

Economic Impacts of the Proposed U.S. House of Representatives Amendment to the Jones Act Related to Offshore Oil and Natural Gas Installation Vessels

Prepared For:

The American Petroleum Institute (API)

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CALASH



Executive Summary

Introduction

Language focused on installation vessels has been proposed in the House of Representatives to amend Chapter 551 of Title 46, the portion of the United States Code that governs shipping within the United States. Parts of Title 46 make up what is collectively referred to as the Jones Act, which governs coastwise trade or cabotage in the United States.

The proposed language, if implemented, would change long-standing rules related to vessel movement and installation activity of specialized equipment used in the offshore oil and natural gas industry. The proposed language would likely fundamentally impact and greatly diminish the development of offshore oil and natural gas projects on the U.S. Outer Continental Shelf (OCS).

Calash was commissioned by the American Petroleum Institute (API), to provide an update of a previous independent evaluation of the potential impacts on offshore oil and natural gas project development and spending associated with changes to the Jones Act.¹ In addition, potential impacts on Gulf of Mexico oil and natural gas production, supported employment, gross domestic product, and government revenue were also projected. The conclusions set forth in this study are based solely upon government and other publicly available data and Calash's own expertise and analysis.

Given the time constraints and conservative assumptions associated with this study, it is likely that the costs and economic impacts presented represent a conservative projection of the impact of the proposed language. The impacts presented could be imprecise by as much as 10% or more for a variety of reasons, especially interpretations and enforcement decisions given the lack of a historical precedent for the described applications and determinations.

Impact of the Proposed Language on Gulf of Mexico Oil and Natural Gas Development

If the proposed language is enacted as currently written, the study projects a potential reduction in the total amount of Gulf of Mexico oil and natural gas development activity, as well as the domestic content of future projects as manufacturing of equipment is moved overseas. The proposed language would likely negatively influence projects that are currently under development as offshore projects that have yet to be installed are delayed and project economics and risk profiles are negatively impacted. The primary impact of the proposed language likely would be due to either increased difficulty, or in a worst-case scenario an inability to use, foreign

¹ The Economic Impacts of Proposed Modification and Revocation of Jones Act Ruling Letters Related to Offshore Oil and Natural Gas Activities, Calash, April 2017.

flagged, heavy lift vessels to develop U.S. offshore oil and natural gas projects. Depending on the enforcement of the proposed language, operators will face increased uncertainty, delayed engineering and planning, possible increased risks from the use of inappropriate vessels, increased costs and schedule delays from using oversized vessels and project cancellations. If non-coastwise vessels with lifting capacities of at least 1,000 tons are not able to receive determinations for lifts under 1,000 tons, the projections in this study are likely extremely conservative as lifts requiring crane capacities between 250 and 1,000 tons could not take place.

Under the House language, U.S. Customs and Border Protection (CBP) would be required to modify or revoke several ruling letters in which the agency has concluded that certain equipment such as jackets, topsides, and subsea equipment can be installed with a non-coastwise vessel. As a result, such equipment could be no longer considered equipment essential to the vessel and the movement of such equipment would be considered transportation that could only be accomplished by a coastwise vessel, no matter how incidental.

The House language also proposes a process that would be required to use a non-coastwise vessels to install a “platform jacket.”² Under the process, once the Secretary of Transportation determines that a coastwise “installation vessel”³ exists, then a non-coastwise vessel may not be used to install a platform jacket unless the Secretary makes a subsequent determination that no qualified coastwise installation vessel is available. This process would have a significant impact on how operators develop projects, especially because of the long time frames associated with offshore project engineering and procurement and the need for vessel specific engineering. While vessels with lifting capacity of at least 1,000 metric tons could potentially receive determinations, vessels with nominal lifting capabilities below 1,000 tons could not. If no vessels with crane capacities between 250 tons and 1,000 tons (or an appropriate vessel with capacity less than 250 tons due to hook height, water depth, radius, or other technical needs) are available to be used in the U.S. OCS, operators will be forced to decide whether to use a vessel with at least 1,000 tons of crane capacity (via a determination by the Secretary of Transportation), which would add significant costs and schedule delays due to a lack of available vessels or cancelling projects. Some activities which previously took place in the U.S. may move to other countries to allow projects to be developed despite the language, impacting U.S. employment such as manufacturing of large subsea hardware or fabrication of platform topsides and modules. The increased cost of installation due to the need to use oversize vessels to avail

² The bill defines a “platform jacket,” by reference to an existing definition, as “a single physical component and includes any type of offshore exploration, development, or production structure or component thereof, including—(A) platform jackets; (B) tension leg or SPAR platform superstructures (including the deck, drilling rig and support utilities, and supporting structure); (C) hull (including vertical legs and connecting pontoons or vertical cylinder); (D) tower and base sections of a platform jacket; (E) jacket structures; and (F) deck modules (known as ‘topsides’).”

³ The bill defines an “installation vessel” as “a vessel using a crane suitable for offshore use that—(A) is used to install platform jackets; (B) has a slewing or luffing capability; (C) has a lifting capacity of at least 1,000 metric tons; and (D) conducts lifting operations to construct or remove offshore facilities or subsea infrastructure or to install and uninstall component parts or materials from offshore facilities or subsea infrastructure.”

of the ability for the Secretary of Transportation to make a determination allowing the potential use of a non-coastwise vessel would on a per project basis increase domestic U.S. spending.

Total cumulative spending on offshore oil and natural gas exploration and development in the Gulf of Mexico OCS is projected to be just under \$635 billion between 2020 and 2040 or an average of around \$30 billion per year. If the proposed language is adopted, the study projects cumulative spending from 2020 to 2040 to just under \$485 billion, an average reduction of around \$7.1 billion (around 24 percent) per year.

Economic Impact of Proposed Language

The study projects total employment supported by the Gulf of Mexico offshore oil and natural gas industry to average around 360 thousand jobs under the base development scenario from 2020 to 2040. The adoption of the proposed language is projected to lead to a reduction in industry supported employment between 2020 and 2040 of around 85 thousand jobs on average due to reduced activity and U.S. content. As this study predicts that over the long term the industry will adapt through technology and outsourcing to minimize the impacts of the proposed language, the employment is projected to be especially impacted in the near term with reduced employment levels averaging nearly 100 thousand jobs from 2020 to 2025.

The Gulf of Mexico offshore oil and natural gas industry is expected to contribute an estimated average of nearly \$30 billion annually to U.S. GDP from 2020 to 2040. The proposed language, if adopted as written, is projected to lead to a potential reduction of GDP supported by Gulf of Mexico oil and natural gas activities of around \$7.3 billion annually from 2020 to 2040. The cumulative lost GDP burden of the proposal from 2020 to 2040 is estimated at around \$154 billion.

Annual government revenues from Gulf of Mexico lease sales, rents, and royalties are expected to average over \$5.3 billion in the base development scenario. Reduced oil and natural gas development activity, if the language is adopted as written, is projected to lead to an around 24 percent reduction in average annual revenues by nearly \$1.3 billion.

Reduced government revenues would likely primarily be due to reduced oil and natural gas production leading to reduced production royalties. On average from 2020 to 2040, this study projects reduced oil and natural gas production of an average of around 560 thousand barrels of oil equivalent per day.

Adoption of the proposed amendment to the Jones Act related to the use of non-coastwise vessels for offshore oil and natural gas activities in the U.S. OCS is projected to lead to significant delays in offshore exploration and development projects, reduced overall activity levels, and reduced U.S. economic content. This is projected to lead to reduced overall and domestic

spending, which is projected to lead to lower oil and natural production, employment, GDP and government revenues.

Study Limitations

This paper has been limited in scope to the assessment of the effects of the language in the House Coast Guard Authorization Act of 2019 (Section 305) that would amend Chapter 552 of Title 46 of the Jones Act affecting offshore oil and natural gas installation activity. Any further changes could have increased limiting effects on oil and natural gas activities in the U.S. OCS. Additionally, if the currently proposed language is interpreted or enforced in such a way that it further decreases or prevents the ability of non-coastwise vessels to operate in support of oil and natural gas activities in the OCS, then the effects of this language would likely be larger than what is described in this report. This would include the Secretary of Transportation determining that an appropriate coastwise vessel was available and therefore not allowing the use of a non-coastwise vessel based only on the nominal lifting capacity of that vessel's crane(s) without considering safety factors, hook height, positioning systems, or other technical aspects such as the need for heave compensation. As written the language will likely be difficult to effectively enforce without major impacts on the offshore oil and gas industry due to the long planning periods associated with offshore oil and gas projects, the diverse technical needs of projects, and the need for vessel specific installation engineering years before projects are installed.

The study also excludes potential supply chain reductions due to reduced activity levels in the Gulf of Mexico if projects are delayed due to the adoption of the proposed language, as well as potential disruptions to the supply chain if larger marine construction companies which possess in house engineering and project management functions exit the region.

The study has also excluded the impacts of activity in the Alaskan, Pacific, Eastern Gulf and Atlantic OCS regions, which may be material if these areas were opened for additional leasing. As such, exploration and production activities in these OCS areas would likely be projected to see similar disruptions under the proposed language. The study also excludes potential impacts of expired leases due to project delays.

Overall, given the constraints and assumptions discussed above, it is likely that the costs and economic impacts presented in this study represent a conservative projection of the impact of the proposed language. The impacts presented could be imprecise by as much as 10% or more for a variety of reasons, especially government agency enforcement decisions.

Impact Summary

This study projects that the following impacts may result if the proposed language is adopted as written:

- An average reduction in employment of nearly 85 thousand jobs from 2020 to 2040.
- Between 2020 and 2040, decreased Gulf of Mexico offshore oil and natural gas spending in the range of \$7.1 billion on average per year.
- An average reduction in oil and natural gas production of around 560 thousand barrels of oil equivalent per day from 2020 to 2040.
- An average loss of around than \$7.3 billion of GDP from 2020 to 2040.
- An average loss of around \$1.3 billion of government revenue per year from 2020 to 2040.
- A cumulative reduction of around \$390 million in revenue sharing to the Gulf Coast states.
- A loss of future LWCF funding for all states of at least \$10 million.

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Section 1 – Introduction

1.1 Purpose of the Report

Language passed by the House of Representatives in the Coast Guard Authorization Act of 2019 (Sec. 305. Installation Vessels, Chapter 551 of title 46, "§ 55123 Installation vessels") related to the use of Jones Act (coastwise) vessels in oil and natural gas construction activities is projected to have a significant impact on offshore oil and gas development activity. The proposed language would change previous rulings, some of which date back over forty years, which clarified when and in what ways non-coastwise vessels could be used to support offshore oil and natural gas development activities. The proposed language would fundamentally alter the way offshore oil and natural gas activities take place in the U.S. OCS due to the specialized nature of the affected vessels and the lack of Jones Act vessels which could complete these activities.

Calash was commissioned by the American Petroleum Institute (API), to provide an independent evaluation of the potential impacts on project development and spending associated with the proposed language. In addition, Calash also projected potential impacts on Gulf of Mexico oil and natural gas production, supported employment, GDP, and government revenue. The conclusions set forth in this study are based solely upon government and other publicly available data and Calash's own expertise and analysis.

1.2 Report Structure

In this report, Calash will first outline the study methodology including the development of data, the review of the language and its potential impacts on offshore installation vessels, the limitations of this study and how the two scenarios used in the report were developed. The next section will discuss the potential impact on offshore oil and natural gas development, including the impact on projects, production, and spending. The third section examines the potential economic impacts of the proposed language, including employment impacts, GDP impacts, and government revenue impacts. The final section concludes.

1.3 Excluded from This Study

This paper has been limited in scope to the assessment of the effects of the currently proposed language to amend portions of the Jones Act affecting offshore oil and natural gas development activity. Additionally, if the currently proposed language is interpreted or enforced in such a way that further decreases the ability of non-coastwise vessels to operate in support of oil and natural gas activities in the OCS then the effects of this language would likely be larger than what is outlined in this report.

The study also excludes potential supply chain reductions due to reduced activity levels in the Gulf as projects are delayed due to the adoption of the language, as well as potential disruptions to the supply chain if larger marine construction companies which possess in house engineering and project management exit the region.

The study has also excluded the impacts of activity in the Alaskan, Pacific, Eastern Gulf⁴ and Atlantic OCS regions. These impacts could be greater if areas which are not currently available for lease in the 2017-2022 OCS Oil and Gas Leasing Program are made. Under Executive Order 13795 (April 28, 2017) and Secretary's Order 3350 (May 1, 2017), BOEM is initiating a process to develop a new national OCS program for 2019-2024 to, upon completion, replace the current 2017-2022 program. It is a very likely possibility that exploration and production activities in these OCS areas would see similar disruptions under the proposed changes. The study also excludes potential impacts of expired leases due to project delays.

The study also does not attempt to calculate the effects of the proposed language on midstream or downstream oil and natural gas entities. In addition, the calculated government revenue potential does not include personal income taxes, corporate income taxes or local property taxes.

Given the unpredictable nature of advancements in technology and innovation in the oil and natural gas industry, the scope of this paper was limited to the effects that new requirements would have on future activity with the assumption that the methods and equipment mentioned in the language would still be in use at the end of the study period.

Overall, given the constraints and assumptions discussed above, it is likely that the costs and economic impacts presented in this study represent a conservative projection of the impact of the proposed language. The impacts presented could be imprecise by as much as 10% or more for a variety of reasons, including government agency interpretations and enforcement decisions.

1.4 About Calash

Calash is an award-winning energy advisory firm providing strategy, business advisory, economic analysis, and mergers and acquisitions support services across the upstream, midstream, refining and petrochemical industries. As a function of Calash's core business, the company is engaged daily in the collection and analysis of data as it relates to the oil and natural gas industry. Calash serves the global community of operating oil and natural gas companies, their suppliers, financial firms, and many others by providing detailed analysis on projects,

⁴ The Economic Impacts of Allowing Access to the Eastern Gulf of Mexico for Oil and Natural Gas Exploration and Development, Calash, Nov. 2018. The Economic Impacts of Allowing Access to the Pacific OCS for Oil and Natural Gas Exploration and Development, Calash, Nov. 2018. The Economic Impacts of Allowing Access to the Atlantic OCS for Oil and Natural Gas Exploration and Development, Calash, Nov. 2018.

investments, capital investment and operational spending undertaken by the onshore and offshore oil and natural gas industries. Calash analyzes market data from a variety of sources at the project level for projects throughout the world.

Section 2 – Study Methodology

2.1 Data Development

The authors of this report have undertaken a detailed review and analysis of the proposed language in the House Coast Guard Authorization Act of 2019 related to the use of Jones Act (coastwise) and non-coastwise vessels in oil and natural gas installation activities. As the effects of the proposed language are open to a wide interpretation and enforcement, the authors have made a good-faith effort to provide a reasonable interpretation of how the language would likely be interpreted and enforced given the lack of a historical, similar process. This study is in no way exhaustive, especially considering the relatively short period available to develop this analysis and the high degree of uncertainty around the potential implementation of the language.

This analysis focuses on the likely operational effects of the language on project development activity and considers the potential operational changes oil and natural gas operators and contractors could implement to minimize the effects of the revisions. As such, this analysis is essentially forward looking and potentially subject to significant changes based on the interpretation and enforcement of the language by the Secretary of Transportation, who is responsible for making determinations based on the proposed language, and CBP, which is responsible for revoking or modifying existing ruling letters.

Due to the limited time available to prepare this report, as well as the significant uncertainties about the way the language would be implemented and interpreted if adopted, all of the projected costs, engineering requirements and operational burdens that could arise from the language are not included in this report. Additionally, the internal costs to the Secretary of Transportation, CBP, or other agencies of implementing and administering the proposed language are not calculated in this report.

2.2 Requirements Review and Vessel Fleet

The Merchant Marine Act of 1920, also known as the Jones Act, is a United States federal statute that regulates maritime commerce in U.S. waters and between U.S. points. Amongst other things, the Jones Act defines cabotage requirements for U.S. waters requiring that all goods transported by water between U.S. points be carried on U.S.-flag ships, which were constructed in the United States, are owned by U.S. citizens, and are crewed by U.S. citizens and/or U.S. permanent residents. Historically, rulings by CBP held that the Jones Act did not apply to certain types of drilling, pipelay, heavy lift and other construction vessels that operate in the Gulf of Mexico and other OCS areas. Despite these rulings, the vast majority of vessels operating in support of offshore oil and natural gas activities have been coastwise vessels; CBP requires that

vessels transporting persons and supplies to offshore drilling rigs and platforms, such as platform supply vessels and crew boats, be coastwise vessels.

The proposed language in the House Coast Guard Authorization Act of 2019, Sec. 305. Installation Vessels, proposing changes to Chapter 551 of title 46, "§ 55123 Installation vessels," would alter greatly the way offshore oil and natural gas projects are executed in the U.S. OCS. One significant effect is that the language would require changes to longstanding rulings allowing the use of non-coastwise vessels for the installation of oil and natural gas platforms and subsea equipment. Under the proposed language, CBP will be required to revoke or modify ruling letters concluding that equipment such as jackets, topsides, and subsea equipment are considered equipment essential to the mission of the vessel, which could result in a requirement that movement of such equipment will be considered transportation of merchandise and thus lifting would be considered transportation that could only be accomplished by a coastwise vessel.

The language would create a process by which the Secretary of Transportation can make a determination that no qualified coastwise vessel exists, which would be required before a non-coastwise vessel could be used to lift a platform jacket, subsea equipment, or topsides. The proposed process lacks any historical precedent and would likely impose significant burdens on operators and contractors due to the lack of appropriate Jones Act vessels and the proposed process's impact on project engineering, procurement and development timelines. In addition, this process is restricted to so called installation vessels which are defined as vessels that have a lifting capacity of at least 1,000 metric tons (amongst other requirements). Accordingly, vessels with lifting capacity of at least 1,000 metric tons could potentially receive waivers, but vessels with nominal lifting capabilities below 1,000 tons could not. If no vessels with crane capacities between 250 tons and 1,000 tons are available to be used in the U.S. OCS, operators will be forced to decide whether to use a vessel with at least 1,000 tons of crane capacity (via a determination by the Secretary of Transportation), which could add significant costs and schedule delays due to a lack of available vessels or cancelling projects. If non-coastwise vessels with lifting capacities of at least 1,000 tons are not able to receive determinations for lifts under 1,000 tons, the projections in this study are likely extremely conservative as lifts requiring crane capacities between 250 and 1,000 tons could not take place.

As written, the language will likely be difficult to effectively enforce without major impacts on the offshore oil and gas industry due to the long planning periods associated with offshore oil and gas projects, the diverse technical needs of projects, and the need for vessel specific installation engineering years before projects are installed. If the currently proposed language is interpreted in such a way that further decreases or prevents the ability of non-coastwise vessels to operate in support of oil and natural gas activities in the OCS, then the effects of this language would likely be larger than what is described in this report, especially on larger projects requiring

offshore lifting of jackets and topsides and ultra-deep water projects. This would include the Secretary of Transportation determining that an appropriate coastwise vessel was available and therefore not allowing the use of a non-coastwise vessel based only on the nominal lifting capacity of that vessel's crane(s) without considering safety factors, hook height, positioning systems, or other technical aspects such as the need for heave compensation.

Crane Barges

Crane Barges are non-self-propelled barges equipped with various cranes for lifting jackets, topsides, modules or other equipment. They are used in installation, decommissioning, and other non-oil and natural gas related construction activities. These barges must be moved to location using tugboats and are moored when in operation by anchoring to the seabed, which prevents them from operating in deep water. The effect of the proposed language on activities utilizing crane barges would likely be less as there are a limited number of coastwise crane barges with nominal lifting capacities of up to 1,000 tons. There are currently 13 coastwise crane barges suitable for shallow water offshore oil and gas work, compared to a global fleet of 154. The largest of these crane vessels have lifting capacities of 800 to 1,000 tons which covers most shallow water lifts but would be incapable of lifting the largest, fixed platform jackets and topsides in the Gulf of Mexico. This restriction could be circumvented by increasing the number of lifts to install or decommission heavier items which would increase operational complexity, costs and safety risks. Alternatively, in some cases this could lead to operators fabricating topsides, jackets, or modules, which require a larger crane barge, outside the U.S. to avoid the potential inability to use a non-coastwise crane barge or project delays, engineering difficulties and higher costs due to the proposed language.

Multipurpose Support / Remotely Operated Vehicle Support Vessels (MPSV/ROV)

This category includes a wide variety of vessels which perform light construction work across water depths using remotely operated vehicles (ROV), and smaller cranes. While some vessels in this category can perform only one of these roles, many are equipped, or can be equipped, to perform a variety of work. ROV vessels typically have work class ROVs, and the cranes on these vessels typically can lift between 100 and 250 tons. Some of these cranes are equipped with special heave compensators to install equipment on the seafloor in deep waters. These vessels perform installation of subsea equipment, hookup, and other miscellaneous work for offshore oil and natural gas projects. Currently, across this category there are 16 coastwise vessels in service or under construction out of a global fleet of around 156. There are no coastwise vessel with lifting capacity of greater than 250 tons which coupled with the required crane radius (lifting capacities are decreased for larger radiuses) makes coastwise vessels unsuitable for most subsea lifts greater than 100 tons. Additionally, there is a lack of coastwise "DP3" vessels whose station keeping ability is more resilient in case of faults. Given the fact that vessels with lifting

capabilities less than 1,000 tons will not be able to avail of the proposed process there will potentially be a complete lack of vessel availability for vessels with lifting capacities between 250 and 1,000 tons. There are currently no coastwise vessels with lifting capacities in this range, while the global fleet contains around 65 such vessels which are equipped with the dynamic positioning systems required for deepwater lifts. It is important to note that required crane capacities are a function of not just the weight of equipment to be installed, but also water depth (as the wire which is paid out to lower equipment to the sea floor has significant weight), hook height, and safety factors. The lack of larger cranes and more resilient station keeping ability may lead to larger subsea equipment being fabricated outside the U.S. to avoid coastwise requirements as well as delays to projects due to reengineering to avoid operationally difficult or unsafe lifts. If no vessels with crane capacities between 250 tons and 1,000 tons are available to be used in the U.S. OCS, operators will be forced to decide whether to use a vessel with at least 1,000 tons of crane capacity (via a determination by the Secretary of Transportation) which would add significant costs and schedule delays due to a lack of available vessels or cancelling projects.

Heavy Lift Construction Vessels

Heavy lift offshore construction vessels are large, often semi-submersible, vessels that can lift as much as fifteen thousand tons. These vessels are used to install topsides and modules, install moorings in deepwater, pull in risers, install subsea equipment, and perform decommissioning work. These vessels, which are typically dynamically positioned and self-propelled, are some of the costliest and most complex vessels involved in offshore oil and natural gas construction. There are over 25 of these vessels in the global fleet capable of lifting over 1,000 tons, none of which are coastwise vessels. One coastwise vessel, the VB10,000 which uses an unusual dual barge-mounted truss system is capable of lifting fixed topsides and jackets up to 7,500 tons but is limited by its crane hook height when lifting topsides and modules and does therefore not typically undertake traditional heavy lift work. Worldwide, the number of vessels capable of performing the largest lifts in deep water which requires the highest level of DP systems is at most 16. Use of these vessels is required for the largest deepwater projects, for many complex tasks in addition to classical topsides lifts, such as the installation of moorings and pulling in risers from extreme water depths. The proposed language, depending on its enforcement, would likely severely reduce the ability of these vessels to work in the OCS lifting U.S. built topsides or equipment because oil and gas equipment previously considered essential to the mission of the vessel will now be deemed merchandise. Due to the immense complexity of large offshore lifts and the need for years of complex vessel specific engineering to safely perform these lifts while minimizing risks, many projects requiring these types of vessels would likely be delayed or cancelled due to the uncertainty, which would likely arise from the proposed process.

Due to the specialized nature of these vessels, their tendency to work across the world's oil and natural gas areas, their high cost, and the lack of facilities capable of constructing these vessels in the U.S., it is unlikely that Jones Act compliant vessels would be constructed. Operators and contractors therefore may instead utilize non-U.S. yards and fabricators to construct potentially affected equipment to avoid conflicting with the proposed language.

2.3 Limitations of the Report

The report's authors make no representation as to the effects of the proposed language not addressed specifically in this report and do not discount the possibility that the proposed language could impose significantly greater engineering, operational, cost or other burdens on industry or regulators. The report's authors' estimates herein of the effects that the proposed language will have on current and future engineering, operations, and costs are an independent good faith, qualitative view arising from a reasonable review of the proposed language. As this language is subject to interpretation by the Secretary of Transportation, CBP, and potentially other regulators, the effects of these changes will be highly dependent on those regulators' interpretation and enforcement of the language. Calash provides this independent view expressly disclaiming any warranty, liability, or responsibility for completeness, accuracy, use, or fitness to any person for any reason.

2.4 Scenario Development

The report's scenario development focused on constructing a tiered "bottom-up" model that separates the complete life cycle of offshore operations and subsequent effects into three main categories and five subcategories. The three main categories are as follows: 1) an "Activity" model that assesses potential reserve information in the context of estimating the possible number of projects within the Gulf of Mexico OCS and the currently forecasted projects and trends in exploration and project development in the region; 2) a "Spending" model based on the requirements to develop projects within the "Activity Forecast"; and 3) an "Economic" model focused on the economic impact on employment and government revenue from the "Spending" model. These categories include leasing activity, drilling, infrastructure & project development, and production & operation.

After the creation of the baseline model utilizing the oil and natural gas price strip and production profile from the Energy Information Administration's "Annual Energy Outlook 2019"⁵, the potential effects of the proposed language were considered on the basis of both potentially affected vessel types as well as potentially affected offshore oil and natural gas activities. Potential effects that were unclear or considered unlikely given a reasonable reading of the proposed changes were excluded from the study. The following potential effects were deemed

⁵ Annual Energy Outlook 2019, Energy Information Administration

most likely to impact U.S. OCS oil and natural gas activities based on direct impacts from affected vessel types. (Table 1)

Table 1: Projected Direct Vessel Impacts from Proposed Language

Vessel Type	Potential Impact of Proposed Language	Potential Effect
Shallow Water Crane Barges	Coastwise vessels available with nominal lifting capacity of up to 1,000 tons. Inability to use non-coastwise vessels with <1,000 tons capacity. Determination required for larger lifts with non-coastwise vessels.	Largest shallow water projects (greater than 1,000 tons crane required) delayed, postponed or cancelled due to lack of available vessels, increased engineering, operational complexity, and costs. Potential safe lifting issues. Fabrication of large topsides potentially moved outside of US.
MPSV/ROV	Lack of available coastwise vessels to complete construction subsea work requiring crane capacity >250 tons, especially lifting of larger equipment in deepwater. Inability to use non-coastwise vessels with lifting capacity <1,000 tons.	Projects currently underway but not installed delayed, postponed or cancelled. Increased engineering and operational complexity. Higher costs due to oversizing of vessels impacts project economics. Potential safe lifting issues. Fabrication of equipment moved outside of US.
Heavy Lift Construction Vessels	Heavy lift construction vessels unable to lift U.S. built topsides, modules, jackets and other equipment without approval of Secretary of Transportation due to change to vessel equipment rulings.	Due to operational, planning, engineering and safety issues larger projects delayed, postponed and cancelled. Fabrication of platform topsides, modules, and other subsea equipment moved outside of the US.

Source: Calash

In addition to the potential direct impacts above, further impacts due to the proposed language are likely due to the increased operational complexity of projects, planning, engineering and procurement issues, increased costs and reduced vessel availability due to vessels with less than 1,000 tons crane capacity not being subject to the determination process, as well as due to operators' strategies for developing projects under the proposed language. (Table 2)

Table 2: Other Projected Impacts from the Proposed Language

Cause of Impact	Potential Impact of Proposed Language	Potential Effect
Engineering, Operational and Safety Impact	The proposed language would likely lead to increased engineering and operational complexity as well as potentially unsafe operations if work was performed by a less robust vessel with a smaller safety factor.	Operators may delay, postpone, or cancel projects where increased costs affect project economics or engineering, operational, or safety concerns increase risks.
Engineering, Procurement and Planning Issues	Currently underway and future projects are delayed or postponed due to the need to plan, engineer, and contract these projects due to the language.	Delay of current projects will delay later projects out due to limited operator engineering, project management, and procurement resources. Operators may find it difficult to develop projects due to the need to complete the certification process before beginning engineering.
Increased costs and complexity of projects affect project feasibility and economics	Potential project may fail to meet IRR thresholds compared to competing projects (Both U.S. and International) and inability to meet operator safety/risk thresholds.	Larger and more complex projects as well as deep and ultra-deepwater projects which would typically use a construction vessel with crane capacity between 250 and 100 tons may be permanently cancelled reducing overall project activity.
Fabrication and manufacturing moved outside of the US	To avoid coastwise equipment transport requirements operators and contractors may relocate platform, topsides, and subsea equipment manufacturing fabrication and other facilities outside the US.	Reduced domestic U.S. content, spending and employment.
Increased local installation spending	Increased installation costs due to the need to use oversized vessels.	Increased U.S. installation spending and employment.

Source: Calash

After the potential impacts of the proposed language as discussed in the above tables were considered, the effects on near-term projects were considered. Upcoming near-term projects were classified based on if the major installation activity had been completed, and if this

activity may be affected. For projects not yet installed, depending on the size and complexity of the project, an appropriate delay (generally one to three years) was applied to the projects' timing. For projects not yet sanctioned, potential delays were calculated along with an estimation of the likelihood that the project could be postponed or cancelled due to technical or cost reasons. For exploration activity as well as potential projects from new discoveries, a general factor based on potential complexity was applied to account for projected reductions in activity due to increased complexity, costs and risk. The study assumed that over time the impacts of the proposed language would be reduced as operators and contractors developed technical and commercial solutions to reduce the impact of the proposed language on project development activity. The potential delays and reductions in activity were applied to the base scenario forecast resulting in the creation of the "House Proposed Language Scenario" which attempts to provide a reasonable projection of oil and natural gas exploration and development activity in the Gulf of Mexico OCS if the proposed language were adopted as currently proposed. After the development of this scenario, the scenario's potential implications for oil and natural gas production, employment, GDP, and government revenues were then calculated.

Section 3 – Impact on Development

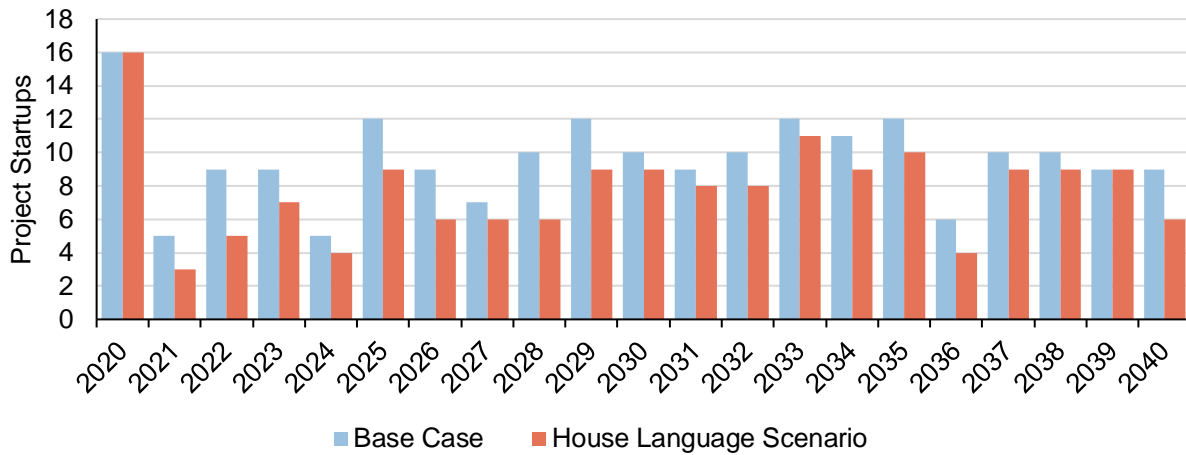
Natural gas and crude oil exploration and production activities in the U.S. OCS provide large contributions to employment, gross domestic product and state and federal government revenues. To quantify the effects of the proposed amendment to the Jones Act, the study forecasted activity levels for Gulf of Mexico OCS oil and natural gas activity with and without the proposed changes. The forecasted activity levels include the number of wells drilled, projects executed, total production, and spending. These activity forecasts drive the spending projections from which GDP, employment and government revenue effects are estimated.

3.1 Projects Executed

The development of an offshore oil and natural gas project is a complex process that requires a significant amount of time, planning and high levels of capital investment. Changes to project planning, engineering and contracting strategies typically lead to project delays as well as project cancellations due to changes in project economics and risk profiles. Project executions and their respective timelines are the best indicator of overall market health, as they can be viewed as representative of total trends in production, employment and revenue for the market.

Over the forecasted period of this study (2020-2040), the proposed language is projected to lead to a decline in the number of projects coming online in the range of twenty four percent. A decrease in the number of projects coming online is projected as soon as 2021, and this effect is projected to persist throughout the forecast period. Due to the nature of the proposed language, project delays and reductions are most likely to impact larger projects in deep and especially ultra-deep water, which typically are associated with larger capital expenditures. (Figure 1)

Figure 1: Projected Gulf of Mexico OCS Project Startups 2020-2040 Base Case and House Proposed Language Scenario



Source: Calash

It should be noted that overall project numbers in both scenarios in the latter part of the forecast are lower than in the earlier part of the forecast due to a projected shift towards larger deepwater projects in the Gulf of Mexico. Larger deepwater projects are typically more complex and require more wells and a longer development period, in addition to requiring increased material resources and larger equipment such as platforms, production trees and pipelines. Smaller projects, on the other hand, often rely on larger projects for certain types of infrastructure such as pipelines or processing facilities. This leads to the spending, production and other effects on a per project basis to be highly variable. The forecast also predicts a relative reduction in new project installations from 2021 to 2024 due to reduced exploration in recent years.

3.2 Production

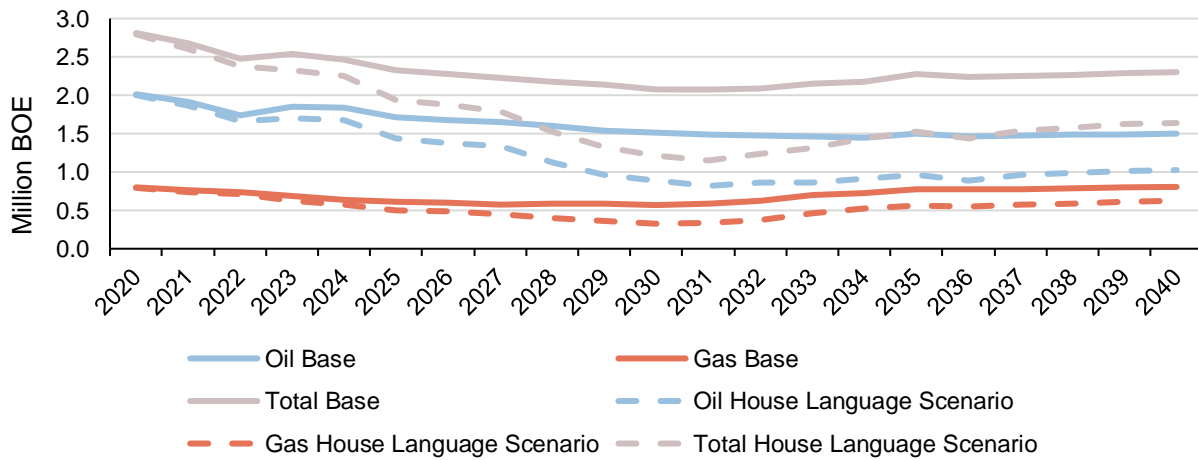
The number of projects developed, coupled with reservoir size, productivity and decline rates determines oil and natural gas production levels. Most oil and natural gas reservoirs contain a combination of oil, natural gas, water, and other substances. In order to forecast aggregate production, each project or potential project was modeled based on production curves for similar developments and reservoirs. The base case production curve for this report was modeled to be relatively in line with the projected offshore production forecast from the Energy Information Administration's "Annual Energy Outlook 2019".⁶

This study projects production in the Gulf of Mexico in the range of 2.8 million barrels of oil equivalent (BOE) per day in 2020 with production, for the most part, slowly declining throughout

⁶ Annual Energy Outlook 2019, Energy Information Administration

the forecast period. Approximately 71 percent of production in 2020 is projected to be oil (2.0 million BOE per day), and approximately 29 percent of the production is projected to be natural gas (.8 million BOE per day). Under the House Proposed Language Scenario, reductions in Gulf of Mexico production are projected to average 24 percent over the forecast period. (Figure 2)

Figure 2: Projected Gulf of Mexico Oil and Natural Gas Production Base and House Proposed Language Scenario 2020-2040



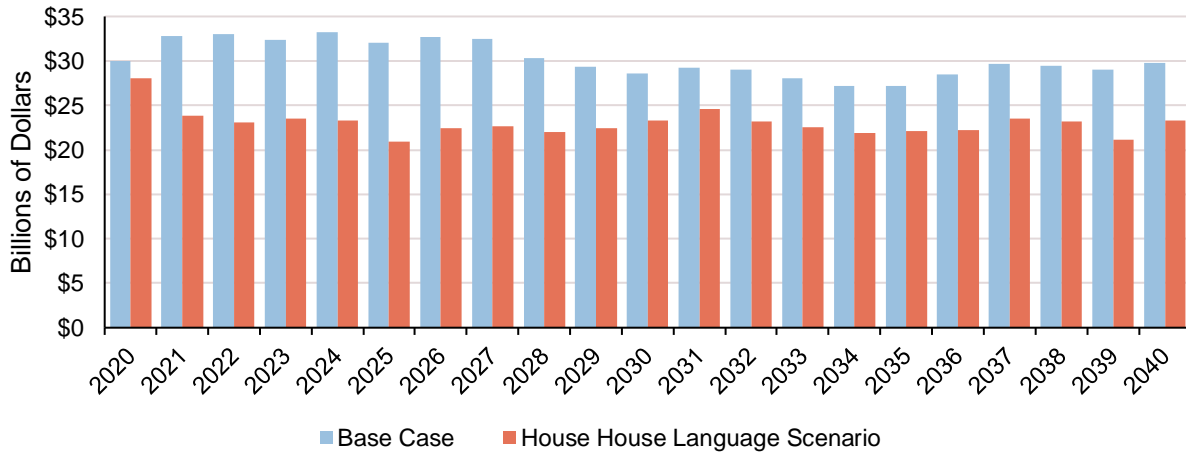
Source: EIA, Calash

3.3 Spending

Offshore oil and natural gas exploration and development is a capital-intensive process. Offshore projects require exploratory seismic surveys, drilling, production equipment, engineering, and operational expenditures to maintain production. In the base case, cumulative spending from offshore oil and natural gas development from 2020 to 2040 is projected to be in the range of \$634 billion, compared to projected spending in the range of \$483 billion in the House Proposed Language Scenario. This represents a decline across the period of 24 percent, or projected spending in the range of \$23 billion per year compared to projected spending in the range of \$30.2 billion a year in the base case.

For the purposes of this report, spending is divided into seven main categories: Drilling, Engineering, G&G, Installation, OPEX, Platforms, and Subsea Umbilicals, Risers and Flowlines (SURF). Each category encompasses a major type of exploration and production activity and has a significant influence on overall spending. Both development scenarios estimate total spending amounts that rise slightly through the end of the decade, decline briefly, then recover due to normal project development cycles. Under the base case, spending on offshore oil and natural gas is projected to begin to recover in 2020 and recover relatively strongly through 2027 before declining (with fluctuations due to normal investment cycles). (Figure 3)

Figure 3: Projected Total Offshore Oil and Natural Gas Spending Base and House Proposed Language Scenario 2020-2040



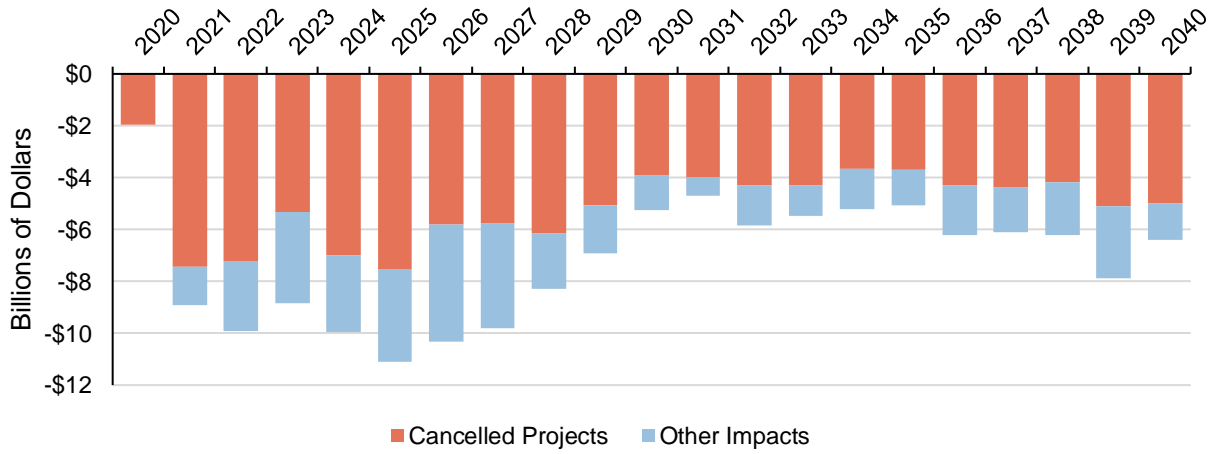
Source: Calash

In contrast, in the House Proposed Language Scenario spending is projected to drop below the base case next year (2020) as projects currently under development but not installed are delayed. Spending is projected to decline further in 2021 before staying relatively flat throughout the forecast period albeit with significant year to year fluctuations due to investment cycles. Spending is projected to remain below the base case spending levels throughout the forecast period.

3.4 Lost Spending Analysis

Reduced spending because of the proposed language is projected due to project delays, as well as to reduced drilling and project activity due to failure to meet IRR thresholds due to increased costs and project timelines compared to competing projects and exploration targets. Additionally, projects are projected to be delayed or canceled due to an inability of projects to meet operator safety and risk thresholds. According to this analysis 70 percent of lost spending is projected to be due to projects not executed or wells not drilled in the forecast period, and the remainder is due to delays and other impacts. (Figure 4)

Figure 4: Lost Spending Analysis – Projected Reduced Spending by Cause 2020-2040



Source: Calash

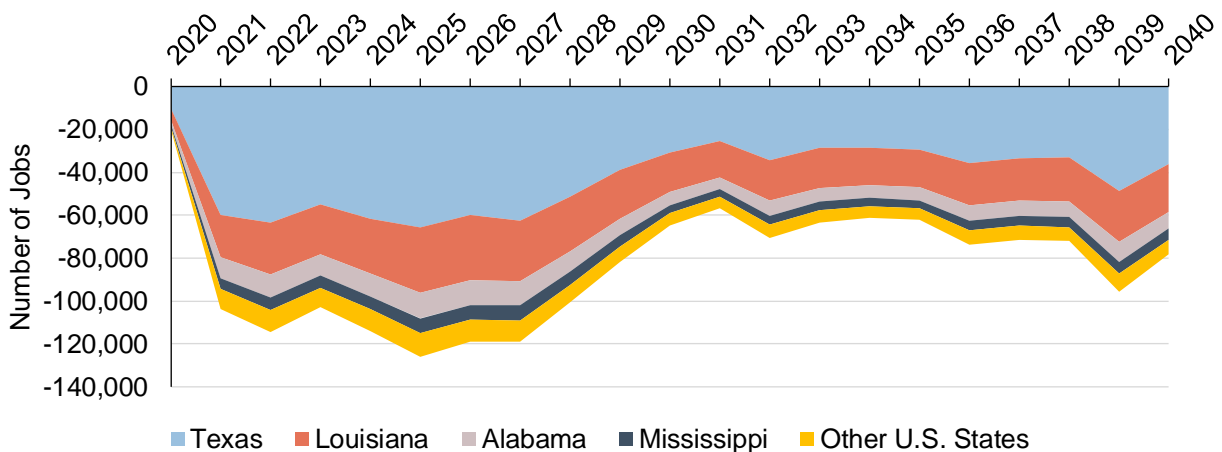
Section 4 – Macro-Economic Impact Conclusions

4.1 Employment

The offshore oil and natural gas industry has a long history of providing significant employment in the United States, particularly in the Gulf Coast states. Continued investment in offshore oil and gas infrastructure led to a large U.S. based supply chain that has provided high wages to large numbers of workers. Despite the ongoing downturn in the global oil and natural gas industry, Calash estimates that the offshore oil and natural gas industry is likely to support over 360 thousand U.S. jobs in 2020 in the base case (including indirect and induced employment)⁷.

As the industry begins to recover, employment is projected to grow to an average of around 385 thousand jobs between 2021 and 2027 before beginning to decline albeit with year to year fluctuations due to investment cycles. Between 2021 and 2027, average employment due to offshore oil and natural gas related activities is projected to be just over 275 thousand if the proposed language is adopted, a 23 percent reduction. (Figure 5)

Figure 5: Projected Employment by State - Base Scenario 2020-2040



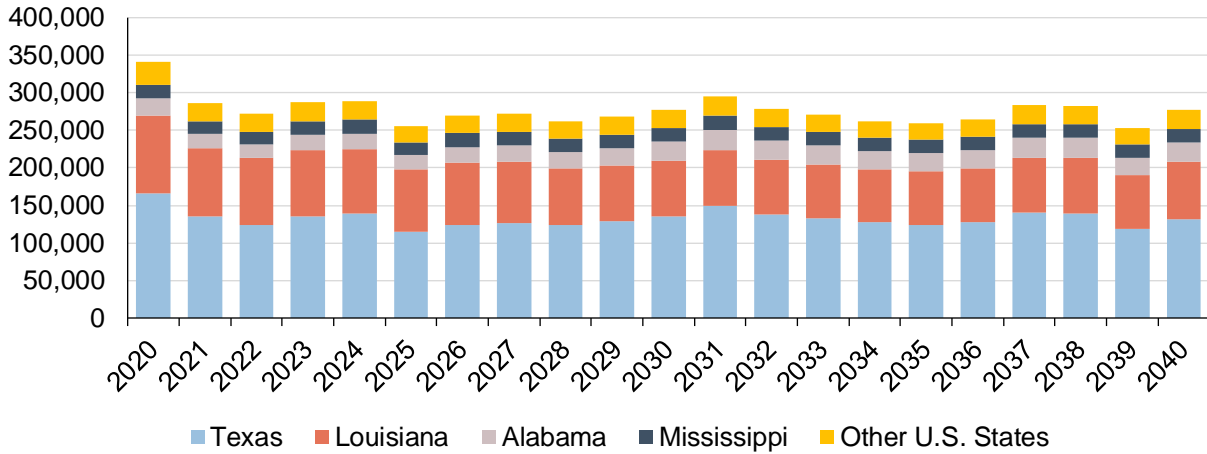
Source: Calash

On average from 2020 to 2040, employment is projected to be reduced from 360 thousand jobs to 275 thousand jobs as projects are delayed and canceled due to the inability to execute them as they were planned, engineered and procured. In addition to jobs lost due to reduced

⁷ Indirect jobs are those related to the oil and natural gas supply chain. Induced jobs are created from more income that is spent throughout the economy.

activity, employment reductions are projected due to suppliers moving manufacturing of equipment and fabrication of jackets and topsides outside of the U.S. Increased spending on installation will lead to higher per project installation employment. (Figure 6)

Figure 6: Projected Jobs by State – House Proposed Language Scenario 2020-2040

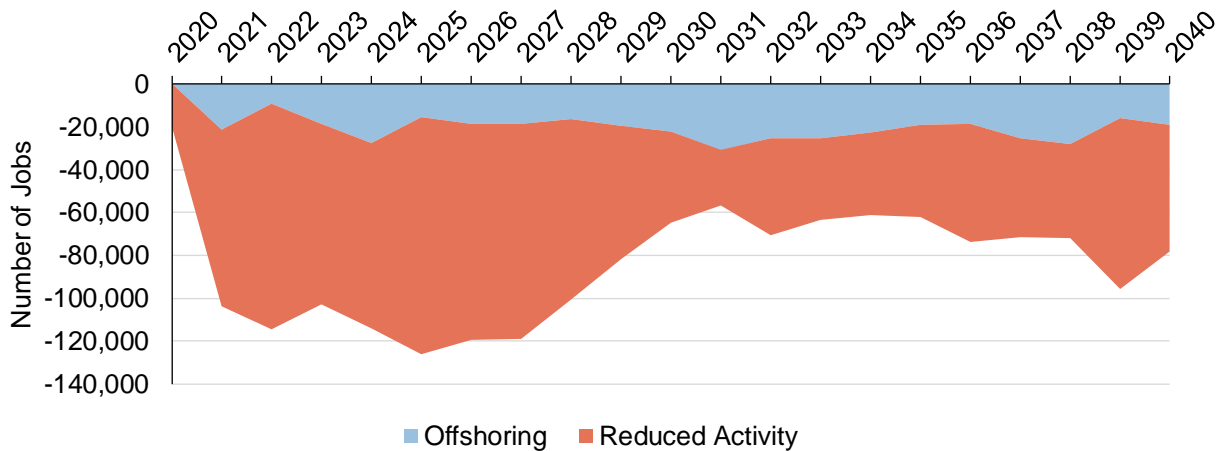


Source: Calash

4.2 Employment Impact Analysis

Decreased employment in the House Proposed Language Scenario is due to both decreased overall spending and activity levels as well as decreased U.S. content as certain activities, such as the manufacturing and fabrication of certain jackets, topsides and subsea equipment is moved to other countries. Although the exact strategies operators and contractors may employ to develop U.S. OCS projects if the proposed language is adopted will depend on a variety of factors, offshoring certain activities to countries such as Mexico (due to its proximity to U.S. Gulf of Mexico oil and natural gas activity), South Korea (due to its highly developed platform fabrication industry), or Brazil (due to its large capacity for manufacturing subsea equipment) to enable projects to be economically developed may reduce overall U.S. content in U.S. OCS projects. This study projects that lost employment would average in the range of 85 thousand jobs over the forecast period, of which 76 percent on average is projected to be due to reduced project activity (some of which is offset by increased installation spending), while 24 percent on average is projected to be due to reduced U.S. content. (Figure 7)

Figure 7: Lost Employment Analysis – Projected Reduced Employment by Cause 2020-2040



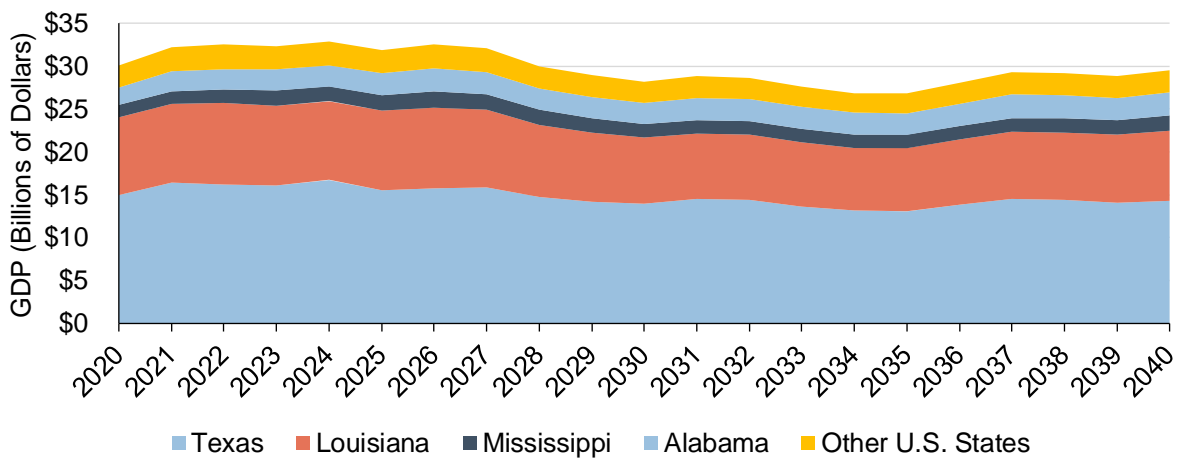
Source: Calash

4.3 GDP (Gross Domestic Product)

Potential gross domestic product (GDP) effects were calculated as a multiplier on spending within the U.S., further utilizing the BEA’s RIMS II model. The estimated effects of proposed language are therefore likely to be strongly correlated to any shifts within spending with international spending excluded, and mirror shifts in employment.

The GDP impact of the Gulf of Mexico offshore oil and natural gas industry in the U.S. in the base case in 2020 is projected to be around \$30 billion and is projected to average around \$29.8 billion from 2020 to 2040. (Figure 8)

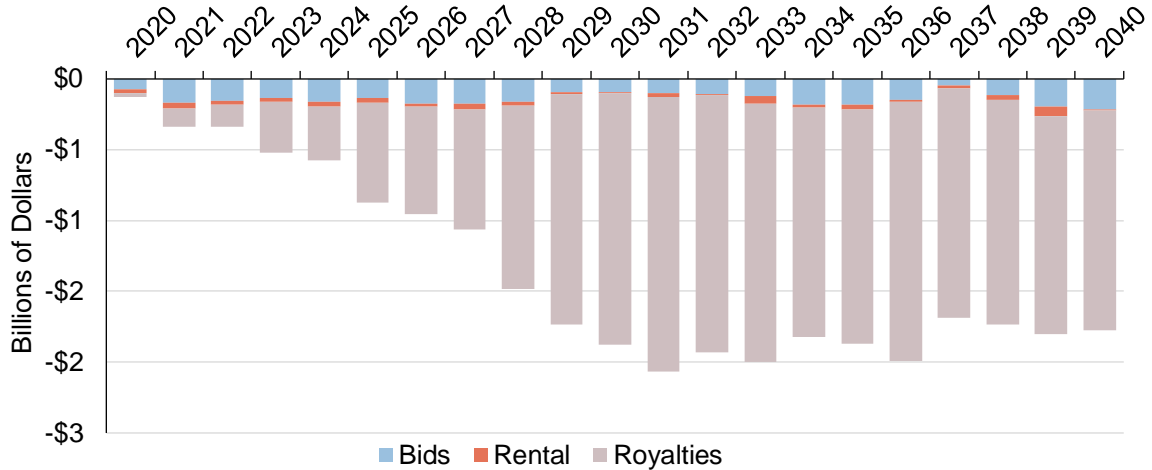
Figure 8: Projected GDP by State - Base Scenario 2020-2040



Source: Calash

The proposed language, if adopted as written, is projected to lower the GDP impact from Gulf of Mexico oil and natural gas activities by an average of around \$7.3 billion from 2020 to 2040. Cumulative lost GDP from 2020 to 2040 is projected to be around \$154 billion. (Figure 9)

Figure 9: Projected Lost GDP by State – House Proposed Language Scenario 2020-2040

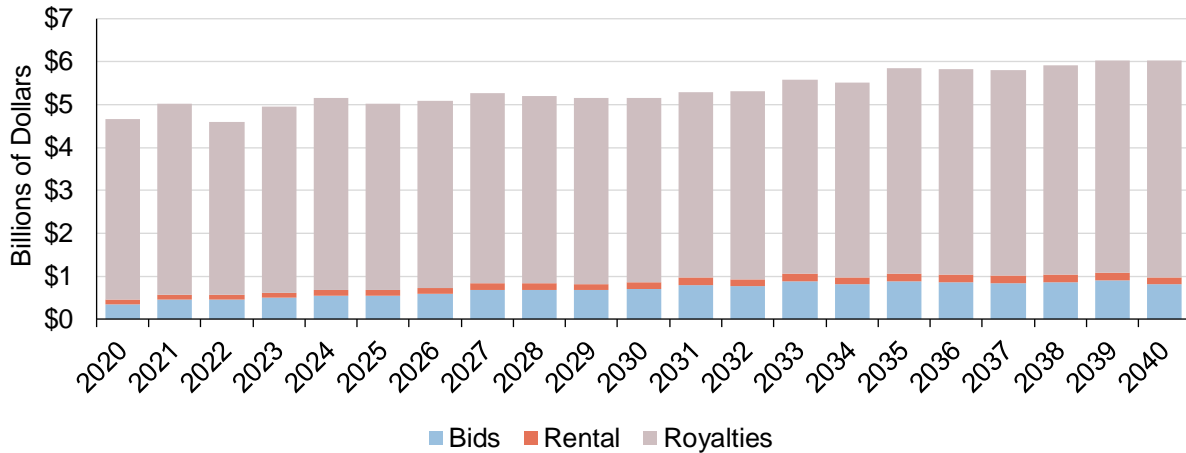


Source: Calash

4.4 Government Revenues

Government revenues due to Gulf of Mexico offshore oil and natural gas operations are currently collected through three main revenue streams: lease sale bonus bids, lease rentals, and production royalties. The distribution of these revenue streams is heavily skewed towards production royalties, which account for around 80 to 90 percent of revenues in a given year from offshore oil and natural gas activities. Total government revenues from Gulf of Mexico offshore oil and natural gas royalties have been between \$2.8 and \$4.7 billion in recent years, lease sale revenues have been between \$230 million and \$975 million, lease rental revenues have been approximately \$100 to \$200 million per year, and production revenues have provided around \$2.4 to \$4 billion per year. (Figure 10)

Figure 10: Projected Governmental Revenues – Base Development Scenario 2020-2040



Source: Calash

In the House Proposed Language Scenario, projected government revenues are projected to be around 24 percent lower, at \$4.1 billion per year on average compared to \$5.4 billion on average in the base case. Over the forecast period of 2020 to 2040, cumulative government revenues are projected to be around \$90 billion in the House Proposed Language Scenario, compared to around \$112 billion in the base case scenario.

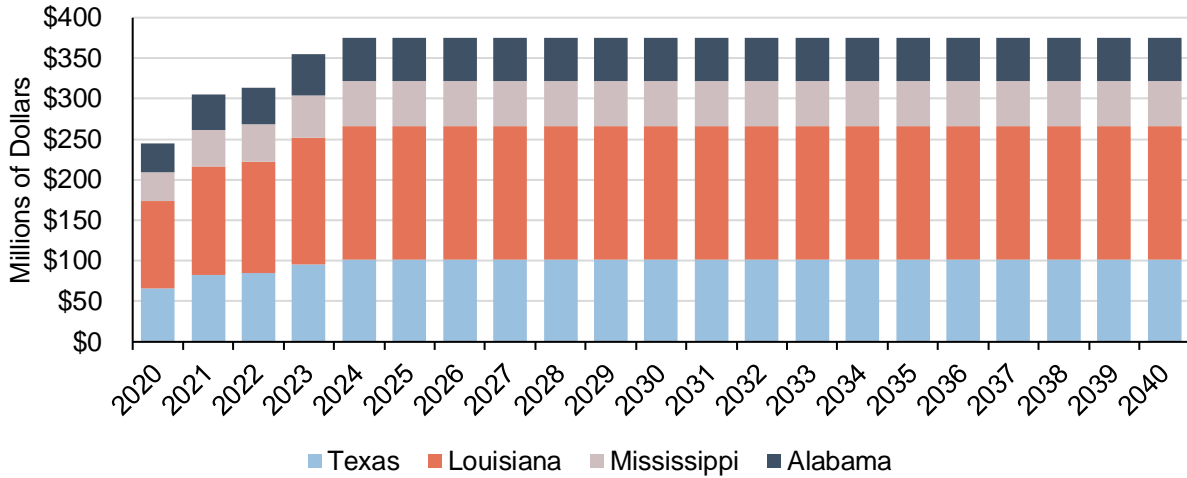
Reduced government revenues will also potentially impact the Land and Water Conservation Fund (LWCF), which was enacted to help preserve, develop, and ensure access to outdoor recreation resources. Under the LWCF Act, the fund is credited with revenues totaling \$900 million annually. The revenues come from three sources: “(1) surplus federal property sales, (2) the federal motorboat fuel tax, and (3) revenues from oil and gas leases on the Outer Continental Shelf (OCS).” Since the early 1990s, nearly all revenues deposited in the LWCF have been from OCS receipts.⁸ In addition, under the Gulf of Mexico Energy Security Act of 2006 (GOMESA), 12.5% of the revenues from OCS leases in the Gulf of Mexico is provide to the states through a LWCF grant program, up to \$125 million (except in FY2020 and FY2021, when the maximum is \$162.5 million). It is likely that a reduction in government revenues due to reduced oil and natural gas activity would lead to a reduction in funding for the LWCF of at least \$10 million per year.

State and Federal governments share revenue from Gulf of Mexico oil and natural gas development under GOMESA. As GOMESA is implemented, Gulf of Mexico offshore revenues have been split between state and federal governments. The second phase of GOMESA took effect in 2017, which includes a split of 50% to the federal government, 12.5% to the LWCF state grant program (as noted above), and 37.5% to state governments, with revenue capping

⁸ Land and Water Conservation Fund (LWCF): Fund Frequently Asked Questions, Congressional Research Service, May 3, 2019

provisions at \$375 million for states. Revenue for the states is capped at \$487.5 million for fiscal years 2020 and 2021 and \$375 million for fiscal years 2022–2055. Under the base scenario, states are expected to reach the revenue cap in 2024. (Figure 11)

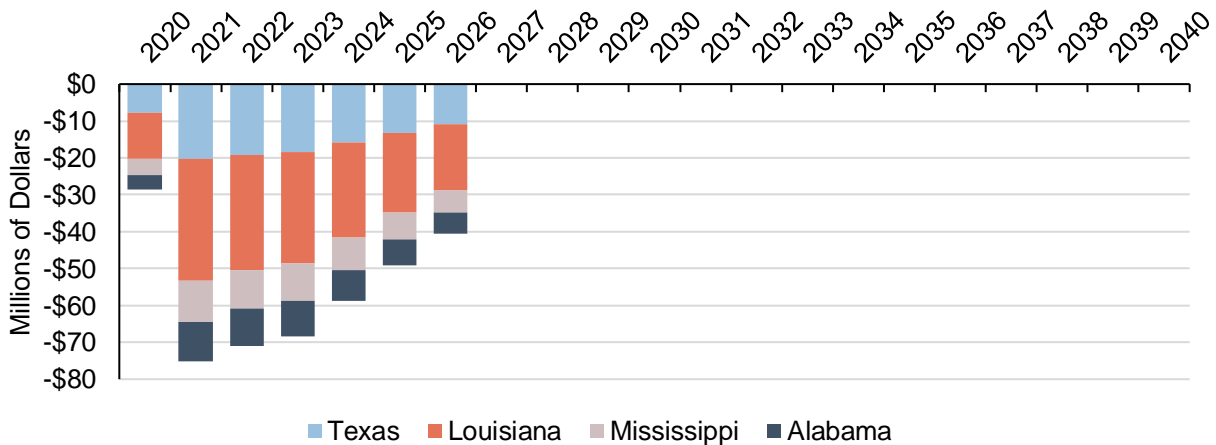
Figure 11: Projected State Revenues – Base Development Scenario 2020-2040



Source: Calash

In the House Proposed Language Scenario, state revenues are projected to reach the \$375 million cap in 2027, with cumulative lost revenue to states of over \$390 million. Under the House Proposed Language Scenario, Louisiana is projected to lose a total of around \$172 million of total revenue, Texas is projected to lose around \$105 million of total revenue, while both Mississippi and Alabama are projected to lose around \$55 million in total revenue each. (Figure 12)

Figure 12: Projected Lost Revenue by State – House Proposed Language Scenario 2020-2040



Source: Calash

After 2027, state revenues are projected to be \$375 million per year in both scenarios due to revenue caps, however any changes to revenue sharing legislation, which increases the share of potential state revenues, would likely increase lost state revenues due to the proposed language.

Section 5 – Conclusions

The oil and natural gas industry in the Gulf of Mexico has been a long-term provider of contributions to the economies of the Gulf coast states and the broader U.S. economy. The industry supports hundreds of thousands of American jobs providing revenues to many levels of the U.S. government and contributes to domestic energy production. Despite currently depressed activity levels due to low oil prices, the region is currently producing near record levels of oil and natural gas. Assuming that oil prices begin to stabilize, activity levels are also projected to increase leading to an upward trend in spending and employment.

This study concludes that the proposed House of Representatives language that would amend Chapter 551 of Title 46, as currently written, will seriously limit the ability of operators, installation contractors, and service providers to safely, effectively, and economically develop offshore oil and natural gas projects in U.S. OCS, as well as decrease the domestic U.S. content of equipment and services used in offshore oil and natural gas activities (though this will be partially offset by increased domestic U.S. installation spending). This decrease in activity and U.S. content is projected to further damage an important industry that is already dealing with the repercussions of a volatile and challenging commodity price environment. This reduction in activity and spending is projected to have a negative impact on the Gulf Coast States and the U.S.'s economy.

After analyzing the operational and economic impacts of the proposed language, this study has projected that the following effects may result from its adoption and implementation:

- Delays in projects currently under development but not installed due to an inability to utilize foreign flagged vessels.
- Decreased development activity due to increased costs and risk profiles of offshore oil and natural gas projects.
- Decreased U.S. domestic content due to offshoring of certain parts of the supply chain such as the manufacturing of subsea equipment and the fabrication of topsides and modules partially offset by higher U.S. installation spending.
- Between 2020 and 2040, decreased Gulf of Mexico offshore oil and natural gas spending in or around \$7.1 billion (24 percent) on average per year.
- An average reduction in oil and natural gas production of around 560 thousand barrels of oil equivalent per day from 2020 to 2040 (Equivalent to around 4.5 percent of U.S. oil production).

- A reduction of average employment levels due to reduced oil and natural gas industry activity of around 85 thousand jobs.
- An average loss of more than \$7.3 billion of GDP from 2020 to 2040.
- An average loss of almost \$1.3 million of government revenue per year from 2020 to 2040.
- A loss of future LWCF funding for all states of at least \$10 million.
- The adoption of the proposed amendment to the Jones Act is projected to lead to reduced activity, spending, GDP, government revenue, domestic U.S. content, and employment due to the offshore oil and natural gas industry in the U.S.

Section 6 – Appendices

6.1 Extended Methodology Appendix

General Methodology

Calash’s methodology focused on constructing a tiered “bottom-up” model that separated the complete life cycle of offshore operations and subsequent effects into four main categories – these categories are further developed into cases and presented as the base scenario and House Proposed Language Scenario within the paper. The four main categories are as follows;

- A “House Proposed Language Scenario” model that independently assesses the individual or combined effects of the proposed amendment to the Jones Act affecting offshore oil and natural gas installation activities
- An “Activity Forecast” model assessing Calash’s projects and project modeling information under which the number of expected projects is developed
- A “Spending” model based on the requirements of developing projects within the “Activity Forecast”
- An “Economic” model focusing on the economic impact on employment and government revenue from the “Spending” model.

Three (Activity Forecast, Spending, and Economic models) of the four individual subsections were further split into five additional criteria that create an individual “Project” model. These categories include seismic, leasing activity, drilling, infrastructure & project development, and production & operation.

In order to estimate the economic effects and project activity losses through the “Project” model, additional analysis was undertaken to understand which projects would be disrupted due to delays and changes to project economics and risk profiles. This was presented through additional analysis of the Base Development scenario and is provided as the House Proposed Language Scenario.

Project Development Methodology

In order to account for both currently active projects within the Gulf of Mexico and longer-term prospects that will be developed towards the end of the forecast period into the study’s project development activity, Calash incorporated two models into the project development forecast. The near-term activity was developed on known projects or prospects currently under consideration for development, while a longer-term forecast was developed on top of the near-term forecast through the analysis of reserves, oil prices, leasing trends, development trends,

historic project sizes and other relevant factors. The longer-term forecast was modelled after the Energy Information Administration's 2019 Long Term Energy Outlook's forecast of Gulf of Mexico oil and natural gas production forecast.

Longer term projects were developed by applying historical and current trends within the region to future developments based on undiscovered oil and natural gas resources in order to apply the proper costs and timelines to the expected activity. Projects were still delineated by individual timelines and the development scenarios that may be expected of future activity within the region but were calculated using assumptions on industry trends in production methods instead of on confirmed aspects of the specific projects.

With regards to the House Proposed Language Scenario, projects were examined for potential hurdles that would be encountered under the proposed changes through several criteria identified from Calash's research. These were focused on how changes to the law and ruling letters were likely to affect specific projects and how these changes would affect specific aspects of project development. These identified factors drove the forecasted possibility of delays or lost activity due to contracting and operational issues, project economics due to increased installation costs and delays and changing risk profiles. The study assumed that over time operators and contractors would develop new technical and commercial models to reduce the impact of the proposed language.

Project Spending Methodology

This spending analysis accounts for all capital investment and operational spending through the entire "life cycle" of operations. Every offshore oil or natural gas project must go through a series of steps in order to be developed. Initial expenditures necessary to identify targets and estimate the potential recoverable resources in place include seismic surveys (G&G) and the drilling and evaluation of exploration & appraisal (E&A) wells. For projects that are commercially viable, the full range of above-surface and below-water (subsea) equipment must be designed and purchased. Offshore equipment includes production platforms and on-site processing facilities, as well as below-water equipment, generally referred to as SURF (Subsea, Umbilicals, Risers and Flowlines). Finally, the equipment must be installed, and additional development wells must be drilled. Once under production, further operational expenditures (OPEX) are required to perform ongoing maintenance, production operations and other life extension activities as necessary for continued field production and optimization.

Spending for individual projects was subdivided into sixteen categories covering the complete life cycle of a single offshore project, as well as two additional groups for natural gas processing and operation. Timing and cost for individual categories were assigned based on the

previously mentioned project types where prices are scaled according to the complexity and size of the project.

Upon compiling the scenario of overall spending estimates, Calash deconstructed the “local content” of oil and natural gas operations within the studied region. Individual tasks were analyzed on a component-by-component basis to provide an estimate of the percentage of regional, national, and international construction required by offshore operations. Additionally, delineations were made at the regional level in order to project spending for individual states. Considerations were based on current oil and natural gas development, the proximity to reserves and production, strategic locations such as shore bases and ports, as well as Bureau of Economic Analysis (BEA) data pertaining to each state’s present economic distribution. For the House Proposed Language Scenario, these distributions were modified to account for likely changes to the offshore oil and natural gas supply chain as a result of the proposed changes including offshoring of work to other countries.

Economic Methodology

The study’s GDP and job data were calculated using the BEA’s RIMs II Model providing an input-output multiplier on spending at the industry and state levels for each defined category. Model outputs considered from spending effects include number of jobs and GDP multiplier effects. Further delineation is presented in the form of direct and indirect and induced job numbers, which encompass the number of jobs relating to the spending in that category versus indirect and induced jobs that are created from pass-through spending. For states considered within the study that contained no RIMs II multipliers for specific sectors, state multipliers from economies that most closely paralleled those in question were replicated.

Rims Categories used:

- Architectural, Engineering, and Related Services
- Construction
- Drilling Oil and Gas Wells
- Fabricated Metal Product Manufacturing
- Mining and Oil and Gas Field Machinery Manufacturing
- Oil and Gas Extraction
- Steel Product Manufacturing from Purchased Steel
- Support Activities for Oil and Gas Operations

Governmental Revenue Development

Governmental revenue data is presented in three categories: bonus bids from lease sales, rents from purchased but not yet developed leases, and royalty payments from producing leases. The projected revenue was calculated under the assumption that the current operating structure of the Gulf of Mexico would remain in place where applicable. Lease sales and rental rates were calculated through the simulation of yearly lease sales within each individual area, while the number of leases acquired was modeled on oil price forecasts, historical rates, and on the estimated amount of reserves in the western and central OCS regions.

The federal / state government revenue split of leases, rents and royalties were modeled under the application of GOMESA (Gulf of Mexico Energy Security Act).

Production pricing were calculated using the EIA estimates for both West Texas Intermediate (WTI) spot and Henry Hub natural gas prices⁹ as well as on differentials between historically realized royalties and commodity prices. Additional governmental revenues such as income and corporate taxes were considered outside of the scope of this study and are likely to provide additional government revenues throughout the studied period.

⁹ Annual Energy Outlook 2019, Energy Information Administration

6.2 Glossary of Terms

Coastwise vessel – A vessel permitted to engage in Jones Act protected domestic trade between two or more coastwise points in the United States. Coastwise vessels are required to be U.S. built, crewed by U.S. Citizen mariners, U.S. owned, and issued a Coastwise Endorsement by the Coast Guard on the vessel's Certificate of Documentation

Gross Domestic Product (GDP) – The total dollar value of all goods and services produced over a specific time period

Gulf of Mexico Energy Security Act (GOMESA) – Act signed into law in 2006 which enhances OCS oil and natural gas leasing activities and revenue sharing in the Gulf of Mexico (GOM)

Lease Sales – Periodic sales of leases by the federal government to offshore areas for the purpose of developing oil, natural gas, and sulfur

Module – A part of a topside structure which can typically be lifted independently before being integrated into a topside

Outer Continental Shelf (OCS) – the submerged lands, subsoil, and seabed, lying between the seaward extent of the States' jurisdiction and the seaward extent of Federal jurisdiction

Rents – Ongoing rental income paid by leaseholders to the federal government to maintain offshore oil and natural gas leases

Riser – A pipeline used to convey fluids between a subsea and a surface facility

Royalties – Ongoing payments to the federal government by leaseholders based on the value of produced oil and natural gas

Subsea Equipment – Seabed placed equipment used in the production of oil and natural gas

Topsides – The upper part of a fixed or floating platform used to process oil, natural gas, water and other fluids, control production, and house workers

Umbilical – A collection of cables, tubes, and hoses used to control, monitor and provide communications, chemicals, hydraulic and electrical power to subsea oil and natural gas wells



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