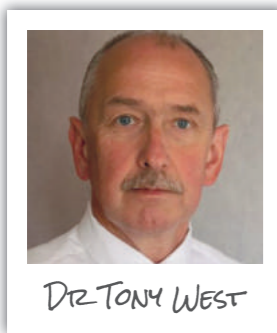




# 2015-2018 Electricity Purchasing Case Study

By Pulse Business Energy and  
Nottingham Express Transit





## About the Author - Dr Tony West

Dr Tony West has over 30 years' experience in the energy and power industry

Tony has formerly been Head of Trading for Scottish Power based in Glasgow and Npower's trading business. Prior to joining

Scottish Power, he worked at Sapient as Director of Business Consulting within the Trading and Risk Management practice.

As well as establishing Npower's (National Power's/ Innogy's) trading business, Tony was instrumental in the development of the utility's internal market/asset backed trading model. Tony conceived and led the introduction of many new innovative B2B risk management product

offerings; one such campaign was specifically recognised in the Utility Week Industry Achievement Awards, Marketing Initiative of the Year.

Recently Tony worked at Gazprom Marketing & Trading, developing their power activity as well as the power strategy across Europe for Gazprom in Moscow.

Tony has also worked in a variety of senior positions at BP, JP Morgan, RWE Trading, Standard Chartered Bank and smaller trading companies and hedge funds. Tony currently provides trading and risk management oversight for Pulse Business Energy's clientele.

## Background – 2012-2015 contractual arrangements

Prior to the Pulse Business Energy (PBE) arrangement starting from April 2015, NET purchased electricity on a fixed price basis for three years at a time starting April 2012. NET also fixed the non-commodity cost element up- front too.

At that time, the wholesale electricity market was in contango (i.e. forward prices were higher than nearby seasons) whereas flexible contracts were not readily available. Because of the forward price structure (showing forward year prices trading at increasingly higher levels) many TPIs (Third party Intermediaries, often referred to as brokers) encouraged business consumers to book extended fixed price contracts, ostensibly to achieve lower prices and reduce risk; unfortunately, the forward curve is often mistakenly thought of as a forecast.

Accordingly, while NET had a clear fixed cost for electricity, by fixing the full 3-year volume at one time, the Project faced the following risks:

- opportunity cost should prices reduce; contango markets are historically and theoretically consistent with over supply and a bearish market sentiment – more often than not implying prices are likely to drop throughout the forward curve.
- The timing of the 'trade' pricing: the contract may have been a better deal for the supplier/TPI rather than NET; in hindsight, the day of agreeing the price could be good or bad depending on market development post contract agreement.

In November 2013, PBE did a comparison of the previous contract prices and compared it to the forward contracts for the next period. Figure 1, below shows the baseload prices at the time NET fixed their 2012-2015 contract and the baseload equivalent prices NET would have achieved if fixing in November 2013 for the coming 2015-2018 3 year period.



## Foreward and Introduction - Adrian Wallace

Welcome to our flexible purchasing case study. This study recounts the purchasing processes and decisions made by Pulse and Nottingham Express Transit (NET) for the period 2015 to 2018.

NET consists of a 32-km long tram network in Nottingham, United Kingdom. The original tram line opened to public in 2004 and construction of a second phase consisting of two new lines started in late 2011 and reached completion in August 2015. Such extension more than doubled the size of the network and increased the annual electricity consumption to c. 18 MW per annum, thus making the energy purchase strategy a critical element of the Project.

Energy purchasing beyond 2015 became even more important to the success of service and required balancing purchasing risk with budget constraint to keep pricing for the commuters stable throughout the period and to enable NET to compete with other local public transport operators.

NET appointed Pulse in 2013 to manage and implement a purchasing strategy that could meet the objectives of best value and cost stability. Looking back on how the energy was purchased (now fully secured up to March 2018) we hope this case study will provide good insight to energy managers and procurement teams facing similar challenges on their respective projects.

### Strike price

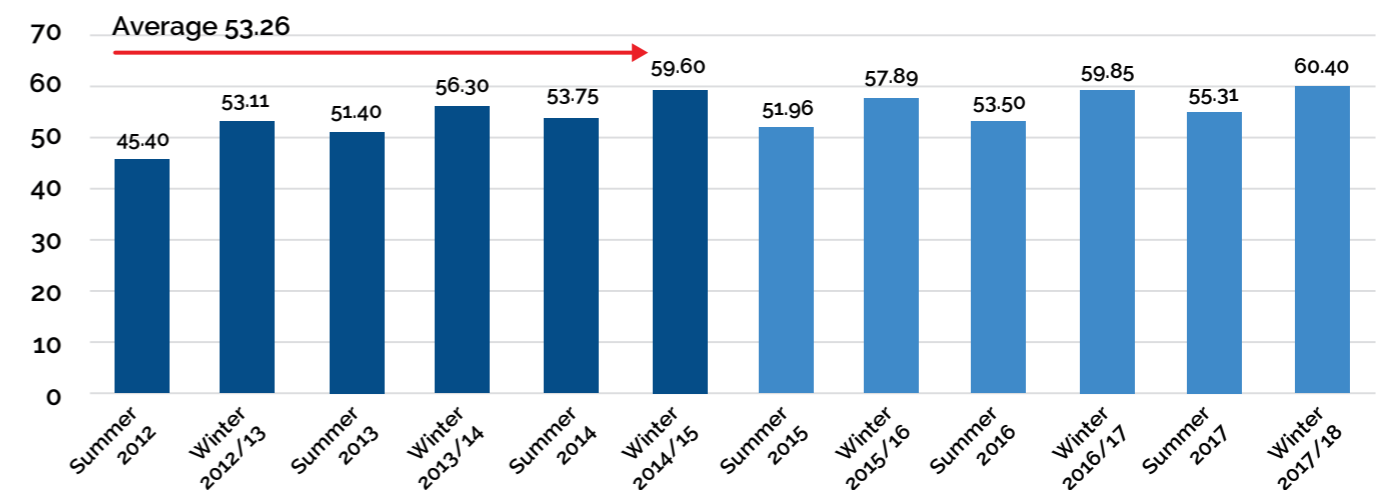


Figure 1. NET baseload equivalent 2012-2015 to 2015-18 comparison, November 2013:

The chart shows the baseload equivalent prices at the time of NET's previous contract compared to fixed prices for their next contract period as of November 2013.

## Review of 2012-2015 contract

Prior to agreeing a new arrangement with NET, PBE reviewed whether the fixed prices agreed previously could have been improved upon if the forward market structure had been properly taken in to consideration and if PBE's flexible purchasing approach had been utilised. While such a methodology, when looking with hindsight, is unlikely to achieve the lowest possible price (or that matter the highest), achieving a significantly better than average result should be expected.

As the market was in contango in 2012 (see Figure 2), this implied an oversupply structure leading to a general bearish sentiment and therefore indicating

that prices were likely to drop as time progressed. Consequently, in such a market it would generally be better to buy as late as reasonably possible while attempting to avoid unnecessary risk. Furthermore, purchasing in several lots, rather than at one time for the entire volume, will reduce the risk of being caught out by sudden adverse market movements and so avoid contracting all the volume at extremes in prices. The combination of PBE's flexible methodology would enable a more careful and considered approach with a better result.

### Forward curve at end of Feb 2012

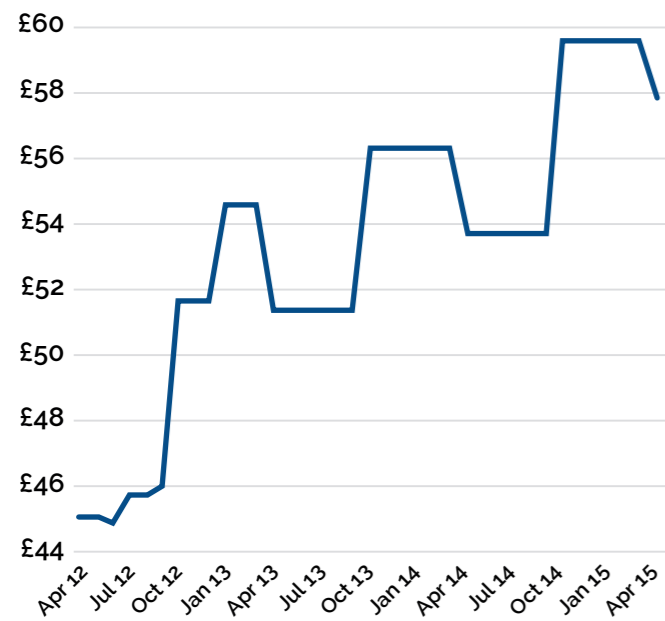


Figure 2. UK Electricity Market February 2012

The contango structure indicating a general bearish sentiment and the likelihood of progressively weaker market (lower prices)

As can be seen in Figure 3, the market evolved as anticipated, with electricity prices 1 month ahead of supply mostly lower than the forward curve at the start of the 2012-15 contract.

### Rolling annual forward curve

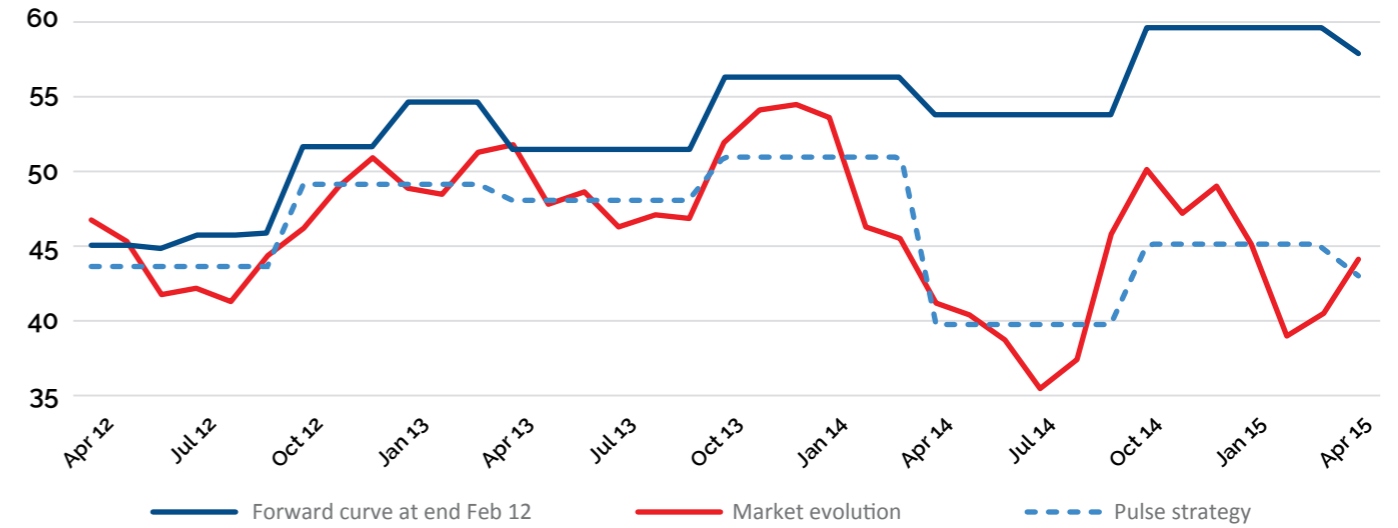
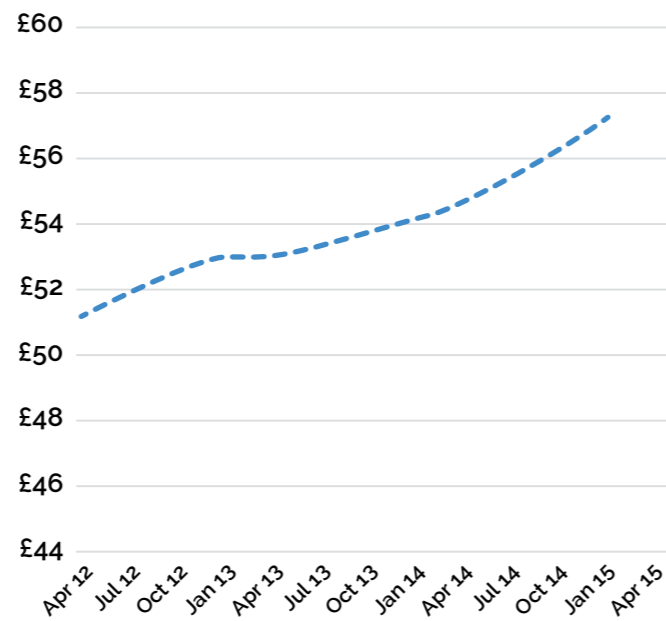


Figure 3. UK Electricity Market evolution post 2012 agreement

Furthermore, Figure 4 shows that the month ahead price generally traded lower than the annual price and certainly the annual average of monthly prices were lower than the annual price.

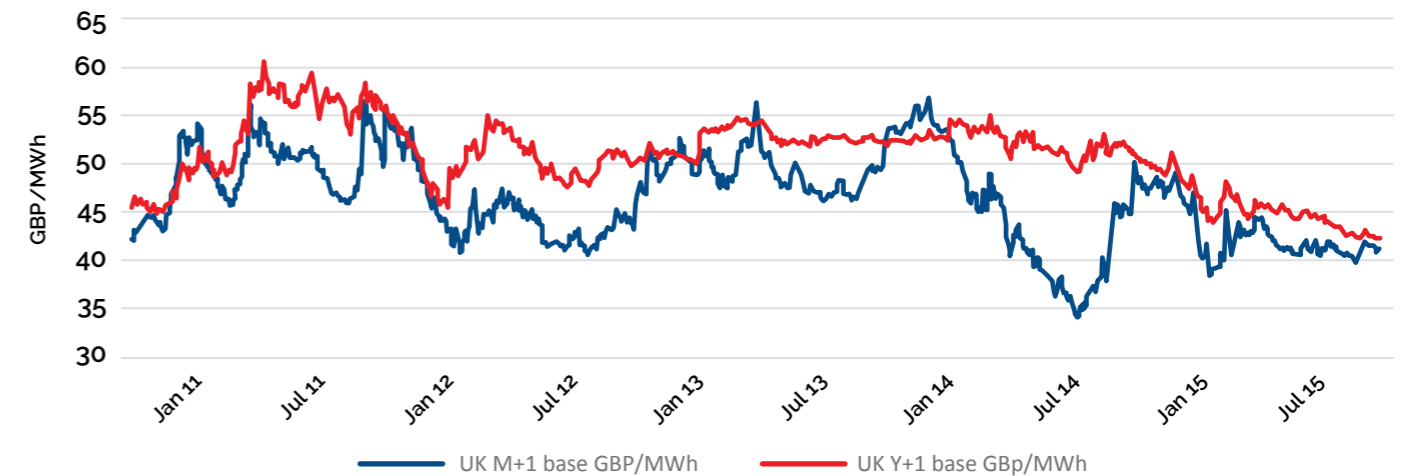


Figure 4. UK Electricity month ahead prices compared to annual traded prices

The contango structure of the market resulted in monthly prices generally trading lower than the annual prices.

The PBE base strategy in contango markets is to fix the price (buy) for shorter periods (say, monthly or quarterly) and later (nearer time of supply) rather than well in advance of the year of consumption. Also, such a strategy would normally be adjusted depending on market volatility and other market fundamentals to mitigate risk.

Assuming PBE's strategy had been employed from 2012-15, while in hindsight we can't be sure exactly what would have been done, on the basis of buying at the average of the month ahead price, purchases would have been between 5% and 25% lower; the dotted line in Figure 3 represents this strategy.

## 2015-2018 contractual arrangements: PBE agree sourcing for NET

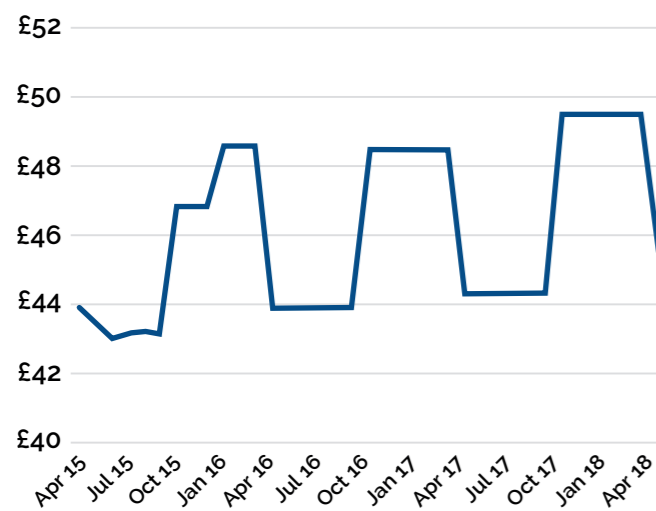
PBE proposed to NET a flexible purchasing approach for the 2015-18 electricity purchase arrangements with a default strategy that would be:

- i) driven by the market fundamentals and structure, such that in the then existing bearish (contango) market, volumes will be fixed closer to consumption and if fundamentals and market structure turn bullish (backwardated), purchasing will be accelerated.
- ii) Volumes will be split in to 'lots' in order to reduce exposure to one off market event.
- iii) The default strategy would be modified to meet the client's specific needs and to reflect changes in market sentiment
- iv) Non-commodity costs would also be reviewed during the supply tendering process and a decision whether to fix these costs would be agreed upon at the time of concluding supplier agreements.

This approach is designed to 'beat the market' in order to achieve a better than average market price, ensuring a competitive cost position rather than just aiming to beat historic budget levels. In the then falling markets, it was easy to beat last year's price but in bullish markets it would also be more challenging; aiming to beat the market would always maintain competitiveness verses ever changing market circumstances while keeping performance realistic verses budget plans.

At the time PBE agreed the current 2015-18 arrangement, in early 2015, the UK electricity market was still in contango (see Figure 5), and therefore still indicating over supplied fundamentals and weaker market sentiment.

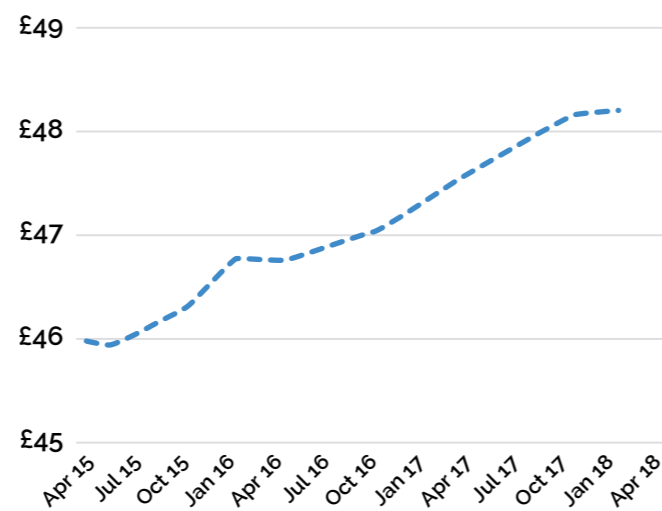
### Forward curve at end of Feb 2015



**Figure 5. UK Electricity Market February 2015**

The continued contango structure indicating a general bearish sentiment and the likelihood of a progressively weaker market (lower prices)

### Rolling annual forward curve



NET considered the new flexible approach being proposed by PBE and decided it was appropriate for several reasons. Electricity prices were now lower than the previous contract, having been higher in 2013, and appeared to be dropping further. NET wanted to try and achieve better prices than the forward prices, which were trading higher than the monthly prices. Essentially, NET wished to achieve lower prices overall and in consideration of the contango market, PBE's proposed flexible contract allowed fixing of price closer to consumption while the market remains weak. NET also supported PBE's risk-balanced strategy. By way of reference, and in order to judge the success of whether it was correct to move to a flexible approach from the previous fixed price approach, Figure 6 shows the baseload equivalent fixed price at the end of February 2015.

### Baseload equivalent prices end Feb 2015 as reference

Season	£/MWh
Summer 15	43.32
Winter 15	47.71
Summer 16	43.93
Winter 16	48.50
Summer 17	44.35
Winter 17	49.54

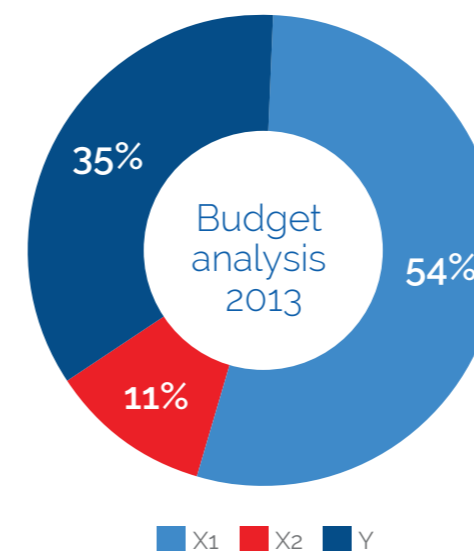
**Figure 6. UK Electricity Market equivalent prices, Feb 2015**

Baseload equivalent prices have been used for ease of comparison and to maintain confidentiality of specific contract and load shape details.

## Note on non-commodity costs

To better understand and budget for their Electricity Costs beyond 2015 Nottingham Trams would also need to separate their budget into energy cost and other non-commodity costs (see Figure 7).

Non-commodity costs will continue to rise; Figure 8 shows the anticipated changes to those known at that time up to 2020; in fact, the extent and type of these costs have further changed.



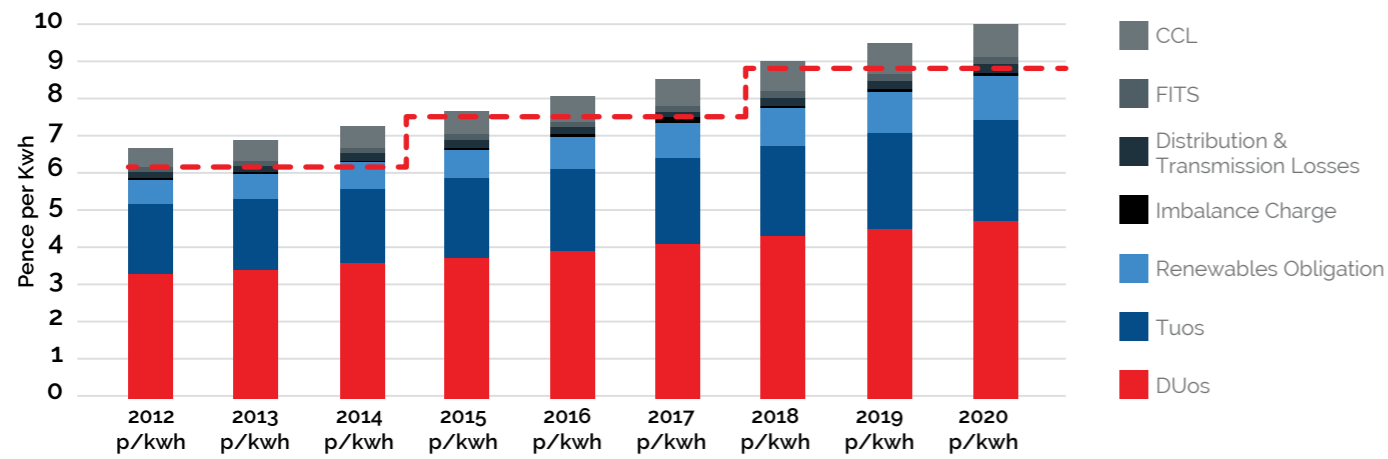
**Figure 7. Breakdown of budget analysis**

X1 & X2: non-commodity costs, taxes, levies and network costs  
Y: Wholesale electricity costs.

Financial planning and negotiation of these costs was possible through the supplier tender process to curb yearly exposure to these non-commodity costs. Competition between suppliers, via the tender process, allowed these costs to be fixed at the contract stage to secure budget security and best possible price for the period 2015-2018.

A tender exercise was run to compare X1 and X2 charges across suppliers offering fixed rates for these cost elements. The results showed that suppliers had differing predictions of risk associated with these costs and as a result the cost stack for the elements led to further opportunities to mitigate these charges with the supplier offering lowest risk premiums to fix these charges. As a policy fixed X1 charges (Distribution costs) were a sensible solution for NET as due to the nature of their operations they would be heavy peak time users and could not mitigate peak time usage.

It further transpired that the suppliers offering the lowest X2 costs (taxes and levies) underestimated the level of these increases and the X1 and X2 fixed tender provided NET with a 1.5% saving on the actual increases that occurred between 2015 to 2018.



**Figure 8. Expected increases in non-commodity costs from 2012-2020**

In reality, not only have the non-commodity costs gone up but the nature and type have also changed.

Figure 9. shows the evolution of the UK electricity price after the existing PBE electricity arrangement was agreed in 2015. As can be seen prices continued to drop until mid-2016. As can be seen prices continued to drop until mid-2016.

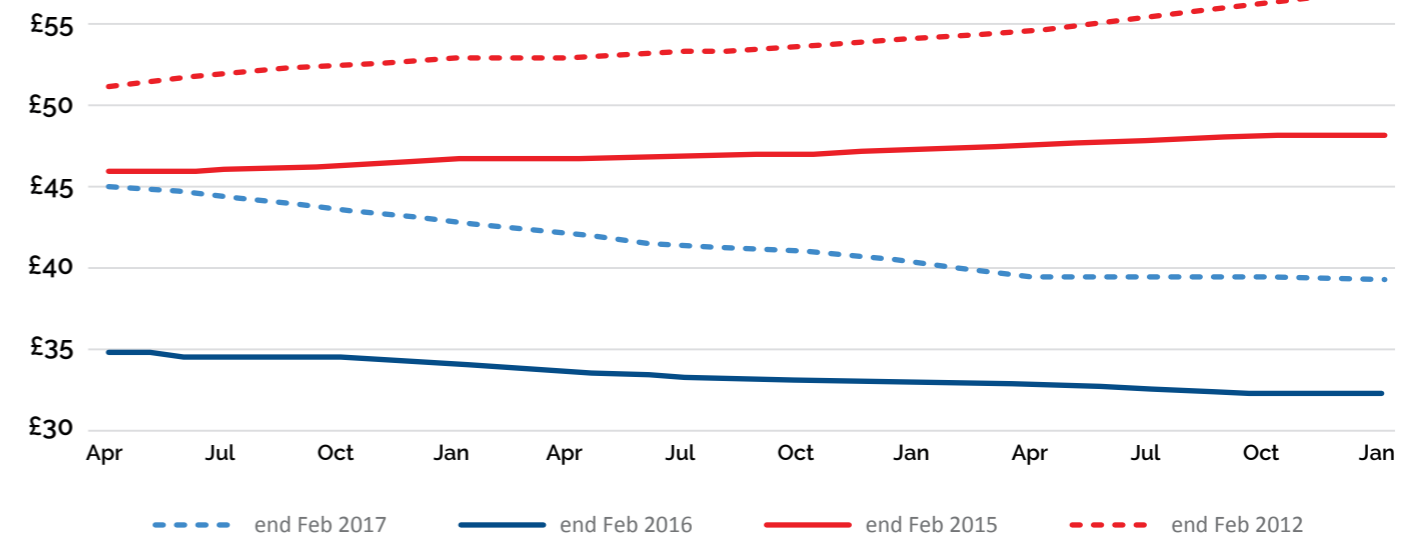


**Figure 9. UK Electricity Market evolution post 2015**

Baseload equivalent prices continued to drop until mid-2016, when the trend reversed and volatility significantly increased.

During the early part of the arrangement PBE optimised the flexible arrangements by fixing electricity prices during the month ahead of supply, thereby taking advantage of the dropping prices.

As prices dropped to the lows, the market structure reversed from contango in 2015 to backwardation in 2016 (see Figure 10.) reflecting the shifting structural change, stronger market fundamentals and the consequently more bullish market sentiment.



**Figure 10. Rolling Annual Electricity Forward Curves**

Changes in the forward curve, from contango to backwardation, evidenced the changing market sentiment.

During this time, in line with the proposed strategy, the forward price also changed. Purchasing actions were amended to match the market structure, moving from the initial month ahead purchases to buying slightly in advance of the month. As the forward curve continued to change, purchases moved from month to quarterly in advance and then seasonal and even further forward.

Eventually as the electricity market became solidly backwardated, purchasing accelerated so much that NET are now fully covered until the end of the contract

period, taking advantage of the backwardation to buy the forward years at discounts to the more nearby years.

Post completion of the NET purchases prices started to move up and eventually spiked to high levels on supply disruptions in EU, primarily led by concerns related to the French Nuclear power stations. By this time NET's volume had been full secured.

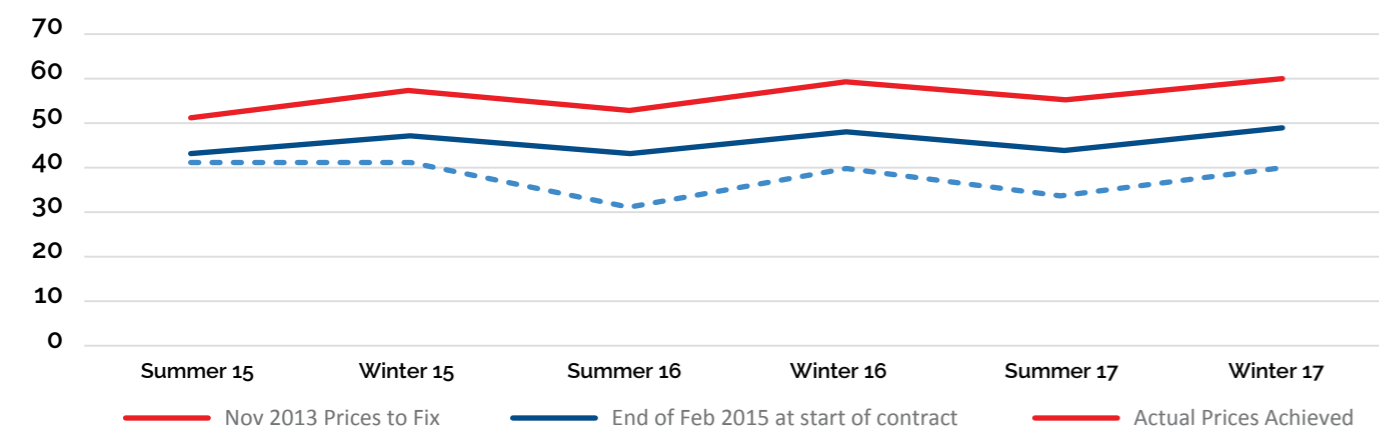


## Review of 2015-2018 contract performance

Now that NET's 2015-18 contract period is fully covered, it is possible to compare the performance to the previous approach of buying fixed price in advance. Figure 11 shows the comparison of NET's achieved baseload equivalent price in comparison to the seasonal prices available in 2015, consistent with NET's previous buying approach. Achieved prices are clearly well below the forward curve at the time of the contract start date in 2015.

Season	Nov 2013 Prices to Fix	Feb 2015 Prices to Fix	Actual Prices Achieved
Summer 15	51.96	43.32	41.74
Winter 15	57.86	47.71	42.04
Summer 16	53.5	43.93	31.73
Winter 16	59.85	48.5	39.85
Summer 17	55.31	44.35	34.13
Winter 17	60.4	49.54	40.45

### NET Baseload prices in £/MWh



**Figure 11. 2015-18 Contract performance**

Showing the saving between of the actual achieved prices from the flexible contract in comparison to the forward curve in 2015.

Because the flexible strategy utilised a methodology that changed with market fundamentals, even though market sentiment changed the flexible arrangement was still significantly better than NET's previous approach. Essentially, PBE's methodology enabled NET to take advantage of lower backwardated forward prices while managing risk through procurement of reduced volume sizes per transaction, avoiding any risk of being hit significantly as prices started to aggressively move up.

Of course, with perfect hindsight lower prices could possibly have been achieved if purchases were done all on the lowest price days. However, nevertheless even looking at buying over the lowest days, the results are still likely to be in the lower quartile of possible range of price levels.

The table below shows the cash savings based on the purchase of 22 MW per annum (11 MW per season).

	Nov 2013 Prices to Fix	Saving vs Actual	Feb 2015 Prices to Fix	Saving vs Actual	Actual Prices Achieved
S15	£571,560.00	£112,420.00	£476,520.00	£17,380.00	£459,140.00
W15	£636,460.00	£174,020.00	£524,810.00	£62,370.00	£462,440.00
S16	£588,500.00	£239,470.00	£483,230.00	£134,200.00	£349,030.00
W16	£658,350.00	£220,000.00	£533,500.00	£95,150.00	£438,350.00
S17	£608,410.00	£232,980.00	£487,850.00	£112,420.00	£375,430.00
W17	£664,400.00	£219,450.00	£544,940.00	£99,990.00	£444,950.00
		<b>£1,198,340.00</b>		<b>£521,510.00</b>	

## Conclusion

Before 2010, flexible buying was only offered to larger customers. However, certain supplier products enabled availability of flexible electricity and gas contracts to a wider range of customers from 2012.

We feel more energy brokers and procurement teams should utilise these products because they promote a greater understanding of the procurement process and result in more choices and buying opportunities.

Overlooking this purchasing option over a sustained period can often be to the detriment of the consumer due to the opportunity loss. The sustained engagement of flexible contracts also leads to better buying decisions and a more educated and skilled end user.

In simple terms had a fixed term deal been secured in Nov 2013 NET would have been £1,198,340 worse off over the 2015-2018 year term and had the fixed price been settled towards the start of the contract NET would have been £521,510.00 worse off.

Working closely with NET's finance and procurement team PBE was able to get the board level approval to change the purchasing strategy and culture at NET. These results assist NET in providing a sustainable world class transport facility to the city and people of Nottingham.

We hope this case study shows the savings that can be unlocked if the right understanding and right level of professional services are deployed in this area over a sustained period of time. We believe that the case study shows how expertise in the field of energy procurement needs continued growth and investments to increase the talent pool in this field and to allow other companies to access these currently niche services.

In 2016 Pulse launched its first energy trader apprenticeship scheme. We believe similar schemes are needed across the country to manage the needs of other businesses like NET whose energy costs will require continued optimisation in the years ahead.

### Additional notes:

As a consequence of contracting via a flexible arrangement, rather than an up-front fixed arrangement, NET were also able to exploit an embedded volume flexibility. As the supply contract progressed it became evident that volume requirements would end up being less than anticipated at the outset. The resetting/sell-back flexibility within the supplier arrangement, combined with the consumption tolerance, allowed NET to sell back some volume at a higher price than the purchase cost. This gave an added benefit of not needing to buy significant month ahead volumes during the large spike in prices at the end of 2016.



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