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representatives, gas  
transporters, gas shippers, gas  
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value for all customers*

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Date: 22 March 2011

Dear colleague

### **Open Letter Consultation: Setting new revenue drivers, updating existing revenue drivers and adding new exit points to the Gas Transporter Licence**

This letter consults on three proposed changes to the Gas Transporter Licence (the "Licence"). These are to:

- set revenue drivers at the exit points at Tonna (Baglan Bay) and Pembroke (Phase 2). This would determine the revenues for National Grid Gas (NGG) in providing incremental capacity at these points.
- revise the revenue driver triggers at Marchwood and Pembroke (Phase 1). This would change the current level of incremental capacity that NGG needs to deliver to trigger additional revenues.
- add five new exit points to the Licence. This would include the new exit points in the licence with a zero baseline and is the first step in National Transmission System (NTS) users being able to request capacity at those points.

#### **The role of revenue drivers**

NGG is funded to provide baseline levels of capacity through its price control settlement. If NGG delivers additional capacity that is financially backed by user demand, ie incremental capacity, it automatically receives additional funding via revenue drivers.<sup>1</sup>

Gas shippers who wish to use the NTS must first buy capacity rights either to enter gas onto the NTS (entry capacity) or to take gas off the NTS (exit capacity). Users can buy exit capacity rights for different time periods at various application windows or auctions. Users wanting to buy incremental exit capacity can do so at the Annual Application Window held each July or via an ad-hoc application at other times in the year (or in the case of developers, that can reserve capacity via an Advanced Reservation of Capacity Agreement (ARCA)).

Before NGG can allocate incremental exit capacity at a particular exit point, that point must be included in the Licence. If reinforcement work is required to provide the additional flows, a revenue driver must be set for that exit point to fund the investment required.

Revenue drivers are set using three main steps:

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<sup>1</sup> Revenue drivers are parameters in the Licence that automatically adjust NGG's revenue allowances upwards in response to financially backed user demand for incremental capacity.

1. Modelling is done to see what, if any, reinforcement works are required on the NTS to accommodate the additional flows
2. Unit cost assumptions are applied to the reinforcement works to calculate the incremental cost
3. The unit revenue driver is calculated, and this figure is annuitised and then converted to the appropriate cost base.

### **Revenue driver setting for Tonna (Baglan Bay) and Pembroke**

NGG has had discussions with users of exit capacity at Tonna (Baglan Bay) (for gas to be delivered and used at Abernedd Power Station) and Pembroke Power Station who have indicated that they want incremental capacity for the following two projects:

- **Tonna (Baglan Bay):** 20.983<sup>2</sup> GWh/day from March 2015
- **Pembroke (Phase 2):** 20 GWh/day from October 2013. This is in addition to the 103.2 GWh/day already signalled via an ARCA ie Pembroke (Phase 1). In this letter we refer to this additional request of 20 GWh/day at Pembroke as Phase 2.

NGG has identified that reinforcement work will be required for these capacity requests and therefore a revenue driver is needed in the Licence for users to participate in the exit capacity application process. We therefore need to determine the revenue drivers for these two projects.

#### *Derivation of revenue drivers*

After the July 2010 Application Window, NGG requested that Ofgem set revenue drivers for the two projects listed above and include these in the Licence.

In August 2010 Ofgem asked NGG to do the relevant modelling. NGG's modelling is based on certain assumptions which are set out in detail in Annex 1. It broadly conforms to the assumptions we set out in our request in August 2010, though Ofgem had concerns over the entry flow assumption used for Milford Haven.

#### *Issue*

Milford Haven is a Liquefied Natural Gas (LNG) import terminal which began commercial flows of gas onto the NTS in October 2009. It has 950 GWh/day of entry capacity and is located in South West Wales, close to both Abernedd and Pembroke power stations. Therefore, the flow assumption at Milford Haven has a significant impact on the potential reinforcement costs for incremental flows in South Wales. NGG's modelling assumed entry flows at Milford Haven of 166 GWh/day.<sup>3</sup> This was the same flow assumption NGG used in a similar revenue driver setting exercise in 2009, before commercial flows began at Milford Haven.<sup>4</sup> When NGG did this current round of modelling in September 2010 it considered that using flow data at Milford Haven from high demand days over one winter was not enough to give confidence in the level of flows that could be guaranteed in future. Ideally NGG would like data from high demand days over at least two winters.

#### *Ofgem's provisional view*

Ofgem considers this flow assumption to be very conservative in light of our own analysis, which is set out in detail in Annex 3. We are of the view that there have been sufficient days of high national demand since Milford Haven has been operational to give confidence in any analysis based on this dataset. There have been 57 high demand days in winter

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<sup>2</sup> The amount of incremental capacity initially required at Tonna (Baglan Bay) was for 20.4 GWh/day. This was recently revised to 20.983 GWh/day. This has no impact on the amount of reinforcement work required and only a marginal impact on the unit revenue driver.

<sup>3</sup> Annex 2 provides further detail on NGG's entry flow assumptions.

<sup>4</sup> NGG requested revenue drivers for Abernedd Power Station, Barking and Coryton in 2009. Ofgem consulted on setting these revenue drivers in August 2009. However, we only added revenue drivers for Barking and Coryton in April 2010 because developers at Abernedd were uncertain of the quantity and timing of capacity requirements. So we postponed setting the revenue drivers there until there was greater certainty. Hence we are now setting the revenue driver for Tonna (Baglan Bay) which will deliver gas to Abernedd Power Station.

2009/10 and 2010/11 compared to 20 high demand days in winter 2007/8 and 2008/9. Applying NGG's analytical method to Milford Haven flows on high demand days from 2009 to 2011 suggests that flows of 383 GWh/day or above would be likely on 95 per cent of such days.

This provides confidence in the Milford Haven flows in winter. We also need to be confident of the Milford Haven flows in summer, since summer flow patterns at LNG import terminals are less well known. We calculated the capacity utilisation rates<sup>5</sup> for summer 2010 and used these to forecast flows in 2013/14 (the year which is being modelled). This suggests that Milford Haven flows could be expected to be above 327 GWh/day on 84 per cent of summer days.

Our view that Milford Haven summer flows should match requirements for these projects is underpinned by three further factors:

- NGG recently submitted its Financial Business Plan Questionnaire (FBPQ) to Ofgem as part of the work on the roll-over of the fourth Transmission Price Control Review (TPCR4). This stated NGG's forecast minimum deliverability of 313 GWh/day flows at Milford Haven in 2013/14.
- Electricity demand is first met by power stations higher up in the merit order (ie those with lower costs). Nuclear and renewable generators are typically higher in the merit order than gas and coal, and so we would expect a significantly reduced demand in summer from these gas fired projects. Any modelling of incremental gas flows at full load would overestimate the flow requirements of power stations in summer and therefore the reinforcement works of any modelling.
- We have also noted that Milford Haven flows are amongst the most responsive to changes in national demand, so in the event of an abnormal summer demand requirement, we think it likely that Milford Haven flows would increase to react to any shortfalls.

These suggest that modelling based on a flow assumption of 300 GWh/day should give confidence for winter and summer flows. **This is our provisionally preferred approach.**

### *Options*

In the table below we present four different Milford Haven flow assumptions and the revenue drivers for the reinforcement works needed for each of the two projects. These flow rates are:

- Option 1a: 166 GWh/day
- Option 1b: 200 GWh/day
- Option 1c: 250 GWh/day
- Option 1d: 300 GWh/day

### *Unit revenue driver values*

NGG provided the reinforcement works for Option 1a as part of its initial submission in October 2010. Ofgem asked NGG to do the modelling using flow assumptions of 200, 300 and 389<sup>6</sup> GWh/day on 3 November 2010 and NGG provided its analysis on 30 November 2010.

The unit cost assumptions applied to the reinforcement works are the same as those used in setting revenue drivers at TPCR4 and more recently as requested at Canonbie, Gilwern, Barking and Coryton.<sup>7</sup> This is for reasons of consistency with the previous approach and we

<sup>5</sup> Where this is the ratio of used capacity to booked capacity.

<sup>6</sup> When Ofgem asked NGG to do this modelling on 3 November 2010, data from winter 2009/10 gave a Milford Haven flow of 389 GWh/day. When this method was extended to include data to 2 January 2011 the method gave a Milford Haven flow of 383 GWh/day.

<sup>7</sup> See the Ofgem decision letters 'Determining revenue drivers for entry and exit points: Canonbie and Gilwern' published on 29 May 2009 with reference number 58/09 and 'Determining revenue drivers for exit points: Abernedd, Barking and Coryton' published 18 March 2010 with reference number 36/10, which are both published on our website [www.ofgem.gov.uk](http://www.ofgem.gov.uk).

do not consider that unit prices have changed significantly since then to merit a review of the unit costs.

In order to estimate the cost of the reinforcement works for Option 1c (250 GWh/day flows) we have taken the mid-point between the costs for Option 1b (200 GWh/day) and Option 1d (300 GWh/day).

**Table 1: Licence revenue driver figures under various options, 2005/6 prices**

£/GWh/year	Option 1a	Option 1b	Option 1c	Option 1d
Milford Haven flows (GWh/day)	<b>166</b>	<b>200</b>	<b>250</b>	<b>300</b>
Pembroke (Phase 2)	106,974	21,525	11,415	1,305
Tonna (Baglan (Bay) – Phase 1	108,801	24,993	13,118	1,243

**Views sought**

- 1. Do you agree with our provisionally preferred approach to assume flows of 300 GWh/day at Milford Haven for the modelling to identify the reinforcement work needed to accommodate the incremental flows, ie Option 1d? Please provide reasons for your view.**
- 2. Are there any other factors we should consider? Please provide these.**

**Revision of revenue driver triggers at Marchwood and Pembroke (Phase 1)<sup>8</sup>**

*Background*

At TPCR4 specific revenue drivers were determined for a number of larger exit capacity projects which were anticipated over the price control period. These revenue drivers took the form such that when a specified trigger amount of incremental exit capacity was released NGG would earn a specified amount of annual revenue for a fixed five year period. Revenue drivers in this form were set in the Licence for Marchwood and Pembroke (Phase 1) as per the values in Table 2, eg if 87 GWh/day of incremental capacity was released at Pembroke (Phase 1) then NGG would earn £6.4 million each year for five years.

**Table 2: Marchwood and Pembroke (Phase 1) revenue driver values, 2005/6 prices**

	Licence project description (incremental capacity)	Annual revenue driver (£)	Capacity agreed in the ARCA
Marchwood	45 GWh/day	4,500,000	39.84 GWh/day
Pembroke (Phase 1)	87 GWh/day	6,400,000	103.2 GWh/day

ARCAs are agreements between NGG and NTS users. They oblige NGG to release an agreed amount of exit capacity whilst committing the developer/user to pay NGG in respect of lost revenue should it later decide it no longer wants the capacity. Since TPCR4 NGG has entered into ARCAs with developers at both Marchwood and Pembroke (Phase 1).

*Issue*

The amounts of capacity that the users requested in the ARCAs differ from the project description in the Licence. For example, the Marchwood shipper signed an ARCA for 39.84 GWh/day of exit capacity, whilst the trigger to provide NGG with the revenue driver allowance is for 45 GWh/day of capacity to be delivered.

This creates a mismatch between the project description capacity values in the Licence, which trigger the additional revenues for NGG, and the amount agreed in the ARCA. In the example of Marchwood, if NGG delivers the 39.84 GWh/day capacity, as agreed in the ARCA, then it is not enough to trigger the allowance of £4.5m of revenue to NGG (since this is less than the 45 GWh/day trigger as set out in the Licence project description). This also creates some ambiguity in the application of the revenue driver for Pembroke (Phase 1).

<sup>8</sup> For the purposes of this consultation Pembroke (Phase 1) refers to the 103.2 GWh/day signalled already via an ARCA.

There are two main options, these are:

- Option 2a: retain the status quo
- Option 2b: revise project descriptions in the Licence to reflect the ARCA amount

#### *Ofgem provisional view*

**Our provisionally preferred approach is Option 2b** which is to replace the project description values in the Licence with the amounts of capacity agreed in the ARCA. Our initial view is that it constitutes a pragmatic response to the divergence between the capacity amounts in the project description in the Licence and that agreed in the ARCA. If NGG delivered 39.84 GWh/day at Marchwood, as agreed in the ARCA, under the current project description it would not trigger the revenue driver and NGG would not be able to recover the costs from delivering the incremental exit capacity amount. This would not allow NGG to finance its duties of connecting and conveying gas to premises where it is economical to do so. The Authority, when carrying out its duties, must have regard to the need to secure that licence holders are able to finance their activities. Likewise it appears sensible to update the project description for Pembroke (Phase 1) to avoid any ambiguity and reflect the current situation.

At TPCR4 certain investment options were identified to deliver the 45 GWh/day and 87 GWh/day of incremental exit capacity at Marchwood and Pembroke respectively involved certain reinforcement works. NGG has confirmed that these are still relevant in delivering the slightly reduced amount of 39.84 GWh/day of incremental exit capacity at Marchwood and the increased amount of 103.2 GWh/day at Pembroke (Phase 1).

We consider that the impacts on charges from Option 2b would reflect the underlying costs and usage of the NTS. In terms of the charging implications, the fact that the same System Operator (SO) revenue would be collected for the Marchwood project despite the reduced flows would, in its own, result in a marginally higher SO commodity charge. The opposite would be the case for the Pembroke project. We expect that if both projects were to go ahead, there would be no net impact on SO commodity charge.

#### **Views sought**

- 3. Do you agree with our provisionally preferred approach to revise the project descriptions in the Licence to reflect the amounts signed in the ARCA, ie Option 2b? Please provide reasons for your view.**
- 4. Are there any other factors we should consider? Please provide these.**

#### **Addition of new exit points to the Licence**

To allow a shipper to provide a signal for incremental exit capacity at a new exit point, the exit point needs to be included in the Licence. Where NGG identifies investment will be required at these exit points NGG will request a revenue driver be included in the Licence.

Following discussions with users, NGG has requested that a number of exit points be added to the Licence (with zero baseline capacity). These are at:

- Deborah Storage (Bacton)
- Tilbury Power Station
- Willington Power Station
- Cockenzie Power Station
- Saltfleetby Storage (Theddlethorpe)

Adding the exit points to the Licence has no impact on NGG's allowed revenues at this point.

**Our provisionally preferred approach is to add these five new exit points to the Licence.**

### ***Views sought***

**Do you agree with our provisionally preferred approach to add the five new exit points to the Licence? Please provide reasons for your view.**

### **Next steps**

We are now seeking views on the three issues set out above, specifically on our provisionally preferred approaches of:

- Using a flow assumption at Milford Haven of 300 GWh/day in the modelling to identify the reinforcement work required to accommodate incremental flows at Pembroke (Phase 2) and Tonna (Baglan Bay) ie Option 1d
- revising the revenue driver project description in the Licence for Pembroke (Phase 1) to 103.2 GWh/day and for Marchwood to 39.84 GWh/day to reflect the amounts agreed in the ARCA ie Option 2b
- adding five new exit points to the Licence

We welcome comments from interested parties on the above issues and any other points of relevance. We are asking for responses by **20 April 2011**.

Unless marked confidential, all responses will be published by placing them in Ofgem's library and on its website [www.ofgem.gov.uk](http://www.ofgem.gov.uk). Respondents may request that their response is kept confidential. Ofgem shall respect such requests subject to any obligations to disclose information, for example, under the Freedom of Information Act 2000 or the Environmental Information Regulations 2004. Any respondent who wishes their response to remain confidential should clearly mark the response to that effect and give their reasons for confidentiality. It would be helpful if responses could be submitted both electronically, to [Gas.TransmissionResponse@ofgem.gov.uk](mailto:Gas.TransmissionResponse@ofgem.gov.uk), and in writing. Respondents are asked to put any confidential material in appendices to their response.

Subject to consideration of responses, we expect to follow up this consultation with a Notice under section 23 of the Gas Act 1986 in April 2011, such that the Licence could be changed by May 2011.

If you have any comments or questions on this letter, please contact Richard Miller on +44 (0)141 331 6013 or [Richard.Miller@ofgem.gov.uk](mailto:Richard.Miller@ofgem.gov.uk) in the first instance.

Yours faithfully

**Hannah Nixon**  
**Partner, Transmission and Governance**

## Annex 1 – Modelling request to National Grid Gas (NGG)

- A. For **Tonna (Baglan Bay)**, to provide Ofgem with a list of work projects which would be required for an incremental exit capacity amount of 20.983 GWh/day<sup>9</sup> at the National Transmission System (NTS) exit point at Tonna (Baglan Bay), to the level of detail specified below.
- B. For **Pembroke (Phase 2)**, to provide us with a list of work projects which would be required for an incremental exit capacity amount of 20 GWh/day at the NTS exit point at Pembroke, to the level of detail specified below. This is in addition to the 103.2 GWh/day already requested at Pembroke via an Advanced Reservation of Capacity Agreement (ARCA).

For each project, Ofgem requested the following level of detail in terms of the NTS reinforcement work required:

- Additional compressors (in MW)
- Additional NTS pipelines, highlighting any pipeline required for connection purposes to the NTS (by diameter and length)
- Work to modify the pressure at the offtake point and associated cost
- Any other relevant work and associated cost
- Confirmation of the treatment of any connecting pipeline as to whether this is to be built by the developer (and whether this is then to be sold to NGG or another gas network owner) or by NGG itself

For each project, the modelling work to provide Ofgem with the list of work projects used the following assumptions (which reflect those used previously):

- **Number of years modelled:** 2013/14
- **Base network:** model the 2013/14 physical network using the information used in the most recent Ten Year Statement (TYS), ie 2009
- **Demand:**
  - **National Gas Distribution Network (GDN) assumptions:** 2013/14 exit capacity allocations (from 2009 Annual Application Window)
  - **Local GDN assumptions:** the higher of (a) 2013/14 exit capacity allocation (b) baseline obligations
  - **National Direct Connect (DC) assumptions:** peak forecast from NGG's internal forecasts<sup>10</sup>, interruptible loads off, storage and interconnectors not exiting
  - **Adjacent DC assumptions:** obligated levels plus exit capacity secured via 2009 Annual Application Window or via ARCA/commercial agreement
- **Balancing network:** least helpful supply balancing method used
- **Supply:** model the above with the 'Low local supply' supply/demand scenarios for 2013/14 from the 2009 planning cycle

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<sup>9</sup> See footnote 2.

<sup>10</sup> The 2009 Transporting Britain's Energy (TBE) figures (published June 2009) were used in this analysis for national DC demands.

## **Annex 2 – NGG’s modelling of Milford Haven flows and setting of ‘low local supply’ value**

In August 2010 Ofgem gave specific assumptions to NGG on which to base the modelling of reinforcement costs for the two projects – Pembroke (Phase 2) and Tonna (Baglan Bay). In September 2010 NGG gave us the initial results of the modelling as per our request. An issue arose relating to the supply flow assumptions. The supply flow assumption used was that of a ‘low local supply’. This assumes low flows of gas at entry points close to the exit point under investigation. In the case of Pembroke (Phase 2) and Tonna (Baglan Bay) this relates mainly to supply flows at Milford Haven.

NGG’s approach to calculating the low local supply value is to take days of high national demand (NGG assumes this is when demand exceeds 400 mcm/d or 4,332 GWh/day). It then ranks the flows at the relevant local supply point and selects the value at the fifth percentile ie if there are 100 observations ranked in order it would choose the value ranked five places from the bottom. NGG states that this gives sufficient confidence that at least this level of supply will materialise at the entry point on high demand days. NGG states that ideally it wants data from at least two previous winters to give it sufficient confidence in the low local supply assumption.

As Milford Haven started to flow commercially from October 2009 there was only data from one winter when the modelling was first done in September 2010. NGG therefore did not use its low local supply method as considered the lack of data points would not give it sufficient confidence in the results. NGG decided to set the Milford Haven flow assumption at a conservative level of 166 GWh/day for reasons of prudence, though no further evidence has been provided as to why this specific value should be used. This was the same flow assumption NGG used for setting a revenue driver at Abernedd Power Station in 2009.<sup>11</sup>

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<sup>11</sup> NGG requested revenue drivers for Abernedd Power Station, Barking and Coryton in 2009. Ofgem consulted on setting these revenue drivers in August 2009. However, we only added revenue drivers for Barking and Coryton in April 2010 because developers at Abernedd were uncertain of the quantity and timing of capacity requirements and so we postponed setting the revenue drivers there until there was greater certainty. Hence we are now setting the revenue driver for Tonna (Baglan Bay) which will deliver gas to Abernedd Power Station.



## Annex 3 – Ofgem analysis

### Winter analysis

NGG had a concern that when it did its initial analysis in September 2010 there had not been enough high demand days since October 2009 (ie when operations began at Milford Haven) to give sufficient confidence in the results. NGG prefers to have data from high demand days over two winters to give it sufficient confidence. We considered this concern and set out our analysis below.

The number of high demand days in recent winters is shown in Table 3. This shows that by January 2011 there had been more days of high national demand in the winter periods that Milford Haven has been operational (winter 2009/10 and part of winter 2010/11) than in the two winters of 2007/8 and 2008/9. We consider this data set of 57 points should give sufficient confidence in any low local supply assumption based on it.

**Table 3: Number of high demand days in recent winters<sup>12</sup>**

Winter period	Number of high demand days
1-Nov-2007 to 23-Mar-2008	11
1-Oct-2008 to 31-Mar-2009	9
1-Oct-2009 to 31-Mar-2010	35
1-Oct-2010 to 2-Jan-2011	22

In January 2011 we asked NGG to use its method to derive the low local supply assumption for Milford Haven using the data from winter 2009/10 and 2010/11. In February 2011 NGG responded that this gives a low local supply flow assumption of 383 GWh/day.

This suggests that flows above 383 GWh/day can be expected to be delivered on a high demand day 95 per cent of the time.

### Summer analysis

But we want to ensure that sufficient gas flows arrive at the LNG import terminal at Milford Haven in summer as this is a relatively new source of gas. To do this we did some analysis on the summer flows observed at Milford Haven in 2010.<sup>13</sup>

### Utilisation rates

We calculated the utilisation rates of Milford Haven capacity for the various time periods. The utilisation rate is the actual flow divided by the capacity sold<sup>14</sup> after removing the effect of the Force Majeure.<sup>15</sup> We then calculated the statistical properties of the utilisation rates to develop confidence intervals – this is shown in Table 4.

We then took the utilisation rates in Table 4 and estimated the flows that would be anticipated in 2013/14, this was when the modelling was done for Abernedd and Pembroke (Phase 2). This was done by multiplying the utilisation rates by the capacity sold for summer 2014, ie 950 GWh/day<sup>16</sup>, which gives the results in Table 5. We assume the full 950 GWh/day will be available. The Force Majeure, resulted from the Pressure Reduction Installation (PRI) at Corse initially being refused planning permission. The PRI has recently been granted planning permission and it is anticipated that the pipeline will be fully

<sup>12</sup> Source: NGG

<sup>13</sup> The source of the data for this analysis was from NGG.

<sup>14</sup> Note this does not include sales of daily entry capacity at Milford Haven which were assumed to be very low or zero.

<sup>15</sup> NGG gave notification of a Force Majeure on 9 November 2007 such that from 1 January 2009 the maximum amount of capacity available at Milford Haven (950 GWh/day) would be reduced by approximately 200 GWh/day. To remove the impact of the Force Majeure we capped the capacity sold figure at a maximum of 750 GWh/day.

<sup>16</sup> For the period from Oct-2013 to Mar-2017 950 GWh/d of capacity has been sold at Milford Haven.

operational early in the winter of 2012/13.<sup>17</sup> As this is less than the 36 month exit lead time the 200 GWh/day should be available before any incremental exit capacity in respect of Pembroke (Phase 2) and Tonna (Baglan Bay) is delivered.

**Table 4: Capacity utilisation rates (%)**

	Max	Min	Mean	Standard Deviation	Confidence Intervals					
					68%		95%		99.7%	
					Mean +/- 1 standard deviation	Mean +/- 2 standard deviations	Mean +/- 2 standard deviations	Mean +/- 3 standard deviations	Mean +/- 3 standard deviations	Mean +/- 3 standard deviations
Winter 2009/10	83	13	51	14	37	65	23	79	9	93
Summer 2010	92	10	52	17	34	69	17	86	0	103
Winter 2010/11	101	40	66	16	50	82	34	98	17	114
All 3 periods	101	10	55	17	38	72	21	89	4	105

**Table 5: Projected flows (GWh/day)**

	Confidence Intervals					
	Mean +/- 1 standard deviation		Mean +/- 2 standard deviations		Mean +/- 3 standard deviations	
Winter 2009/10	353	617	220	749	88	882
Summer 2010	327	655	163	819	-1	983
Winter 2010/11	472	778	319	931	165	1085
All 3 periods	359	681	199	841	38	1002

The results suggest that on 84% of summer days flows will be above 327 GWh/day.

#### Correlation

We took the daily change in total flows onto the NTS as well as the daily change in flows onto the NTS at particular entry points or entry point types (we did this on an individual entry point basis for Milford Haven and Isle of Grain). We then took the correlation between the change in total daily flows and the daily change in flows for each of the entry point or entry point type considered. We did this for the two winter periods and the summer period for which we have data for Milford Haven flows. This was to assess the responsiveness of flows at different entry points or entry point types to changes in total demand.

Table 6 shows the results. For all days from October 2009 to January 2011 the correlation between the daily change in total supply flows onto the NTS and the daily change in flows at Isle of Grain was 0.57.

**Table 6: Correlation between total change in flow from previous day and that at entry point type**

	All days <sup>18</sup>	Winter 2009/10	Summer 2010	Winter 2010/11 <sup>19</sup>
Isle of Grain	0.57	0.50	0.61	0.63
Milford Haven	0.45	0.50	0.32	0.56
UKCS	0.09	0.07	0.13	0.05
Norway	0.28	0.26	0.33	0.24
Medium Range Storage	0.43	0.48	0.29	0.52
Other LNG	0.16	0.05	0.22	0.23
Long Range Storage	0.39	0.47	0.08	0.48
IUK	0.16	0.12	0.05	0.28
Short Range Storage	0.09	0.12	0.06	0.24
BBL	0.06	0.07	0.30	-0.08

<sup>17</sup> The time at which the pipeline will be fully operational is taken from a fax from NGG to all shippers on 24 December 2010, with reference DIS/001743/FSR/3037.

<sup>18</sup> This is from 1 October 2009 to 20 January 2011.

<sup>19</sup> This is from 1 October 2010 to 20 January 2011.

The table shows that Milford Haven is the second most responsive entry point or entry point type to changes in demand for all days and in summer 2010.