

Staythorpe Power Station ExCS Informal Notice - Appendix 1

7th November 2018

Our Ref: 2018 – Staythorpe Power Station ExCS

This Appendix relates to the proposed substitution of NTS Exit Capacity to Staythorpe NTS Exit Point from Silk Willoughby GDN (EM), Peterborough Power Station DC, Tatsfield GDN (SE), Farningham B GDN (SE), Farningham GDN (SE), and Shorne GDN (SE) NTS Exit Points.

1. Recipient selection:

The PARCA application in respect of Staythorpe power station for Enduring Annual NTS Exit (Flat) Capacity was received through a PARCA Exit Window triggered by Drax Power Station. National Grid received no further applications during this PARCA Window. The geographical area of both sites is the North East, Yorkshire & Lincolnshire (region 3 in the Gas Ten Year Statement).

2. Donor selection:

Substitution from individual donor NTS Exit Points were assessed by reducing the capacity at the most favourable NTS Exit Points that had Substitutable Capacity. The most favourable donor NTS Exit Points will normally be the furthest downstream NTS Exit Points from the recipient NTS Exit Point as measured by pipeline distance.

For the purposes of the NTS Exit Capacity Substitution analysis, six (6) donor sequences of NTS Exit Point sites were analysed to determine the best exchange rate.

The exit points identified as potential donor sites were as follows:

NTS Exit Point	Type	Obligated Capacity (kWh/d)	Unsold Capacity (at 1/04/23 (kWh/d)
Tatsfield	GDN (SE)	200,601,605	7,826,972
Farningham B	GDN (SE)	117,883,000	37,509,029
Farningham	GDN (SE)	135,120,000	48,496,593
Shorne	GDN (SE)	67,060,000	47,233,893
Horndon	GDN (SE)	46,410,000	13,102,331
Barking (Horndon) Power Station	DC (SE)	58,590,000	58,590,000
Matching Green	GDN (EA)	92,341,877	41,871,373
Silk Willoughby	GDN (EM)	3,273,238	1,070,148
Peterborough Power Station	DC (SE)	23,280,000	20,480,000
Wragg Marsh (Spalding) Power Station	DC (SE)	37,283,600	37,283,600
Gosberton	GDN (EM)	15,230,000	2,908,880
Kirkstead	GDN (EM)	1,210,000	351,297
Little Barford Power Station	DC (SE)	35,200,000	35,200,000
Peters Green	GDN (NT)	151,860,000	39,896,856
Peters Green South Mimms	GDN (NT)	197,176,511	32,300,466
Hardwick	GDN (SO)	123,699,000	28,564,617
Didcot Power Station	DC (SW)	137,760,000	137,760,000
Mappowder	GDN (SW)	44,675,218	10,013,650
Braishfield B	GDN (SO)	58,866,000	1,726,693
Braishfield	GDN (SO)	107,280,000	33,046,153

Ipsden 2	GDN (SO)	15,678,000	14,738,133
Ipsden	GDN (SO)	12,390,000	11,842,019
Winkfield (SO)	GDN (SO)	71,863,120	35,363,689
Winkfield (SE)	GDN (SE)	106,260,000	61,403,360
Winkfield (NT)	GDN (NT)	15,910,000	15,810,000

The pipeline distances to the potential donor NTS Exit Points are:

<i>From</i>	<i>To</i>	<i>Pipeline distance (km)</i>
Staythorpe Power Station	Tatsfield	318.99
	Farningham B	293.96
	Farningham	293.96
	Shorne	279.44
	Horndon	266.48
	Barking (Horndon) Power Station	266.48
	Matching Green	226.93
	Silk Willoughby	38.47
	Peterborough Power Station	102.96
	Wragg Marsh (Spalding) Power Station	133.36
	Gosberton	120.97
	Kirkstead	91.25
	Little Barford Power Station	147.2
	Peters Green	197.13
	Peters Green South Mimms	197.13
	Hardwick	199.29
	Didcot Power Station	250.76
	Mappowder	392.46
	Braishfield B	326.45
	Braishfield	326.45
Ipsden 2	245.9	
Ipsden	245.9	
Winkfield (SO)	274.92	
Winkfield (SE)	274.92	
Winkfield (NT)	274.92	

Because of these analyses, the final NTS Exit Points selected were as follows;

NTS Point	Type	Recipient / Donor
Staythorpe Power Station	DC (SE)	Recipient
Silk Willoughby	GDN (EM)	Donor
Peterborough Power Station	DC (SE)	Donor
Tatsfield	GDN (SE)	Donor
Farningham B	GDN (SE)	Donor
Farningham	GDN (SE)	Donor
Shorne	GDN (SE)	Donor

3. Network analysis: Supply & demand scenario

- Substitution analysis was conducted for the Gas Year 2023/24 as the first year the full capacity cannot be met by existing unsold capacity at Staythorpe Power Station.
- The analysis starting point is our 2023/24 1-in-20 peak day demand network. From this a South East sensitivity network is created, taking the most onerous credible demand levels for power stations (and other DCs), and GDN offtakes from sold and forecast levels for the South East zone as detailed in Section 5, and with South East supplies reduced to a credible minimum.
- The substitution network is created from a South-East sensitivity network, with the potential GDN NTS Exit Points in the area increased to obligation in accordance with the Methodology, as these were deemed to have a reasonable probability of being donors.
- Staythorpe NTS Exit Point was set at the level of prevailing Obligated Exit Capacity from April 2023 (0 kWh/d).

4. Enhanced Network

- Isle of Grain supply increased to 35 mcm/d
- Huntingdon compressor re-wheel
- Aylesbury compressor re-wheel
- Cambridge compressor re-wheel
- Chelmsford compressor re-wheel
- Diss compressor re-wheel

5. Exit points set at obligated, sold or otherwise:

- All South East DC sites are set at obligated level, with the remaining DCs being scaled back from the forecast so that the aggregate total matches the forecast total.
- All other potential donor DC sites as listed above increased to their obligated level in accordance with the substitution methodology.
- All GDN exit point potential donor sites as listed above increased to their obligated level. None of these sites had already been set at their obligated level.
- All other GDN NTS Exit Points are at Sold levels as booked through the annual NTS Exit (Flat) Capacity application processes.

6. Flow adjustments:

- Flow adjustments were made in accordance with Paragraph 45 of the Methodology.
- Flow adjustments are detailed in Section 3 above, the substitution network demand is 537 GWh/d, which is higher than the 1 in 20 peak demand (including sold capacity levels at GDN NTS Exit Points).

7. Summary of network analysis key parameter changes:

- No significant parameter changes were required between substitution networks.

8. Exchange Rate Validation

In order to validate that the above donor list and the sequence of substitution provides the best exchange rate, six different donor sequences were assessed. These are listed, with their respective exchange rates, in the following tables:

Sequence 1

Recipient NTS Exit Point	Donor NTS Exit Points	Capacity Donated (kWh/d)	Capacity Received (kWh/d)	Exchange Rate (Donor: Recipient)	Total Exchange Rate (Donor: Recipient)
Staythorpe Power Station	Mappowder	10,013,650	6,470,002	1.5477:1	1.5710:1
	Braishfield	33,046,153	20,768,247	1.5912:1	
	Braishfield B	1,726,693	1,084,417	1.5923:1	
	Ipsden 2	14,738,133	9,247,333	1.5938:1	
	Ipsden	11,842,019	7,430,583	1.5937:1	
	Winkfield	57,455,833	36,999,417	1.5529:1	

Sequence 2

Recipient NTS Exit Point	Donor NTS Exit Points	Capacity Donated (kWh/d)	Capacity Received (kWh/d)	Exchange Rate (Donor: Recipient)	Total Exchange Rate (Donor: Recipient)
Staythorpe Power Station	Silk Willoughby	1,070,148	1,349,996	0.7927:1	1.5321:1
	Peterborough Power Station	20,480,000	14,809,979	1.3829:1	
	Didcot Power Station	104,079,166	65,840,025	1.5808:1	

Sequence 3

<i>Recipient NTS Exit Point</i>	<i>Donor NTS Exit Points</i>	<i>Capacity Donated (kWh/d)</i>	<i>Capacity Received (kWh/d)</i>	<i>Exchange Rate (Donor: Recipient)</i>	<i>Total Exchange Rate (Donor: Recipient)</i>
Staythorpe Power Station	Tatsfield	7,826,972	5,489,997	1.4257:1	1.4879:1
	Farningham B	37,509,029	25,168,336	1.4903:1	
	Farningham	48,496,593	32,510,833	1.4917:1	
	Shorne	28,179,167	18,830,833	1.4964:1	

Sequence 4

<i>Recipient NTS Exit Point</i>	<i>Donor NTS Exit Points</i>	<i>Capacity Donated (kWh/d)</i>	<i>Capacity Received (kWh/d)</i>	<i>Exchange Rate (Donor: Recipient)</i>	<i>Total Exchange Rate (Donor: Recipient)</i>
Staythorpe Power Station	Silk Willoughby	1,070,148	1,349,996	0.7927:1	1.5122:1
	Peterborough Power Station	20,480,000	14,809,979	1.3829:1	
	Spalding (Wragg Marsh) Power Station	37,283,600	25,440,025	1.4655:1	
	Gosberton	2,908,880	2,009,995	1.4472:1	
	Little Barford Power Station	35,200,000	22,070,002	1.5949:1	
	Peters Green	27,060,001	16,320,002	1.6581:1	

Sequence 5

<i>Recipient NTS Exit Point</i>	<i>Donor NTS Exit Points</i>	<i>Capacity Donated (kWh/d)</i>	<i>Capacity Received (kWh/d)</i>	<i>Exchange Rate (Donor: Recipient)</i>	<i>Total Exchange Rate (Donor: Recipient)</i>
Staythorpe Power Station	Silk Willoughby	1,070,148	1,349,996	0.7927:1	1.4953:1
	Peterborough Power Station	20,480,000	14,809,979	1.3829:1	
	Spalding (Wragg Marsh) Power Station	37,283,600	25,440,025	1.4655:1	
	Gosberton	2,908,880	2,009,995	1.4472:1	
	Didcot Power Station	60,875,833	38,390,005	1.5857:1	

Sequence 6 (Selected)

<i>Recipient NTS Exit Point</i>	<i>Donor NTS Exit Points</i>	<i>Capacity Donated (kWh/d)</i>	<i>Capacity Received (kWh/d)</i>	<i>Exchange Rate (Donor: Recipient)</i>	<i>Total Exchange Rate (Donor: Recipient)</i>
Staythorpe Power Station	Silk Willoughby	1,070,148	1,349,996	0.7927:1	1.4645:1
	Peterborough Power Station	20,480,000	14,809,979	1.3829:1	
	Tatsfield	7,826,972	5,766,692	1.3573:1	
	Farningham B	37,509,029	25,198,333	1.4886:1	
	Farningham	48,496,593	32,814,167	1.4779:1	
	Shorne	4,710,000	2,060,825	2.2855:1	