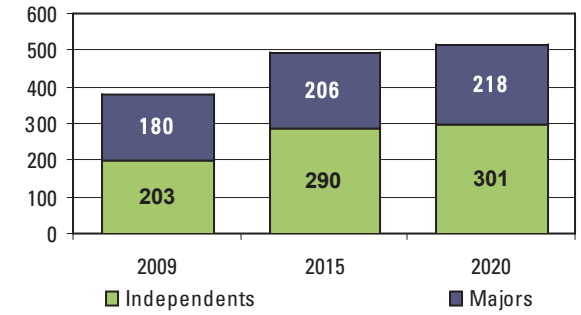
Presented in the chart Independents' Offshore Oil & Gas Industry Contributions to the GOM Coastal Economy in 2009 are the contributions of the independents in the GOM to the metropolitan areas of the Gulf Coastal economy. In 2009, the independents accounted for almost 5.0% of total employment and 6.5% of value added in that specific region.

Total tax payments and royalties by the independents are estimated at over $10.0 billion in 2009, $14.7 billion in 2015, and $14.7 billion in 2020. From 2011 to 2020, total federal, state, and local tax receipts and federal royalty payments from this segment are estimated at $147 billion. Federal royalty payments are expected to be $42 billion over the same 10-year period.

When isolating the effects exclusively for the independent producers' GOM activity, our analysis demonstrates that their influence in the marketplace is considerable relative to overall industry activity. Throughout the forecast period of 2010–20, the total direct, indirect, and induced employment effect by independent producers is estimated to surge nearly 50%, from 202,502 in 2009 to 300,974 in 2020. Direct employment by the independents further exceeds the trend within the aforementioned overall total employment growth rate, increasing 71% during the forecast period. Indirect and induced employment effects increase 50% and 36%, respectively, over the forecast period.

Total Employment Impact in GOM

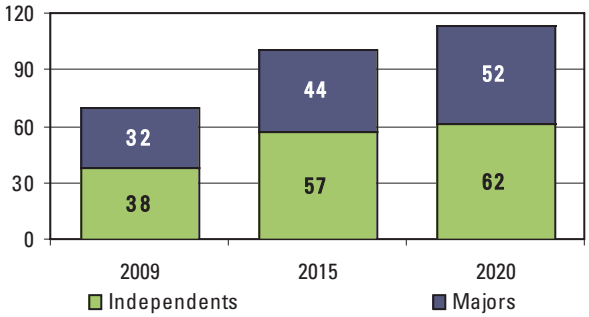
(Thousands)



Source: Results generated by IHS Global Insight from IMPLAN model

Total Value Added Impact in GOM

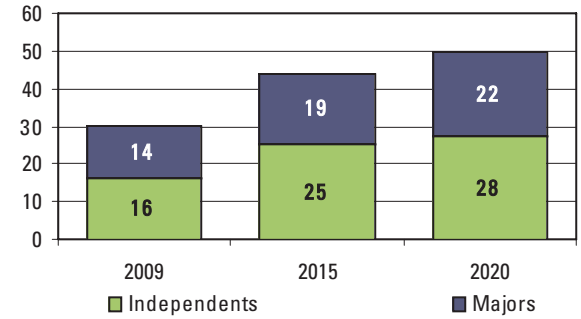
(Billions of dollars)



Source: Results generated by IHS Global Insight from IMPLAN model

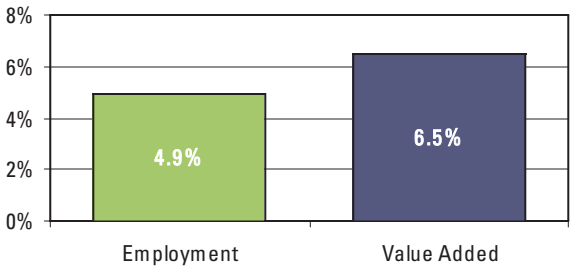
Total Labor Income Impact in GOM

(Billions of dollars)



Source: Results generated by IHS Global Insight from IMPLAN model

Independents' Offshore Oil & Gas Industry Contributions to the GOM Coastal Economy in 2009
(Percentage)



Source: IHS Global Insight Regional Service & IMPLAN model results

Viewed another way, IHS Global Insight's forecast for total employment growth for the four-state Gulf economy is 11% from 2009 to 2015, whereas direct employment for the independent producers is 55% for the same period.

The total value-added contribution by independent producers to the four-state Gulf economy increases 63% over the forecast period, which, even after accounting for inflation, represents a considerable increase in total contribution. Put into further context, by 2015, the independents are making a $57.4-billion contribution to a regional economy of $2.3 trillion, according to IHS Global Insight's most recent forecast for the states.

Consistent with trends in direct employment, total direct, indirect, and induced labor-related income emanating from the independent producers' activity in the GOM grows over 71% during the forecast period. The principal driver in the labor income impact is labor income derived from direct employment, while the indirect and induced labor income effect experiences accelerated growth in the later years of the forecast period. Our analysis demonstrates that of the total GOM labor income ($50.1 billion), more than half stems from the independent producers' contribution ($27.8 billion).

What we have presented thus far relates to the entire offshore Gulf of Mexico oil and gas industry. In the following section, we turn to the deepwater segment.

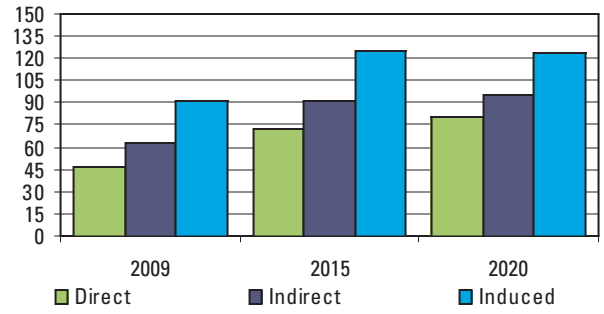
Estimated Tax Receipts from Independents' Offshore Operations in the GOM
(Billions of dollars)

	2009	2015	2020	Total (2011-2020)*
Federal Taxes	3.86	5.96	6.49	59.60
Personal Taxes	*2.58*	*4.06*	*4.52*	*40.62*
Corporate Taxes	*1.29*	*1.90*	*1.98*	*18.98*
State and Local Taxes	3.18	4.59	4.68	45.87
Personal Taxes	*0.20*	*0.32*	*0.35*	*3.19*
Severance Taxes	*0.19*	*0.27*	*0.27*	*2.68*
Other Business Taxes	*2.78*	*4.00*	*4.06*	*40.00*
Total	7.04	10.55	11.18	105.47
Federal Royalty Payments	3.48	4.17	3.49	41.65
Grand Total	10.52	14.71	14.67	147.12

**The total column is estimated by multiplying the 2015 figure by 10*

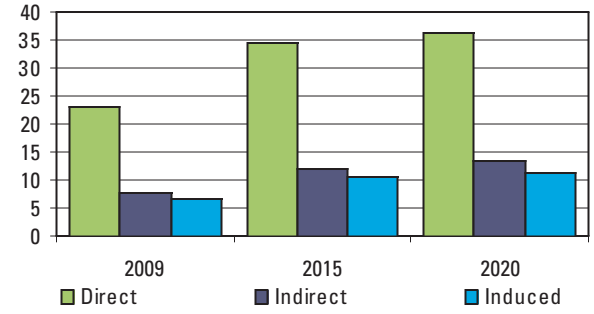
Source: Federal, state & local tax estimates generated by IHS Global Insight from IMPLAN model. Federal royalty payments based on IHS Global Insight estimates from MMS data.

Independents' Employment Impact in GOM
(Thousands)



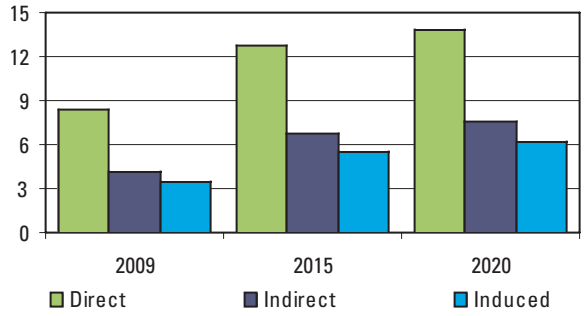
Source: Results generated by IHS Global Insight from IMPLAN model

Independents' Value Added Impact in GOM
(Billions of dollars)



Source: Results generated by IHS Global Insight from IMPLAN model

Independents' Labor Income Impact in GOM
(Billions of dollars)



Source: Results generated by IHS Global Insight from IMPLAN model

C. Economic Contribution of Independents in the Deepwater

Our analysis, with respect to the economic impact in the deepwater segment of the GOM, first presents background information on the growing role of independent producers and then provides results for the 2009–20 forecast interval.

Since the late 1980s, the independents have had a growing presence in the deepwater Gulf of Mexico. Their presence is an important component of a dynamic, competitive industry structure in this region that has made the deepwater GOM one of the more efficient of the deepwater regions of the world in terms of finding and developing the resources there. For example, more than 50% of the reserves found in the deepwater Gulf have been developed compared with the less than 25% of reserves that have been developed in the Angola or Brazil deepwater areas. The Gulf reserves have been developed despite the challenge of overall smaller field sizes and complex geology found there as compared with Angola and Brazil. One of the reasons for this efficiency is the niche market that independents fill, which is to find and develop the smaller fields that the majors consider too small for their portfolio.

The role of the independents has been steadily growing since the earliest days of exploration and development in the deepwater Gulf of Mexico:

- Independents have taken an average of 70% of the farmed-out acreage from the majors over the past 10 years. This is acreage that the majors no longer wanted, and without the independents' willingness to pick it up, fewer wells would have been drilled and fewer new resources found. Almost 3 billion barrels of oil equivalent in reserves that were originally found by the majors are now operated by independents.
- The independents' contribution to drilling activity has steadily increased over the past 20 years. In 1988, independents drilled less than 15% of all wells (exploration and development) in deepwater GOM. For four of the past seven years, they have drilled more than 50% of all wells (figure 1).
- While the growth in total drilling is impressive, the independents' role in exploration is even more so. Independents have drilled (as operators) over half of the total exploration wells in the deepwater Gulf for the past 10 years (figure 2). With a success rate of 29%, their skill in discovery is on a par with the majors' 32% deepwater GOM success rate.
- The independents are catching up with the majors in terms of total volumes found. Over the past 10 years, the annual volumes found by major companies have been generally declining while those found by the independents have been on the increase (figure 3). The independents draw even with the majors even as the average discovery size of the majors has been increasing in that time while that of the independents has remained relatively flat.
- Independents are contributing significantly to bringing new volumes onstream. Although the volumes of hydrocarbons currently under production operated by majors is more than double that operated by independents, the volumes that are currently being appraised or being developed are roughly equal (4.2 billion barrels of oil equivalent—bboe—for independents vs. 4.4 bboe for majors), indicating the independents are catching up and may well exceed the impact of the majors in the future.

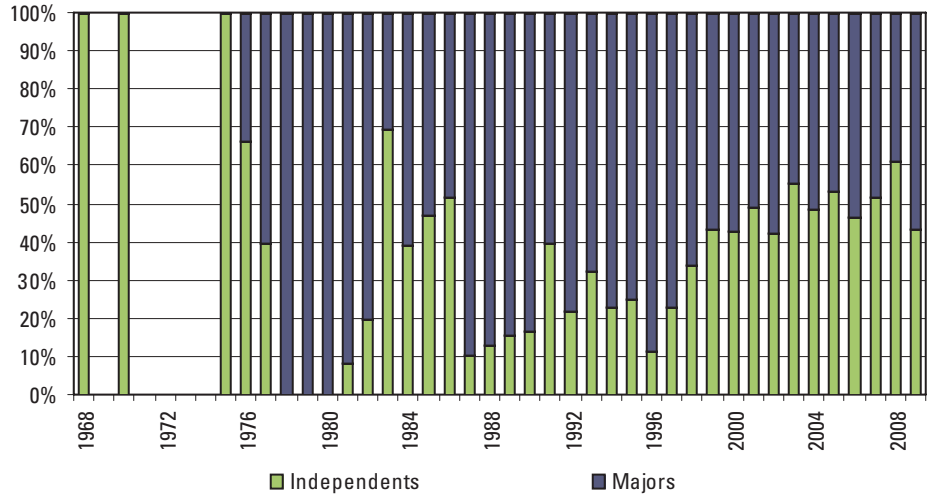
The results for the independent deepwater segment of the Gulf of Mexico reflect a growing share of economic activity of the 2009–20 forecast period. From 2009 to 2020, the total deepwater employment impact share by independents grows from 41.1% to 55.7%. In the same period, the total labor income impact and value-added impact exceeds 50% of economic contribution from deepwater activity.

The independents play a vital role in the deepwater. IHS analysis indicates that the majors would not have the economic justification or the risk tolerance for drilling marginally producing wells found in mature fields, for example. As such, the vitality of the domestic deepwater industry is linked directly to the independents' ability to viably operate in the Gulf of Mexico.

Figure 1

Percent of Total Wells Drilled

(Percentage)

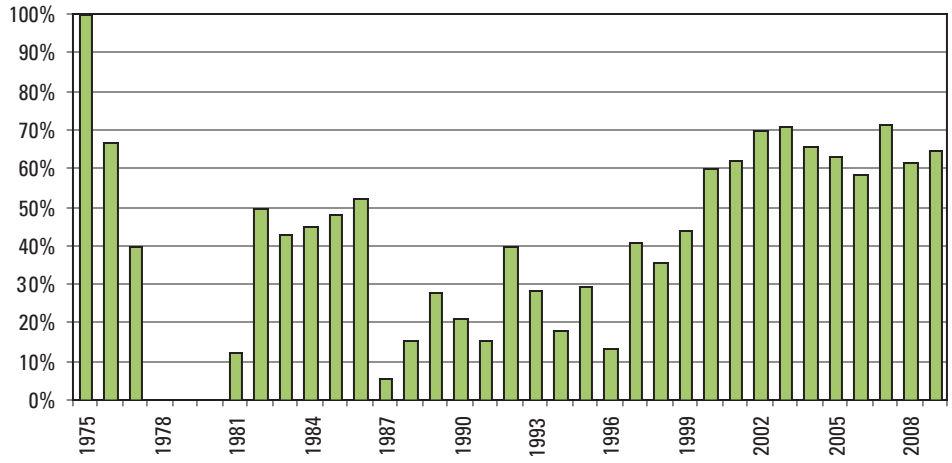


Source: Based on IHS CERA analysis & IHS data

Figure 2

Independents' Share of Total Exploration Wells Drilled

(Percentage)

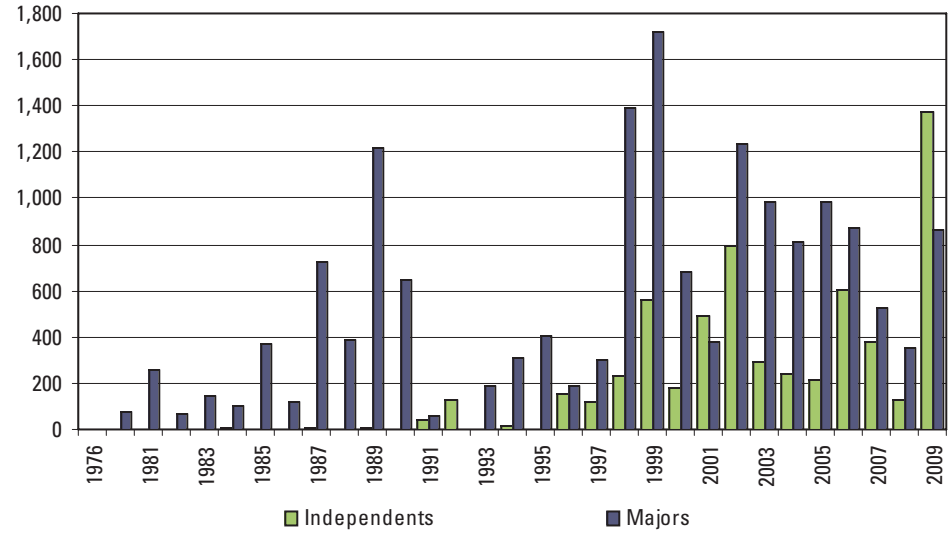


Source: Based on IHS CERA analysis & IHS data

Figure 3

Total Hydrocarbon Discovered

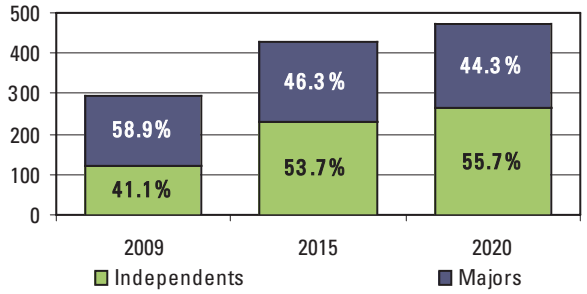
(Millions of barrels oil equivalent)



Source: Based on IHS CERA analysis & IHS data

Deepwater Gulf of Mexico Employment Impact in Gulf States

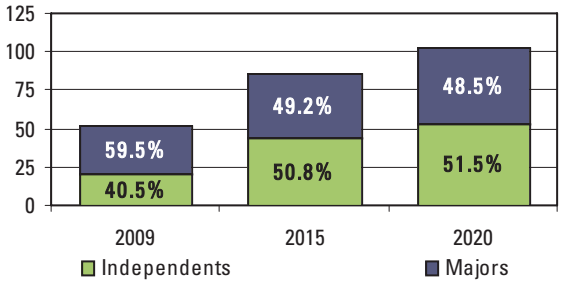
(Thousands)



Source: Results generated by IHS Global Insight from IMPLAN model

Deepwater Gulf of Mexico Value Added Impact in Gulf States

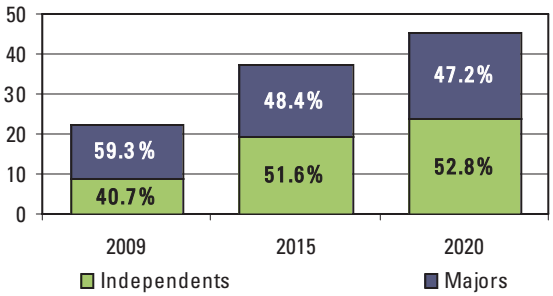
(Billions of dollars)



Source: Results generated by IHS Global Insight from IMPLAN model

Deepwater Gulf of Mexico Labor Income Impact in Gulf States

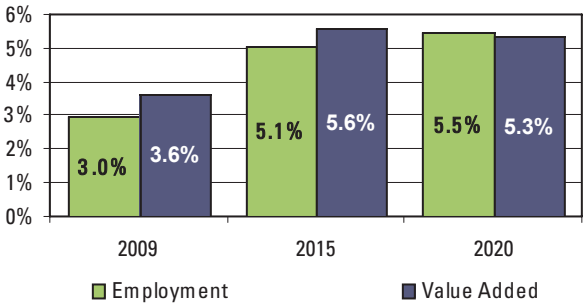
(Billions of dollars)



Source: Results generated by IHS Global Insight from IMPLAN model

Presented in this chart are the contributions of the independents operating in the deepwater GOM to the metropolitan areas of the Gulf Coastal economy. The independents in deepwater alone accounted for approximately 3.0% of total employment in 2009 and are expected to account for 5.0% in 2015 and almost 5.5% in 2020. These shares of employment activity represent about two years of total employment growth that would typically occur in the Gulf Coastal economy. On a value-added basis, the comparable estimates are 3.6%, 5.6%, and 5.3%.

Independents' Oil & Gas Industry Deepwater Contributions to the GOM Coastal Economy



Source: IHS Global Insight Regional Service & IMPLAN model results

Total federal, state, and local tax payments, as well as federal royalty payments, by independents operating in the deepwater Gulf are estimated at $5.3 billion in 2009, $10.6 billion in 2015, and $12.3 billion in 2020. During the 10 years from 2011 to 2020, federal, state, and local receipts from all sources are expected to be $106 billion. Federal royalty payments over that same period are anticipated at almost $27 billion.

Estimated Tax Receipts from Independents' Operations in Deepwater Segment of the GOM
(Billions of dollars)

	2009	2015	2020	Total (2011-2020)*
Federal Taxes	2.17	4.57	5.62	45.73
Personal Taxes	*1.47*	*3.15*	*3.93*	*31.55*
Corporate Taxes	*0.69*	*1.42*	*1.68*	*14.18*
State and Local Taxes	1.63	3.35	3.94	33.51
Personal Taxes	*0.12*	*0.25*	*0.31*	*2.47*
Severance Taxes	*0.09*	*0.19*	*0.23*	*1.94*
Other Business Taxes	*1.42*	*2.91*	*3.41*	*29.10*
Total	3.79	7.92	9.56	79.25
Federal Royalty Payments	1.47	2.69	2.71	26.91
Grand Total	5.26	10.62	12.27	106.15

**The total column is estimated by multiplying the 2015 figure by 10*

Source: Federal, state & local tax estimates generated by IHS Global Insight from IMPLAN model. Federal royalty payments based on IHS Global Insight estimates from MMS data.

D. Economic Contribution of Offshore Oil and Gas Industry Construction in the Gulf

This activity includes construction of rigs, platforms, pipelines, and production facilities. Project construction is much less predictable on an annual basis, so the analysis of construction costs has been conducted over the entire forecast interval. The estimates of employment, value added, and labor income for construction activity are in addition to the figures previously presented.

The table below presents the direct, indirect, and induced impacts for the entire Gulf of Mexico offshore oil and gas industry. During the entire 2009–20 time period, the total employment effect is expected to be 137,503. The sum of the direct, indirect, and induced impact on a value-added basis is expected to be $12.5 billion.

On a comparable basis, independents are expected to account for more than 40,000 jobs over the forecast period on a direct, indirect, and induced basis, and $3.7 billion in value added.

Total Offshore Oil & Gas Industry Construction Economic Impact on the Gulf of Mexico, 2009-2020

	Direct	Indirect	Induced	Total
Employment (Average annual workers)	54,753	39,074	43,676	137,503
Value Added (Billions of dollars)	5.43	3.81	3.30	12.55
Labor Income (Billions of dollars)	3.80	2.36	1.77	7.92

Source: Results generated by IHS Global Insight from IMPLAN model

Independents' Offshore Oil & Gas Industry Construction Economic Impact on The Gulf of Mexico, 2009-2020

	Direct	Indirect	Induced	Total
Employment (Average annual workers)	15,824	11,491	12,762	40,077
Value Added (Billions of dollars)	1.59	1.12	0.96	3.68
Labor Income (Billions of dollars)	1.10	0.69	0.52	2.31

Source: Results generated by IHS Global Insight from IMPLAN model

IV. CONCLUSIONS

The intent of this study has been to quantify the economic contributions resulting from offshore oil and natural gas industry activity in the Gulf of Mexico. Our analysis indicates that the independents represent a significant and growing portion of the economic value of the oil and gas offshore industry in the Gulf of Mexico, and a large and increasing portion of the deepwater segment of the oil and gas industry. Furthermore, in a forward-looking framework, taking into account the baseline forecasts (with no change in legislation) during the 2010–20 time frame, the independent producer segment of the industry is projected to remain a significant participant in the overall industry and, in particular, in its deepwater segments.

In this study, we analyzed the economic contribution and potential loss as a result of policies that effectively prevent independents from participating in future development in the offshore Gulf of Mexico and, in particular, in the deepwater. Our analysis for the 2009–20 forecast period indicates that the exclusion of the independents from the offshore Gulf of Mexico would mean:

- The following lost jobs in the four-state Gulf region (Alabama, Louisiana, Mississippi, and Texas)—direct, indirect, and induced:
    - 2009 – 202,503
    - 2015 – 289,716
    - 2020 – 300,974
- The total lost construction-related jobs in the four-state Gulf region in 2009–20: 40,777
- The following lost taxes and royalties to the federal government:
    - 2009 – $7.34 billion
    - 2015 – $10.13 billion
    - 2020 – $9.98 billion
- The following lost state and local tax revenues in the four-state Gulf region:
    - 2009 – $3.18 billion
    - 2015 – $4.59 billion
    - 2020 – $4.68 billion

Altogether, more than $147 billion in federal, state, and local revenues would be lost over a 10-year period if independents are excluded from the Gulf of Mexico.

In terms of the offshore oil and gas industry contribution to overall employment for the four-state Gulf region, the independents accounted for 53% in 2009 and are expected to account for 58% in 2015 and 58% in 2020. In terms of value added and labor income for the four-state region, the comparable estimates are 54% and 54%, respectively, in 2009, and 57% and 57%, respectively, in 2015, and 54% and 56%, respectively, in 2020.

The challenge is how best to evaluate the spectrum of policy options designed to promote safety and ensure future financial and environmental sustainability, while maintaining the economic contribution of the offshore oil and gas industry, in general, and the economic contribution of the independent sector, in particular. This study seeks to provide the critical economic impact analysis necessary to inform these policy evaluations.

Total Offshore Oil & Gas Industry Economic Impact on the Gulf of Mexico

	Direct	Indirect	Induced	Total
Employment (Average annual workers)				
2009	91,173	120,675	170,402	382,250
2015	120,192	155,814	219,308	495,313
2020	130,510	163,348	224,902	518,760
Value Added (Billions of dollars)				
2009	42.61	14.64	12.53	69.78
2015	61.53	21.44	18.44	101.40
2020	67.97	24.27	20.88	113.12
Labor Income (Billions of dollars)				
2009	15.49	7.88	6.70	30.07
2015	22.79	11.58	9.86	44.23
2020	25.62	13.31	11.17	50.11

Source: Results generated by IHS Global Insight from IMPLAN model

Independents' Offshore Oil & Gas Industry Economic Impact on the Gulf of Mexico

	Direct	Indirect	Induced	Total
Employment (Average annual workers)				
2009	46,958	63,660	91,884	202,502
2015	72,861	91,571	125,284	289,716
2020	80,632	95,522	124,821	300,974
Value Added (Billions of dollars)				
2009	23.21	7.87	6.76	37.83
2015	34.56	12.30	10.54	57.39
2020	36.36	13.56	11.60	61.52
Labor Income (Billions of dollars)				
2009	8.42	4.17	3.61	16.21
2015	12.88	6.76	5.64	25.28
2020	13.93	7.70	6.21	27.83

Source: Results generated by IHS Global Insight from IMPLAN model

Total Deepwater Oil & Gas Industry Economic Impact on the Gulf of Mexico

	Direct	Indirect	Induced	Total
Employment (Average annual workers)				
2009	73,885	93,860	127,347	295,092
2015	106,481	135,334	187,102	428,916
2020	121,073	150,182	205,092	476,347
Value Added (Billions of dollars)				
2009	31.23	11.01	9.37	51.62
2015	51.94	18.34	15.73	86.01
2020	61.64	22.16	19.05	102.84
Labor Income (Billions of dollars)				
2009	11.39	6.08	5.01	22.49
2015	19.31	10.02	8.42	37.75
2020	23.29	12.22	10.19	45.70

Source: Results generated by IHS Global Insight from IMPLAN model

Independents' Deepwater Oil & Gas Industry Economic Impact on the Gulf of Mexico

	Direct	Indirect	Induced	Total
Employment (Average annual workers)				
2009	30,843	38,676	51,779	121,298
2015	60,506	73,214	96,522	230,241
2020	72,498	84,365	108,249	265,113
Value Added (Billions of dollars)				
2009	12.61	4.49	3.81	20.91
2015	26.01	9.52	8.12	43.66
2020	31.11	11.79	10.06	52.96
Labor Income (Billions of dollars)				
2009	4.61	2.50	2.04	9.14
2015	9.78	5.37	4.34	19.49
2020	11.99	6.77	5.38	24.15

Source: Results generated by IHS Global Insight from IMPLAN model

Total Offshore Oil & Gas Industry Construction Economic Impact on the Gulf of Mexico, 2009-2020

	Direct	Indirect	Induced	Total
Employment (Average annual workers)	54,753	39,074	43,676	137,503
Value Added (Billions of dollars)	5.43	3.81	3.30	12.55
Labor Income (Billions of dollars)	3.80	2.36	1.77	7.92

Source: Results generated by IHS Global Insight from IMPLAN model

Independents' Offshore Oil & Gas Industry Construction Economic Impact on the Gulf of Mexico, 2009-2020

	Direct	Indirect	Induced	Total
Employment (Average annual workers)	15,824	11,491	12,762	40,077
Value Added (Billions of dollars)	1.59	1.12	0.96	3.68
Labor Income (Billions of dollars)	1.10	0.69	0.52	2.31

Source: Results generated by IHS Global Insight from IMPLAN model

V. DETAILED IMPACT TABLES

The following tables provide all detailed impact estimates underlying the results generated in Section III. All of the information contained in these tables provides the basis for the charts contained in the body of this report.

Gulf of Mexico Oil and Natural Gas Production

Area	Type	Product	Units	2009	2015	2020
Deepwater	Independents Share	Liquids	b/d	410,657	476,698	452,015
Deepwater	Major	Liquids	b/d	661,297	674,435	743,904
Deepwater	All	Liquids	b/d	1,071,954	1,151,133	1,195,919
Deepwater	Independents Share	Gas	Mcf/d	1,203	1,328	1,349
Deepwater	Major	Gas	Mcf/d	1,938	1,879	2,220
Deepwater	All	Gas	Mcf/d	3,141	3,206	3,569
Shallow Water	Independents Share	Liquids	b/d	498,615	264,587	150,416
Shallow Water	Major	Liquids	b/d	20,452	20,859	23,007
Shallow Water	All	Liquids	b/d	519,067	285,446	173,424
Shallow Water	Independents Share	Gas	Mcf/d	2,645	668	46
Shallow Water	Major	Gas	Mcf/d	455	332	247
Shallow Water	All	Gas	Mcf/d	3,099	1,000	292
GOM Total	Independents Share	Liquids	b/d	909,272	741,285	602,432
GOM Total	Independents Share	Gas	Mcf/d	3,848	1,996	1,395
GOM Total	Majors	Liquids	b/d	681,750	695,294	766,911
GOM Total	Majors	Gas	Mcf/d	2,392	2,210	2,467
GOM Total	All	Gas	Mcf/d	6,240	4,206	3,861
GOM Total	All	Liquids	b/d	1,591,021	1,436,579	1,369,343

APPENDIX A

Data Requirements and Transformations

Oil and Natural Gas Prices				
		2009	2015	2020
Liquids	$/bbl	$ 61.64	$ 100.20	$ 104.92
Gas	$/MMbtu	$ 3.86	$ 5.36	$ 5.75

IHS Global Insight with support from IHS CERA has compiled the data required to undertake an economic impact analysis of the oil and natural gas sector in the Gulf of Mexico. The dataset segments the economic activity for this sector into deepwater versus shallow water and distinguishes between major players versus independents for the Gulf region. The model requires average annual estimates for all of the oil and natural gas sector metrics for the Gulf. The following sectoral activities were determined to be the major direct contributors:

Gulf of Mexico Oil and Natural Gas Value of Production						
Area	Type	Product	Units	2009	2015	2020
Deepwater	Independents	Liquids	Dollars	$ 9,239,937,524	$17,434,807,887	$17,309,737,306
Deepwater	Major	Liquids	Dollars	$14,879,433,300	$24,666,878,179	$28,487,490,081
Deepwater	All	Liquids	Dollars	$24,119,370,824	$42,101,686,067	$45,797,227,387
Deepwater	Independents	Gas	Dollars	$ 1,740,939,963	$ 2,666,986,850	$ 2,902,607,305
Deepwater	Major	Gas	Dollars	$ 2,803,503,811	$ 3,773,270,125	$ 4,776,964,280
Deepwater	All	Gas	Dollars	$ 4,544,443,774	$ 6,440,256,975	$ 7,679,571,585
Shallow Water	Independents	Liquids	Dollars	$11,219,011,948	$ 9,677,054,585	$ 5,760,127,385
Shallow Water	Major	Liquids	Dollars	$ 460,188,659	$ 762,893,140	$ 881,056,394
Shallow Water	All	Liquids	Dollars	$11,679,200,606	$10,439,947,725	$ 6,641,183,779
Shallow Water	Independents	Gas	Dollars	$ 3,826,504,961	$ 1,341,927,180	$ 98,208,669
Shallow Water	Major	Gas	Dollars	$ 657,612,005	$ 665,871,198	$ 530,773,809
Shallow Water	All	Gas	Dollars	$ 4,484,116,966	$ 2,007,798,379	$ 628,982,478
GOM Total	Independents	Liquids	Dollars	$20,458,949,472	$27,111,862,473	$23,069,864,691
GOM Total	Independents	Gas	Dollars	$ 5,567,444,924	$ 4,008,914,030	$ 3,000,815,974
GOM Total	Majors	Liquids	Dollars	$15,339,621,959	$25,429,771,319	$29,368,546,475
GOM Total	Majors	Gas	Dollars	$ 3,461,115,816	$ 4,439,141,323	$ 5,307,738,089
GOM Total	All	Gas	Dollars	$ 9,028,560,740	$ 8,448,055,353	$ 8,308,554,063
GOM Total	All	Liquids	Dollars	$35,798,571,430	$52,541,633,792	$52,438,411,166
GOM	All	All	Dollars	$44,827,132,171	$60,989,689,145	$60,746,965,229

- Oil and Natural Gas Extraction
- Drilling and Support Activities for Oil and Natural Gas
- Construction of Facilities, Platforms, and Oil and Natural Gas Pipeline Transport

The IMPLAN model requires all the input values in dollar terms, hence the following conversions were performed to arrive at the final set of data.

Oil and Natural Gas Drilling and Support Services			
	2009	2015	2020
Deepwaters (Wells Drilled)			
Independents	62	102	114
Majors	81	55	49
Total	143	157	164
Avg. Cost (000)	$ 76,689	$ 89,825	$ 100,026
Drilling			
Independents	$ 4,754,713,673	$ 9,156,233,991	$11,450,169,057
Majors	$ 6,211,803,347	$ 4,930,279,841	$ 4,907,215,310
Total	$10,966,517,019	$14,086,513,833	$16,357,384,368
Support Services			
Independents	$ 5,698,106,416	$11,479,782,309	$14,168,712,541
Majors	$ 7,444,300,317	$ 6,181,421,243	$ 6,072,305,375
Total	$13,142,406,733	$17,661,203,552	$20,241,017,916
Drilling & Support			
Independents	$10,452,820,088	$20,636,016,300	$25,618,881,599
Majors	$13,656,103,664	$11,111,701,085	$10,979,520,685
Total	$24,108,923,752	$31,747,717,385	$36,598,402,284
Shallow waters (Wells Drilled)			
Independents	122	103	90
Majors	8	7	7
Total	130	110	96
Avg. Cost (000)	$ 6,685	$ 7,830	8,719
Drilling			
Independents	$ 812,422,849	$ 805,072,103	$ 781,279,822
Majors	$ 55,079,515	$ 54,581,159	$ 58,806,008
Total	$ 867,502,364	$ 859,653,262	$ 840,085,830
Support Services			
Independents	$ 973,617,376	$ 1,009,372,684	$ 966,774,303
Majors	$ 66,007,958	$ 68,432,046	$ 72,767,958
Total	$ 1,039,625,334	$ 1,077,804,731	$ 1,039,542,261
Drilling & Support			
Independents	$ 1,786,040,225	$ 1,814,444,787	$ 1,748,054,124
Majors	$ 121,087,473	$ 123,013,206	$ 131,573,966
Total	$ 1,907,127,698	$ 1,937,457,993	$ 1,879,628,091

Oil and natural gas production data were collected on barrels per day and millions of cubic feet per day for 2009, 2015, and 2020. The historical data and forecasts data were transformed to value of output using IHS price forecasts. Data were compiled for independents and major players for deepwater versus shallow water activity.

Oil and Natural Gas Drilling and Support Services (continued)			
	2009	2015	2020
Gulf of Mexico (Wells Drilled)			
Independents	184	205	204
Majors	89	62	56
Total	273	267	260
Drilling			
Independents	$ 5,567,136,522	$ 9,961,306,094	$12,231,448,879
Majors	$ 6,266,882,862	$ 4,984,861,001	$ 4,966,021,318
Total	$11,834,019,384	$14,946,167,095	$17,197,470,198
Support Services			
Independents	$ 6,671,723,792	$12,489,154,993	$15,135,486,844
Majors	$ 7,510,308,275	$ 6,249,853,290	$ 6,145,073,333
Total	$14,182,032,066	$18,739,008,283	$21,280,560,177
Drilling & Support			
Independents	$12,238,860,313	$22,450,461,087	$27,366,935,723
Majors	$13,777,191,137	$11,234,714,291	$11,111,094,651
Total	$26,016,051,450	$33,685,175,378	$38,478,030,375

Oil and natural gas prices, as shown in the table below, were used to calculate the value of output for independents and majors in the Gulf of Mexico. The oil price is in terms of dollars per barrel, and the natural gas price is expressed as dollars per millions of British thermal units. The next table shows the value of output for Gulf of Mexico (i.e., production volume multiplied by price).

Oil and natural gas drilling total costs are estimated using the number of wells drilled, by depth in deep and shallow waters, and an estimate of average costs for 2009, 2015, and 2020. Data and forecasts of the num-

Future Project Plans for All of GOM				
Field/Project Name	Prod Start Date	Capacity Addition (,000 bd)	Operator Names	Total Construction Cost ($B)
Caesar, Tonga & West Tonga (Phase 1)	2011	40	Anadarko Petroleum Corp	$1.25
Isabela & Santa Cruz	2011	30	BP Expl & Prod Inc & Noble Energy Inc	$1.00
Ozona Deep	2011	6	Marathon Oil Corp	$0.07
Phoenix*	2011	30	Energy Resource Technology Inc	$1.35
Thunder Bird	2013	30	Murphy Expl & Prod Co USA	$1.00
Jack	2014		Chevron USA Inc	$3.00
Knotty Head	2014	100	Nexen Petroleum USA Inc	$2.75
St. Malo	2014		Union Oil Co of California	$3.00
Big Foot	2015	120	Chevron USA Inc	$3.05
Julia	2015	30	Exxon Mobil Corp	$1.10
Puma	2015	70	BP Expl & Prod Inc	$1.20
Tubular Bells	2015	25	BP Expl & Prod Inc	$1.95
Kaskida	2017	140	BP Expl & Prod Inc	$3.73

ber of deepwater and shallow water wells are from an IHS database. Average costs are a weighted average of Gulf state costs measured for a benchmark year. The average cost series is forecasted using growth from IHS Global Insight's U.S. oil and natural gas drilling price index. Estimates of support services are obtained from a ratio of the value of U.S. support services output to the value of U.S. oil and natural gas drilling output. The following table exhibits the cost of drilling and support services for oil and natural gas for the Gulf of Mexico. The estimates are isolated for deep and shallow waters as well as major and independent players.

All Future Project Costs by Input Sector

IMPLAN Category	Costs ($M)
Construction (Manufacturing Structures)	$3,250
Metal Tank Manufacturing	$757
Valve Fittings Manufacturing	$1,209
Pipe and Pipe Fitting Manufacturing	$928
Other Fabricated Metal	$1,283
Oil and Gas Field Machinery	$6,795
Cutting tool and machine tool mfg	$905
Mechanical Power Transmission mfg	$452
Pump and Pumping Equipment	$379
Marine Transport	$850
Ground Transport	$757
Engineering Services	$379
TOTAL CONSTRUCTION COSTS	**$17,943**

Independent Operated Future Project Costs by Input Sector

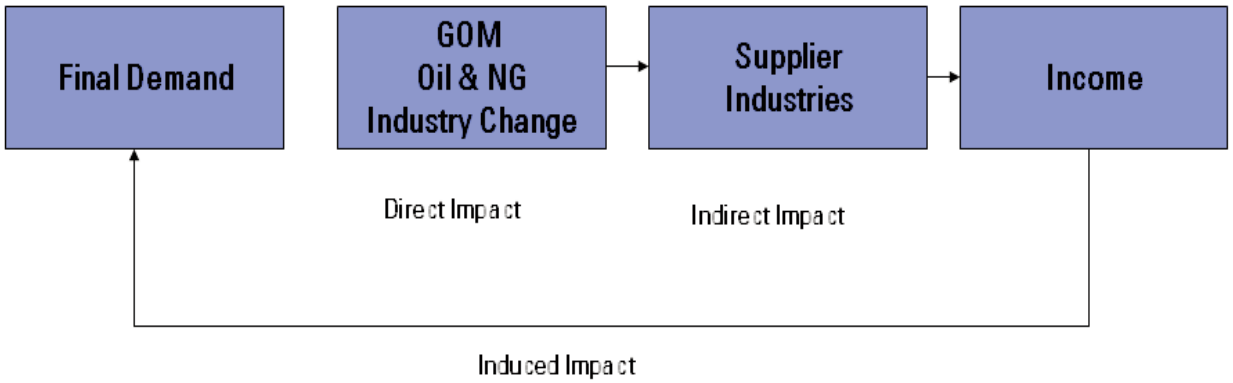
IMPLAN Category	Costs ($M)
Construction (Manufacturing Structures)	$865
Metal Tank Manufacturing	$187
Valve Fittings Manufacturing	$319
Pipe and Pipe Fitting Manufacturing	$368
Other Fabricated Metal	$358
Oil and Gas Field Machinery	$1,885
Cutting tool and machine tool mfg	$265
Mechanical Power Transmission mfg	$132
Pump and Pumping Equipment	$94
Marine Transport	$290
Ground Transport	$187
Engineering Services	$94
TOTAL CONSTRUCTION COSTS	**$5,043**

The construction costs for new projects, including facilities, drilling, and pipeline, were analyzed for all those projects that are currently in the IHS CERA future project plan database. As project construction is a much less predictable or annual event, the analysis of construction costs was not conducted for any particular year, as was the case for the extraction, drilling, and support activities, but was done to highlight the cumulative impact over the entire forecast interval. The list below highlights the projects, their planned start date, the capacity addition they will bring, the operator name for the project, and the IHS estimate for total construction costs. All of the future projects planned for the GOM are in deepwater, so there is no split between deepwater and total GOM construction costs.

The estimated construction costs that were generated for this analysis include facility, drilling, and pipeline (if the project was not set to tie back to an existing facility) aspects. These costs were then further broken down to exclude the expected percentage of total costs that was likely to be imported from other markets. The locally sourced costs were allocated to the primary supplier industries so that the dollar values could be directly input into the IMPLAN model. The two tables listed below highlight the total costs for locally sourced materials and services as they were allocated to the appropriate IMPLAN sectors and also those costs for just the projects that will be operated by the independents.

APPENDIX B

Tracing the Impact of Gulf of Mexico Oil & Natural Gas Activity Through the Gulf States Economy



The economic importance and impact of an industry can be traced through all regional industrial sectors as well as the regional and the macroeconomy. In this appendix, we define key terms and the conceptual framework that underlies the analysis of the impact of Gulf of Mexico oil and natural gas activity on the Gulf states economy. Documentation of the models used is provided in a later appendix.

The primary objective of this type of study is to present a complete account of how various activities of a given industry—in this case, Gulf of Mexico oil and natural gas—flow through the four-state economy. Any dollar of industrial revenue results in both direct and indirect repercussions on final demand; furthermore, any dollar of trade expenditure also results in indirect repercussions on final demand.

- For example, a theoretical reduction of oil and natural gas production, with everything else constant, would lead to less revenue and output in the utility industry. This decline would result in lower U.S. demand for pipeline and transports, which in turn requires less energy products such as gasoline and electricity. These repercussions are only a few in the chain resulting from the isolated initial change in an industry.

Because oil and natural gas are sources of energy for many of the primary-goods industries, almost all agriculture, mining, and manufacturing sectors would be indirectly influenced by a change in the oil and natural gas industry. The impact on each industry would have repercussions on all other producing industries, magnifying the indirect impact due to the chain process.

- The change in primary-good industries would affect domestic production and trade.
- The limitation on imports could increase domestic production; however, because of the short-term adjustment period, purchasers of the import products would experience a shortage of input and a reduction in their output.
- Purchasers of import products can be final users such as consumers, investors, or intermediate good users of primary products. In all cases, purchasers will experience a change in usage.

The net effects of these changes on the Gulf states economy and its industrial sectors, due to the direct impact, are divided into two stages: indirect impact and expenditure-induced impact.

The direct impact, as explained in previous chapters, is the effect of an industrial sector on the core industry's output, employment, and income. A detailed industry model (IHS Global Insight utilized the IMPLAN model) can evaluate that change in the context of a linked comprehensive industrial structure of a given economy.

- For instance, the total value of production of oil and natural gas for the Gulf of Mexico is the direct impact and was calculated for 2009, 2015, and 2020, as described in the previous chapter. The mechanism through which these direct output values are analyzed in the context of input-output modeling is as an inputted "change."

The change in purchasing activities of an industry and immediate impact on the agriculture, mining, and manufacturing sectors leads to indirect effects on output, employment, and income that are attributable to those sectors, their suppliers, and suppliers' inter-industry linkages. Supplier activities will include the majority of industries in the Gulf states regions.

Finally, because workers and their families in both the direct and indirect industries spend their income on food, housing, autos, household appliances, furniture, clothing, and other consumer items, additional output, employment, and income effects are part of the expenditure-induced impact. The following chart depicts this flow.

The Flow of Oil and Natural Gas Change Through the State Economy

The direct and indirect impacts represent all of the production, marketing, and sales activities that are required to bring the primary products to the marketplace in a consumable form. The use of input/output analysis allows one to analyze and quantify indirect and induced impacts. The sum of all impacts relative to the total size of the economy provides initial benchmark estimates to evaluate the importance of a given industry.

Methodology for this Study

IHS Global Insight used the IMPLAN regional models to quantify the contribution of the Gulf of Mexico oil and natural gas industry to the Gulf states. The IMPLAN model closely follows the accounting conventions used in the Bureau of Economic Analysis (BEA)'s study, "Input-Output Study of the U.S. Economy," and is flexible enough to evaluate the change via the value of output or employment from the source industry. When possible, IHS Global Insight customized the IMPLAN models by creating an aggregate Gulf states model by integrating IMPLAN state models. This process allowed for the examination of impacts of selected large sectors of the oil and natural gas industry and its interactions with other sectors.

APPENDIX C

IMPLAN Model

IMPLAN, short for "Impact Analysis for Planning," is a widely used commercially available model for input/output analysis. Minnesota IMPLAN Group, Inc., is responsible for the production of the IMPLAN data, model, and software. Using classic input/output analysis in combination with region-specific social accounting matrices and multiplier models, IMPLAN provides a highly accurate and adaptable model for its users. The IMPLAN database contains country, state, zip code, and federal economic statistics, which are specialized by region. IMPLAN accounts closely follow the accounting conventions used in the "Input-Output Study of the U.S. Economy" by the BEA and the rectangular format recommended by the United Nations. The IMPLAN system was designed to serve three functions:

(1) Data retrieval,

(2) Data reduction, model development, and

(3) Impact analysis

Comprehensive and detailed data coverage of the entire United States by geography, and the ability to incorporate user-supplied data at each stage of the model-building process, provides a high degree of flexibility both in terms of geographic coverage and model formulation. There are two components to the IMPLAN system, the software and databases. The databases provide all information to create regional IMPLAN models. The software performs the calculations and provides an interface for the user to make final-demand changes.

The IMPLAN system consists of two major parts:

(1) A national-level technology matrix and

(2) Estimates of sectoral activity for final demand, final payments, industry output, and employment for each detailed geography in the United States along with the aggregate region.

Input-output accounting describes commodity flows from producers to intermediate and final consumers. The total industry purchases of commodities, services, employment compensation, value added, and imports are equal to the value of the commodities produced.

Purchases for final use (final demand) drive the model. Industries produce goods and services for final demand and purchase goods and services from other producers. These other producers, in turn, purchase goods and services. This buying of goods and services (indirect purchases) continues until leakages from the region (imports and value added) stop the cycle.

These indirect and induced effects (the effects of household spending) can be mathematically derived. The derivation is called the Leontief inverse. The resulting sets of multipliers describe the change of output for each and every regional industry caused by a one dollar change in final demand for any given industry.

Creating regional input-output models requires a tremendous amount of data. The costs of surveying industries within each region to derive a list of commodity purchases production functions) are prohibitive. IMPLAN was developed as a cost-effective means to develop regional input-output models.

IMPLAN easily allows the user to do the following:

- Develop his/her own multiplier tables;
- Develop a complete set of SAM (Social Accounting Matrix) accounts;
- Change any component of the system, production functions, trade flows, or database;

- Generate type I, II, or any true SAM multiplier internalizing household, government, and/or investment activities
- Create custom impact analysis by entering final-demand changes;
- Obtain any report in the system to examine the model's assumptions and calculations.

There are two components to the IMPLAN system, the software and databases. The databases provide all information to create regional IMPLAN models. The software performs the calculations and provides an interface for the user to make final-demand changes.

IMPLAN Software

Minnesota IMPLAN Group developed the current version of IMPLAN Professional® version 2.0 in 1999. It is a Windows-based software package that performs the calculations necessary to create the predictive model. The software reads the database, creates the complete set of social accounting matrices (SAM), the I/O accounts, and integrates all user-defined inputs to produce an alternative scenario.

The IMPLAN Input/Output System derives the predictive multipliers. The software also enables the user to make changes to the data, the trade flows, or technology. It also enables the user to make final-demand changes, which results in the impact assessment.

Features of IMPLAN Professional® include:

(1) Windows file and printer management;

(2) Economic database editor;

(3) Complete Social Accounting Matrix structure;

(4) A choice of trade-flow assumptions: Supply-Demand Pooling; Regional Purchase Coefficients; Location quotients;

(5) Production function editor, i.e., the tools and opportunity necessary to modify the "absorption" and "byproducts" matrices;

(6) Libraries for production functions and impact analysis expenditures;

(7) Flexible model aggregation tools;

(8) Report generator; many preset reports for all stages of model building and analysis;

Export feature to many of the major PC file formats;

(9) Flexible assumptions for induced effects;

Type SAM – true SAM multipliers which allow internalizing any number of institutions;

Type II - Based on PCE and SAM based local income relationship;

Type II - Based on user-specified disposable income rate;

Type III (CPMM) - Traditional Forest Service employment based multipliers;

(10) Menu structure for easy impact analysis;

(11) Event-based impact databases;

(12) Built-in and editable transaction margins;

(13) Built-in and editable deflators;

(14) Technical support by MIG, Inc.;

(15) Data in Access Database format.

Database

Each database has information for these components for all 508 industrial sectors in the IMPLAN model.

Employment is total wage and salary and self-employed jobs in a region. In the 1985 database, employment was measured as full-time equivalent jobs. This meant that total employment in a region would generally be below most published estimates because these are generally full-time and part-time. In the 1990 and subsequent databases, employment includes both full-time and part-time workers. Employment in the 1990 and subsequent databases are measured in total jobs.

There are four sub-components for value added:

1. Employee Compensation;

2. Proprietary Income;

3. Other Property Type Income;

4. Indirect Business Taxes;

Employee compensation is wage and salary payments as well as benefits, including health and life insurance, retirement payments, and any other non-cash compensation. This provides a measure of income to workers who are paid by employers.

Proprietary income consists of payments received by self-employed individuals as income. This would be recorded on Federal Tax Form 1040C. This includes income received by private business owners, doctors, lawyers, and so forth. Any income a person receives for payment of self-employed work is counted here.

Other property-type income consists of payments from rents royalties and dividends. This includes payments to individuals in the form of rents received on property, royalties from contract, and dividends paid by corporations. This also includes corporate profits earned by corporations.

Indirect business taxes consist primarily of excise and sales taxes paid by individuals to businesses. These taxes are collected during the normal operation of these businesses but do not include taxes on profit or income. Goods and services purchased for their ultimate use by an end user are called final demands. For a region, this would include exports as that is a final use for that product. In an input-output framework, final demands are allocated to producing industries with margins allocated to the service sectors (transportation, wholesale and retail trade, insurance) associated with providing that good to the final user.

Thus, final demands are in producer prices. There are 13 subcomponents for final demands:

1. Personal Consumption Expenditures (PCE)—nine income levels;

2. Federal Government Military Purchases;

3. Federal Government Nonmilitary Purchases;

4. Federal Government Capital Formation Purchases;

5. State and Local Government Non-Education Purchases;

6. State and Local Government Education Purchases;

7. State and Local Government Capital Formation Purchases;

8. Inventory Purchases;

9. Capital Formation;

10. Foreign Exports;

11. State and Local Government Sales;

12. Federal Government Sales;

13. Inventory Sales.

All final demands in the original data are on a commodity basis. The distinction between industries and commodities is as follows from the 1972 I-O Definitions and Conventions Manual:

- An input-output industry is a grouping of establishments, as classified by Standard Industrial Classification (SIC);
- An input-output commodity consists of the characteristic products of the corresponding I-O industry wherever made. There are several industries that have no commodities. This is a result of departures from the strict SIC of industries. Also, some commodities have no associated industry. An example of this is noncomparable imports.

PCE consists of payments by individuals/households to industries for goods and services used for personal consumption. Individuals tend to buy little directly from industries other than retail trade. In an input-output table, though, purchases made by individuals for final consumption are shown as payments made directly to the industry producing the good. PCE is the largest component of final demand.

Federal government purchases are divided between military and nonmilitary uses and capital formation. Federal military purchases are those made to support the national defense. Goods range from food for troops to missile launchers. Nonmilitary purchases are made to supply all other government functions. Payments made to other governmental units are transfers and are not included in federal government purchases.

State and local government purchases are divided between public education and non-education and capital formation. Public education purchases are for elementary, high school, and higher education. Non-education purchases are for all other government activities. These include state government operations, operations including police protection and sanitation. Private-sector education purchases are not counted here. Private education purchases show up in IMPLAN sectors 495 and 496.

Inventory purchases are made when industries do not sell all output created in one year. This is generally the case. Each year, a portion of output goes to inventory. Inventory sales occur when industries sell more than they produce and need to deplete inventory. Inventory purchases and sales generally involve goods-producing industries (e.g., agriculture, mining, and manufacturing).

Capital formation is private expenditures made to obtain capital equipment. The dollar values in the IMPLAN database are expenditures made to an industrial sector producing the capital equipment. The values are not expenditures by the industrial sector.

Foreign exports are demands made to industries for goods for export beyond national borders. These represent goods and services demanded by foreign parties. Domestic exports are calculated during the IMPLAN model creation and are not part of the database.

The national transactions matrix is based on the most current BEA National Benchmark Input-Output Model. It is re-sectored to IMPLAN industrial sectoring. We use our IMPLAN data for the current year to update the most recent National Benchmark study.

IMPLAN Multipliers

The notion of a multiplier rests upon the difference between the initial effect of a change in final demand and the total effects of that change. Total effects can be calculated either as direct and indirect effects, or as direct, indirect, and induced effects. Direct effects are production changes associated with the immediate effects or final-demand changes. Indirect effects are production changes in backward-linked industries caused by the changing input needs of directly affected industries (for example, additional purchases to produce additional output). Induced effects are the changes in regional household spending patterns caused by changes in household income generated from the direct and indirect effects.

Five different sets of multipliers are estimated by IMPLAN corresponding to five measures of regional economic activity: total industry output, personal income, total income, value added, and employment. For each set of multipliers, four types of multipliers are generated, Type I, Type II, Type SAM, and Type III.

Type I Multiplier

A Type I multiplier is the direct effect, produced by a change in final demand, plus the indirect effect divided by the direct effect. Increased demands are assumed to lead to increased employment and population with the average income level remaining constant. The Leontief inverse (Type I multipliers matrix) is derived by inverting the direct coefficients matrix. The result is a matrix of total requirement coefficients, the amount each industry must produce for the purchasing industry to deliver one dollar's worth of output to final demand.

Type II Multipliers

Type II multipliers incorporate "induced" effects resulting from the household expenditures from new labor income. The linear relationship between labor income and household expenditure can be customized in the IMPLAN Professional® software:

1. The default relationship is PCE and total household expenditures. Each dollar of workplace-based income is spent based on the SAM relationship generated by IMPLAN.

2. The second possibility is a RIMS II style of Type II multiplier, where PCE is adjusted to represent only the spending of the disposable income portion of labor income. In this way, there is a direct one-to-one relationship to labor income and PCE. Then, a ratio which the user can specify is applied to convert total income to disposable income before the rounds of induced effects are calculated.

Type SAM

Type SAM multipliers are the direct, indirect, and induced effects where the induced effect is based on information in the social account matrix. This relationship accounts for social security and income tax leakage, institution savings, and commuting. It also accounts for inter-institutional transfers. This multiplier is flexible in that you can include any institutions you want. In other words, if you want to create a model closed to households and state and local government, you can. If you select this option, an additional dialog box with be displayed allowing you to select the institutions you want to include.

Output Multipliers

This report shows the total industry output multipliers and per-capita personal consumption expenditures. Output multipliers can be used to gauge the interdependence of sectors; the larger the output multiplier, the greater the interdependence of the sector on the rest of the regional economy. A Type I entry represents the value of production (from direct and indirect effects) required from all sectors by a particular sector to deliver one dollar's worth of output. Type II, SAM, and III adds in the induced requirements.

Example: If a Type I multiplier for the dairy farm industry is 1.0943, for each dollar of output produced by the dairy farm sector, 0.0943 dollars' worth of indirect output is generated in other local industries. If the Type

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