

**Congress of the United States**  
**U.S. House of Representatives**  
**Committee on Small Business**  
**2361 Rayburn House Office Building**  
**Washington, DC 20515-0515**

To: Members, Subcommittee on Agriculture, Energy and Trade  
From: Committee Staff  
Date: June 24, 2014  
Re.: Hearing: "The New Domestic Energy Paradigm: Downstream Challenges Facing Small Energy Businesses"

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At 10:00 a.m. on June 26, 2014 in room 2360 of the Rayburn House Office Building, the Subcommittee on Agriculture, Energy and Trade of the Committee on Small Business will meet for a hearing titled, "The New Domestic Energy Paradigm: Addressing Downstream Challenges Facing Small Energy Businesses." Previous Committee hearings have examined some of the upstream challenges in developing the hydrocarbon resources of the United States, such as obtaining access and permits to extract oil from federal lands. The purpose of this hearing is to examine some of the potential downstream<sup>1</sup> challenges that could reduce potential crude oil output and how these challenges may affect small businesses and the economy.

**I. The New Domestic Energy Paradigm**

Until very recently, many geologists, energy market participants and policymakers assumed that the overall rate of domestic crude oil production had peaked.<sup>2</sup> However, the advent of new technologies and changes to petroleum market fundamentals has made it economical to produce significant quantities of oil from unconventional fields.<sup>3</sup> This, in turn, has significantly increased the amount of proven reserves in, and the production potential of, the United States.

According to the United States Energy Information Agency, after decades of persistent declines, total domestic crude oil production is expected to increase from 6.5 million barrels per day (bpd) in 2012 to 9.6 million bpd by the year 2019, based mainly on increased extraction of oil from shale and other tight formations.<sup>4</sup> Other

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<sup>1</sup> Downstream oil activities include converting raw crude oil into finished products and bringing those products to market. 3 IHS, AMERICA'S NEW ENERGY FUTURE, THE UNCONVENTIONAL OIL AND GAS REVOLUTION AND THE U.S. ECONOMY, AN AMERICAN MANUFACTURING RENAISSANCE 3 (2013), available at [http://www.energyxxi.org/sites/default/files/file-tool/Americas New Energy Future Exec Sum.pdf](http://www.energyxxi.org/sites/default/files/file-tool/Americas%20New%20Energy%20Future%20Exec%20Sum.pdf).

<sup>2</sup> The production of hydrocarbons from geologic formations typically follows a curve during which production from a field reaches a peak and then begins to decline, often referred to as depletion. Needless to say, oil and gas markets are not static, and the advent of new technologies and changes to market fundamentals alters the supply and consumption of oil and natural gas. DANIEL YERGIN, THE QUEST: ENERGY, SECURITY, AND THE REMAKING OF THE MODERN WORLD 235-37 (2011).

<sup>3</sup> UNIVERSITY OF TEXAS PETROLEUM EXTENSION SERVICES, FUNDAMENTALS OF PETROLEUM 244 (5<sup>th</sup> ed. 2011). Unconventional fields are generally those where the geological formations lack sufficient porosity or permeability to allow hydrocarbons to flow freely into the wellbore under natural pressures. 1 IHS GLOBAL INSIGHT, AMERICA'S NEW ENERGY FUTURE: THE UNCONVENTIONAL OIL AND GAS REVOLUTION AND THE U.S. ECONOMY, NATIONAL ECONOMIC CONTRIBUTIONS 2 (2012), available at [http://marcelluscoalition.org/wp-content/uploads/2012/10/IHS\\_Americas-New-Energy-Future.pdf](http://marcelluscoalition.org/wp-content/uploads/2012/10/IHS_Americas-New-Energy-Future.pdf) [hereinafter National Economic Contributions Report].

<sup>4</sup> UNITED STATES ENERGY INFORMATION AGENCY, ANNUAL ENERGY OUTLOOK 2013, at 2 (2013), available at [http://www.eia.gov/forecasts/aeo/pdf/0383\(2013\).pdf](http://www.eia.gov/forecasts/aeo/pdf/0383(2013).pdf) [hereinafter EIA Outlook]. The estimates for years after 2012 are based on certain assumptions about future economic and environmental conditions. *Id.* at ii.

forecasts estimate domestic oil production to reach 11.2 million bpd by the year 2022.<sup>5</sup> These tight oil deposits produce light sweet grades of crude.<sup>6</sup>

The surge in production of light sweet grade crude from tight oil deposits has greatly reduced United States crude oil imports. According to the United States Energy Information Agency, the United States imported 60 percent of the oil it used in 2005, but this figure is forecast to fall to 25 percent in 2016.<sup>7</sup> More than half of this decline is attributed to fewer imports of light sweet crude oil.<sup>8</sup>

As production of oil from tight formations has continued to exceed previous projections, increased attention has begun to focus on emerging downstream challenges that could affect the economic fundamentals of oil production. These downstream challenges may adversely affect the economic incentives that currently exist to extract oil from tight formations.

## II. Emerging Downstream Challenges to Potential Oil Production

Increased domestic production of light sweet crude has resulted in the displacement of imported crude oil of the same grade. However, while United States refineries have been able to absorb the recent increases in domestically produced light sweet crude, there may be a point in the future where refiners are unable to efficiently process all of the light sweet crude produced in the United States as many domestic refineries have been specifically configured to process different grades of crude oil.<sup>9</sup>

This is leading to fears of a potential mismatch between the potential supply of domestically-produced oil and the capacity of the refining sector's ability to absorb it. Assuming that producers continue to extract light sweet crude at current or increased rates, this will increase supply of upstream crude.<sup>10</sup> However, this rise in production without concomitant downstream utilization will result in an oversupply of light sweet crude. Basic economics then suggests that the proper response would be to curtail production.

If domestic utilization is not possible, the logical outlet would be for American producers to export the amount that cannot be utilized domestically. However, this alternative is foreclosed to domestic oil producers as the federal government has imposed a "de facto" ban on oil exports since 1975.<sup>11</sup> Absent a change in this "de facto" ban on exports, the potential mismatch between upstream supply and downstream utilization must be addressed.

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<sup>5</sup> IHS, US CRUDE OIL EXPORT DECISION: ASSESSING THE IMPACT OF THE EXPORT BAN AND FREE TRADE ON THE US ECONOMY E-3 (2014) [hereinafter IHS Report] (available from Committee).

<sup>6</sup> *Id.* at II-2. There are many different types, or grades, of crude oil. For the purposes of the hearing, the memorandum largely focuses on two specific grades of crude: light sweet crudes, which have a higher American Petroleum Institute (API) gravity and have relatively low levels of sulfur, while heavy sour crudes have lower API gravity and higher sulfur content. The grade of crude determines the degree to which the oil must be subject to refining processes. Generally, light sweet crudes require less refining to turn into useful products than heavier and sourer grades of crude. *Id.* at III-3. An oil's API gravity is a measure of its density. *Id.* As will be discussed later in the memorandum, refineries are often configured to process a specific grade of crude.

<sup>7</sup> UNITED STATES ENERGY INFORMATION AGENCY, ANNUAL ENERGY OUTLOOK 2014 EARLY RELEASE OVERVIEW 2, (2014), available at [http://www.eia.gov/forecasts/aeo/er/pdf/0383er\(2014\).pdf](http://www.eia.gov/forecasts/aeo/er/pdf/0383er(2014).pdf).

<sup>8</sup> IHS Report, *supra* note 5, at V-8.

<sup>9</sup> IHS Report, *supra* note 5, at ES-3. Issues pertaining to the factors influencing refinery configurations is addressed in a later section of the memorandum.

<sup>10</sup> The downward pressure on light sweet crude prices could average \$25 per barrel. IHS Report, *supra* note 5, at II-2.

<sup>11</sup> 42 U.S.C. § 6201-6422 Stat. 871 (1975). Under this statute, the President has the authority to impose restrictions on the export of crude petroleum from the United States but may allow such restrictions, once imposed, to be lifted under certain circumstances. This has resulted in the export of 120,000 bpd of crude oil, versus more than 7.4 million in total domestic production. [http://www.eia.gov/dnav/pet/pet\\_move\\_exp\\_dc\\_NUS-Z00\\_mbbldpd\\_a.htm](http://www.eia.gov/dnav/pet/pet_move_exp_dc_NUS-Z00_mbbldpd_a.htm). In effect, this constitutes a "de facto ban" on exports despite the fact that some oil is exported from the United States.

### III. Addressing the Supply/Refining Capacity Mismatch

The primary source of the mismatch is the present configuration of the United States refining industry.<sup>12</sup> While all refineries technically can process any grade of oil, the configuration of the refinery determines how much of the oil the facility most efficiently can process into high-value products, such as transportation fuels.<sup>13</sup> Today, most refineries in the United States are configured to process heavier grades of oil than those produced from tight oil formations.<sup>14</sup> The investment in these configurations was based on the assumption that domestic production of oil, and hence its supply to refineries, was in permanent decline and that United States consumption would have to be met with larger quantities of imports, many of which happen to be heavier grade oils.<sup>15</sup>

To process this increased volume of domestically-produced light sweet crudes, refiners either will need to build new facilities or modify existing facilities to process this grade of crude. Additionally, new or enhanced transportation networks will need to be constructed to efficiently transport oil produced from tight oil formations to refineries.<sup>16</sup>

However, expanding the capacity of refineries to process light sweet crude may present a series of challenges. While a complete explanation of these is beyond the scope of this memorandum, the most commonly cited barriers to a large-scale expansion of domestic refining capacity are expensive and time-consuming construction and operational permitting requirements,<sup>17</sup> costs associated with shipping oil to refineries and logistical bottlenecks that reduce the potential flow of light sweet crudes from oil fields to refining centers,<sup>18</sup> as well as marketplace challenges.<sup>19</sup>

As a result, there are many practical impediments to expanding oil transportation and refining capacity as a means of addressing the potential supply glut of domestically-produced light sweet crude oil. Therefore, an alternative may need to be found to ensure the glut does not reduce prices for domestically-produced light sweet crude to the extent that it negatively affects incentives to drill additional wells.

One such solution may be in lifting the United States' de facto ban on the export of domestically produced crude oil enacted as part of the Energy Policy and Conservation Act of 1975. Under current law, exporters of domestically produced crude oil and natural gas must obtain a license issued by the Bureau of Industry and Security to export the oil or gas.<sup>20</sup> These licenses only become available upon the President issuing a finding that the export of domestically produced crude oil or natural gas is in the interest of the United States.<sup>21</sup> If this ban was removed, it would be an efficient means of ensuring oil producers have a market for all the oil they

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<sup>12</sup> IHS Report, *supra* note 5, at III-2.

<sup>13</sup> *Id.*

<sup>14</sup> *Id.*

<sup>15</sup> *Id.* at ES-2- ES-3. It should also be noted that while imports of "light sweet" crude has declined, imports of "heavy sour" crude have remained relatively constant. JOHN POWELL, UNITED STATES ENERGY INFORMATION AGENCY, IMPLICATIONS OF INCREASING U.S. CRUDE OIL PRODUCTION 4 (2013), *available at* <http://www.eia.gov/conference/2013/pdf/presentations/powell.pdf> [hereinafter Powell Report].

<sup>16</sup> Another potential consequence of the pre-new energy paradigm period's reduction in domestic light sweet crude production was the change in crude oil transportation networks to refineries. This resulted in an overinvestment in port facilities to handle crude oil imports and pipelines being built from ports to refineries rather than pipelines from domestic fields to refineries. *See* Powell Report, *supra* note 15, at 3.

<sup>17</sup> UNITED STATES DEPARTMENT OF ENERGY, SMALL REFINERY EXEMPTION STUDY G-1 (2011), *available at* <http://www.epa.gov/otaq/fuels/renewablefuels/compliancehelp/small-refinery-exempt-study.pdf> [hereinafter DOE Small Refiner Study].

<sup>18</sup> Powell Report, *supra* note 15, at 6.

<sup>19</sup> IHS Report, *supra* note 5, at IV-2.

<sup>20</sup> 15 C.F.R. § 754.2.

<sup>21</sup> 42 U.S.C. § 6212(b)(1)-(2).

could potentially produce in the absence of a sufficient domestic market for light sweet crude.<sup>22</sup> A further benefit of lifting the ban could be to reduce fuel prices for United States consumers. While it may seem counterintuitive, low prices for domestically-produced crude oil would not necessarily translate into lower price gasoline and other transportation fuels.<sup>23</sup> The reasons for this include: the aforementioned capacity constraints of domestic refineries to process light sweet crude into usable transportation fuels; and the ability to export processed crude oil (transportation fuels) whose price is based on the international demand for such products and the concomitant international price for feedstock – oil.<sup>24</sup> Absent changes to the underlying refinery infrastructure in the United States, any potential reduction in the United States price of transportation fuels is then predicated on the extent that exports of domestically-produced crude help add to global supply and thus help put downward pressure on the world price of oil.<sup>25</sup>

The potential benefit on domestic fuel prices resulting from a lift of the export ban of crude oil prices is quite speculative. However, the effects on employment from resolving the mismatch between United States crude oil production and refining capacity, either through the construction of new facilities or lifting the export ban on domestically-produced crude oil, is not at all speculative. Resolution is likely to benefit small businesses and the broader economy.

#### **IV. Small Business Implications of Resolving the Supply/Refining Capacity Mismatch**

Many of the economic benefits of the new domestic energy paradigm result from upstream oil and natural gas production activities.<sup>26</sup> As small businesses are substantially involved in upstream oil production, they stand to realize these benefits.

Direct economic benefits accrue to those small businesses involved in activities related to the exploration, production, transporting and delivery of oil and natural gas to downstream elements or activities that provide critical on-site equipment and services.<sup>27</sup> Indirect economic benefits generally are defined as those that accrue as the result of activities in outside industries that supply materials and services to the developers of unconventional oil and gas and to their suppliers.<sup>28</sup>

To the extent that a mismatch reduces economic incentives to engage in upstream oil production activities, these benefits could be diminished.<sup>29</sup> According a recent study, federal policies that may eliminate the negative crude oil price impacts of a supply/refining mismatch could increase domestic oil output by between

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<sup>22</sup> Potential export markets include Europe and Latin America. IHS Report, *supra* note 5, at IV-9.

<sup>23</sup> IHS Report, *supra* 5, at IV-18.

<sup>24</sup> *Id.*

<sup>25</sup> *Id.* at IV-24.

<sup>26</sup> National Economic Contributions Report, *supra* note 3, at 26-27.

<sup>27</sup> 2 IHS GLOBAL INSIGHT, AMERICA'S NEW ENERGY FUTURE: THE UNCONVENTIONAL OIL AND GAS REVOLUTION AND THE U.S. ECONOMY, STATE ECONOMIC CONTRIBUTIONS 10 (2012), *available at* [http://www.energyxxi.org/sites/default/files/Americas\\_New\\_Energy\\_Future\\_State\\_Highlights\\_Dec2012.pdf](http://www.energyxxi.org/sites/default/files/Americas_New_Energy_Future_State_Highlights_Dec2012.pdf) [hereinafter State Economic Contributions Report]. Upstream unconventional oil and gas activity, on average, demonstrates one of the larger employment multipliers as much of the knowledge, technologies, tools and services used in the industry are domestically derived. In addition, the larger an industry's multiplier, the more residual economic benefits, such as indirect employment contributions, will be experienced across the economy. National Economic Contributions Report, *supra* note 3, at 26-27.

<sup>28</sup> State Economic Contributions Report, *supra* note 27, at 10. Another potential category of economic benefits are induced economic benefits. These induced benefits are generally those created when workers directly and indirectly involved in oil and gas production spend their incomes in the broader economy on consumer goods and services. National Economic Contributions Report, *supra* note 3, at 23. As these have not been quantified in relation to the present topic, they will not be addressed in the memorandum.

<sup>29</sup> The memorandum assumes that a supply/refining capacity mismatch results in declines in light sweet crude oil prices which would diminish the potential economic benefits of the upstream oil production potential of the United States discussed in the next section of the memorandum.

1.2 million bpd to 2.3 million bpd.<sup>30</sup> This level of output would necessitate a 20 to 40 percent increase in investment in upstream oil production activities.<sup>31</sup> The direct and indirect employment gains from the increase are estimated to be in the range of an additional 964,000 to 1.5 million new jobs.<sup>32</sup> As small businesses are significantly involved in upstream oil production activities, many of these new jobs could be created by small energy firms.

In addition, the increased production of crude oil could provide other significant benefits to the broader United States economy. For example, revenues from taxes and royalties could contribute an additional \$1.3 to \$2.8 trillion to the federal budget between the years 2016-2030.<sup>33</sup> Additionally, a reduction in United States imports of crude and expansion of exports, improves the nation's current account trade balance.

While there are no estimates on the number of jobs that could be created if the United States addressed certain challenges, such as inefficient federal government regulatory policies facing the refining sector, a recent report noted that the compounded burden of federal regulations was a significant factor in the closure of 66 petroleum refineries from 1990 to 2010.<sup>34</sup> Overall, from 1990 to 2012, domestic refiners have spent approximately \$128 billion in order to comply with various environmental regulations,<sup>35</sup> which could reduce incentives to build additional refinery capacity.

## V. Conclusion

It is doubtful that there is a nation in this world that would not want to possess significant and economically extractable hydrocarbon resources, particularly crude oil. These resources are important components to the viability and health of modern industrial economies and national living standards.

The United States possesses crude oil resources well in excess of what could have been imagined as little as 5 years ago. The annual rate of growth in domestic oil production, predominately from tight oil formations, continues to exceed previous forecasts and has displaced a significant amount of imported oil. New jobs and economic opportunities resulting from new oil production has been one of the primary benefits of this new domestic energy paradigm.

In order to maximize these potential benefits, policymakers could make removing or reducing regulatory impediments facing the refining sector and lifting the ban on crude oil exports part of an "all of the above" policy strategy. However, such a solution must carefully consider potential trade-offs. Reducing regulatory burdens on the refining sector may come at the cost of pollution reduction goals. Similarly, while addressing the potential supply/refining capacity mismatch may result in increased employment in the upstream oil production sector, crude oil resources are ultimately finite, and policymakers may seek to conserve this resource for future use.

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<sup>30</sup> IHS Report, *supra* note 5, at V-2. These figures are production estimates for 2016-2030. *Id.* at V-5. It also should be noted that the potential production of crude oil is ultimately influenced by its price and there are many other factors beyond the de facto ban on oil exports that could reduce its price and thus the amount of oil produced.

<sup>31</sup> *Id.* at V-6.

<sup>32</sup> *Id.* at V-10. The significant multiplier effect can be seen in that almost a quarter of the jobs would be in states without significant oil production activity. *Id.* at V-2.

<sup>33</sup> *Id.* at V-2. Maximization of royalty payments to the federal government depends on complete access to federal lands which was examined in prior hearings.

<sup>34</sup> DOE Small Refiner Study, *supra* note 17, at 29.

<sup>35</sup> *The American Energy Initiative: Hearing Before the Sub. Comm. on Energy and Power, H. Comm. on Energy and Commerce*, 112<sup>th</sup> Cong., at 17 (2012) (statement of Charles Drevna, President, American Fuel and Petrochemical Manufacturers), available at

<http://energycommerce.house.gov/sites/republicans.energycommerce.house.gov/files/Hearings/EP/20120307/HHRG-112-IF03-WState-DrevnaC-20120307.pdf>.