

## Evidence that the Shannon LNG Terminal is for the importation of US Fracked Gas

### Introduction

Shannon LNG is being proposed as an LNG Import Terminal by its owners, New Fortress Energy, to receive fracked gas from the one of the world's largest natural gas fields, the Marcellus Shale Formation in Pennsylvania, U.S.A. However, comments by politicians and some individuals from public organisations that the sources of gas for the proposed Shannon LNG terminal have not been specified yet are attempting to cast doubt over this fact. We calculate that almost 100% of the Gas in Pennsylvania is fracked gas since so-called *conventional* wells are also being drilled in shale and also need to be fracked. However, even if we take the more conservative approach of only *unconventional* wells being fracked, then it is still proven from official US figures that up to 97.85% of gas in Pennsylvania is fracked gas. This paper puts forward the evidence that Shannon LNG is a US fracked gas import project. This evidence comes from the following sources:

1. From the Company itself and it's company filings to the US Securities and Exchange Commission (SEC) on November 9th, 2018 where
  - New Fortress Energy tells the SEC that " *Certain of our suppliers employ hydraulic fracturing techniques*"
  - New Fortress Energy tells the SEC " *Increased regulation or difficulty in permitting of hydraulic fracturing, and any corresponding increase in domestic natural gas prices, could materially adversely affect demand for LNG and our ability to develop commercially viable LNG facilities*"
  - New Fortress Energy admits to the SEC that it " *seeks to use "stranded" natural gas to satisfy the world's large and growing power needs*"[...] " *We are currently developing two liquefiers in the Marcellus area of Pennsylvania, each of which is expected to have the capacity to produce approximately 3 to 4 million gallons of LNG*"
  - New Fortress Energy tells the SEC " *Shannon, Ireland – We have entered into an agreement to purchase all of the ownership interests in a project company that owns the rights to develop and operate an LNG terminal and a CHP plant on the Shannon Estuary near Ballylongford, Ireland [...]* ***We intend to supply all existing and future customers with LNG produced primarily at our own Liquefaction Facilities.*** *We have one operational liquefaction facility in Miami, are currently are currently developing our Pennsylvania Facilities and plan to develop five to ten additional liquefaction facilities over the next five years*"
2. From the Pennsylvania Department of Environmental Protection (DEP) 98.23% of Gas produced in Pennsylvania in 2018 was fracked gas
3. From the US Energy Information Administration (EIA) at least 97.85% of Gas produced in Pennsylvania in 2018 was fracked gas
4. From the Methane Life Cycle Scientist Professor Robert Howarth, Cornell University who informed the Oireachtas Joint Committee on Climate Action on October 9th 2019 that " *If Ireland were to import liquefied natural gas from the United States, it would largely be shale gas*"
5. From Richard Bruton, T.D., the Minister for Communications, Climate Action and Environment himself who admitted on RTE Radio on May 10<sup>th</sup> 2019 that the gas coming from the US would be fracked gas
6. From Business and Investment Media Reports on the Issue
7. From Industry Analysis on the Issue
8. From U.S. President Donald Trump on 23rd October 2019 who stated at *the 9th Annual Shale Insight Conference in Pittsburgh, Pennsylvania* " *they won't do any fracking in New York [...] They don't do it in New York. Somebody, someday, will explain why. They do it in Pennsylvania. They do it in Ohio.*"

## Detailed Evidence

### 1. From the Company itself and it's company filings to the US Securities and Exchange Commission (SEC):

- We know from the corporation - New Fortress Energy - seeking to build the 'Shannon LNG' terminal that the gas is from fracking in Pennsylvania because they said that to their investors and in their filing to the US Securities and Exchange Commission. See their direct quotes from their SEC filing here<sup>1</sup>:
  - New Fortress Energy LLC Filing at the US Securities and Exchange Commission on November 9, 2018 *"Hydraulic Fracturing. Certain of our suppliers employ hydraulic fracturing techniques to stimulate natural gas production from unconventional geological formations (including shale formations), which currently entails the injection of pressurized fracturing fluids (consisting of water, sand and certain chemicals) into a well bore. Moreover, hydraulically fractured natural gas wells account for a significant percentage of the natural gas production in the U.S.; the U.S. Energy Information Administration reported in 2016 that hydraulically fractured wells provided two-thirds of U.S. marketed gas production in 2015"* (Page 49)
  - *"Hydraulic fracturing activities are typically regulated at the state level, but federal agencies have asserted regulatory authority over certain hydraulic fracturing activities and equipment used in the production, transmission and distribution of oil and natural gas, including such oil and natural gas produced via hydraulic fracturing. Federal and state legislatures and agencies may seek to further regulate or even ban such activities. For example, the Delaware River Basin Commission ("DRBC"), a regional body created via interstate compact responsible for, among other things, water quality protection, water supply allocation, regulatory review, water conservation initiatives, and watershed planning in the Delaware River Basin, has implemented a de facto ban on hydraulic fracturing activities in that basin since 2010 pending the approval of new regulations governing natural gas production activity in the basin. More recently, the DRBC has stated that it will consider new regulations that would ban natural gas production activity, including hydraulic fracturing, in the basin. If additional levels regulation or permitting requirements were imposed on hydraulic fracturing operations, natural gas prices in North America could rise, which in turn could materially adversely affect the relative pricing advantage that has existed in recent years in favor of domestic natural gas prices (based on Henry Hub pricing). Increased regulation or difficulty in permitting of hydraulic fracturing, and any corresponding increase in domestic natural gas prices, could materially adversely affect demand for LNG and our ability to develop commercially viable LNG facilities"* (Page 49 and 50)
- New Fortress Energy is trying to get planning permission in Pennsylvania to build two plants to liquify the fracked gas in order to ship it here to Ireland. This is also stated in the SEC filing here:

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<sup>1</sup> [https://marcellusdrilling.com/wp-content/uploads/2018/11/s002392x7\\_s1.pdf](https://marcellusdrilling.com/wp-content/uploads/2018/11/s002392x7_s1.pdf)

- New Fortress Energy LLC Filing at the US Securities and Exchange Commission on November 9, 2018 *“We are an integrated gas-to power company that seeks to use “stranded” natural gas to satisfy the world’s large and growing power needs”[...] “We are currently developing two liquefiers in the Marcellus area of Pennsylvania, each of which is expected to have the capacity to produce approximately 3 to 4 million gallons of LNG (which is the equivalent of 250,000 to 350,000 MMBtu) per day, and intend to develop five or more additional liquefiers over the next five years.”* (Page 9)
- *“On March 2, 2018, the Company entered into a gas purchase agreement with a major Marcellus Shale producer to supply approximately 160 mcf/d or equivalent of approximately 2,000,000 LNG gallons per day to the Company effective upon fulfillment of certain conditions precedent”.* (Page 175)
- *"Shannon, Ireland – We have entered into an agreement to purchase all of the ownership interests in a project company that owns the rights to develop and operate an LNG terminal and a CHP plant on the Shannon Estuary near Ballylongford, Ireland. The Ireland Terminal is expected to commence commercial operations in the fourth quarter 2020. We intend this terminal to include a storage facility with onshore regasification equipment and pipeline connection into the distribution system of Gas Networks Ireland, Ireland’s national gas network. We plan to deliver LNG to the terminal via a traditional size LNGC. The equipment on site will have the capacity to import and regasify more than 6 million gallons of LNG (500,000 MMBtu) per day, which is the equivalent of Ireland’s total foreign natural gas imports. Additionally, the planning permission approval for the terminal includes the ability to build an integrated 500MW power plant on-site with priority dispatch. Our Liquefaction Assets*  
***We intend to supply all existing and future customers with LNG produced primarily at our own Liquefaction Facilities.*** *We have one operational liquefaction facility in Miami, are currently are currently developing our Pennsylvania Facilities and plan to develop five to ten additional liquefaction facilities over the next five years."* (Page 80)
- New Fortress Energy has stated that the fracked gas will come to the Gibbstown, PA liquification plant directly from fracked gas from the Marcellus Shale in Bradford County PA. As noted in the “State Impact Pennsylvania”<sup>2</sup> journal about local opposition in Pennsylvania to the plant.
  - *“LNG would be shipped to the Gibbstown port via truck from a new liquefaction plant being built in Bradford County, Pennsylvania, amid the abundant natural gas supplies of the Marcellus Shale, according to a Securities and Exchange filing by the plant’s developer, New Fortress Energy. The plant, costing an estimated \$750-\$850 million, would have a capacity of 3.6 million gallons a day and could serve markets in the Northeast by truck, the company said in a statement.”*
  - *“Environmentalists said during a conference call with reporters that an LNG export terminal would endanger public safety by risking an explosion; boost fracking for natural gas by opening up overseas markets...“We’re looking at massive public safety impacts from Bradford County all the way to South Jersey,” O’Malley said.*

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<sup>2</sup> <https://stateimpact.npr.org/pennsylvania/2019/06/15/delaware-river-basin-commission-confirms-plan-to-build-lng-export-terminal-at-new-south-jersey-port/>

**2. From the Pennsylvania Department of Environmental Protection (DEP) 98.23% of Gas produced in Pennsylvania in 2017 was fracked gas:**

- We assume that almost 100% of the Gas in Pennsylvania is fracked gas since so-called conventional wells are also being drilled in shale and also need to be fracked (for more details see point 7.4). However, even if we take the more conservative approach of only unconventional wells being fracked, then it is still proven from official US figures that up to 98.23% of gas in Pennsylvania in 2017 was fracked gas.
- According to the Pennsylvania Department of Environmental Protection (DEP)<sup>3</sup>, most of the gas coming from Pennsylvania, the second largest producer of natural gas in the States after Texas - which New Fortress Energy wants - is from fracking otherwise known as unconventional drilling. Over 90% of Well Drilling permits issued in Pennsylvania were for unconventional wells in 2017 and this figure was over 86% in 2018.

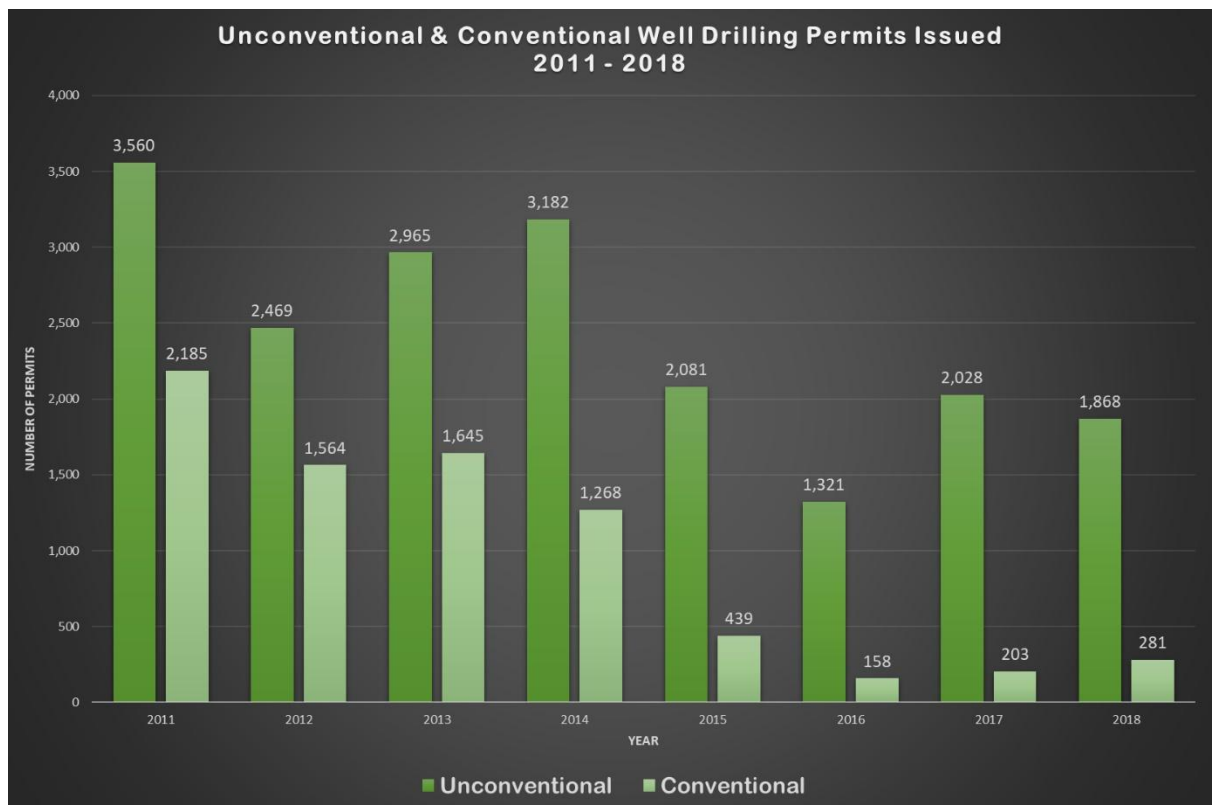


Figure 1. Source:

[https://www.depgis.state.pa.us/OGAnnual2018Report/DrillingPermitIssued11\\_18.png](https://www.depgis.state.pa.us/OGAnnual2018Report/DrillingPermitIssued11_18.png) ( Percentage of Unconventional/Fracking Well Permits issued in Pennsylvania in 2017 is  $2,028/2,231*100 = 90.9\%$  and in 2018 is  $1,868/2,149*100=86.92\%$ )

<sup>3</sup> <https://www.depgis.state.pa.us/2018OilGasAnnualReport/index.html> and <http://www.depgis.state.pa.us/2017oilandgasannualreport/>

- According to the Pennsylvania Department of Environmental Protection (DEP)<sup>4</sup>, unconventional/fracked gas production in Pennsylvania increased from 5.3 trillion cubic feet in 2017 to 6.1 trillion cubic feet in 2018.

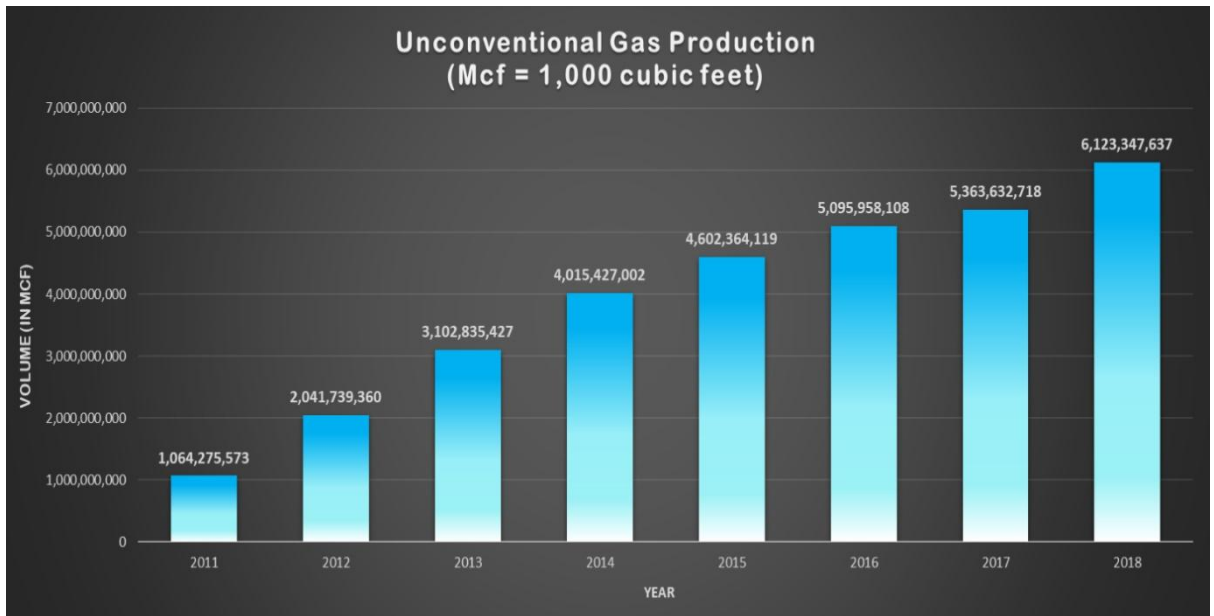


Figure 2. Source: <https://www.depgis.state.pa.us/OGAnnual2018Report/UnconvGasProd.png>

- And again, according to the Pennsylvania Department of Environmental Protection (DEP)<sup>5</sup>, unconventional/fracked gas production in Pennsylvania as a percentage of total gas production was 98.23% in 2017.

<b>Pennsylvania Department of Environmental Protection</b> <b>Office of Oil and Gas Management</b> <b>AT A GLANCE</b>	
<b>PA Natural Gas Production (unconventional):</b>	5.36 trillion cubic feet
<b>Avg. # Wells Reporting Gas Production (unconventional):</b>	7,794
<b>PA Natural Gas Production (conventional wells):</b>	96.5 billion cubic feet
<b># Wells Reporting Gas Production in 2017 (total):</b>	57,461

Figure 3: Source <https://www.depgis.state.pa.us/2017oilandgasannualreport/img/OGKeyFacts-2017.pdf> This gives a figure of natural gas production in Pennsylvania from unconventional/fracked sources as a percentage of overall production of  $5.36 / (5.36 + 0.0965) * 100 = 98.23\%$  in 2017

<sup>4</sup> <https://www.depgis.state.pa.us/2018OilGasAnnualReport/index.html>

<sup>5</sup> <http://www.depgis.state.pa.us/2017oilandgasannualreport/>

**3. From the US Energy Information Administration (EIA) at least 97.85% of Gas produced in Pennsylvania in 2018 was fracked gas:**

- According to the US Energy Information Administration (EIA)<sup>6</sup>, Pennsylvania's gross natural gas production, primarily from the Marcellus Shale, reached 5.4 trillion cubic feet in 2017, rising to 6.2 trillion cubic feet in 2018. This means that, as per Figure 4 below, Unconventional Shale gas production in Pennsylvania was 98.01% of total gas production in 2017 and **97.85%** in 2018.

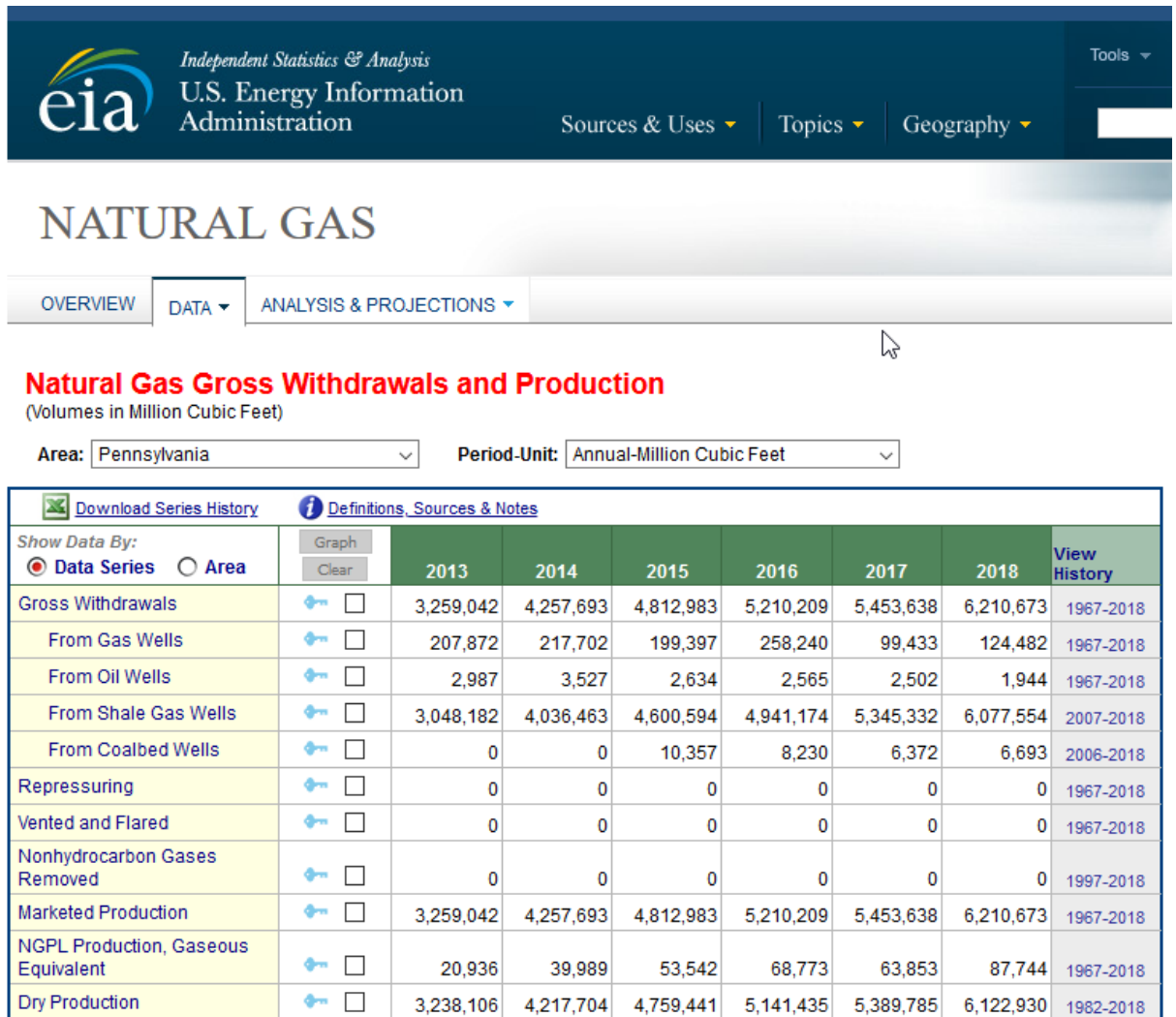


Figure 4. Natural Gas Production in Pennsylvania. Source: US Energy Information Administration - [https://www.eia.gov/dnav/ng/ng\\_prod\\_sum\\_dc\\_spa\\_mmcf\\_a.htm](https://www.eia.gov/dnav/ng/ng_prod_sum_dc_spa_mmcf_a.htm). This shows that Unconventional Shale gas production in Pennsylvania in 2017 was  $5,345,332/5,453,638,000 \times 100 = 97.85\%$  of total gas production and in 2018 this figure was  $6,077,554/6,210,673 \times 100 = 97.85\%$  of total gas production.

<sup>6</sup> [https://www.eia.gov/dnav/ng/ng\\_prod\\_sum\\_dc\\_spa\\_mmcf\\_a.htm](https://www.eia.gov/dnav/ng/ng_prod_sum_dc_spa_mmcf_a.htm)

#### **4. From the Methane Life Cycle Scientist Professor Robert Howarth of Cornell University New York :**

- Professor Robert Howarth of Cornell University of New York, an expert on the global methane cycle, addressed the Oireachtas Joint Committee on Climate Action meeting on Wednesday, 9 October 2019 to discuss *'the impact of fracked gas on the climate and its impact on Irelands climate goals should we facilitate the importation of fracked gas from North America into Ireland'*. He stated that

*"If Ireland were to import liquefied natural gas from the United States, it would largely be shale gas."<sup>7</sup>*

#### **5. From Richard Bruton, T.D., the Minister for Communications, Climate Action and Environment himself:**

- In an interview with Seán O'Rourke on RTE Radio on May 10<sup>th</sup> 2019, Minister Bruton, in the defence of exploration in Ireland, admitted that the gas coming from the US would be fracked gas when he stated the following:
  - *"My attitude is that we are not in a position now to talk about ceasing exploration. We need, for this transition, we need access to fossil fuels, particularly to gas, and if that gas resource is available, that can be supplied through our own network, which we have built and is available to us, that is far preferable to being dependent on bringing in **FRACTED** gas from the US, bringing in Russian gas. So it is absolutely appropriate that we have security of supply for fossil fuels during this transition but our determination is to reduce dramatically and rapidly our dependence on fossil fuels. So at the end of the day I have to pick the route, the changes, select measures carefully and weigh the costs of proposals against the benefit of the yield and introduce them in a timely way".<sup>8</sup>*

#### **6. From Business and Investment Media Reports on the Issue:**

- <https://www.bloomberg.com/news/articles/2019-06-04/fortress-billionaire-wes-edens-bets-on-freedom-gas-exports>
- <https://www.naturalgasintel.com/articles/116533-new-fortress-energy-planning-two-lng-plants-in-northeast-pennsylvania>
- <https://www.rivieramm.com/news-content-hub/news-content-hub/lng-refuelling-options-grow-with-new-small-scale-plants-55949>
- <https://www.inquirer.com/business/lng-export-terminal-philadelphia-repauno-fortress-approved-20190612.html>

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<sup>7</sup> [https://www.oireachtas.ie/en/debates/debate/joint\\_committee\\_on\\_climate\\_action/2019-10-09/2/](https://www.oireachtas.ie/en/debates/debate/joint_committee_on_climate_action/2019-10-09/2/)

<sup>8</sup> <https://www.youtube.com/watch?v=ie6agMwF9jE&feature=youtu.be>



- <https://marcellusdrilling.com/2018/11/new-fortress-energy-building-second-pa-lng-export-facility/>
- <https://eu.delawareonline.com/story/money/business/2019/03/02/new-fortress-energy-lng-port-delaware-river/2990003002/>
- <https://www.desmogblog.com/2018/10/04/lng-by-rail-small-scale-exports-florida-edens-fortress>
- <https://www.njspotlight.com/2019/07/19-07-16-lng-export-terminal-would-take-360-trucks-a-day-24-7-army-corps-says/>
- <https://stateimpact.npr.org/pennsylvania/2019/06/15/delaware-river-basin-commission-confirms-plan-to-build-lng-export-terminal-at-new-south-jersey-port/>
- <https://therealnews.com/columns/a-fossil-fuel-baron-just-bought-usa-today>

## 7. From Industry Analysis on the Issue:

7.1 The Shale boom in the US because of fracking. The Fracking debate that is happening in the US, EU and Ireland is because of shale.

- The Marcellus Shale is the most prolific natural gas-producing formation in the Appalachian basin (in Pennsylvania). EIA estimates proven reserves in the Marcellus Play of 77.2 trillion cubic feet (Tcf) at year end 2015 which makes it one of the largest natural gas plays in the U.S.<sup>9</sup>
- Pennsylvania's marketed natural gas production averaged a record 15 billion cubic feet per day (Bcf/d) in 2017, 3% higher than the 2016 level<sup>10</sup>. This production is largely from shale plays in the Appalachian Basin<sup>11</sup>. Pennsylvania accounted for 19% of total U.S. marketed natural gas production in 2017 and produced more natural gas than any other state except Texas<sup>12</sup>.

7.2 Shale gas production in the Appalachia region has increased rapidly since 2012, driving an overall increase in U.S. natural gas production. According to EIA's *Drilling Productivity Report*<sup>13</sup>, natural gas production in the Appalachia region—namely the Marcellus and Utica shale plays—has increased by more than 14 billion cubic feet per day (Bcf/d) since

<sup>9</sup> [https://www.eia.gov/maps/pdf/MarcellusPlayUpdate\\_Jan2017.pdf](https://www.eia.gov/maps/pdf/MarcellusPlayUpdate_Jan2017.pdf)

<sup>10</sup> [https://www.eia.gov/dnav/ng/ng\\_prod\\_sum\\_a\\_EPGO\\_VGM\\_mmcfa.htm](https://www.eia.gov/dnav/ng/ng_prod_sum_a_EPGO_VGM_mmcfa.htm)

<sup>11</sup> <https://www.eia.gov/todayinenergy/detail.php?id=33972>

<sup>12</sup> <https://www.eia.gov/todayinenergy/detail.php?id=35892>

<sup>13</sup> <https://www.eia.gov/petroleum/drilling/>



2012. Overall Appalachian natural gas production grew from 7.8 Bcf/d in 2012 to 22.1 Bcf/d in 2016 and was 23.8 Bcf/d in 2017, based on EIA data through October 2017.<sup>14</sup> Drilling wells in the Appalachia region has become very productive. The average monthly natural gas production<sup>15</sup> per rig for new wells in the Appalachia region increased by 10.8 million cubic feet per day since January 2012. EIA attributes this increase to efficiency improvements in horizontal drilling and hydraulic fracturing<sup>16</sup> in the region, which include faster drilling, longer laterals, advancements in technology, and better targeting of wells<sup>17</sup>.

### 7.3 Dry Gas Production in the U.S.

- "The U.S. Energy Information Administration (EIA) estimates that in 2018, U.S. dry shale gas production<sup>18</sup> was about 20.95 trillion cubic feet (Tcf), and equal to about 69% of total U.S. dry natural gas production in 2018."<sup>19</sup>
- LNG Exports based on shale
  - New LNG exports will super-charge additional fracking, as 80 percent of the increased exports will come from new, i.e. fracked, wells.<sup>20</sup>
  - "About 80% of the increase in LNG exports is satisfied by increased U.S. production of natural gas...Possible future export levels in the scenarios evaluated include very unlikely extremes, from zero in cases in which the U.S. "shale revolution" ends abruptly and global demand is limited to levels that exceed the total export capacity for which LNG export authorization applications have currently been filed at DOE/FE."<sup>21</sup>
- "In just a matter of years, American shale gas exports have loosened the grip of traditional exporters and restrictive long-term contracts. Significant surplus gas production, increasingly competitive E&P techniques, rising oil prices and export-favourable policies at home are likely to support growth in the US LNG industry, with eleven LNG export projects approved by the US Department of Energy and 16 others proposed so far. [...] Transcontinental Gas Pipe Line's Atlantic Sunrise project could have an impact much sooner. By September, the new pipe would move low-

<sup>14</sup> <https://www.eia.gov/petroleum/drilling/#tabs-summary-2>

<sup>15</sup> <https://www.eia.gov/petroleum/drilling/#tabs-summary-1>

<sup>16</sup> <https://www.eia.gov/todayinenergy/detail.php?id=22252>

<sup>17</sup> <https://www.eia.gov/todayinenergy/detail.php?id=33972>

<sup>18</sup> <https://www.eia.gov/tools/glossary/index.php?id=Dry%20natural%20gas>

<sup>19</sup> <https://www.eia.gov/tools/faqs/faq.php?id=907&t=8>

<sup>20</sup> <https://www.foodandwaterwatch.org/insight/fracking-endgame-locked-plastics-pollution-and-climate-chaos>

<sup>21</sup>

<https://www.energy.gov/sites/prod/files/2018/06/f52/Macroeconomic%20LNG%20Export%20Study%202018.pdf>

priced gas from the Marcellus Shale to Transco's mainline, bringing cheaper Appalachian supply into Louisiana."<sup>22</sup>

#### 7.4. The Misleading "Conventional vs. Unconventional" terminology:

- One is always warned to avoid using these terms because they are entirely misleading. We must talk about fracked and non-fracked wells. Germany has used the same trick to still allow fracking (in sandstone layers) in protected areas.
- The Pennsylvania Department of Environmental Protection (DEP) definition of "conventional" wells is as follows:

*"A conventional well is typically a well that is drilled vertically into a shallow oil or gas reservoir. Conventional wells are constructed on much smaller well pad sites than unconventional wells. Most conventional wells do not require large volumes of water for hydraulic fracturing and do not employ horizontal drilling techniques. In Pennsylvania, what constitutes a conventional well is defined by law in Act 52 of 2016 and 25 Pa. Code Chapter 78."*<sup>23</sup>

- The General Assembly of Pennsylvania defines a "conventional oil and gas well." in Senate Bill Number 279 as:

*"a bore hole drilled or being drilled for the purpose of or to be used for construction of a well regulated under 58 pa.c.s. Ch. 32 (relating to development) that is not an unconventional well, irrespective of technology or design. The term includes, but is not limited to:(1) wells drilled to produce oil.(2) wells drilled to produce natural gas from formations other than shale formations.(3) wells drilled to produce natural gas from shale formations located above the base of the elk group or its stratigraphic equivalent.(4) wells drilled to produce natural gas from shale formations located below the base of the elk group where natural gas can be produced at economic flow rates or in economic volumes without the use of vertical or nonvertical well bores stimulated by hydraulic fracture treatments or multilateral well bores or other techniques to expose more of the formation to the well bore."*<sup>24</sup>

Having already anticipated the "trick" to exclude some wells from being counted as "fracking", (i.e. "unconventional") wells it is now clear from the definition above that "conventional wells" in Pennsylvania still produce gas from shale plays.

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<sup>22</sup> <https://www.spglobal.com/platts/plattscontent/assets/files/en/specialreports/naturalgas/us-Ing-shale-june-2018.pdf>

<sup>23</sup> <http://www.dep.state.pa.us/2017oilandgasannualreport/>

<sup>24</sup> <https://www.legis.state.pa.us/CFDOCS/Legis/PN/Public/btCheck.cfm?txtType=PDF&sessYr=2015&sessInd=0&billBody=S&billTyp=B&billNbr=0279&pn=1903>

In support of this argument, it is also of note that more new permits were given to "unconventional wells" and more violations were reported concerning "conventional" wells in 2017<sup>25</sup>:

Permits Issued:

Unconventional Drilling Permit	2,028
Conventional Drilling Permit	203

Wells Drilled:

Unconventional	810
Conventional	103
Total Wells Drilled	913

Violations:

Unconventional	821
Conventional	3,273

- Even the Industry itself (The Pennsylvania Independent Oil & Gas Association) confirms the "conventional vs. unconventional" misleading terminology – and leave no doubt that nearly all of the Gas produced in Pennsylvania is fracked:

*"Thanks to technological advances in finding and producing natural gas" [i.e. FRACKING - ndr]" Pennsylvania again is playing a key role in meeting the nation's energy needs. A rock formation approximately a mile below the surface known as the Marcellus Shale has become one of the world's largest natural gas fields, containing over 500 trillion cubic feet of natural gas. A significant portion of Pennsylvania is underlain by the Marcellus Shale, and drilling activity targeting this formation is taking place in more than 25 counties. A few thousand feet below the Marcellus is another formation called the Utica Shale that could ultimately become another huge natural gas resource for Pennsylvania, as could Upper Devonian formations just above the Marcellus. ...*

*Pennsylvania law defines an unconventional gas well as a well drilled into a shale formation below the base of the Elk Sandstone or its geologic equivalent where natural gas cannot be produced by horizontal or vertical well bores except when stimulated by hydraulic fracturing. Essentially, these wells are drilled into a shale that is so dense that the gas trapped inside cannot be released except by cracking the rock by means of hydraulic fracturing.*

*A traditional, conventional well is usually drilled into a sandstone formation that can range from as shallow as 1,500 feet to as much as 21,000 feet deep. Oil and gas are able to pass through these formations without hydraulic fracturing, but nearly all wells are stimulated through fracturing to improve production. Conventional wells have been drilled vertically, although a few operators are experimenting with horizontal drilling techniques in conventional formations. An estimated 350,000 conventional oil and gas wells have been drilled in Pennsylvania over the years (most*

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<sup>25</sup> <http://www.depgis.state.pa.us/2017oilandgasannualreport/>

*of which were plugged and abandoned as their useful lives came to an end), compared to the current total of more than 11,000 unconventional wells.*

*Conventional oil and gas wells can be found in parks and on public land, along highways, even in residential neighborhoods. A well pad cleared for a conventional oil or natural gas well is smaller than that of a deep well and requires a smaller drilling rig to drill vertically and reach the targeted formation. It typically takes less than two weeks to drill these wells, with a few additional days required to stimulate and complete the well. Since the number of fractures into the rock are fewer than those of a horizontal well, the scope of the well stimulation operation is not as significant and does not require as much equipment or water.*

*The average conventional gas well in Pennsylvania produces less than 13 thousand cubic feet (mcf) per day, compared against 2,000 mcf for the average unconventional well."<sup>26</sup>*

#### 7.5. FracTracker Oil & Gas Activities in PA<sup>27</sup>

- FracTracker, the project, was originally developed to investigate health concerns and data gaps surrounding western PA fracking. Today, as a non-profit organization, FracTracker Alliance supports groups across the United States, addressing pressing extraction-related concerns with a lens toward health effects and exposure risks on communities from oil and gas development. We provide timely and provocative data, ground-breaking analyses, maps, and other visual tools to help advocates, researchers, and the concerned public better understand the harms posed by hydrocarbon extraction.

#### 8. **From U.S. President Donald Trump on 23rd October 2019:**

- *At the 9th Annual Shale Insight Conference in Pittsburgh, Pennsylvania, President Trump admitted that Pennsylvania is being fracked when he stated*
  - *" New York doesn't allow pipelines to go through. I don't know, there has to be some kind of a federal something that we can do there. But they won't allow pipelines to go through New York; this is for a long time. And they won't do any fracking in New York. And they won't take all of that wealth underneath and reduce their taxes. Wouldn't that be nice? They don't do it in New York. Somebody, someday, will explain why. [...] They do it in Pennsylvania. They do it in Ohio. They do it in states right around New York. They don't do it in New York."<sup>28</sup>*

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<sup>26</sup> <https://pioga.org/education/pa-oil-and-gas/>

<sup>27</sup> <https://www.fractracker.org/map/us/pennsylvania/>

<sup>28</sup> <https://www.whitehouse.gov/briefings-statements/remarks-president-trump-9th-annual-shale-insight-conference-pittsburgh-pa/>