

# 4-Part Blog Series on the Bankruptcy of Philadelphia Energy Solutions

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## Part 1: Philadelphia Energy Solutions Bankruptcy Basics

As you've probably heard, the Philadelphia Energy Solutions (PES) neighborhood refinery—the oldest and largest refinery on the East Coast — [filed for Chapter 11 bankruptcy restructuring](#) last week.

The bankruptcy plan intends to allow PES to continue uninterrupted operations while shedding or converting debt, extending debt maturities, and gaining \$260 million in new capital. One of the many critical parts of the plan assumes that the bankruptcy court will relieve PES of \$350 million in RIN obligations. ([54](#))

If the bankruptcy plan is unsuccessful, PES may be forced to enter into Chapter 7 liquidation. The refining and marketing segment is estimated to be worth \$643 to \$708 million upon liquidation, while the logistics segment is estimated at \$77 to \$100 million. ([Exhibit C](#))

### **Background on the Business**

The PES refining complex includes two separate refineries with a total of 335,000 barrels per day (bpd) of crude oil distillation capacity, situated near Center City, Philadelphia. The refining business employs 1,100 people and represents 28% of the U.S. East Coast's refining capacity. The PES refineries rely on light, sweet crude oil feedstocks, delivered by rail and ship, which it primarily sells into the New York Harbor market ([19](#))

### **Stated Reasons for Bankruptcy**

In its [filing](#) to the U.S. Bankruptcy Court for the District of Delaware, PES primarily blamed regulatory compliance costs associated with the federal Renewable Fuels Standard (RFS) policy for its economic woes.

PES asserts it cannot blend biofuels onsite because the pipeline owners that distribute its product will not accept blended gasoline. PES also notes it is disadvantaged compared to its integrated oil company competitors that comply with the RFS through their fuel blending operations. As a result, PES has relied on buying RFS compliance credits (called renewable identification numbers, or RINs), which cumulatively cost PES \$832 million between 2012 and 2017 (see the annual RIN cost break down to the right). PES asserts its 2017 RIN expenses were twice its annual payroll and represent its largest expense after crude oil. ([17](#))

<b>PES Annual RIN Costs (millions)</b>					
<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>
<b>\$ 13</b>	<b>\$ 116</b>	<b>\$ 130</b>	<b>\$ 124</b>	<b>\$ 231</b>	<b>\$ 218</b>

PES blames the elimination of affordable access to domestic crude (namely from the Bakken formation) as the second reason pushing it into Ch. 11. Next, PES cited industry-wide reduced gross

refining margins—a measure of the profitability of converting crude oil to refined products—as another critical factor driving bankruptcy.

We will kick the tires on these claims in the next blog of the series. For now, let's review a little history.

### **A Distressed Asset**

PES has a long history of being unprofitable. Back in 2011, former refinery owner, Sunoco, announced it was exiting the refinery business in order to focus on its more profitable segments, like retail operations.

Sunoco intended to [shut down](#) its last two remaining refineries—in South Philly and Marcus Hook—by July 2012, if a new buyer couldn't be found. Management claimed the company's northeast refinery operations lost [\\$772 million between 2009 and 2011](#), and the company could not justify the new investments needed to make the two refineries sustainable. Sunoco was [acquired by Energy Transfer Partners](#) in April 2012.

A combination of political will, public subsidies (e.g. \$10 M for rail terminal expansion, \$15 M for catalytic cracker turnaround, and the creation of Keystone Opportunity Zone tax benefits), private capital from the Carlyle Group, and continued participation from Sunoco coalesced to save the refinery—[creating PES](#).

Currently, Carlyle owns 65% of PES, followed by PES Equity Holdings (successor-in-interest to Sunoco) at 32.5%, and current and former PES senior management owns 2.5%.

So, PES was in bad shape to begin with, but did the business fall victim to unforeseen events and bad government policy (like the RFS) as PES claims, or could its challenges be predicted and managed? Check out the [next blog](#) in this series to learn more.

## **Part 2: Philadelphia Energy Solutions Ch. 11 Fact and Fiction**

Now that you understand some [basics](#) about the Philadelphia Energy Solutions (PES) business and bankruptcy, let's examine if PES' claims about the RFS being the primary factor driving the company into bankruptcy really make sense.

**Increasing Renewable Fuel Standard (RFS) Compliance Costs.** PES states the primary factor driving them into bankruptcy is RFS compliance costs. For context, RFS policy is generally objectionable to crude refiners, as mandates to increase the use of alternative fuels are likely to reduce sales of traditional refined petroleum products. So undermining RFS policy may seem attractive to this industry.

It is true that prices for renewable identification numbers (RINs) used for RFS compliance were generally very low (i.e. a few cents per RIN) prior to 2013—when the [ethanol \(E10\) blendwall was reached](#)—and have remained much higher than pre-2012 levels [in the years thereafter](#).

However, [one must note](#) both merchant (i.e. standalone) and integrated (i.e. part of a larger supply chain company) refineries have RFS obligations and associated compliance costs, and they both [recover their compliance costs through the market price of refined fuel](#).

Integrated refineries purchase and blend renewable fuel with their refined product to comply with the RFS. Here, the standalone RIN cost may or may not be tracked separately.

Merchant refiners that don't have blending capacity purchase standalone RINs. As a result, for merchant refiners, the RIN-based compliance cost is more direct and evident, via RIN market prices. In addition, the market for RINs is subject to pricing impacts from banking, speculation, and other activities that can increase costs and volatility.

**Lost Access to Cheap Domestic Crude.** Next, PES blames loss of access to cheap domestic crude. Between the time PES was formed in 2012 through much of 2014, West Texas Intermediary (WTI) priced crude was trading [at a significant discount to Brent](#) priced crude. The WTI discount [eroded significantly](#) in 2015 and 2016, but has been [increasing](#) in 2017 and 2018. As a result of a [variety of factors](#) (e.g. investments to reduce Midwest pipeline congestion, reduced domestic production volumes after OPEC failed to cut production, lifting of the oil export ban, etc.) PES gradually received less WTI supply. Then, when the Dakota Access pipeline project came online in 2017, PES was largely shut out from the supply of cheap domestic crude, forcing a return to more expensive Brent crudes.

**Compressed Refining Margins.** PES blames compressed gross refining margins (citing the Brent 2-1-1 crack spread) as the third of several factors driving it into bankruptcy. PES stated that for every \$1 drop in the 2-1-1 crack spread, PES loses \$110 million in annual revenues and cites a little over a dollar drop in the average crack spread from 2012 to 2017. ([28](#))

*However, PES comparing Brent-to-Brent crack spreads over this time period is not accurate, because PES was predominately reliant on WTI feedstocks (and therefore a WTI crack spread) through much of 2014 and into 2015. [Average WTI 3-2-1 crack spreads](#) were \$10/bbl in 2010, jumping to \$30/bbl in 2012, and by May 2016 average 3-2-1 gross refining margins year-to-date dropped back to a little over \$15/bbl, more in line with historic levels. These ultra-high crack spreads were driven in part by cheap domestic oil resulting from a supply glut of new oil-shale production and insufficient takeaway infrastructure.*

So, the 2012 investment in the historically unprofitable Philadelphia refinery came at the peak of a temporary margin boom period for some in the domestic refinery business.

### Estimated Financial Impacts

Now, let's put all this into context with some back of the envelop calculations.

I assume PES was predominately reliant on WTI-priced supply from 2012 through 2015, and Brent for 2016 and 2017. I use the average annual WTI 3-2-1 crack spreads from [Morningstar](#), and the average 2-1-1 Brent crack spreads that PES reports in its Chapter 11 filing. ([28](#)) I then multiply the proportional monetary increase or reduction in crack spread by \$110 million (as PES states for every \$1 reduction in crack spread they lose a \$110 million in annual revenues).

As shown in this first table, this leads to a total reduction in revenues related to crude supply dynamics of almost \$1.83 billion between 2012 and 2017. (Note the sum total 2012 to 2017 results are the same if the \$14.52 average Brent crack is used for 2015.)

Annual Average Crack Spreads	WTI-NYMEX (Morningstar)			ICE-Brent (PES Ch. 11 Filing)		
	2012	2013	2014	2015	2016	2017
Spreads	\$ 30.00	\$ 24.00	\$ 19.00	\$ 14.52	\$ 13.37	\$ 13.37
Revenue Impact		\$ (660,000,000)	\$ (550,000,000)	\$ (492,800,000)	\$ (126,500,000)	\$ 0

PES invested \$750 million in refinery upgrades and another \$130 million in expanding rail receiving capacity (\$25 million of this capital investment was funded by PA taxpayers and is therefore

subtracted from capital expenditures in the table below). PES also had to siphon over \$616 million between 2012 and 2017 in the form of dividends, debt repayment, and advisory fees to equity investors. (22) In addition, there is the \$832 million in RFS compliance costs.

Select PES Costs/Revenue Reductions	2012 - 2017
<b>WTI to Brent, with Margin Compression</b>	<b>\$ 1,829,300,000</b>
<b>Capital projects (less PA grants)</b>	<b>\$ 855,000,000</b>
<b>RFS Compliance (RINs)</b>	<b>\$ 832,000,000</b>
<b>Dividends, debts, fees</b>	<b>\$ 616,000,000</b>
<b>Total</b>	<b>\$ 4,132,300,000</b>
<b>Annualized Total</b>	<b>\$ 688,716,667</b>

Hopefully, this second table presents a more accurate picture of the financial challenges facing PES.

The primary challenge facing PES is the attractive environment it experienced when Bakken crude was shut in and Brent was expensive, no longer exists. On top of that, WTI and Brent crack spreads have dropped precipitously, shrinking margins for all refineries. Next, PES management invested significantly in refining and went long on rail capacity, the latter of which is now largely underutilized. RFS compliance costs are high, but recall that all refineries—both merchants and integrated refiners—have to comply with the RFS.

Now that we have a more accurate sense of how these factors are stressing PES economics, the [next blog post](#) in the series will explore whether PES investors could have anticipated these challenges and what if anything was done to manage these risks.

### Part 3: Philadelphia Energy Solutions Investors Prioritized Stronger Investments

Now that you have a better understanding of the [real financial challenges plaguing Philadelphia Energy Solutions](#) (PES), you might be surprised to find that many of the challenges stressing PES were known and anticipated by its investors. And, reasonably, these investors sacrificed PES for the benefit of their more profitable investments.

**The Known Knowns.** It is clear that in 2012, the PES investors had certain information at their disposal. As reviewed in the [first blog](#) of this series, investors knew the PES asset was distressed and in need of capital investment. Investors knew there would be escalating [Renewable Fuel Standard \(RFS\) compliance requirements](#); as a merchant refinery they could potentially face certain disadvantages on RFS compliance options (e.g. RIN market price volatility); and as a large refinery it would generate significant RFS compliance obligations. They also knew cheap domestic oil production from the Bakken was [ramping up](#); crude-by-rail movement was [starting to increase](#); and PES equity investors required significant payments as part of the acquisition deal.

**The Unknown Knowns.** Here is where it gets interesting. In July 2012, [Energy Transfer Partners \(ETP\)](#) began efforts at FERC to proceed with [conversion of its natural gas Trunkline pipeline](#) with an eye towards moving Canadian and Bakken crude to the Gulf Coast. The resultant ETCO pipeline project enabled crude to move from Illinois to Sunoco’s petroleum terminal in Nederland, Texas. A newly

constructed [Dakota Access pipeline](#) (DAPL) would be needed move Bakken crude from North Dakota to ETCO in Illinois. DAPL's initial [open season began in March 2014](#) and came into service in June 2017.

The combination of ETP's ETCO and DAPL projects, collectively the "[Bakken Pipeline](#)," enabled Bakken crude to move to the Gulf Coast, largely shutting out the East Coast refineries from cheaper WTI-priced crude. As mentioned, both ETCO and Dakota Access are part-owned by ETP, who acquired Sunoco in [April 2012](#). ETP/Sunoco own 32.5% of PES, and the Bakken Pipeline terminates at Sunoco's terminal.

***In other words, ETP owns a part of PES, yet invested billions of dollars in more profitable infrastructure that rendered PES uncompetitive.***

Furthermore, when Carlyle and ETP/Sunoco made the decision to acquire the refinery in June 2012, they were aware of the larger Bakken Pipeline vision that began its regulatory path in July 2012. PES had at least a 4-year heads up from its own parent company that it might be getting squeezed out of WTI-priced feedstock. The only unknown was whether or not the full Bakken Pipeline could be realized.

In 2012, PES didn't know what the cost of RINs (the credits used to comply with the RFS) would be in the future. But, by the end of 2013, they knew compliance costs were much higher than expected when the refinery asset was purchased in June 2012.

Some other merchant refineries, like [PBF Energy](#) and [Valero](#), have acquired or strategically partnered with blending terminal facilities in order to reduce exposure to RIN costs and secondary market volatility. PES has right of first offer to purchase Sunoco's (SXL's) Belmont Rack at fair market value, if Sunoco chooses to sell the asset. ([SEC 163](#))

When PES [was profitable in 2014](#) and higher RIN costs were known, it would have been an ideal time to exercise this option, or develop a strategic partnership. But it seems no action was taken even when increasing RIN costs were known.

In June 2015, a one-year agreement (with term extension options) was developed where PES would sell ethanol to Sunoco, and Sunoco agreed to sell PES 8 million RINs per month, at prevailing market prices. ([F-32](#)) Back of the envelope, this quantity of RINs would cover only about 5% of PES' monthly D6 RIN obligation.\* Prior to June 2015, PES and Sunoco also had a contract for RFS obligations that was structured more like an integrated company, but limited details of this contract have been disclosed. ([F-32](#))

**The Unknown Unknowns.** PES investors could not have predicted the actions of OPEC, namely the organization's [failure to cut production](#) in the face of low oil prices in a deliberate effort to squeeze out U.S. shale-oil producers. Similarly, PES could not have predicted that in December 2015, congress and president Obama would [pass a law lifting the decades-old ban on oil exports](#). Together, these actions increased competition for [a reduced volume](#) of cheap domestic crude, disadvantaging PES.

### **The Hedge and the Option**

The sophisticated energy investors in PES knew the ultra-high refinery margins in 2012 would be temporary, especially as they were heavily investing in pipeline infrastructure responding to the domestic shale-oil glut. Furthermore, these investors—namely ETP/Sunoco—knew if their primary investment, the Bakken Pipeline, panned out it could cripple the PES refinery.

On the other hand, if the pipeline project didn't work out, the refinery could continue to access discounted WTI crude and could provide a nice profit, upon initial public offering.

### ***Perhaps a hedge or silver lining, in case ETP's larger Bakken Pipeline project didn't pan out?***

The refinery venture was risky, but that is just what private equity companies like Carlyle Group take bets on (plus, Carlyle negotiated [attractive payouts](#), sweetening the PES prospect). ***PES could also be seen as an option, in the event a large-diameter natural gas pipeline was built into Southeastern PA, creating a lucrative opportunity for conversion to petrochemical refining.***

PES filed IPO registration for its logistics operation in late 2014 and for its refining segment in early 2015. Turns out, PES launched its IPO efforts a little too late. By that time public and private investors saw the writing on the wall. PES [ended its bids to go public](#) in September 2016.

And, the gas pipeline into Philly didn't work out either, so the prospect of a petrochemical [energy hub](#) in Philadelphia waned.

### **Failure to Act**

Given what PES investors and management knew and when they knew it, perhaps PES should have been focusing on what they could control? Specifically, better managing their approach to RFS compliance. However, it seems investors prioritized their larger and more lucrative investments over PES. Specifically, the Bakken Pipeline project and Sunoco's operations.

The [next blog](#) in the series will explore the future of PES, assuming the company can successfully emerge from Ch. 11 restructuring.

*\* PES has a 335,000 barrel of oil per day capacity and an approximate capacity utilization of 81% ([typical for East Coast refineries](#)). Assuming one barrel of oil converts to 20.3 gallons of gasoline, PES would yield about 165,250,000 gallons of gasoline in a 30-day month. Meaning the new agreement with Sunoco for 8 million RINs per month at market price would cover about 4.8% of the refinery's ethanol (D6) RIN requirements.*

## **Part 4: The Speculative Future of Philadelphia Energy Solutions**

Now that we've explored the [basics of the Philadelphia Energy Solutions bankruptcy](#), established the [real reasons behind its failing financials](#), and demonstrated these [challenges were largely foreseen](#), let's explore the potential future of PES.

PES' bankruptcy filings include financial forecasts for 2018 to 2021, presenting the company's estimates of future performance upon successful completion of the Chapter 11 reorganization. PES forecasts net income of \$386 million (M) for 2018, \$33 M in 2019, \$99 M in 2020, and \$121 M in 2021. ([Exhibit E](#))

But are these rosy forecasts realistic? Will PES continue to face challenges in its future, or will reorganization open new doors to success?

### **Ongoing Challenges**

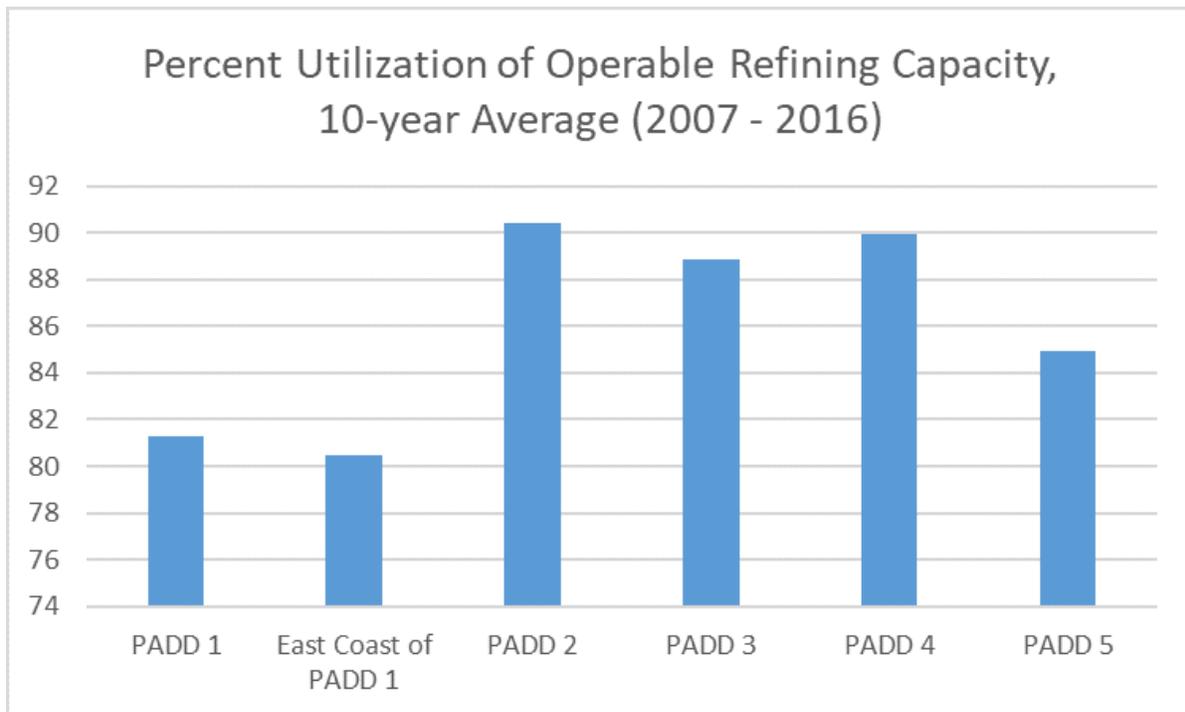
Bankruptcy will delay the debt service burden on PES, but it will do nothing to change the fundamental challenges facing the business. While refining margins could improve, PES will continue to largely be shut out from cheap domestic crude, unless there is significant development of oil from

the Utica formation or the Jones Act is amended to improve the economics of waterborne delivery of domestic crudes.

PES will continue to be subject to RIN market price volatility, unless a better partnership contract or strategic investment is developed. Conversely, the Trump administration could potentially [waive](#), cap, shift, or [otherwise reduce](#) the RFS compliance burden on PES.

But there are many other challenges.

**Low Utilization.** As shown in this chart, the non-inland east coast portion of [PADD 1](#) has the lowest refinery utilization rates in the country ([EIA Data](#)), indicating less competitive refining capacity. PES is the largest East Coast refiner, and likely contributes significantly to these data.



**Capital Investments Needed.** As mentioned in the [first blog](#) of the series, the Chapter 11 plan includes an infusion of \$230 M of new capital, but it is unclear how this capital will be used. PES notes \$139 to \$191 million in annual capital spends and turnarounds, ([Exhibit E](#)) plus is likely to require capital investments related to regulatory compliance with air quality maintenance, for example:

**Compliance with Tier 3 Standards.** EPA's Tier 3 motor vehicle standards established more stringent vehicle emissions requirements expected to reduce the sulfur content of gasoline beginning in 2017. As of August 2016, the gasoline currently manufactured by the Philadelphia refining complex did not fully meet the Tier 3 requirements. ([F-46](#)) It is unclear whether these compliance investments occurred, or if they did not occur and PES secured a [compliance waiver](#) from the EPA.

**Compliance with International Maritime Organization (IMO) Low Sulfur Rules.** Reports indicate that PES has [not yet made the investment](#) to produce cleaner fuel for oceangoing vessels, which will be required to reduce sulfur emissions 85% by 2020. It is expected these vessels will opt to use cleaner fuel rather than invest in costly retrofits, creating opportunities for Gulf Coast refineries and [disadvantaging less complex East Coast refineries](#).

While PES suffers from low utilization rates and will likely require costly upgrades, it is also facing greater competition.

**Competition from Midwest Refineries:** Midwest refineries in PADD 2 have [invested heavily to increase capacity and their ability to process heavy crudes](#) in expectation of new Canadian feedstock priced at the Western Canada Select (WCS) that currently trades below WTI and Brent prices. [Morningstar](#) maintains that Midwestern refinery heavy crude crack spreads will continue to be more attractive than light crude spreads, as long as Canadian crude production stays high and pipeline takeaway capacity is constrained.

**Laurel Pipeline Reversal.** PES is [objecting to a proposal](#) pending at the Pennsylvania Public Utility Commission (PA PUC) that would allow the existing Laurel Pipeline to reverse direction of oil flow on a portion of its line. PES maintains that 20 percent of its total production is delivered to the Pittsburgh area on the Laurel line and flow reversal would materially damage its business. A final ruling on this issue is anticipated by the PA PUC sometime in Q1 to Q3, 2018.

**Adelphia Gateway Pipeline Project.** Morningstar believes the [PES and the Monroe refineries are the weakest performers on the East Coast](#). It may be that only one of the two refineries can survive (in 2017, Monroe hired consultants to [investigate various impacts related to closing](#) the refinery). If it is a race to the bottom, then the [recent application](#) to FERC to convert an existing oil pipeline to move Marcellus natural gas to southeastern Pennsylvania, including building a 16-inch lateral (the “Tilghman Lateral”) to deliver gas (presumably as fuel, not feedstock) to the Monroe refinery may not bode well for the future of PES.

A collection of other issues may negatively impact PES. For example: If and how the Federal Reserve finalizes its [proposed rule](#) to limit financial holding company activities in physical commodity activities. [PES believes finalizing this rule as proposed would harm its business](#).

The degree to which PES can negotiate an attractive extension or replacement to its collective bargaining agreement with the United Steelworkers (USW) union, that expires on September 9, 2018. ([footnote on 14](#)) Approximately 650 of PES’s 1,100 employees belong to USW.

The degree to which northeastern demand for heating oil [continues to decline](#) in the presence of attractive alternatives, like cheap Marcellus shale natural gas. ([3](#))

After December 31, 2023, PES will lose the attractive Keystone Opportunity Zone state and local tax benefits and will be subject to full state and local tax rates. ([F-39](#))

So, it seems the future may still be quite rocky for PES, even if it can successfully shed its past RIN obligations and emerge from Chapter 11. If PES is unable to successfully complete Chapter 11 reorganization, it may be forced to enter into Chapter 7 liquidation. The combined liquidated value of the refinery and rail terminal are around \$800 M.